UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 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, 2023

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 001-39378

ORIGIN MATERIALS, INC.
(Exact name of registrant as specified in its charter)

Delaware	**87-1388928**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
930 Riverside Parkway, Suite 10 West Sacramento, CA	**95605**
(Address of principal executive offices)	(Zip Code)

(916) 231-9329
Registrant's telephone number, including area code

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

Title of each class:	Trading Symbol(s)	Name of each exchange on which registered:
Common Stock, $0.0001 par value per share	**ORGN**	**The NASDAQ Capital Market**
Warrants	**ORGNW**	**The NASDAQ Capital Market**

Securities registered pursuant to section 12(g) of the Act:

Common Shares
(Title of class)

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, 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.

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. ☐

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

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 voting stock held by non-affiliates of the Registrant on June 30, 2023, based on the closing price of $4.26 for shares of the Registrant's common stock as reported by the Nasdaq Capital Market, was approximately $526.3 million. Shares of common stock beneficially owned by each executive officer, director, and holder of more than 10% of our 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.

The registrant had issued and outstanding an aggregate of 145,917,486 shares of common stock as of February 23, 2024.

Documents Incorporated by Reference

Specified portions of the registrant's definitive proxy statement to be issued in conjunction with the registrant's 2024 Annual Meeting of Stockholders, which is expected to be filed not later than 120 days after the registrant's fiscal year ended December 31, 2023 ("Proxy Statement"), are incorporated by reference into Part III of this Annual Report on Form 10-K (this "Annual Report"). Except as expressly incorporated by reference, the registrant's Proxy Statement shall not be deemed to be a part of this Annual Report.

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WHERE YOU CAN FIND MORE INFORMATION

Investors and others should note that we announce material financial information to our investors using our investor relations website, which can be found at https://investors.originmaterials.com/, as well as press releases, SEC filings, and public conference calls and webcasts. We also use the following social media channels as a means of disclosing information about the company, our products, our planned financial and other announcements and attendance at upcoming investor and industry conferences, and other matters and for complying with our disclosure obligations under Regulation FD:

Origin X (f/k/a Twitter) Account (https://twitter.com/OriginMaterials)

Origin LinkedIn Page (https://www.linkedin.com/company/origin-materials)

Origin Facebook Page (https://www.facebook.com/people/Origin-Materials/100057468488825)

These channels may be updated from time to time on Origin's investor relations website. The information we post through these channels may be deemed material. Accordingly, investors should monitor them in addition to following our investor relations website, press releases, SEC filings, and public conference calls and webcasts. This list may be updated from time to time. The information we post through these channels is not a part of this Annual Report on Form 10-K.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Origin Materials, Inc. (“the Company”, “Origin”, “we”, “us” and “our”) makes forward-looking statements in this Annual Report (this “Annual Report”) and in documents incorporated herein by reference. All statements, other than statements of present or historical fact included in or incorporated by reference in this Annual Report, regarding the Company’s future financial performance, as well as the Company’s strategy, future operations, financial position, estimated revenues, and losses, projected costs, prospects, plans and objectives of management are forward-looking statements. When used in this Annual Report, the words “anticipate,” “believe,” “continue,” “could,” “estimate,” “expect,” “intends,” “may,” “might,” “plan,” “possible,” “potential,” “predict,” “project,” “should,” “will,” “would,” the negative of such terms and other similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain such identifying words. These forward-looking statements are based on management’s current expectations, assumptions, hopes, beliefs, intentions and strategies regarding future events and are based on currently available information as to the outcome and timing of future events. The Company cautions you that these forward-looking statements are subject to all of the risks and uncertainties, most of which are difficult to predict and many of which are beyond the control of the Company, incident to its business.

These forward-looking statements are based on information available as of the date of this Annual Report, and current expectations, forecasts and assumptions, and involve a number of risks and uncertainties. Accordingly, forward-looking statements in this Annual Report and in any document incorporated herein by reference should not be relied upon as representing the Company’s views as of any subsequent date, and the Company does not undertake any obligation to update forward-looking statements to reflect events or circumstances after the date they were made, whether as a result of new information, future events or otherwise, except as may be required under applicable securities laws.

As a result of a number of known and unknown risks and uncertainties, the Company’s actual results or performance may be materially different from those expressed or implied by these forward-looking statements. Some factors that could cause actual results to differ include:

- the effectiveness of the Company’s disclosure controls and procedures and internal control over financial reporting;
- the Company’s future financial and business performance, including financial projections and business metrics;
- changes in the Company’s strategy, future operations, financial position, estimated revenues and losses, projected costs, prospects and plans;
- the Company’s ability to scale in a cost-effective manner;
- the Company’s ability to raise capital, secure additional project financing and secure government incentives;
- the Company’s ability to complete construction of its plants in the expected timeframe and in a cost-effective manner;
- the Company’s ability to procure necessary capital equipment and to produce its products in commercial quantities;
- the impact of laws and regulations and liabilities thereunder, including any decline in the value of carbon credits;
- the Company’s ability to procure and store necessary raw materials, works in process, and finished goods;
- any increases or fluctuations in raw material costs;
- the Company’s ability to avoid, mitigate, and recover from business and supply chain disruptions
- the ability to maintain the listing of the Company’s common stock on the Nasdaq Capital Market (“Nasdaq”); and
- the impact of worldwide economic, political, industry, and market conditions, global health crises, geopolitical instability, global supply chain disruptions, increased inflationary pressure, labor market constraints, bank failures, and other macroeconomic factors.

Other risks and uncertainties set forth in this Annual Report, including risk factors discussed in Item 1A under the heading, “Risk Factors”.

RISK FACTOR SUMMARY

The following risk factors summary and other information included in this Annual Report should be carefully considered. The summary risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not currently known to us or that we currently deem less significant may also affect our business operations or financial results. If any of the following risks actually occur, our stock price, business, operating results and financial condition could be materially adversely affected. For more information, see item 1A titled “Risk Factors” for more detailed descriptions of each risk factor.

- We are an early stage company with a history of losses and our future profitability is uncertain.
- We may not manage growth effectively.
- Our business plan assumes we can secure substantial additional project financing and government incentives, which may be unavailable on favorable terms, if at all.
- Construction of additional plants beyond Origin 1 may not be timely completed or completed in a cost-effective manner or at all. Any delays in or failure to complete the construction of additional plants could severely impact our business, financial condition, results of operations and prospects.
- We plan to rely on a limited number of plants to meet customer demand for our future intermediate chemical sales.
- We have not yet produced our products in large commercial quantities.
- We rely on a limited number of customers for a significant portion of our near-term revenue.
- Our industry is highly competitive, and we may lose market share to producers of products that can be substituted for our products, which may have an adverse effect on our results of operations and financial condition.
- Increases or fluctuations in the costs of our raw materials or other operating costs may affect our cost structure.
- We are dependent on third-party suppliers and service providers, some of which are sole source suppliers, who may fail to deliver raw materials or equipment or fail to supply needed services at all or according to schedules, prices, quality and volumes that are acceptable to us, or we may be unable to manage these supplies effectively.
- We have entered into and may in the future enter into collaborations, strategic alliances, or licensing arrangements, which expose us and our intellectual property to competitive risks and limitations associated with third-party collaborations and that may not produce the benefits we anticipate.
- Compliance with extensive environmental, health and safety laws could require material expenditures, changes in our operations or site remediation.
- Our business relies on proprietary information and other intellectual property, and our failure to protect our intellectual property rights could harm our competitive advantages with respect to the use, manufacturing, sale or other commercialization of our processes, technologies and products, which may have an adverse effect on our results of operations and financial condition.
- We may face patent infringement and other intellectual property claims that could be costly to defend, result in injunctions and significant damage awards or other costs (including indemnification of third parties or costly licensing arrangements, if licenses are available at all) and limit our ability to use certain key technologies in the future or require development of non-infringing products or technologies, which may cause us to incur significant unexpected costs, prevent us from commercializing our products and otherwise harm our business.
- We rely on trade secrets to protect our technology, and our failure to maintain trade secret protection could limit our ability to compete.
- Our management has limited experience in operating a public company.
- We previously identified a material weakness in our internal control over financial reporting that we have concluded has been remediated, though we may identify additional material weaknesses in the future or fail to maintain effective internal control over financial reporting, which may result in material misstatements of our consolidated financial statements or result in failure to meet our periodic reporting obligations.

Part I

Item 1. Business

Overview

Origin is an innovative materials company with a mission to enable the world's transition to sustainable materials. We have pioneered a technology that has the potential to replace petroleum-based materials with decarbonized materials in a wide range of end products, such as food and beverage packaging, clothing, textiles, plastics, car parts, carpeting, tires, adhesives, soil amendments, fuels, and more. We have also developed other products that can enhance sustainability, such as our 100% PET circular caps and closures that can enable fully-recyclable PET containers and reduce waste through light-weighting, while providing enhanced performance such as greater oxygen and CO2 barrier properties that can increase shelf-life. These products complement our biomass conversion technology.

We were formerly known as Artius Acquisition Inc. ("Artius"). Artius was originally registered under the Companies Law of the Cayman Islands on January 24, 2020, as a special purpose acquisition company formed for the purpose of effecting a merger, capital stock exchange, asset acquisition, stock purchase, reorganization, or other similar business combination with one or more target businesses. On June 25, 2021, we consummated a merger pursuant to that certain Agreement and Plan of Merger and Reorganization, dated as of February 16, 2021 (as amended by the letter agreement dated March 5, 2021, the "Merger Agreement"), by and among Artius, Zero Carbon Merger Sub Inc., a Delaware corporation and a direct, wholly owned subsidiary of Artius (the "Merger Sub"), and Micromidas, Inc., a Delaware corporation doing business as Origin Materials ("Legacy Origin"). Pursuant to the terms of the Merger Agreement, Artius effected a business combination with Legacy Origin through the merger of Merger Sub with and into Legacy Origin, with Legacy Origin surviving as the surviving company and as our wholly-owned subsidiary. We refer to this as the "Merger" and, collectively with the other transactions described in the Merger Agreement, the "Business Combination." In connection with the closing of the Business Combination (such time is referred to herein as the "Effective Time"), we changed our name to Origin Materials, Inc.

Unless the context indicates otherwise, references in this Annual Report to the "Company," "Origin," "we," "us," "our" and similar terms refer to Origin Materials, Inc. (f/k/a Artius Acquisition Inc.) and its consolidated subsidiaries (including Legacy Origin). References to "Artius" refer to the predecessor company prior to the consummation of the Business Combination.

We believe that our biomass conversion technology can help make the world's transition to "net zero" possible and support the fulfillment of greenhouse gas reduction pledges made by countries as part of the United Nations Paris Agreement as well as corporations that are committed to reducing emissions in their supply chains.

Our proprietary biomass conversion technology can use sustainable feedstocks such as sustainably harvested wood residues, agricultural waste, wood waste and even corrugated cardboard to produce materials and products that are currently made from fossil feedstocks such as petroleum and natural gas. The ability to use sustainable feedstocks that are not used in food production is one of the things that differentiates our biomass conversion technology from other sustainable materials companies that are limited to feedstocks used in food production such as vegetable oils or high fructose corn syrup and other sugars.

We believe that products made using Origin's biomass conversion technology at commercial scales will be able to compete directly with petroleum-derived products on both performance and price while being sustainable. Due to abundant and renewable wood supplies that have historically stable pricing, our cost of production when using these feedstocks is expected to be more stable than potential competing platforms that use other types of feedstocks. We believe that end products made at commercial scale using our biomass conversion technology and wood feedstocks will have a significant unit cost advantage over products made from other low carbon feedstocks.

Our chemicals can be converted into both "drop-in" materials and new materials with differentiated functional performance. The "drop-in" products are chemically fungible with those produced from petroleum-based raw materials, and therefore these "drop-in" products can be fed into existing supply chains without modification to the equipment or production processes of our customers.

Origin's capability to produce carbon negative materials is protected by an intellectual property portfolio comprised of over 40 patents as well as trade secrets covering non-discoverable aspects of Origin's critical manufacturing processes.

We have developed strong partnerships with large, brand-name corporations determined to transition to sustainable materials to help meet their emissions reduction goals. For example, in 2017, we founded the "NaturALL Bottle Alliance" with Danone and Nestlé Waters, with PepsiCo joining in 2018, to accelerate the development of innovative packaging solutions made with 100% sustainable and renewable resources. Each member of the NaturALL Bottle Alliance has agreed to assist in establishing a supply chain for the production of the sustainable materials being developed by the NaturALL Bottle Alliance. Each member also agreed to provide technical equipment, resources, know-how and scientific skills necessary for the performance of the NaturALL Bottle Alliance's research and development program, and to be responsible for its own expenses. The members' agreements with us provided additional financial support for the research and development program and the commercialization of sustainable materials under development by the NaturALL Bottle Alliance. In addition to being customers, Danone, Nestlé and PepsiCo also invested in Origin. We have also significantly expanded our customer and partnership base over time to other industries, including relationships with Ford Motor Company, Mitsubishi Gas Chemical, PrimaLoft, Solvay, AECI, Stepan, Mitsui & Co., Packaging Matters, Minafin Group, LVMH Beauty, Mitsubishi Chemical Group, Kuraray, Revlon, ATC Plastics, Intertex, and others.

We also expect to accelerate the development of high-performance products through technology collaborations and joint development agreements, which are also referred to as service agreements, with current and prospective customers. In these relationships, we expect to supply expertise and materials, including products we manufacture at our Origin 1 plant, and our customer partner provides funding and its own expertise. Together, we work to test and establish market demand, product formulations, and specifications that meet the customer's needs in anticipation of that customer's purchase of commercial volumes of the co-developed product.

For example, we have created an all-PET (polyethylene terephthalate) closure, making "100% recycled PET" possible from cap to container to improve post-consumer recycling. Our PET caps and closures are more sustainable than common alternatives because they may be produced with any type of PET, from recycled PET to Origin's 100% bio-based, carbon-negative virgin PET. PET offers better oxygen and CO2 barrier than HDPE and PP, common materials used in the production of caps.

Our vision for the future is the replacement of fossil-based feedstocks and materials with non-food, plant-based feedstocks and materials, while capturing carbon in the process. Our decarbonizing biomass conversion technology potentially addresses an estimated $1.0 trillion dollar market opportunity, and we believe it can help revolutionize the production of a wide range of end products.

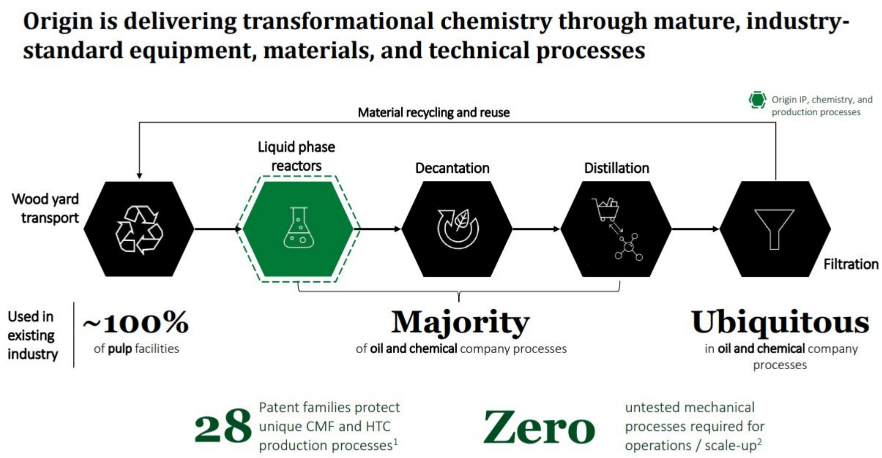
Our Biomass Conversion Technology

We have developed a proprietary biomass conversion technology to convert biomass, or plant-based carbon, into the versatile "building block" chemicals chloromethylfurfural ("CMF") and hydrothermal carbon ("HTC"), which we collectively refer to as Furanic Intermediates, as well as other oils and extractives and other co-products. Our biomass conversion technology is capable, using wood feedstocks, of producing CMF and HTC with a negative carbon impact. We believe these chemicals can replace petroleum-based inputs, lowering the carbon footprint of a wide range of materials without increasing cost or sacrificing performance.

CMF. CMF is a chemically flexible intermediate that can be converted into a variety of products, including paraxylene ("PX"), that can "drop in" to current supply chains to produce purified terephthalic acid ("PTA"), and subsequently polyethylene terephthalate ("PET"). Alternatively, CMF can be used to produce furandicarboxylic acid ("FDCA"), which can be converted into polyethylene furanoate ("PEF"). CMF and its derivatives can be used to produce numerous commodity and specialty chemicals. We have developed products made from CMF that can be used in applications such as food and beverage packaging and apparel and carpet fibers, and our product development pipeline includes applications such as adhesives, coatings and plasticizers.

HTC. HTC is a diverse, high-potential material. Current applications of our HTC include a drop-in, energy-dense solid fuel. HTC can also be calcined to produce a carbon-negative activated carbon for food and water treatment and filtration. Our HTC product development pipeline includes carbon black replacement for tires, foams and dyes, paint and coating applications, and agriculture and soil products. Notably, our carbon black has no detectable polyaromatic hydrocarbons, which are carcinogenic compounds found in carbon black produced from fossil feedstocks.

Our manufacturing process to produce CMF and HTC consists of front end feedstock handling, and subsequent liquid phase reaction with our catalyst mixture, followed by downstream separation processes to separate and purify CMF, HTC and other co-products, as described in the following diagram.



Oils and Extractives. An “oils and extractives” co-products stream is produced alongside our CMF and HTC. We have made progress toward development of new products and applications such as biofuels from this stream, which may be incorporated into the design of Origin 2 and future plants. We believe such cellulose-derived, low carbon intensity biofuels could potentially be used in transportation and marine fuel, industrial applications, and heat and power generation.

Market Opportunity

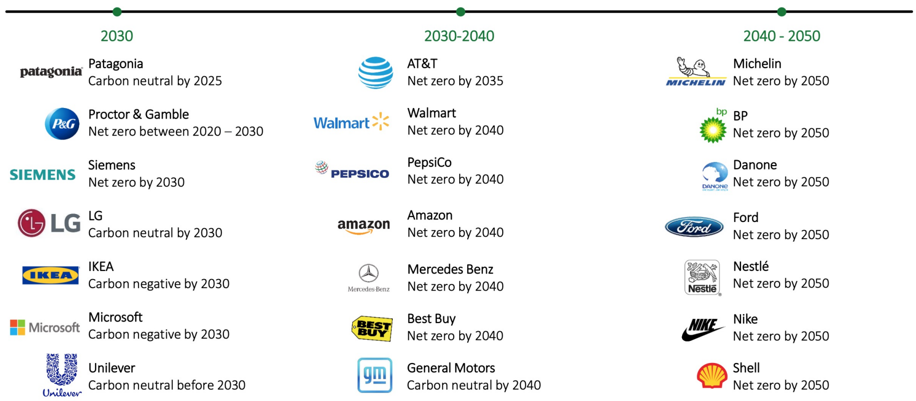
Global Decarbonization Commitments

We believe that increasing consumer awareness and growing governmental initiatives are driving a shift in the global community towards decarbonized materials. The UN Paris Agreement of 2015, joined by 194 countries and the European Union to date, includes commitments to limit the global average temperature increase by 2100 to well below 2°C compared to pre-industrial levels. To achieve this target, the UN estimated in 2019 that annual carbon dioxide (“CO2”) emissions must be 15 gigatons lower than current nationally determined contributions imply.

Many companies have already pledged to achieve net zero carbon targets, with some aiming to achieve that target within the next decade. Despite the progress in the shift to renewable energy generation and electric vehicles, we believe that reducing emissions from energy use alone is insufficient to achieve the goals and commitments established by companies and governments. Consequently, in the near-term, we believe that these companies will need to integrate decarbonized materials into their supply chains.

Our vision for the future is to replace fossil-based feedstocks and materials with sustainably harvested wood and other non-food, sustainable feedstocks. As a tree grows, it consumes existing CO2 from the atmosphere, and when it dies and decays, that CO2 is released back into the atmosphere. However, through our proprietary manufacturing process, we convert the wood into manufacturing and feedstock materials, thereby capturing that CO2.

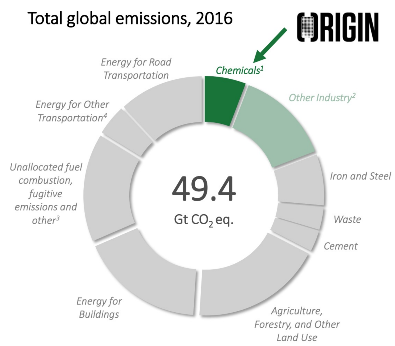
The graphic below highlights some of the notable companies that have made public commitments, either in the press or on their websites, to decarbonization and their respective decarbonization targets:



Note: Graphic not intended to represent that these are all Origin customers. Source: Press search and company websites.
As previously reported on a Rule 425 filing of Artius Acquisition, Inc. dated April 19, 2021.

Our Addressable Market

According to the International Energy Agency, the chemical sector is the largest industrial consumer of both oil and gas. Currently, organic chemicals are predominantly derived from fossil sources such as petroleum. These chemicals are used to produce a wide array of materials from paints to plastics, space suits to solar panels, and from medicines to electronics. According to a 2019 Barclays estimate, more than 10 million barrels of oil are consumed daily to create these materials, releasing massive quantities of new carbon into the atmosphere in the process. According to a 2018 report by The Association of Plastic Recyclers, for example, every kilogram of virgin fossil-PET has a life cycle global warming potential of 2.78 kilograms of carbon emissions. Our biomass conversion technology can enable companies to lower their overall CO2 emissions and meet their emissions reduction commitments by substituting decarbonizing Furanic Intermediates and their derivatives for all or a portion of the fossil-based content of materials like PET in their supply chains.



Source: Origin Materials estimates (2020), Climate Watch (2020), the World Resources Institute (2020), ourworldindata.org.

At full commercial scale, our biomass conversion technology can produce carbon-negative and low carbon replacements for chemicals that have many potential applications. Origin's near-term and long-term addressable markets together exceed $1.0 trillion.

$65+ billion immediate opportunity - We expect our all-PET caps to begin to address a greater than $65 billion global caps and closures market.

$390+ billion near-term market focus. We believe our technology can serve near-term markets representing an aggregate market opportunity that we believe is over $390 billion. These markets include polyesters for textiles, resin for packaging, solid fuels, activated carbon and carbon black for tires and polymer fillers.

$750+ billion long-term market focus. Our biomass conversion technology produces versatile chemical "building blocks" that we anticipate, in the long term, can be converted into products to replace a broad range of chemicals and materials representing an addressable market that we believe is more than $750 billion. These markets include paints, coatings, soil additives, advanced polyesters, epoxies, plasticizers, polyurethanes, elastomers, emulsions and solvents.

Competitive Landscape

We expect our products to compete with traditional, petroleum-based materials currently used in Origin's target markets, as well as compete with alternatives to these materials that both established and new companies seek to produce.

In our near-term markets, we expect to compete with global oil and petrochemical companies and large international diversified chemical companies. Several of these producers are seeking to develop materials from renewable sources that could compete with our products. Moreover, a number of established companies and new entrants have announced intentions to develop renewable alternatives for existing chemical products used in our near-term focus markets.

In addition to competition from producers of petroleum-based materials and renewable alternatives, we expect to face competition from recycled materials such as recycled PET ("rPET") in certain applications in our near-term focus markets. We do not believe that recycled materials will achieve the required scale and penetration to impact the market demand for our products before 2030 because recycling streams are significantly supply-constrained. We believe that improving the supply constraint for recycling will require substantial investments in infrastructure and fundamental changes to the existing entrenched governmental and institutional recycling systems and customer behavior and habits. Additionally, unless there are major changes to current technology and infrastructure, we believe that it will be difficult to implement 100% rPET material sourcing for many applications.

In the caps and closures market, we anticipate potential competition from other cap producers in the supply chain. At the same time, we believe there are opportunities for cooperation with these businesses to help commercialize and increase adoption of our all-PET caps and closures.

In our long-term focus markets, we expect to face competition from, among others, incumbents that include large chemical companies that continue to rely on petroleum-based feedstocks in their production processes.

Given our leading position in decarbonized materials, we also expect to compete with alternative technologies targeting different sources of emissions. These competitors include electric vehicles, renewable power generation, and food technology. While we do not anticipate competing directly for market share with producers of these technologies, we expect to compete for wallet share from customers looking to reduce overall carbon emissions throughout their supply chain and operations. In the long-term, once adoption of various technologies has increased and customers no longer have to prioritize different methods of reducing overall carbon emission, we expect only to compete against other materials producers.

Our Competitive Strengths

We believe that our biomass conversion technology can replace petroleum as the foundational feedstock for the materials economy. Our competitive strengths related to that technology. and to other Origin technologies, include:

- ***Flexible platform enables drop-in solutions serving a large addressable market.*** We believe that our biomass conversion technology is well-positioned to address a substantial global market that is just beginning to transition from petroleum-based materials to sustainable materials. Many of our products are drop-in replacements for traditional petrochemicals, enabling our customers to use our products in their existing manufacturing processes to produce chemically and physically identical end products with little to no change in customer behavior.

- ***Abundant, low-cost and historically price-stable feedstock.*** Our biomass conversion technology can use timber and forest residues such as pine pulpwood, which is currently abundant and renewable, as its base-case feedstock. The feedstock for the pulp industry in North America is plentiful and the cost has historically been relatively low and stable compared with the cost of oil. The market for these wood-based feedstocks tends to be local due to relatively high transport costs, and therefore is insulated from typical commodity price volatility. Furthermore, pulpwood feedstock does not compete for use as a food source, insulating products made from such feedstock from demand price pressures faced by other agricultural-based renewable feedstocks such as corn and sugarcane.
- ***Carbon Footprint.*** We believe our products can help enable prospective customers to achieve their net zero carbon emissions commitments by transitioning away from fossil-based materials towards materials made with our biomass conversion technology, which can use sustainable, non-food, plant-based feedstock.
- ***High Barriers to Entry.*** Over more than a decade, we have generated a robust patent portfolio as well as critical trade secrets. We believe our competitors now significantly lag behind us and will be unable to replicate the efficiency, yield and quality of our process, as we expect to continue to improve our existing technology and processes.
- ***Proprietary Packaging Solutions for Improved Recycling and Performance.*** Our patent-pending, cost-competitive caps and closure design and manufacturing innovation aids in producing "mono-material" products made with any type of PET, including recycled PET. These are typically easier to recycle than products made from multiple materials, and are highly sought-after for consumer packaged goods to improve recycling. Origin's all-PET caps offer improved performance compared with incumbent caps, enabling lighter cap weight and improved product shelf life.

Business Strategy

Our goal is to build a commercially successful business that can scale and meet current and future expected demand for carbon negative materials. As we advance and scale up our biomass conversion technology and other application development, we expect to introduce manufacturing capacity, which may include acquiring production lines or construction of chemical plants, that can produce sustainable materials and product applications. We also expect to continue to develop new materials and product applications, together with our partners, to maintain and increase its competitive advantage.

Inflationary pressures and global supply chain shocks during 2023 significantly increased major capital project costs including financing costs, building materials, labor, and manufacturing equipment. Together, these rising costs have significantly increased the funding requirements and time to completion of our planned manufacturing facilities.

In response to these cost pressures, we continue to evaluate alternative financing strategies for our capital project plans [including the build out of Origin 2], as well as opportunities to collaborate with well capitalized strategic partners committed to utilizing our biomass conversion technology to enable carbon advantaged materials manufacturing for their businesses. We believe the collective interest from these partners represents a viable source of funding to maintain forward momentum for our capital project plans, despite the inflationary cost environment.

Key elements of our strategy include:

Near-term revenue generation:

- We are focusing our available human and cash resources on developing near-term, recurring revenues through high value products like our all-PET caps and closures. We expect a majority of our near-term revenues to be derived from products sold into the caps and closures markets and other high value polymer product markets. Initial indications of demand expressed by prospective customers for our circular caps and closure solutions is sufficient for us to reach significant gross margin generation within twelve to twenty-four months and will not require us to raise additional equity capital for these initiatives. We expect to then use a portion of those profits to fund the further development of our biomass conversion technology and the requisite manufacturing capacity.

Operation of Origin 1 and development of Origin 2:

- Origin 1 is a strategic asset which we plan to use to qualify higher-value applications for our intermediates CMF and HTC. Origin 1 commenced commercial-scale production in October 2023. Origin 1 is not just to scale our technology, but to produce samples in higher volumes than produced at our pilot facilities.

- At scale, Origin 2 is intended to focus on supplying products that serve our markets of interest. Applications for CMF produced at Origin 2 are expected to include the FDCA-based polymers PEF and PETF for advanced packaging, textiles, and other potential applications. As of December 31, 2023, Origin 2 remains in the project development stage. Our current strategy for carrying out that development work and constructing Origin 2 depends on near-term revenue from products like our all-PET caps and closures and our ability to secure substantial financial support from strategic partners.

Identify new and progress existing strategic partnerships to develop future plants and begin to address indicative demand for carbon-negative and low-carbon materials:

- We believe our agreements with customers and partners such as Ford Motor Company, Danone, Nestlé Waters, PepsiCo, Mitsubishi Gas Chemical, PrimaLoft, Solvay, Mitsui & Co., Ltd., Minafin Group, LVMH Beauty, Revlon, Mitsubishi Chemical Group, Kuraray, Intertex World Resources, ATC Plastics, and others indicate substantial and broad demand for the carbon-negative, low-carbon, and performance-advantaged materials that our biomass conversion technology is intended to produce. We believe that this demand represents a more than $10 billion opportunity if we are able to supply the maximum volume of product our customers may purchase, or reserve for purchase, at the prices specified under these offtake agreements (including customer options that may or may not be exercised) and non-binding capacity reservations. That demand encompasses production from both Origin 1 and multiple future plants, some of which have not yet entered the project development stage and will require substantial additional capital. As such, we are focused on identifying strategic partners, and progressing our work with existing strategic partners, to facilitate the development work and support the construction costs necessary to bring Origin 2 and other future plants online and begin to address the indicative demand for our products.

Expand and develop new partnerships across the value chain:

- Our strategy includes, among other things, engaging procurement and engineering companies and entering into strategic partnerships for production, which would provide us with best-in-class capabilities to efficiently construct our plants and complete the production process. In addition, we expect to collaborate with partners who have the market knowledge and expertise to design compelling products and penetrate new markets. We believe that helping these partners build profitable new businesses and product lines using our cost-advantaged chemical intermediate platform enhances the value of our platform and promotes long-term committed customer relationships for an expanding and diversifying set of markets. We intend to continue using demand from industry-leading brands to motivate and align the intermediate supply chain to meet carbon reduction commitments.

Continue development of next-gen materials and applications:

- Our strategy focuses on developing low and negative carbon materials for use in a variety of products, including textiles and fabrics, next generation packaging, paints, coatings, and epoxies, fillers for tires and other rubber products, fuels, and agricultural products.
- Our CMF product focus is on low or negative carbon and performance advantaged polyesters. We intend to focus on improving polyesters with the incorporation of furanic content to make products such as “PETF” blended products, and we expect to focus on producing next generation high-performance polyesters with strong gas barrier and high heat resistance that can be fully recyclable with current technologies.
- Our HTC product focus is on energy-dense fuels. We intend to focus on developing carbon negative, carcinogen-free carbon black replacement for tires and other rubber and polymer filled materials. We also expect to focus on developing next generation agricultural products such as slow-release fertilizers as well as microbial and biologics delivery.

Develop new revenue streams through technology licensing:

- We have developed technologies to convert CMF and HTC into a variety of valuable end products, and expect to continue to develop these technologies. We expect, over time, to license this technology to relevant manufacturers of those end products while we supply the CMF and HTC to the licensees.

Our Products and Intermediates

Our products comprise both innovative applications like our sustainable all-PET caps and closures as well as versatile Furanic Intermediates such as CMF and HTC and several minority co-products, including levulinic acid, furfural, and an oils and extractives stream, depending on the specific feedstock we use.

PET - Caps & Closures:

- We have created an all-PET (polyethylene terephthalate) cap, making 100% recycled PET possible from cap to container to improve post-consumer recycling. Our PET caps enable greater sustainability and circularity than common alternatives because they may be produced with any type of PET, from recycled PET to Origin's 100% bio-based, carbon-negative virgin PET, all of which can be recycled together. Origin's all-PET caps offer improved performance compared with incumbent caps, enabling lighter cap weight and improved product shelf life.

CMF—chloromethylfurfural:

- CMF is an organic compound derived directly from cellulosic biomass through our patented process, consisting of furan substituted at the 2 and 5 positions with a formyl group and chloromethyl group. CMF is easily derivatized into multiple products including those for polyesters, nylons, epoxies, surfactants, and several others. Produced by Origin's process at full commercial scale, CMF is expected to have a low or negative carbon impact.

HTC—hydrothermal carbon:

- HTC is a carbonaceous composite consisting of furanic resin and lignin fragments. It is derived from ligno-cellulose through our patented process, and is a structured composite resin comprising furanic chemical groups that can be further functionalized or de-functionalized while retaining nano-scale morphology of the HTC. Via functionalization or de-functionalization, HTC may be further derivatized into products such as carbon black, activated carbon, as well as a variety of agricultural products. Produced by Origin's process at full commercial scale, HTC is expected to have a low or negative carbon impact.

Oils and Extractives:

- An "oils and extractives" co-products stream is produced alongside our CMF and HTC. We have made progress toward development of new products and applications such as biofuels from this stream, which may be incorporated into the design of Origin 2 and future plants. We believe such cellulose-derived, low carbon intensity biofuels could potentially be used in transportation and marine fuel, industrial applications, and heat and power generation.

Raw Materials Supply

Our biomass conversion technology can produce building block chemicals from a variety of abundant, low-cost bio-feedstocks including wood residues and wood processing waste. Our process was designed to be able to take advantage of idled and aging pulp mills and may be co-located with such mills to secure access to existing site-specific feedstock supplies and skilled labor while lowering required capital investment. We believe we will be able to contract for the necessary quantity and quality of these or suitable alternative feedstocks needed to manufacture products. We expect our demand for wood residues and wood processing waste in 2030 represents less than 1% of the world's total supply of these feedstocks and less than 0.5% of the global supply of suitable alternative feedstocks that can be used in our process, such as agricultural wastes, mixed paper waste, and construction wastes.

Research and Development

Our strategy depends upon both continued improvement of our biomass conversion technology and development of new chemical pathways, next-generation materials and product applications, and our research and development efforts are focused on supporting these two objectives. We operate an in-house laboratory and pilot-scale manufacturing facilities in West Sacramento, California and Sarnia, Ontario, Canada to conduct research and development work. Using its versatile biomass conversion technology, Origin has been developing commercialization pathways for higher-value applications for its intermediates CMF and HTC such as FDCA and carbon black, respectively. In addition, Origin is exploring product applications such as epoxies and resins, surfactants, bio-asphalt, fuel pellets, as well as biofuel and bio-solvents from an "oils and extractives" stream co-produced with CMF and HTC. In addition, we conduct joint research and development work with third parties including academic institutions, vendors, and other partners such as members of the NaturALL Bottle Alliance, carbon black co-development partners, cosmetics packaging partners, chemical manufacturers, textile manufacturers and suppliers, automotive companies, and partners focused on the development of advanced monomers and polymers such as FDCA and PEF.

Intellectual Property

Our patent portfolio is comprised of more than 40 patents focused on the conversion of biomass to CMF and HTC and downstream derivatives thereof. Origin intends to retain exclusive rights to commercially work its biomass to CMF and HTC pathways. We also rely on trade secrets, know-how and continuing technological innovation to develop and maintain our proprietary position.

Patents. As of February 8, 2024, we own 27 U.S. utility patents, 16 foreign patents, 7 pending U.S. non-provisional applications, and 10 pending international applications. We also own 3 pending U.S. design applications and 39 pending international design applications. The term of individual patents depends upon the legal term of the patents in countries in which they are obtained. In most countries, including the United States, the patent term is generally 20 years from the earliest date of filing a non-provisional patent application in the applicable country. In the United States, a patent's term may, in certain cases, be lengthened by patent term adjustment, which compensates a patent holder for administrative delays by the United States Patent and Trademark Office in examining and granting a patent or may be shortened if a patent is terminally disclaimed over a commonly owned patent or a patent naming a common inventor and having an earlier expiration date.

Our core technology—biomass to CMF and HTC—is protected with patents, trade secrets, and know-how. We have 23 patents directed to CMF. One U.S. and one Korean composition of matter patent expiring in 2034 are directed to crystalline forms of CMF. Twelve patents are directed to compositions of and methods for preparing CMF. These include three in the United States, and one each in Brazil, and Mexico, which expire in 2032, as well as three patents in the United States, one in Malaysia, one in Europe, and one in Brazil that expire in 2034. Nine patents are directed to methods and systems for purifying CMF. These include one patent in the United States and one in China, each expiring in 2033, and three patents in the United States and one each in Brazil, China, Malaysia, and South Korea that expire in 2034. We have five pending applications directed to crystalline CMF, compositions, and methods for preparing CMF. These include one in the United States that would expire in 2034, two in China that would expire in 2034, one in Hong Kong that would expire in 2034, and one in Europe that would expire in 2034.

We also have eight patents directed to methods for preparing PX and terephthalic acid (PTA when purified). These include two patents in the United States and one each in China and Japan that expire in 2032, as well as three patents in the United States and one in Japan that expire in 2033.

We have five patents directed to dimethylfuran ("DMF"), a derivative of CMF, including three patents in the United States expiring in 2034 directed to methods of producing DMF and two patents in the United States expiring in 2035 directed to compositions of and methods for preparing DMF. We also have one pending patent application in Thailand expiring 2035 directed to DMF.

We have two pending patent applications directed to furandicarboxylate-polymer compositions, including PEF, and methods for producing such compositions. These include one pending application in China that would expire 2036 and one pending application in the United States that would expire in 2037.

In addition, we have four patents directed to polyhydroxylalkanoate ("PHA"), a biodegradable plastic. These include one composition of matter patent in the United States and one in Malaysia, each expiring in 2031, that are directed to bacterial strains for producing PHA, as well as two patents in the United States, and one in Malaysia expiring in 2033 directed to compositions and methods for converting PHA into PHA derivatives.

We have two patents and one pending application directed to other derivatives of CMF. These include two U.S. patents expiring in 2035 and 2036, respectively, directed to methods of preparing chemical derivatives from CMF, and one pending application in China directed to compositions for preparing CMF derivatives.

We have one pending patent application in the United States that would expire in 2036 and is directed to compositions and resins of activated carbon and methods for producing these.

Finally, we have forty pending international applications directed to closures for containers including one pending utility patent application with the Patent Cooperative Treaty, and three pending design applications each in Australia, Brazil, Canada, China, Europe, India, Japan, Mexico, Saudi Arabia, South Korea, Taiwan, Turkey, and the United Kingdom that would expire in 2038. We also have three pending design patent application in the United States,

Trade secrets. We maintain a secure digital vault of our trade secrets with heightened confidentiality protections. Access to this vault is limited to a select group and is granted on a need-to-know basis. Further, the information in the vault is left strategically incomplete and requires corroboration from referenced internal documents to ensure that the entirety of any trade secret is known only by someone who has access to each such document. Our employees are required to participate in invention assignment and non-disclosure protocols to further ensure the protection of our trade secrets.

Know-how. An important aspect of our intellectual property, in addition to our patent portfolio and trade-secrets, is the depth of understanding and proficiency we gained in the behavior of the Origin technology platform's chemical reactions, the handling of feedstocks, and the process-ability of feedstocks given certain conditions. This know-how into our process and materials is carefully captured in many ways, such as by being photographed, videoed, measured, quantified, summarized, compared, and otherwise described. Within this information set, we have identified many key insights without which we believe a would-be competitor could not successfully operate in our industry or replicate our results.

Regulatory

Regulation by government authorities in the United States, Canada and other countries is a significant factor in the production and sale of our products and our ongoing research and development activities. The chemicals and intermediates that we manufacture and use, including CMF and HTC, require (or as the products are further commercialized are anticipated to require) authorization or exemptions under the Toxic Substances Control Act (TSCA) administered by the U.S. Environmental Protection Agency (the EPA), the Canadian Environmental Protection Act (CEPA) administered by Health Canada and Environment and Climate Change Canada, and the European Union's regulation entitled the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). Our production processes are subject to regulations and permit requirements relating to air emissions, wastewater discharges, waste generation and disposal and other environmental matters. Additionally, some applications will involve food contact and will be regulated by the U.S. Food and Drug Administration (the FDA).

Chemical control regulations applicable to us, such as TSCA, CEPA or REACH, impose restrictions with respect to the permitted volumes of, or the sites at which, certain chemicals manufactured or used by us may be manufactured, imported, transported and/or released into the environment. For example, manufacture or import into Canada of HTC is limited to a certain amount per year prior to submitting a New Substance Notification. Compliance with these regulations is complex and could require significant capital and/or operating expenses, and failure to comply with any of these regulations can have significant consequences. Our regulatory focus has been on seeking the removal or relaxation of certain restrictions to enable scaled up production. We have filed or will be filing notifications under TSCA and CEPA seeking to remove these restrictions, as necessary, and are working to identify alternatives that are not similarly restricted in the location where they are used.

Several states like California, Maine, and New Jersey, as well as Canada and the European Union, have enacted or are considering "minimum recycled content" regulations mandating certain minimum post-consumer recycled content in certain types of packaging, including, specifically, plastic beverage containers. Legislative and regulatory measures to mandate or encourage waste reduction and recycling also have been considered, or are under consideration, in jurisdictions where we expect to produce or sell our products. These regulations may present new opportunities for sustainable products like our all-PET caps and closures, which can be made from recycled PET and be recycled together with the PET containers on which they are used.

Employees and Human Capital Resources

Intentional Culture and Leadership. At Origin, our values inform our decision making and how we act. We are deliberate, open, and transparent about our dedication to our core purpose; to enable the world's transition to sustainable materials as the leading carbon negative materials company. We have assembled an exceptional team of scientists, engineers, and business leaders to develop and execute our strategic plans.

Diversity, Equity & Inclusion. We believe that having a diverse workforce, equitable employment practices, and an inclusive workplace better positions us to respond to the unique needs of all our stakeholders. In 2020, we created the Origin Committee on Diversity and Inclusion. This committee is responsible for ensuring that Origin policies, procedures, and practices are conducive to creating and maintaining a diverse and inclusive environment that is valuable for all stakeholders. In late 2021, we hired a leading diversity, equity & inclusion ("DE&I") consulting firm, to help us map out our DE&I strategy and operationalize our DE&I goals. In 2022, Origin Materials began executing on a multiyear strategy that includes prioritizing the hiring of a diverse workforce, an annual "Inclusion Survey" to benchmark & track DE&I progress, DE&I in person and online training for all levels of the organization, and building internal expertise around DE&I issues.

Human Capital. We believe that our ability to attract, retain and motivate exceptional employees is vital to our long-term competitive advantage. As such, our compensation practices, including long-term equity incentive plans, are designed to drive sustainable performance and align employee incentives with shareholder values. As of December 31, 2023, we had approximately 112 employees located in the United States and 50 employees in Canada, all of whom were full-time employees. The number of employees decreased by approximately 30% as a result of the reduction in workforce affected in November 2023. None of our employees is subject to a collective bargaining agreement and we believe we have a good relationship with our employees.

Corporate Information

Artius Acquisition Inc. ("Artius") incorporated in the Cayman Islands on January 24, 2020. Legacy Origin was incorporated in 2008 as a Delaware corporation. Our principal executive offices are located at 930 Riverside Parkway, Suite 10, West Sacramento, California 95605. We have the following wholly-owned subsidiaries:

- Origin US Megasite Holding, LLC;
- Origin US Megasite 1, LLC;
- Origin US Megasite Development, LLC;
- Origin US Megasite Operating, LLC;
- Origin Materials Canada Holding Limited;
- Origin Materials Canada Pioneer Limited;
- Origin Materials Canada Polyesters Limited; and
- Origin Materials Canada Research Limited.

Additional Information

Origin's annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and all amendments to those reports are available free of charge on the Company's website at https://investors.originmaterials.com as soon as reasonably practicable after such material is electronically filed with, or furnished to, the Securities and Exchange Commission.

Item 1A. Risk Factors

The following risk factors apply to our business and operations. These risk factors are not exhaustive, and investors are encouraged to perform their own investigation with respect to our business, financial condition and prospects. We may face additional risks and uncertainties that are not presently known to us, or that we currently deem immaterial, which may also impair our business. The following discussion should be read in conjunction with the consolidated financial statements and notes to such consolidated financial statements included elsewhere in this Annual Report and the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this Annual Report.

Risks Related to Our Business

We are an early stage company with a history of losses and our future profitability is uncertain.

We have had a history of net losses due to our primary focus on research and development, plant construction, capital expenditures and early-stage commercial activities. Substantially all of our net losses since inception have resulted from our plant construction, research and development, and general and administrative costs associated with our operations. We have only recently begun generating revenue, and we expect that our net losses from operations will continue for the foreseeable future. Based on our estimates and projections, which are subject to significant risks and uncertainties, we expect our commercial scale production to be limited for several years and challenges with the design, construction, funding, and labor and equipment supply for our plants may further delay this timeline. Even as we commercialize and begin to generate revenue, we may not become profitable for many years, if at all.

Our potential profitability is dependent upon many factors, including our ability to effectively operate our current plants, complete development of future plants, maintain an adequate supply chain, anticipate and react to demand for our products, manufacture our products on a commercial scale, secure additional customer commitments, and otherwise execute our growth plan. The rate at which we incur losses may be higher in future periods as we:

- develop our all-PET cap and closure business;
- increase our spending on strategic partnerships;
- begin production at our OM1 plant;
- increase our sales and marketing activities; and
- decide to expand our commercial production capabilities and incur costs associated with developing our plants.

Because we will incur the costs and expenses from these efforts before receiving meaningful revenue, our losses in future periods could be significant. We may find that these efforts are more expensive than we currently estimate or that these efforts may not result in revenues, which would further increase our losses.

We may not manage growth effectively.

Our failure to manage growth effectively could harm our business, results of operations and financial condition. We anticipate that a period of expansion may be required to address potential growth. This expansion will place a significant strain on our management, operational and financial resources. To manage the growth of our operations and personnel, we must establish appropriate and scalable operational and financial systems, procedures and controls and establish and maintain a qualified finance, administrative and operations staff. We may be unable to hire, train, retain and manage the necessary personnel or to identify, manage and exploit potential strategic relationships and market opportunities.

Our business plan assumes we can secure substantial additional project financing and government incentives, which may be unavailable on favorable terms, if at all.

We expect to need substantial additional project financing and government incentives in order to execute our growth strategy and expand our manufacturing capability to advance our biomass conversion technology. We have not yet secured such project financing and government incentives, and they may not be available on commercially reasonable terms, if at all. In particular, our ability to obtain financing for the construction of future plants may depend in part on our ability to first enter into customer agreements sufficient to demonstrate sufficient demand to justify the construction of such plants. If we are unable to obtain such financing and government incentives, or secure sufficient customer agreements, on commercially reasonable terms, or at all, we will not be able to execute our growth strategy.

To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of those securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making acquisitions or capital expenditures or declaring dividends. Debt financing could also have significant negative consequences for our business, results of operations and financial condition, including, among others, increasing our vulnerability to adverse economic and industry conditions, limiting our ability to obtain additional financing, requiring the dedication of a substantial portion of our cash flow from operations to service our indebtedness, thereby reducing the amount of our cash flow available for other purposes, limiting our flexibility in planning for, or reacting to, changes in our business, and placing us at a possible competitive disadvantage compared to less leveraged competitors or competitors that may have better access to capital resources.

If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or products, grant licenses on terms that may not be favorable to us, or make other concessions. If we are unable to raise additional funds through equity or debt financings or other arrangements when needed, we may be required to delay, limit, reduce or terminate our commercialization, research and development efforts or grant rights to third parties to market and/or develop products that we would otherwise prefer to market and develop ourselves.

If we seek government grants, incentives or subsidies, their terms may be limiting or restrict certain of our planned operations, thereby requiring us to alter our operating plans and materially impacting our financial projections and projected results of operations. Government grants may also be terminated, modified or recovered under certain conditions without our consent.

Our outstanding secured and unsecured indebtedness, ability to incur additional debt and the provisions in the agreements governing our current debt, and certain other agreements, could harm our business, financial condition, results of operations and prospects.

Our debt service and similar obligations could have important consequences to us for the foreseeable future, including that our ability to obtain additional financing for capital expenditures, working capital or other general corporate purposes may be impaired and we may be or become substantially more leveraged than some of our competitors, which could place us at a relative competitive disadvantage and make us more vulnerable to changes in market conditions and governmental regulations.

We are required to maintain compliance with covenants under our debt and similar agreements. There are and will be operating or financial restrictions and covenants in certain of our debt and similar agreements, including the promissory notes and prepayment agreements we are party to, as well as certain other agreements to which we are or may become a party. These limit, among other things, our ability to incur certain additional debt, create certain liens or other encumbrances and sell assets. These covenants could limit our ability to engage in activities that may be in our best long-term interests. Our failure to comply with certain covenants in these agreements could result in an event of default under the various debt and similar agreements, allowing lenders to accelerate the maturity for the debt under these agreements and to foreclose upon any collateral securing the debt. Under such circumstances, we might not have sufficient funds or other resources to satisfy all of our obligations.

We are exposed to credit risk in our activities related to potential nonperformance by customers.

In the normal course of our business, we provide payment terms to certain of our customers. As a result, our business could be adversely affected if our customers' financial condition deteriorates and they are unable to repay us. This risk may increase if there is a general economic downturn affecting a large number of our customers or if our customers fail to manage their business effectively or adequately disclose their financial condition to us. The Company manages the risk of customer default through a combination of due diligence, contractual terms, and a diversified customer base. The number of customers, as well as our ability to discontinue service, contributes to reduce credit risk with respect to accounts receivable. Despite such mitigation efforts, customer defaults may occur.

Risks Related to Our Operations and Industry

Construction of additional plants beyond Origin 1 may not be timely completed or completed in a cost-effective manner or at all. Any delays in or failure to finance and complete the construction of additional plants could severely impact the implementation of our biomass conversion technology platform.

Our ability to implement our biomass conversion technology platform and to satisfy our customer demand and contractual obligations depend on our ability to secure financing for and complete construction of several commercial scale plants. In particular, except for Origin 2, subject to finalization of economic incentives, we have not selected a site for any of our future planned plants, and may have difficulty finding a site with appropriate infrastructure and access to raw materials. With respect to these future plants, we also do not have agreements with engineering, procurement or construction firms. Consequently, we cannot predict on what terms such firms may agree to design and construct our future plants. If we are unable to construct these plants within the planned timeframes, timeframes that are relevant to our customers' carbon reduction goals, or in a cost-effective manner, or at all due to a variety of factors, including, but not limited to, a failure to acquire or lease land on which to build our plants, a stoppage of construction as a result of epidemics, disruptions caused by the recent global sanctions imposed against Russia following its military intervention in Ukraine, a major supplier of certain metals such as nickel used in materials of construction, unexpected construction problems, permitting and other regulatory issues, severe weather, inflationary pressures, labor disputes, or issues with subcontractors or vendors, including payment disputes, which we have previously experienced, our business, financial condition, results of operations and prospects could be severely impacted, we may lose customers and customer demand, and we could face litigation.

The construction and commissioning of any new project is dependent on a number of contingencies some of which are beyond our control. There is a risk that significant unanticipated costs or delays could arise due to, among other things, errors or omissions, unanticipated or concealed project site conditions, including subsurface conditions and changes to such conditions, unforeseen technical issues or increases in plant and equipment costs, insufficiency of water supply and other utility infrastructure, inadequate contractual arrangements, or design changes and associated or additional technical development work related, for example, to new or different process steps or product streams, or changes in the scale of equipment or operations. Should these or other significant unanticipated costs or delays arise, this could have a material adverse impact on our business, financial performance and operations. No assurance can be given that construction will be completed on time or at all, or as to whether we will have sufficient funds available to complete construction.

We plan to rely on a limited number of plants to meet customer demand for our future intermediate chemical sales.

Our operating plan assumes that we will rely on a limited number of plants to meet customer demand and that these plants will supply most of our products until additional plants come online. Adverse changes or developments affecting these facilities could impair our ability to produce our products. Any shutdown or period of reduced production at these facilities, which may be caused by regulatory noncompliance or other issues, as well as other factors beyond our control, such as severe weather conditions, natural disaster, fire, power interruption, work stoppage, disease outbreaks or pandemics (such as COVID-19), equipment failure or delay in supply delivery, would, among other things, significantly disrupt our ability to recognize revenue, execute our expansion plans, and meet our contractual obligations and customer demand. In addition, our plant equipment may be costly to replace or repair, and our equipment supply chains may be disrupted in connection with pandemics, trade wars and sanctions (such as those imposed against Russia following its military intervention in Ukraine), or other factors. If any material amount of our equipment is damaged, we could be unable to predict when, if at all, we could replace or repair such equipment or find suitable alternative equipment, which could adversely affect our business, financial condition, results of operations and prospects. Performance guarantees may not be sufficient to cover damages or losses, or the guarantors under such guarantees may not have the ability to pay. We may be unable to obtain appropriate types or amounts of insurance, and any insurance coverage we have may be insufficient to cover all of our potential losses or continue to be available to us on acceptable terms, or at all.

We may be delayed in procuring or be unable to procure necessary capital equipment.

While much of the equipment we use to produce our products is currently widely available, we rely on outside companies to continue to manufacture the equipment necessary to produce our products. In addition, some equipment we use to produce our products requires significant lead time to manufacture. If our suppliers of manufacturing equipment are unable or unwilling to provide us, or if we experience significant delays in obtaining the necessary manufacturing equipment, or parts necessary to repair and maintain that equipment, our business, we may be unable to make our products and our results of operations and financial condition could be adversely affected. The repair, maintenance, or construction of our manufacturing equipment may also require a substantial portion of certain materials and supplies relative to the overall global supply of such materials and supplies. If we are unable to secure an adequate supply of such materials and supplies on commercially reasonable terms, or at all, such repair, maintenance, or construction may be delayed or terminated.

We have not yet produced our products in large commercial quantities.

We have no experience in producing large quantities of our products. While we have succeeded in producing small amounts of our products in our pilot plants and Origin 1 plant for customer evaluation, we have only recently commenced commercial-scale production. There are significant technological and logistical challenges associated with producing, marketing, selling and distributing products in the specialty chemicals industry, including our products, and we may not be able to resolve all of the difficulties that may arise in a timely or cost-effective manner, or at all. While we believe that we understand the engineering and process characteristics necessary to successfully build and operate our additional planned facilities and to scale up to larger facilities, we may not be able to cost-effectively manage such construction and operation at a scale or quality consistent with customer demand in a timely or economical manner.

Any decline in the value of carbon credits associated with our products could harm our results of operations, cash flow and financial condition.

The value of our products may be dependent on the value of carbon credits, programs relating to low-carbon materials and products standards and other similar regulatory regimes or the implicit value of decarbonized materials. The value of these credits fluctuates based on market and regulatory forces outside of our control. There is a risk that the supply of low-carbon alternative materials and products outstrips demand, resulting in the value of carbon credits declining. Any such declines could mean that the economic benefits from our customers' efforts to decarbonize their operations might not be realized. Any decline in the value of carbon credits associated with our products could harm our results of operations, cash flow and financial condition.

We rely on a limited number of customers for a significant portion of our near-term revenue.

We currently have commercial agreements with a limited number of customers from which we expect to derive a significant portion of near-term revenue. The loss of one or more of our significant customers, a substantial reduction in their orders, their failure to exercise customer options to enter into new offtake agreements or purchase commitments or to purchase product, their unwillingness to extend contractual deadlines if we fail to meet production, product, or specification requirements, their inability to perform under their contracts or a significant deterioration in their financial condition could harm our business, results of operations and financial condition. If we fail to perform under the terms of these agreements, the customers could seek to terminate these agreements and/or pursue damages against us, which could harm our business.

Our products may not achieve market success.

We currently have a relatively small number of binding customer commitments for commercial quantities of our products. Some prospective customers are currently evaluating and testing our products prior to making large-scale purchase decisions. Other products we expect to develop have not yet started customer evaluation and testing. The successful commercialization of our products is dependent on our customers' ability to commercialize the end-products that utilize our products, which may gain market acceptance slowly, if at all. Furthermore, the technology for our products is new, and the economic performance and ultimate carbon footprint of these products is uncertain. The market for carbon-negative products is nascent and subject to significant risks and uncertainties.

Market acceptance of our products will depend on numerous factors, many of which are outside of our control, including, among others:

- public acceptance of such products;
- our ability to produce products of consistent quality that offer functionality comparable or superior to existing or new products;
- our ability to produce products fit for their intended purpose;
- our ability to produce new products or customizations of existing products to match changes in public demand;
- our ability to timely obtain necessary regulatory approvals for our products;
- the speed at which potential customers qualify our products for use in their products;
- the pricing of our products compared to competitive and alternative products, including petroleum-based plastics;
- the strategic reaction of companies that market competitive products;
- our reliance on third parties who support or control distribution channels; and
- general market conditions, including fluctuating demand for our products.

Our industry is highly competitive, and we may lose market share to producers of products that can be substituted for our products, which may have an adverse effect on our results of operations and financial condition.

The specialty chemicals industry is highly competitive, and we face significant competition from both large established producers of fossil-based materials, recycled fossil-based materials and a variety of current and future producers of low-carbon, biodegradable, or renewable resource-based materials. Many of our current competitors have longer operating histories, greater name recognition, larger customer bases and significantly greater financial, sales and marketing, manufacturing, distribution, technical and other resources than us. Our competitors may be able to adapt more quickly to new or emerging technologies, changes in customer requirements and changes in laws and regulations. In addition, current and potential competitors have established or may establish financial or strategic relationships among themselves or with existing or potential customers or other third parties. Accordingly, new competitors or alliances among competitors could emerge and rapidly acquire significant market share.

Our competitors may also improve their relative competitive position by successfully introducing new products or products that can be substituted for our products, improving their manufacturing processes, or expanding their capacity or manufacturing capabilities. Further, if our competitors are able to compete at advantageous cost positions, this could make it increasingly difficult for us to compete in markets for less-differentiated applications. If we are unable to keep pace with our competitors' product and manufacturing process innovations or cost position, it could harm our results of operations, financial condition and cash flows.

Our commercial success may be influenced by the price of petroleum relative to the price of non-fossil feedstocks.

Our commercial success may be influenced by the cost of our products relative to petroleum-based products. The cost of petroleum-based products is in part based on the price of petroleum, which is subject to historically fluctuating prices. Our production plans assume use of biomass feedstocks such as timber and forest residues, which historically have experienced low volatility relative to petroleum. If the price of bio-based feedstocks increases, the price of petroleum decreases, or we use bio-based feedstocks such as sugars or starches that may have higher volatility or cost than timber and forest residues, our products may be less competitive relative to petroleum-based products. A material decrease in the cost of conventional petroleum-based products may require a reduction in the prices of our products for them to remain attractive in the marketplace and may negatively impact our revenues.

Increases or fluctuations in the costs of our raw materials may affect our cost structure.

The price of raw materials may be impacted by external factors, including uncertainties associated with war, terrorist attacks, weather and natural disasters, health epidemics or pandemics (such as COVID-19), civil unrest, the effects of climate change or political instability, plant or production disruptions, strikes or other labor unrest, inflationary pressures, breakdown or degradation of transportation infrastructure used in the delivery of raw materials or changes in laws or regulations in any of the countries in which we have has significant suppliers.

Our technology is designed to use biomass such as local timber and forest residues as raw materials. The cost of these raw materials is generally influenced by supply and demand factors, and our operating plans include assumptions that the timber and forest residues we intend to use as feedstock will be available at prices similar to historic levels with low volatility. As we continue to expand our production, we will increase our demand for timber and forest residues which may alter the anticipated stability in the costs of our raw materials and potentially drive an increase in the cost of such raw materials.

Our results of operations will be directly affected by the cost of raw materials and other inputs, like the amount and cost of steam in the manufacturing process. The cost of raw materials and energy to produce steam required during feedstock processing comprises a significant amount of our total cost of goods sold and, as a result, movements in the cost of raw materials, and in the cost of other inputs, will impact our profitability. Because a significant portion of our cost of goods sold is represented by these raw materials, our gross profit margins could be adversely affected by changes in the cost of these raw materials if we are unable to pass the increases on to our customers.

If our raw material prices experience volatility, there can be no assurance that we can continue to recover raw material costs or retain customers in the future. As a result of our pricing actions, customers may become more likely to consider competitors' products, some of which may be available at a lower cost. Significant loss of customers could adversely impact our results of operations, financial condition and cash flows.

We are dependent on third-party suppliers and service providers, some of which are sole source suppliers, who may fail to deliver raw materials or equipment or fail to supply needed services at all or according to schedules, prices, quality and volumes that are acceptable to us, or we may be unable to manage these supplies effectively.

Parts of our supply chain currently are dependent on a limited number, and in some cases a single, third-party supplier or service provider for key inputs, equipment, and services including for conversion of our chemical intermediates produced by our Origin 1 plant into downstream derivatives and applications. We have not yet secured agreements with our preferred (or the only) supplier of some of these inputs, equipment, and services, and we may be unable to do so on a time frame or terms we find acceptable, or at all. Our reliance on few or single suppliers in a limited number of locations risks multiple supply chain vulnerabilities. The military conflict in Ukraine can exacerbate the risks to our supply chain to the extent our suppliers depend on raw materials, components, or parts from Russia or Ukraine including, for example, certain metals used in materials of construction.

Finding substitute suppliers and service providers, to the extent they exist, may be expensive, time-consuming, or impossible and could interrupt or delay the supply of our products causing us to lose revenue and potentially harm our customer relationships or reputation and expose us to contractual remedies under our supply agreements. To the extent we do not have firm commitments from our third-party suppliers or service providers for a specific time period or capacity, quantity, and/or pricing, our suppliers may allocate capacity to their other customers, which could make that capacity unavailable to us when needed or at reasonable prices and prevent us from delivering our products on time or at all. For instance, if we are unable to timely obtain conversion services for some of our intermediates, those intermediates may need to be stored for extended periods and could degrade or become unusable, forcing us to dispose of the intermediates and/or replace them at additional cost. Any of these occurrences could adversely affect our supply chain and cause serious harm to our business.

Our manufacturing processes are designed to use biomass such as local timber and forest residues as our preferred raw materials. However, we may be unable to secure agreements with local suppliers for the necessary amount of raw materials in certain circumstances. Additionally, if our suppliers do not accurately forecast and effectively allocate sufficient materials to us or if they are not willing to allocate sufficient supplies to us, it may reduce our access to raw materials needed for our manufacturing and require us to search for new suppliers. The unavailability of any raw materials could result in production delays, idle manufacturing facilities, product design changes and loss of access to important residues supporting our production, as well as impact our capacity to fulfill our obligations under our offtake agreements. In addition, unexpected changes in business conditions, materials pricing, labor issues, wars, trade policies, natural disasters, epidemics or pandemics, trade and shipping disruptions, and other factors beyond our or our suppliers' control could also affect these suppliers' ability to deliver components to us or to remain solvent and operational.

Additionally, we may be unsuccessful in our continuous efforts to negotiate with existing suppliers to obtain cost reductions and avoid unfavorable changes to terms, or source less expensive suppliers for certain materials, especially in light of the overall increases in supply and shipment pricing. Any of these occurrences may harm our business, prospects, financial condition and operating results.

If we are required to obtain alternate sources for raw materials, for example because a supplier is unwilling or unable to execute or perform under raw material supply agreements, if a supplier terminates its agreements with us, if a supplier is unable to meet increased demand as our commercial scale production expands, if we are unable to renew its contracts or if we are unable to obtain new long-term supply agreements to meet changing demand, we may not be able to obtain these raw materials in sufficient quantities, on economic terms, or in a timely manner, and we may not be able to enter into long-term supply agreements on terms as favorable to us, if at all. A lack of availability of raw materials could limit our production capabilities, require us to use alternate raw materials such as non-timber feedstocks that may be more expensive or have inferior carbon reduction or other performance characteristics, and prevent us from fulfilling customer orders, and therefore harm our results of operations and financial condition.

As the scale of our manufacturing increases, we will also need to accurately forecast, purchase, warehouse and transport raw materials at high volumes to our manufacturing facilities internationally. If we are unable to accurately match the timing and quantities of raw material purchases to our actual needs or successfully implement inventory management and warehousing systems, we may incur unexpected production disruption, storage, transportation and write-off costs, which may harm our business and operating results.

Maintenance, expansion and refurbishment of our facilities, the construction of new facilities and production lines, and the development and implementation of new manufacturing processes involve significant risks.

Our facilities may require regular or periodic maintenance, upgrading, expansion, refurbishment or improvement. Any unexpected operational or mechanical failure, including failure associated with breakdowns and forced outages, could reduce our facilities' production capacity below expected levels, which would reduce our production capabilities and ultimately our revenues. Unanticipated capital expenditures associated with maintaining, upgrading, expanding, repairing, refurbishing, or improving our facilities may also reduce our profitability. Our facilities may also be subject to unanticipated damage as a result of natural disasters, terrorist attacks or other events.

If we make any major modifications to our facilities, such modifications likely would result in substantial additional capital expenditures and could prolong the time necessary to bring the facility online. We may also choose to refurbish or upgrade our facilities based on our assessment that such activity will provide adequate financial returns. However, such activities require time for development and capital expenditures before commencement of commercial operations, and key assumptions underpinning a decision to make such an investment may prove incorrect, including assumptions regarding construction costs and timing, which could harm our business, financial condition, results of operations and cash flows.

The development of new manufacturing facilities entails a number of risks and assumptions, including the ability to begin production within the cost and timeframe estimated and to attract a sufficient number of skilled workers to meet the needs of the new facility. For example, the anticipated costs of constructing Phase 1 of Origin 2 are far higher than initially estimated and timelines may be delayed due to higher material costs, supply chain issues, inflation and labor shortages. Additionally, our assessment of the projected benefits associated with the construction of new manufacturing facilities is subject to a number of estimates and assumptions, which in turn are subject to significant economic, competitive and other uncertainties that are beyond our control. If we experience delays or increased costs, our estimates and assumptions are incorrect, or other unforeseen events occur, our business, ability to supply customers, financial condition, results of operations and cash flows could be adversely impacted.

Finally, we may not be successful or efficient in developing or implementing new production processes. Innovation in production processes involves significant expense and carries inherent risks. Such risks may include difficulties in designing, developing, implementing, and scaling up new process technologies, development and production timing delays, lower than anticipated manufacturing yields, product defects, and inability to consistently meet customers' product specifications, performance and carbon intensity, or cost requirements, among others. Errors, defects in materials, operating permit and license delays, customer product returns, interruption in our supply of materials or resources, and disruptions at our facilities due to accidents, maintenance issues, or unsafe working conditions, all could affect the timing, efficiency, or success of our production processes. Such production issues can lead to increased costs and may affect our ability to meet product demand, which could adversely impact our business and results from operations.

We may not be successful in finding future strategic partners for continuing development of our manufacturing facilities and feedstock opportunities, or tolling and downstream conversion of our products.

We may seek to develop additional strategic partnerships to develop our manufacturing facilities, increase feedstock supply due to manufacturing constraints or capital costs required to develop our products and plants. We may not be successful in our efforts to establish such strategic partnerships or other alternative arrangements for our products, technology, or plants because our research and development pipeline may be insufficient, our products or plant designs or manufacturing processes may be deemed to be at too early of a stage of development for collaborative effort, or third parties may not view our products or plants as having the requisite potential to demonstrate commercial success. In particular, if we are unable to develop strategic partnerships to fund our construction of Origin 2, we may be delayed in the completion of Origin 2 or may never be able to complete construction of Origin 2, which may adversely impact our operation and financial results.

If we are unable to reach agreements with suitable collaborators on a timely basis, on acceptable terms, or at all, we may have to curtail the development of our products, delay commercialization or development of manufacturing facilities, reduce the scope of any sales or marketing activities or increase expenditures and undertake development or commercialization activities at our own expense. If we elect to fund development or commercialization activities on our own, we may need to obtain additional expertise and additional capital, which may not be available to us on acceptable terms or at all. If we fail to enter into collaborations and do not have sufficient funds or expertise to undertake the necessary development and commercialization activities, we may not be able to develop additional products or plants, and our business, financial condition, results of operations and prospects may be materially and adversely affected.

We may rely heavily on future collaborative and supply chain partners.

We have entered into, and may enter into, strategic partnerships to develop and commercialize our current and future research and development programs with other companies to accomplish one or more of the following:

- obtain capital, equipment, and facilities;

- obtain funding for research and development programs, product development programs, and commercialization activities;
- obtain expertise in relevant markets;
- obtain access to raw materials;
- obtain sales and marketing services or support;
- obtain conversion services and other supply chain support; and/or
- obtain access to intellectual property and ensure freedom to operate.

We may not be successful in establishing or maintaining suitable partnerships, and we may not be able to negotiate collaboration agreements having terms satisfactory to us, or at all. Failure to make or maintain these arrangements or a delay or failure in a collaborative partner's performance under any such arrangements could harm our business and financial condition.

In addition, global supply chain disruptions have caused, and may continue to cause, delays in the shipment of goods, particularly those made in Asian countries. We have incurred, and may continue to incur, additional costs to expedite deliveries of such goods or to obtain substitute goods that are available to us sooner. Continued supply chain disruptions and our efforts to mitigate them may adversely impact our financial condition, results of operations, and cash flows.

We have entered into and may in the future enter into collaborations, strategic alliances, or licensing arrangements, which expose us and our intellectual property to competitive risks and limitations associated with third-party collaborations and that may not produce the benefits we anticipate.

We have entered, and may in the future enter, into license and collaboration arrangements for the development and production of some of our materials and products. In the future, we may enter into additional license and collaboration arrangements. Any collaboration we enter into is subject to numerous risks. Such risks may include, among others, collaborators' significant discretion to determine the effort and resources they will apply to the collaboration, to delay or elect not to continue development of a product or process under the collaboration, or to develop, independently or with third parties, products or processes that compete directly or indirectly with our products or manufacturing processes. A collaborator's development, sales, or marketing activities or other operations may not comply with applicable laws resulting in civil or criminal proceedings.

In addition, we could grant exclusive rights to our collaborators that would prevent us from collaborating with others. Collaborators may not properly maintain or defend our intellectual property rights or may use our intellectual property or proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential liability. Our collaborators may own or co-own intellectual property covering products that result from our collaboration with them, depriving us of the exclusive right to develop or commercialize such intellectual property. Disputes may arise with respect to the ownership of any intellectual property developed pursuant to our collaborations.

Disputes between us and a collaborator may delay or terminate the development or commercialization of our products or result in costly litigation or arbitration that diverts management attention and resources. Termination of a collaboration may also result in a need for additional capital to pursue further development of the applicable current or future products.

We may seek to enter into additional collaborations, joint ventures, licenses and other similar arrangements for the development of our products, due to capital costs required to develop the product or potential manufacturing constraints. We may not be successful in our efforts to establish such collaborations for our products because our products may be deemed to be at too early of a stage of development for collaborative effort or third parties may not view our products as having the requisite potential to demonstrate a significant commercial opportunity. In addition, we face significant competition in seeking appropriate strategic partners, and the negotiation process can be time consuming and complex. Further, any future collaboration agreements may restrict us from entering into additional agreements with potential collaborators. We cannot be certain that, following a strategic transaction or license, we will achieve an economic benefit that justifies such transaction. Even if we are successful in our efforts to establish such collaborations, the terms that we agree upon may not be favorable to us, and we may not be able to maintain such collaborations.

In addition, any potential future collaborations may be terminable by our strategic partners, and we may not be able to adequately protect our rights under these agreements. Furthermore, strategic partners may negotiate for certain rights to control decisions regarding the development of our products, and may not conduct those activities in the same manner as we do. Any termination of collaborations we enter into in the future, or any delay in the development of products under such collaborations, could delay the manufacturing and sales of our products, which could have a material adverse effect on our business, financial condition and results of operations.

We may become subject to product liability claims that may not be covered by insurance and could require us to pay substantial sums.

We are subject to an inherent risk of, and adverse publicity associated with, product liability and other liability claims, whether or not such claims are valid. In addition, our customers are subject to product liability claims, and could seek contribution from us. A successful product liability claim or series of claims against us could adversely impact the specialty chemicals industry, our reputation or our financial condition or results of operations. Product liability insurance may not be available to us on commercially acceptable terms, or at all. Even if such insurance is available, product liability or other claims may exceed our insurance coverage limits. A successful product liability claim that exceeds our insurance coverage limits, for which we are not otherwise indemnified, could require us to pay substantial sums and could harm our business, financial condition or results of operations.

Climate change may impact the availability of our facilities and, in addition, we may incur substantial costs to comply with climate change legislation and related regulatory initiatives.

Changing weather patterns and the increase in frequency of severe storms such as hurricanes and tornadoes could cause disruptions or the complete loss of our facilities or delay the construction of future facilities. In addition, climate change concerns, and changes in the regulation of such concerns, including greenhouse gas emissions, could also subject us to additional costs and restrictions, including increased energy and raw materials costs which could negatively impact our financial condition and results of operations. Climate change may also negatively impact our labor force by, for example, reducing the hours during which construction or other outdoor work can be performed safely in extreme hit or under conditions of poor air quality. In addition, climate change may negatively impact the availability of our feedstock, for example, by increasing the prevalence of certain pests harmful to the growth or quality of the biomass we use in our processes. The effects of climate change can not only adversely impact our operations, but also that of our suppliers and customers, and can lead to increased regulations and changes in consumer preferences, which could adversely affect our business, results of operations and financial condition.

Unfavorable global economic conditions could adversely affect our business, financial condition and results of operations.

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets, including inflation and supply disruption. A domestic or global financial crisis can cause extreme volatility and disruptions in the capital and credit markets. A severe or prolonged economic downturn, which could result from an event like the COVID-19 pandemic or the global sanctions imposed against Russia following its military intervention in Ukraine, or inflation in fuel costs resulting from regional instability due to the military conflict in Israel and Gaza, could result in a variety of risks to our business, including our inability to purchase necessary supplies on acceptable terms, if at all, and our inability to raise additional capital when needed on acceptable terms, if at all. A weak or declining economy could strain our suppliers, possibly resulting in supply disruption, or cause delays in payments for our services by third-party payers or our collaborators. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the current economic climate and financial market conditions could adversely impact our business.

Our operating results may fluctuate significantly as a result of a variety of factors, many of which are outside of our control.

We are subject to, among other things, the following factors that may negatively affect our operating results:

- the announcement or introduction of new products by our competitors;
- our ability to upgrade and develop our systems and infrastructure to accommodate growth;
- our ability to attract and retain key personnel in a timely and cost-effective manner;
- our ability to attract new customers and retain existing customers;

- technical difficulties;
- the amount and timing of operating costs and capital expenditures relating to the expansion of our business, operations and infrastructure;
- our ability to identify and enter into relationships with appropriate and qualified third-party providers of necessary testing and manufacturing services;
- regulation by federal, state or local governments; and
- general economic conditions, as well as economic conditions specific to the chemicals, plastics, carbon products, and fuels industries, and other industries related to compostable or biodegradable substitutes for non-biodegradable plastics, as well as changes to commodity prices to which prices in some of our contracts are indexed.

As a result of our limited operating history and the nature of the markets in which we compete, it is difficult for us to forecast our revenues or earnings accurately. We have based our anticipated future expense levels largely on our investment plans and estimates of future events, although certain of our expense levels will, to a large extent, become fixed. As a strategic response to changes in the competitive environment, we may from time to time make certain decisions concerning expenditures, pricing, service or marketing that could harm our business, results of operations and financial condition. Due to the foregoing factors, our revenues and operating results are difficult to forecast.

Changes in tax laws or tax rulings could materially affect our financial position, results of operations, and cash flows.

The tax regimes we are subject to or operate under, including income and non-income taxes, are unsettled and may be subject to significant change. Changes in tax laws, regulations, or rulings, or changes in interpretations of existing laws and regulations, could materially affect our financial position and results of operations. For example, the 2017 Tax Cuts and Jobs Act (the "Tax Act") made broad and complex changes to the U.S. tax code. Future guidance from the IRS with respect to the Tax Act may affect us, and certain aspects of the Tax Act could be repealed or modified in future legislation. The Coronavirus Aid, Relief, and Economic Security Act (the "CARES Act") has already modified certain provisions of the Tax Act. More recently, the Inflation Reduction Act of 2022 (the "IRA") includes provisions that will impact the U.S. federal income taxation of corporations, including imposing a minimum tax on the book income of certain large corporations and an excise tax on certain corporate stock repurchases that would be imposed on the corporation repurchasing such stock. In addition, it is uncertain if and to what extent various states will conform to the Tax Act, the CARES Act, the IRA, or any newly enacted federal tax legislation. The issuance of additional regulatory or accounting guidance related to the Tax Act could materially affect our tax obligations and effective tax rate in the period issued. In addition, many countries in Europe and a number of other countries and organizations, have recently proposed or recommended changes to existing tax laws or have enacted new laws that could significantly increase our tax obligations in the countries where we do business or require it to change the manner in which we operate our business.

The Organization for Economic Cooperation and Development has been working on a Base Erosion and Profit Shifting Project, and issued a report in 2015, an interim report in 2018, and is expected to continue to issue guidelines and proposals that may change various aspects of the existing framework under which our tax obligations are determined in many of the countries in which we do business. Similarly, the European Commission and several countries have issued proposals that would change various aspects of the current tax framework under which we are taxed. These proposals include changes to the existing framework to calculate income tax, as well as proposals to change or impose new types of non-income taxes, including taxes based on a percentage of revenue.

As we expand the scale of our international business activities, these types of changes to the taxation of our activities could increase our worldwide effective tax rate, increase the amount of taxes imposed on our business, and harm our financial position. Such changes may also apply retroactively to our historical operations and result in taxes greater than the amounts estimated and recorded in our financial statements.

Unanticipated changes in effective tax rates or adverse outcomes resulting from examination of our income or other tax returns could adversely affect our operating results and financial condition.

We are subject to taxation in Canada and the United States with increasingly complex tax laws, the application of which can be uncertain. The amount of taxes we pay in these jurisdictions could increase substantially as a result of changes in the applicable tax principles, including increased tax rates, new tax laws or revised interpretations of existing tax laws and precedents, which could have an adverse impact on our liquidity and results of operations. In addition, the authorities in several jurisdictions could review our tax returns and impose additional tax, interest and penalties, which could have an impact on us and on our results of operations. We have previously participated in government programs with the Canadian federal government and Canadian provincial governments that provide investment tax credits based upon qualifying research and development expenditures. If Canadian taxation authorities successfully challenge such expenses or the correctness of such income tax credits claimed, our historical operating results could be adversely affected. As a public company, we will no longer be eligible for refundable tax credits under the Canadian federal Scientific Research and Experimental Development Program ("SR&ED") credits.

Our future effective tax rates could be subject to volatility or adversely affected by a number of factors.

Our future effective tax rates could be subject to volatility or adversely affected by a number of factors, including:

- changes in the valuation of our deferred tax assets and liabilities;
- expected timing and amount of the release of any tax valuation allowances;
- tax effects of stock-based compensation;
- costs related to intercompany restructurings;
- changes in tax laws, regulations or interpretations thereof; or
- future earnings being lower than anticipated in countries where we have lower statutory tax rates and higher than anticipated earnings in countries where we have higher statutory tax rates.

We may conduct activities in other jurisdictions through our subsidiaries pursuant to transfer pricing arrangements and may in the future conduct operations in other jurisdictions pursuant to similar arrangements. If two or more affiliated companies are located in different countries, the tax laws or regulations of each country generally will require that transfer prices be the same as those between unrelated companies dealing at arms' length. While we intend to operate in compliance with applicable transfer pricing laws, our transfer pricing procedures are not binding on applicable tax authorities. If tax authorities in any of these countries were to successfully challenge our transfer prices as not reflecting arm's length transactions, they could require us to adjust our transfer prices and thereby reallocate our income to reflect these revised transfer prices, which could result in a higher tax liability to us.

Our ability to use net operating loss carryforwards and other tax attributes may be limited in connection with the Business Combination or other ownership changes.

We have incurred losses during our history. To the extent that we continue to generate taxable losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire, if at all.

Under the Tax Act, as modified by the CARES Act, U.S. federal NOL carryforwards generated in taxable periods beginning after December 31, 2017, may be carried forward indefinitely, but the deductibility of such net operating loss carryforwards in taxable years beginning after December 31, 2020, is limited to 80% of taxable income. In addition, our NOL carryforwards are subject to review and possible adjustment by the IRS, and state tax authorities. Under Sections 382 and 383 of the Code, our federal net operating loss carryforwards and other tax attributes may become subject to an annual limitation in the event of certain cumulative changes in the ownership of our stock. An "ownership change" pursuant to Section 382 of the Code generally occurs if one or more stockholders or groups of stockholders who own at least 5% of a company's stock increase their ownership (as measured by value) by more than 50 percentage points over their lowest ownership percentage within a rolling three-year period. Our ability to utilize our NOL carryforwards and other tax attributes to offset future taxable income or tax liabilities may be limited as a result of ownership changes, including potential changes in connection with the Business Combination or other transactions. Similar rules may apply under state tax laws. We have recorded a valuation allowance related to the majority of our NOL carryforwards and other deferred tax assets due to the uncertainty of the ultimate realization of the future benefits of those assets.

Risks Related to Government Regulation

Compliance with extensive environmental, health and safety laws could require material expenditures, changes in our operations or site remediation.

We use hazardous materials in our production process, and our operations also produce hazardous waste. The manufacture, transportation and sale of our products can present potentially significant health and safety concerns and are also under increased public and governmental scrutiny. Our products are also used in a variety of applications that have specific regulatory requirements such as those relating to products that have contact with food or are used for medical applications.

Accordingly, our operations are subject to environmental, health and safety laws and regulations at the international, national, state and local level in multiple jurisdictions. These laws and regulations govern, among other things, air emissions, wastewater discharges, solid and hazardous waste management and disposal, occupational health and safety, including dust and noise control, site remediation programs and chemical use and management. Many of these laws and regulations have become more stringent over time and the costs of compliance with these requirements may increase, including costs associated with any necessary capital investments. In addition, our plants will require operating permits that are subject to renewal and, in some circumstances, revocation. The necessary permits may not be issued or continue in effect, and renewals of any issued permits may contain significant new requirements or restrictions. The nature of the specialty chemicals industry exposes us to risks of liability due to the use, production, management, storage, transportation and sale of materials that are heavily regulated or hazardous and can cause contamination or personal injury or damage if released into the environment.

Compliance with environmental laws and regulations generally increases the costs of transportation and storage of raw materials and finished products, as well as the costs of storage and disposal of wastes. We may incur substantial costs, including fines, damages, criminal or civil sanctions and remediation costs, or experience interruptions in our operations for violations arising under environmental laws, regulations or permit requirements. In addition, the market for bioplastics is heavily influenced by applicable federal, state and local government laws, regulations and policies as well as public perception. Changes in these laws, regulations and policies or how these laws, regulations and policies are implemented and enforced could cause the demand for bioplastics to decline and deter investment in the research and development of bioplastics. Concerns associated with bioplastics, including land usage, national security interests, deforestation, food crop usage and other environmental concerns, 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.

Furthermore, various petrochemical products, including plastics, have faced increased public scrutiny due to negative coverage of plastic waste in the environment, which has resulted in local, state, federal and foreign governments proposing and in some cases approving, restrictions or bans on the manufacture, consumption and disposal of certain petrochemical products. Although our products are intended to replace petrochemical products, increased regulation on the use of such products or other products in the specialty chemicals industry, whatever their scope or form, could increase our costs of production, impact overall consumption of our products or result in misdirected negative publicity. Any inability to address these requirements and any regulatory or policy changes could harm our business, financial condition and results of operations.

We are subject to U.S. and foreign anti-corruption and anti-money laundering laws and regulations. We could face criminal liability and other serious consequences for violations, which would harm our business.

We are subject to the U.S. Foreign Corrupt Practices Act of 1977, as amended, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act and possibly other anti-bribery and anti-money laundering laws in countries in which we conduct activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees, agents, contractors and other collaborators from authorizing, promising, offering or providing, directly or indirectly, improper payments or anything else of value to recipients in the public or private sector. We can also be held liable for the corrupt or other illegal activities of our employees, agents, contractors and other collaborators, even if we do not explicitly authorize or have actual knowledge of such activities. Any violations of the laws and regulations described above may result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm and other consequences.

Our operating plan may require us to source feedstock and supplies internationally, and foreign currency exchange rate fluctuations and changes to international trade agreements, tariffs, import and excise duties, taxes or other governmental rules and regulations could adversely affect our business, financial condition, results of operations and prospects.

Our expansion model is global and we expect to need to source feedstock and supplies from suppliers around the world. In particular, our manufacturing process is designed to use local timber and forest residues as our primary raw materials, which must be sourced locally. For the Origin 1 plant, this means we will need to source feedstock, as well as other supplies, from Canadian suppliers or arrange for transport of such feedstock and supplies into Canada. The U.S. federal government or other governmental bodies may propose changes to international trade agreements, tariffs, taxes and other government rules and regulations, and may impose sanctions limiting trade with other countries. If foreign currency exchange rates fluctuate or any restrictions or significant increases in costs or tariffs or sanctions are imposed related to feedstock and supplies sourced to our plants as a result of amendments to existing trade agreements or otherwise, this may increase our supply and shipping costs, resulting in potential decreased margins. We may expand our operations to countries with unstable governments that are subject to instability, corruption, changes in rules and regulations and other potential uncertainties that could harm our business, financial condition, results of operations and prospects. The extent to which our margins could decrease in response to any future tariffs is uncertain. We continue to evaluate the impact of trade agreements, as well as foreign currency exchange rate fluctuations and other recent changes in foreign trade policy on our supply chain, costs, sales and profitability. In addition, pandemics such as COVID-19 may result in increased travel restrictions and the extended shutdown of certain businesses throughout the world, and prolonged closures in Canada, Europe, Asia and elsewhere may disrupt the operations of certain suppliers of feedstock and other supplies, which could, in turn, negatively impact our business, financial condition, results of operations and prospects.

Risks Related to Our Intellectual Property

Our business relies on proprietary information and other intellectual property, and our failure to protect our intellectual property rights could harm our competitive advantages with respect to the use, manufacturing, sale or other commercialization of our processes, technologies and products, which may have an adverse effect on our results of operations and financial condition.

We intend to make significant capital investments into the research and development of proprietary information and other intellectual property as we develop, improve and scale our processes, technologies and products, and failure to fund and make these investments, or underperformance of the technology funded by these investments, could severely impact our business, financial condition, results of operations and prospects.

If we fail to adequately protect our intellectual property rights, such failure could result in the reduction or loss of our competitive advantage. We may be unable to prevent third parties from using our proprietary information and other intellectual property without our authorization or from independently developing proprietary information and other intellectual property that is similar to ours, particularly in those countries where the laws do not protect our proprietary rights to the same degree as in the U.S or those countries where we do not have intellectual property rights protection. The use of our proprietary information and other intellectual property by others could reduce or eliminate competitive advantages that we have developed, potentially causing us to lose sales or actual or potential customers, or otherwise harm our business. We are, and may continue to be, involved in litigation and administrative actions to protect these rights, and such proceedings could be burdensome and costly, could result in counterclaims challenging our intellectual property (including validity or enforceability) or accusing us of infringement, and we may not prevail.

Our patent applications and issued patents may be practiced by third parties without our knowledge. Our competitors may also attempt to design around our patents or copy or otherwise obtain and use our proprietary information and other intellectual property. Moreover, our competitors may already hold or have applied for patents in the U.S. or abroad that, if enforced, could possibly prevail over our patent rights or otherwise limit our ability to manufacture, sell or otherwise commercialize one or more of our products in the U.S. or abroad. With respect to our pending patent applications, we may not be successful in securing issued patents, or the claims of such patents may be narrowed, any of which may limit our ability to protect inventions that these applications were intended to cover, which could harm our ability to prevent others from exploiting our technologies and commercializing products similar to our products. In addition, the expiration of a patent can result in increased competition with consequent erosion of profit margins.

The applicable governmental authorities may not approve our pending service mark and trademark applications. A failure to obtain trademark registrations in the U.S. and in other countries could limit our ability to obtain and retain our trademarks in those jurisdictions. Moreover, third parties may seek to oppose our applications or otherwise challenge the resulting registrations. In the event that our trademarks are not approved or are successfully challenged by third parties, we could be forced to rebrand our products, which could result in loss of brand recognition and could require us to devote significant resources to rebranding and advertising and marketing new brands. The failure of our patents, trademarks, trade secrets, or confidentiality agreements to protect our proprietary information and other intellectual property, including our processes, apparatuses, technology, trade secrets, trade names and proprietary manufacturing expertise, methods and compounds, could have a material adverse effect on our business and results of operations.

Some of our intellectual property has been or will be discovered, conceived or developed through research funded by the Canadian government and thus may be subject to federal regulations providing for certain rights for the Canadian government or imposing certain obligations on us, such as limitations on exploiting such intellectual property outside of Canada. Compliance with such regulations may limit our exclusive rights and ability to commercialize our products and technology outside of Canada.

We may face patent infringement and other intellectual property claims that could be costly to defend, result in injunctions and significant damage awards or other costs (including indemnification of third parties or costly licensing arrangements, if licenses are available at all) and limit our ability to use certain key technologies in the future or require development of non-infringing products or technologies, which may cause us to incur significant unexpected costs, prevent us from commercializing our products and otherwise harm our business.

The various bioindustrial markets in which we plan to operate are subject to frequent and extensive litigation regarding patents, trade secrets and other intellectual property rights. Many of our competitors have a substantial amount of intellectual property. We cannot guarantee that our processes and products do not and will not infringe issued patents (whether present or future) or other intellectual property rights belonging to others.

From time to time, we may oppose third-party patents that we consider overbroad or otherwise invalid in order to maintain the necessary freedom to operate fully in our various business lines without the risk of being sued for patent infringement. If, however, the oppositions are unsuccessful, we could be liable for infringement or have to take other remedial or curative actions to continue our manufacturing and sales activities with respect to one or more products.

We may also be subject to legal proceedings and claims in the ordinary course of our business, including claims of alleged infringement or misappropriation of the patents, trademarks, trade secrets and other intellectual property rights of third parties by us or our licensees in connection with their use of our products. Intellectual property litigation is expensive and time-consuming, regardless of the merits of any claim, and could divert our management's attention from operating our business.

If we were to discover that our processes, technologies or products infringe or misappropriate the valid intellectual property rights of others, we might need to obtain licenses from these parties or substantially re-engineer our processes, technologies or products in order to avoid infringement. We may not be able to obtain the necessary licenses on acceptable terms, or at all, or be able to re-engineer our processes, technologies or products successfully. Moreover, if we or our licensees are sued for infringement or misappropriation and lose, we could be required to pay substantial damages, indemnify our licensees and/or be enjoined from using or selling the infringing processes, technologies or products. If we incur significant costs to litigate infringement or misappropriation claims or to obtain licenses, or if our inability to obtain required licenses prevents us from using or selling our processes, technologies or products, it could have a material adverse effect on our business and results of operations.

We rely on trade secrets to protect our technology, and our failure to maintain trade secret protection could limit our ability to compete.

We rely on trade secrets to protect some of our technology and proprietary information, especially where we believe patent protection is not appropriate or obtainable. We have security measures in place to safeguard our trade secrets database and limit the access to a need-to-know basis. However, trade secrets can be difficult to protect. The misappropriation or other compromise of our trade secrets may lead to a reduction or loss of our competitive advantages resulting from such trade secrets. Further, litigating a claim that a third party had misappropriated our trade secrets would be expensive and time consuming, and the outcome would be unpredictable. Moreover, if our competitors independently develop similar knowledge, methods and know-how, it will be difficult for us to enforce our rights and our business could be harmed.

Our confidentiality agreements could be breached or may not provide meaningful protection for our trade secrets or proprietary manufacturing expertise. Adequate remedies may not be available in the event of an unauthorized use or disclosure of our trade secrets and manufacturing expertise. Violations by others of our confidentiality agreements and the loss of employees who have specialized knowledge and expertise could harm our competitive position resulting from the exclusive nature of such knowledge and expertise and cause our sales and operating results to decline as a result of increased competition. In addition, others may obtain knowledge of our trade secrets through independent development or other access by legal means.

Other Risks Related to Our Business

Our management has limited experience in operating a public company.

Our executive officers have limited experience in the management of a publicly traded company subject to significant regulatory oversight and reporting obligations under federal securities laws. We may not have adequate personnel with the appropriate level of knowledge, experience and training in the accounting policies, practices or internal control over financial reporting required of public companies in the United States. It is possible that we will be required to expand our employee base and hire additional employees to support our operations as a public company, which will increase our operating costs in future periods.

We are dependent on management and key personnel, and our business could suffer if we fail to retain our key personnel or attract additional highly skilled employees.

Our success depends on the specialized skills of our management team and key operating personnel. This may present particular challenges as we operate in a highly specialized industry sector, which may make replacement of our management team and key operating personnel difficult. A loss of our managers or key employees, or their failure to satisfactorily perform their responsibilities, could have an adverse effect on our business, financial condition, results of operations and prospects.

Our future success will depend on our ability to identify, hire, develop, motivate and retain highly qualified personnel for all areas of our organization, particularly research and development, engineering, operations, and sales. Trained and experienced personnel are in high demand and may be in short supply. Many of the companies that we compete with for experienced employees have greater resources than us and may be able to offer more attractive terms of employment. In addition, we invest significant time and expense in training employees, which increases their value to competitors that may seek to recruit them. We may not be able to attract, develop and maintain the skilled workforce necessary to operate our business, and labor expenses may increase as a result of a shortage in the supply of qualified personnel, which could negatively impact our business, financial condition, results of operations and prospects.

We previously identified a material weakness in our internal control over financial reporting that we have concluded has been remediated. However, we may identify additional material weaknesses in the future or fail to maintain effective internal control over financial reporting, which may result in material misstatements of our consolidated financial statements or cause us to fail to meet our periodic reporting obligations.

In connection with the audit of our consolidated financial statements for the fiscal years ended December 31, 2019 and December 31, 2020, during the course of preparing for the Business Combination, and during the second quarter 2021 and third quarter 2021 interim reviews, we identified a material weakness in our internal control over financial reporting. We implemented and continue to employ measures designed to improve our internal control over financial reporting, which remediated this material weakness in the fourth quarter of 2021. A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of its annual or interim financial statements will not be prevented or detected on a timely basis.

If we are unable to successfully remediate any future material weaknesses in our internal control over financial reporting, or if we identify any additional material weaknesses, the accuracy and timing of our financial reporting may be adversely affected, we may be unable to maintain compliance with securities law requirements regarding timely filing of periodic reports in addition to applicable Nasdaq listing requirements, investors may lose confidence in our financial reporting and our stock price may decline as a result. We also could become subject to investigations by Nasdaq, the SEC or other regulatory authorities.

As a public company, we are also required, pursuant to Section 404 of the Sarbanes-Oxley Act, to furnish a report by management on, among other things, the effectiveness of its internal control over financial reporting for our annual reports on Form 10-K to be filed with the SEC. This assessment needs to include disclosure of any material weaknesses identified by management in our internal control over financial reporting. We are required to disclose changes made in our internal control over financial reporting on a quarterly basis. Failure to comply with the Sarbanes-Oxley Act could potentially subject us to sanctions or investigations by the SEC, the applicable stock exchange or other regulatory authorities, which would require additional financial and management resources. In order to evaluate the effectiveness of internal control over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act, management has conducted an assessment, including testing, using the criteria in Internal Control – Integrated Framework, issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") using the 2013 framework. Our system of internal control over financial reporting is 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. Because of its inherent limitations, internal control over financial reporting may not prevent or detect all misstatements.

We are subject to stringent and changing U.S. and foreign laws, regulations, rules, contractual obligations, policies and other obligations related to data privacy and security. Our actual or perceived failure to comply with such obligations could lead to regulatory investigations or actions; litigation; fines and penalties; disruptions of our business operations; reputational harm; loss of revenue or profits; loss of customers or sales; and other adverse business consequences.

In the ordinary course of business, we collect, receive, store, process, generate, use, transfer, disclose, make accessible, protect, secure, dispose of, transmit, and share (commonly known as processing) personal data and other sensitive information, including proprietary and confidential business data, trade secrets, and intellectual property. Our data processing activities subject us to various data privacy and security obligations, which can include laws, regulations, guidance, industry standards, external and internal privacy and security policies, contracts, and other obligations that govern the processing of personal data by us and on our behalf.

In the United States, federal, state, and local governments have enacted numerous data privacy and security laws, including data breach notification laws, personal data privacy laws, and consumer protection laws (e.g., Section 5 of the Federal Trade Commission Act), and other similar laws (e.g., wiretapping laws). For example, the California Consumer Privacy Act of 2018 ("CCPA") imposes obligations on businesses to which it applies, such as providing specific disclosures in privacy notices and affording California residents certain rights related to their personal data and applies to personal information of consumers, business representatives, and employees who are California residents. The CCPA provides for civil penalties of up to $7,500 per violation and allows private litigants affected by certain data breaches to recover significant statutory damages. In addition, the California Privacy Rights Act of 2020 ("CPRA"), effective January 1, 2023, expands the CCPA, including by establishing a new California Privacy Protection Agency to implement and enforce the CPRA and adding a new right for individuals to correct their personal information. Other states have also enacted data privacy laws, including Virginia and Colorado. In addition, data privacy and security laws have been proposed at the federal, state, and local levels in recent years, which could further complicate compliance efforts.

Outside the United States, an increasing number of laws, regulations, and industry standards apply to data privacy and security. For example, the European Union's General Data Protection Regulation ("EU GDPR") and the United Kingdom's GDPR ("UK GDPR") impose strict requirements for processing the personal data of individuals located in the European Economic Area ("EEA") and the UK, respectively. For example, under the EU GDPR, government regulators may impose temporary or definitive bans on data processing, as well as fines of up to €20 million or 4% of annual global revenue, whichever is greater. The GDPR also allows for private litigation related to processing of personal data brought by classes of data subjects or consumer protection organizations authorized at law to represent their interests. Additionally, in Canada, the Personal Information Protection and Electronic Documents Act ("PIPEDA") and various related provincial laws, as well as Canada's Anti-Spam Legislation ("CASL"), may apply to our operations. We also have customers in Asia, and may be subject to new and emerging data privacy regimes in Asia, such as China's Personal Information Protection Law and Japan's Act on the Protection of Personal Information.

In addition, certain jurisdictions have enacted data localization laws and cross-border personal data transfer laws, which could make it more difficult to transfer information across jurisdictions (such as transferring or receiving personal data that originates in Europe or other jurisdictions). Existing mechanisms that may facilitate cross-border personal data transfers may change or be invalidated.

We are also bound by contractual obligations related to data privacy and security, and our efforts to comply with such obligations may not be successful. We publish privacy policies, marketing materials and other statements, such as compliance with certain certifications or self-regulatory principles, regarding data privacy and security. If these policies, materials or statements are found to be deficient, lacking in transparency, deceptive, unfair, or misrepresentative of our practices, we may be subject to investigation, enforcement actions by regulators or other adverse consequences.

Obligations related to data privacy and security are quickly changing in an increasingly stringent fashion, creating some uncertainty as to the effective future legal framework. Additionally, these obligations may be subject to differing applications and interpretations, which may be inconsistent or in conflict among jurisdictions. Preparing for and complying with these obligations may require us to devote significant resources (including, without limitation, financial and time-related resources). These obligations may necessitate changes to our information technologies, systems, and practices and to those of any third parties that process personal data on our behalf.

Although we endeavor to comply with all applicable data privacy and security obligations, we may at times fail (or be perceived to have failed) to do so. Moreover, despite our efforts, our personnel or third parties upon whom we rely may fail to comply with such obligations, which could negatively impact our business operations and compliance posture. For example, any failure by a third-party processor to comply with applicable law, regulations, or contractual obligations could result in adverse effects, including inability to or interruptions in our ability to operate our business and proceedings against us by governmental entities or others.

If we fail, or are perceived to have failed, to address or comply with data privacy and security obligations, we could face significant consequences. These consequences may include, but are not limited to, government enforcement actions (e.g., investigations, fines, penalties, audits, inspections, and similar); litigation (including class-related claims); additional reporting requirements and/or oversight; bans on processing personal data; and orders to destroy or not use personal data.

Any of these events could have a material adverse effect on our reputation, business, or financial condition, including but not limited to: loss of customers; interruptions or stoppages in our business operations; inability to process personal data or to operate in certain jurisdictions; limited ability to develop or commercialize our products; expenditure of time and resources to defend any claim or inquiry; adverse publicity; or revision or restructuring of our operations.

If our information technology systems or data, or those of third parties upon which we rely, are or were compromised, we could experience adverse consequences resulting from such compromise, including but not limited to regulatory investigations or actions; litigation; fines and penalties; disruptions of our business operations; reputational harm; loss of revenue or profits; loss of customers; and other adverse consequences.

In the ordinary course of our business, we may process proprietary, confidential, and sensitive data, including personal data, intellectual property, and trade secrets (collectively, sensitive information).

Cyberattacks, malicious internet-based activity, and online and offline fraud are prevalent and continue to increase. These threats are becoming increasingly difficult to detect. These threats come from a variety of sources, including traditional computer "hackers," threat actors, personnel (such as through theft or misuse), sophisticated nation-states, and nation-state-supported actors. Some actors now engage and are expected to continue to engage in cyber-attacks, including without limitation nation-state actors for geopolitical reasons and in conjunction with military conflicts and defense activities. During times of war and other major conflicts, we and the third parties upon which we rely may be vulnerable to a heightened risk of these attacks, including retaliatory cyber-attacks, that could materially disrupt our systems and operations, supply chain, and ability to produce, sell and distribute our products.

We and the third parties upon which we rely may be subject to a variety of evolving threats, including but not limited to social-engineering attacks (including through phishing attacks), malicious code (such as viruses and worms), malware (including as a result of advanced persistent threat intrusions), denial-of-service attacks (such as credential stuffing), credential harvesting, personnel misconduct or error, ransomware attacks, supply-chain attacks, software bugs, server malfunctions, software or hardware failures, loss of data or other information technology assets, adware, telecommunications failures, earthquakes, fires, floods, and other similar threats.

Ransomware attacks, including those perpetrated by organized criminal threat actors, nation-states, and nation-state-supported actors, are becoming increasingly prevalent and severe – particularly for companies like ours that are engaged in manufacturing – and can lead to significant interruptions in our operations, loss of data and income, reputational harm, and diversion of funds. Extortion payments may alleviate the negative impact of a ransomware attack, but we may be unwilling or unable to make such payments due to, for example, applicable laws or regulations prohibiting such payments. Additionally, remote work has become more common and has increased risks to our information technology systems and data, as more of our employees utilize network connections, computers and devices outside our premises or network, including working at home, while in transit and in public locations. Future or past business transactions (such as acquisitions or integrations) could also expose us to additional cybersecurity risks and vulnerabilities, as our systems could be negatively affected by vulnerabilities present in acquired or integrated entities' systems and technologies. A security incident or other interruption could result in unauthorized, unlawful, or accidental acquisition, modification, destruction, loss, alteration, encryption, disclosure of, or access to our sensitive information. A security incident or other interruption could disrupt our ability (and that of third parties upon whom we rely) to provide our products. Furthermore, we may discover security issues that were not found during due diligence of such acquired or integrated entities, and it may be difficult to integrate companies into our information technology environment and security program.

We rely upon third-party service providers and technologies to operate critical business systems to process sensitive information in a variety of contexts, including, without limitation, third-party providers of cloud-based infrastructure, encryption and authentication technology, employee email, content delivery to customers, manufacturing processing, process orders and invoices, payments, inventory management and other functions. We also depend on these systems to respond to customer inquiries, support our overall internal control process, maintain property, plant and equipment records, and pay amounts due to vendors and other creditors. Our ability to monitor these third parties' information security practices is limited, and these third parties may not have adequate information security measures in place. While we may be entitled to damages if our third-party service providers fail to satisfy their privacy or security-related obligations to us, any award may be insufficient to cover our damages, or we may be unable to recover such award. In addition, supply-chain attacks have increased in frequency and severity, and we cannot guarantee that third parties' infrastructure in our supply chain or our third-party partners' supply chains have not been compromised. We may share or receive sensitive information with or from third parties.

We may expend significant resources or modify our business activities in an effort to protect against security incidents. Certain data privacy and security obligations may require us to implement and maintain specific security measures, industry-standard or reasonable security measures to protect our information technology systems and sensitive information.

While we have implemented security measures designed to protect against security incidents, there can be no assurance that these measures will be effective. We take steps to detect and remediate vulnerabilities, but we may not be able to detect and remediate all vulnerabilities because the threats and techniques used to exploit such vulnerabilities change frequently and are often sophisticated in nature. Therefore, such vulnerabilities could be exploited but may not be detected until after a security incident has occurred. These vulnerabilities pose material risks to our business.

Despite our efforts to identify and remediate vulnerabilities, if any, in our information technology systems, our efforts may not be successful. Further, we may experience delays in developing and deploying remedial measures designed to address any such identified vulnerabilities. Applicable data privacy and security obligations may require us to notify relevant stakeholders of security incidents. Such disclosures are costly, and the disclosures or the failure to comply with such requirements could lead to adverse consequences.

If we (or third parties upon whom we rely) experience a security incident or are perceived to have experienced a security incident, we may experience adverse consequences. These consequences may include: government enforcement actions (for example, investigations, fines, penalties, audits, and inspections); additional reporting requirements and/or oversight; restrictions on processing data (including personal data); litigation (including class claims); indemnification obligations; negative publicity; reputational harm; monetary fund diversions; interruptions in our operations (including availability of data); financial loss; and other similar harms. Security incidents and attendant consequences may negatively impact our ability to grow and operate our business. Our contracts may not contain limitations of liability, and even where they do, there can be no assurance that limitations of liability in our contracts are sufficient to protect us from liabilities, damages, or claims related to our data privacy and security obligations. We cannot be sure that our insurance coverage will be adequate or sufficient to protect us from or to mitigate liabilities arising out of our data privacy and security practices, that such coverage will continue to be available on commercially reasonable terms or at all, or that such coverage will pay future claims. In addition to experiencing a security incident, third parties may gather, collect, or infer sensitive information about us from public sources, data brokers, or other means that reveals competitively sensitive details about our organization and could be used to undermine our competitive advantage or market position.

Risks Related to Ownership of Our Shares

Our Certificate of Incorporation provides, subject to limited exceptions, that the Delaware Court of Chancery is the sole and exclusive forum for certain stockholder litigation matters, which could limit our stockholders' ability to obtain a chosen judicial forum for disputes with us or our directors, officers, employees or stockholders.

Our Certificate of Incorporation requires, to the fullest extent permitted by law, that derivative actions brought in our name, actions against directors, officers and employees for breach of fiduciary duty and other similar actions may be brought in the Delaware Court of Chancery or, if that court lacks subject matter jurisdiction, another federal or state court situated in the State of Delaware. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and consented to the forum provisions in our Certificate of Incorporation. In addition, our Certificate of Incorporation provides that the federal district courts of the United States shall be the exclusive forum for the resolution of any complaint asserting a cause of action under the Securities Act.

This choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum of its choosing for disputes with us or any of our directors, officers, other employees or stockholders, which may discourage lawsuits with respect to such claims. 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 harm our business, operating results and financial condition.

Our charter documents and Delaware law could prevent a takeover that stockholders consider favorable and could also reduce the market price of our stock.

Our Certificate of Incorporation and Bylaws contain provisions that could delay or prevent a change in control of us. These provisions could also make it more difficult for stockholders to elect directors and take other corporate actions. These provisions include:

- initially providing for a classified Board with staggered, three-year terms;
- authorizing our Board to issue Preferred Stock with voting or other rights or preferences that could discourage a takeover attempt or delay changes in control;
- prohibiting cumulative voting in the election of directors;
- providing that vacancies on our Board may generally be filled only by a majority of directors then in office, even though less than a quorum;
- prohibiting the adoption, amendment or repeal of the Bylaws or the repeal of the provisions of our Certificate of Incorporation regarding the election and removal of directors without the required approval of at least two-thirds of the shares entitled to vote at an election of directors;
- prohibiting stockholder action by written consent;
- limiting the persons who may call special meetings of stockholders; and
- requiring advance notification of stockholder nominations and proposals.

These provisions may 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, which is responsible for appointing the members of our management. In addition, the provisions of Section 203 of the General Corporation Law of the State of Delaware ("DGCL") will govern us. These provisions may prohibit large stockholders, in particular those owning 15% or more of our outstanding voting stock, from merging or combining with us for a certain period of time without the consent of our Board. These and other provisions in our Certificate of Incorporation and our Bylaws under Delaware law could discourage potential takeover attempts, reduce the price investors might be willing to pay in the future for shares of our Common Stock and result in the market price of our Common Stock being lower than it would be without these provisions.

Claims for indemnification by our directors and officers may reduce our available funds to satisfy successful third-party claims against us and may reduce the amount of money available to us.

Our Certificate of Incorporation and Bylaws provide that we will indemnify our directors and officers, in each case to the fullest extent permitted by Delaware law.

In addition, as permitted by Section 145 of the DGCL, the Bylaws and its indemnification agreements that we entered into with our directors and officers provide that:

- we will indemnify our directors and officers for serving us in those capacities or for serving other business enterprises at our request, to the fullest extent permitted by Delaware law. Delaware law provides that a corporation may indemnify such person if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the registrant and, with respect to any criminal proceeding, had no reasonable cause to believe such person's conduct was unlawful;
- we may, in our discretion, indemnify employees and agents in those circumstances where indemnification is permitted by applicable law;
- we will be required to advance expenses, as incurred, to our directors and officers in connection with defending a proceeding, except that such directors or officers shall undertake to repay such advances if it is ultimately determined that such person is not entitled to indemnification;
- we will not be obligated pursuant to our Bylaws to indemnify a person with respect to proceedings initiated by that person against us or our other indemnities, except with respect to proceedings authorized by our Board or brought to enforce a right to indemnification;
- the rights conferred in the Bylaws are not exclusive, and we are authorized to enter into indemnification agreements with our directors, officers, employees and agents and to obtain insurance to indemnify such persons; and
- we may not retroactively amend our Bylaw provisions to reduce our indemnification obligations to directors, officers, employees and agents.

We do not intend to pay dividends for the foreseeable future.

We have has never declared or paid any cash dividends on our capital stock and do not intend to pay any cash dividends in the foreseeable future. We expect to retain future earnings, if any, to fund the development and growth of our business. Any future determination to pay dividends on our capital stock will be at the discretion of our Board. In addition, our loan agreements contain restrictions on our ability to pay dividends.

The market price and trading volume of our Common Stock has been and may be volatile and could decline significantly.

The stock markets, including Nasdaq on which we have listed the shares of our Common Stock under the symbol "ORGN," have from time to time experienced significant price and volume fluctuations. Even if an active, liquid and orderly trading market is sustained for our Common Stock, the market price of our Common Stock has been and may be volatile and could decline significantly. Our Common Stock experienced such a decline in August 2023. In addition, the trading volume in our Common Stock may fluctuate and cause significant price variations to occur. If the market price of our Common Stock declines significantly, you may be unable to resell your shares at or above the market price of our Common Stock at which you purchased our Common Stock. We cannot assure you that the market price of Common Stock will not fluctuate widely or decline significantly in the future in response to a number of factors, including, among others, the following:

- the realization of any of the risk factors presented in this Report;
- actual or anticipated differences in our estimates, or in the estimates of analysts, for our revenues, results of operations, level of indebtedness, liquidity or financial condition;
- additions and departures of key personnel;
- failure to comply with the requirements of Nasdaq;
- failure to comply with the Sarbanes-Oxley Act or other laws or regulations;
- future issuances, sales, resales or repurchases or anticipated issuances, sales, resales or repurchases, of our securities;
- publication of research reports about us;
- the performance and market valuations of other similar companies;
- commencement of, or involvement in, litigation involving us;

- broad disruptions in the financial markets, including sudden disruptions in the credit markets;
- speculation in the press or investment community;
- actual, potential or perceived control, accounting or reporting problems;
- changes in accounting principles, policies and guidelines; and
- other events or factors, including those resulting from infectious diseases, health epidemics and pandemics, natural disasters, war, acts of terrorism or responses to these events.

In the past, securities class-action litigation has often been instituted against companies following periods of volatility in the market price of their shares. This type of litigation could result in substantial costs and divert our management's attention and resources, which could have a material adverse effect on us.

In addition, litigation, including securities class action litigation, has often followed announcements of significant business transactions, such as the sale of a company or announcement of any other strategic transaction, or the announcement of negative events, such as negative earnings results. We are, and may in the future be, the target of this type of litigation. These events may also result in investigations by the Securities and Exchange Commission.

Our quarterly operating results may fluctuate significantly and could fall below the expectations of securities analysts and investors due to seasonality and other factors, some of which are beyond our control, resulting in a decline in our stock price.

Our quarterly operating results may fluctuate significantly because of several factors, including:

- labor availability and costs for hourly and management personnel;
- profitability of our products;
- changes in interest rates;
- impairment of long-lived assets;
- macroeconomic conditions, such as inflation and increasing interest rates, which may increase the risk of a potential recession;
- negative publicity relating to products we serve;
- changes in consumer preferences and competitive conditions;
- expansion to new markets; and
- fluctuations in commodity prices.

If securities or industry analysts do not publish or cease publishing research or reports about us, our business, or our market, or if they change their recommendations regarding our Common Stock adversely, then the price and trading volume of our Common Stock could decline.

The trading market for our Common Stock will be influenced by the research and reports that industry or securities analysts may publish about us, our business, our market, or our competitors. Accordingly, we must maintain confidence among current and future analysts, ratings agencies and other parties in our long-term financial viability and business prospects. Maintaining such confidence may be particularly complicated by certain factors including those that are largely outside of our control, such as limited operating history, market unfamiliarity, any delays in scaling manufacturing to meet demand and our eventual production and sales performance compared with the market expectations. If any of the analysts who may cover us change their recommendation regarding our Common Stock adversely, or provide more favorable relative recommendations about our competitors, the price of our Common Stock would likely decline. If any analyst who may cover us were to cease coverage of us, which occurred in November 2023 and may occur again in the future, or if any analyst fails to regularly publish reports on us, we could lose in the financial markets, which could cause our stock price or trading volume to decline.

Future issuances of debt securities and equity securities may adversely affect us, including the market price of our Common Stock and may be dilutive to existing stockholders.

In the future, we may incur debt or issue equity ranking senior to our Common Stock. Those securities will generally have priority upon liquidation. Such securities also may be governed by an indenture or other instrument containing covenants restricting its operating flexibility. Additionally, any convertible or exchangeable securities that we issue in the future may have rights, preferences and privileges more favorable than those of our Common Stock. Because our decision to issue debt or equity in the future will depend on market conditions and other factors beyond our control, we cannot predict or estimate the amount, timing, nature or success of our future capital raising efforts. As a result, future capital raising efforts may reduce the market price of our Common Stock and be dilutive to existing stockholders.

We have failed, and may continue to fail, to meet the listing standards of Nasdaq, and as a result our common stock may become delisted, which could have a material adverse effect on the liquidity of our common stock.

Our Common Stock and the public warrants that were issued in connection with Artius' initial public offering (the "Public Warrants") are currently listed on Nasdaq. If we fail to continue to satisfy the continued listing requirements of Nasdaq, such as the corporate governance or public float requirements, or the minimum closing bid price requirement, Nasdaq will take steps to delist our common stock. The per share price of our common stock has declined below the minimum bid price threshold required for continued listing. On January 4, 2023, we received a deficiency letter from the Listing Qualifications Department of the Nasdaq (the "Nasdaq Staff"), notifying us that, for the last 30 consecutive business days, the closing bid price for our Class A common stock had closed below the minimum $1.00 per share required for continued listing on the Nasdaq pursuant to Nasdaq Listing Rule 5550(a)(2) ("Rule 5550(a)(2)").

If we do not regain compliance with Rule 5550(a)(2) by July 2, 2024, we may be afforded a second 180 calendar day period to regain compliance. To qualify, we would be required to meet the continued listing requirement for market value of publicly held shares and all other initial listing standards for the Nasdaq Capital Market, except for the minimum bid price requirement. In addition, we would be required to notify Nasdaq of our intent to cure the deficiency during the second compliance period.

There are many factors that may adversely affect our minimum bid price. Many of these factors are outside of our control. As a result, we may not be able to sustain compliance with Rule 5550(a)(2) in the long term. Any potential delisting of our common stock from the Nasdaq would likely result in decreased liquidity and increased volatility for our common stock and would adversely affect our ability to raise additional capital or to enter into strategic transactions, in addition to adversely impacting the perception of our financial condition and could cause reputational harm to investors and parties conducting business with us. Any potential delisting of our common stock from the Nasdaq would also make it more difficult for our stockholders to sell our common stock.

If Nasdaq delists our securities from trading on its exchange for failure to meet the listing standards, we and our stockholders could face significant material adverse consequences including:

- a limited availability of market quotations for our securities;
- a determination that our Common Stock is a "penny stock" which will require brokers trading in our Common Stock to adhere to more stringent rules and possibly result in a reduced level of trading activity in the secondary trading market for our securities; or
- a decreased ability to issue additional securities or obtain additional financing in the future.

Additionally, if our securities are not listed on, or become delisted from, Nasdaq for any reason, and are quoted on the OTC Bulletin Board, an inter-dealer automated quotation system for equity securities that is not a national securities exchange, the liquidity and price of our securities may be more limited than if we were quoted or listed on Nasdaq or another national securities exchange. You may be unable to sell your securities unless a market can be established or sustained.

In the event of a delisting, we expect we would take actions to restore our compliance with Nasdaq Marketplace Rules, but we can provide no assurances that the listing of our common stock would be restored, that our common stock will remain above the Nasdaq minimum bid price requirement or that we otherwise will remain in compliance with the Nasdaq Marketplace Rules.

The National Securities Markets Improvement Act of 1996, which is a federal statute, prevents or preempts the states from regulating the sale of certain securities, which are referred to as "covered securities." Because Common Stock and Public Warrants are listed on Nasdaq, they are covered securities. Although the states are preempted from regulating the sale of our securities, the federal statute does allow the states to investigate companies if there is a suspicion of fraud, and, if there is a finding of fraudulent activity, then the states can regulate or bar the sale of covered securities in a particular case.

While we are not aware of a state, other than the State of Idaho, having used these powers to prohibit or restrict the sale of securities issued by blank check companies, certain state securities regulators view blank check companies unfavorably and might use these powers, or threaten to use these powers, to hinder the sale of securities of blank check companies in their states. Further, if we were no longer listed on Nasdaq, our securities would not be covered securities and we would be subject to regulation in each state in which we offer our securities.

Sales of a substantial number of shares of our common stock by our existing stockholders could cause the price of our common stock to decline.

At any time, sales of a substantial number of shares of our common stock in the public market could occur, or there could be a perception in the market that the holders of a large number of shares of common stock intend to sell shares, and any such event could reduce the market price of our common stock. Substantially all of the shares of our common stock outstanding and shares issued upon the exercise of stock options outstanding under our equity incentive plans, subject to applicable securities law restrictions and excluding shares of restricted stock that will remain unvested, may be able to be sold in the public market. We are unable to predict the effect that sales may have on the prevailing market price of Common Stock and Public Warrants.

To the extent our Warrants are exercised, additional shares of Common Stock will be issued, which will result in dilution to the holders of Common Stock and increase the number of shares eligible for resale in the public market. Sales, or the potential sales, of substantial numbers of shares in the public market by the selling securityholders could increase the volatility of the market price of Common Stock or adversely affect the market price of Common Stock.

There is no guarantee that the Warrants will be in the money at the time they become exercisable, and they may expire worthless.

The exercise price for our Warrants is $11.50 per share of Common Stock. There is no guarantee that the Warrants will be in the money following the time they become exercisable and prior to their expiration, and as such, the Warrants may expire worthless. Our Warrants became exercisable on July 25, 2021.

We may amend the terms of the Warrants in a manner that may be adverse to holders with the approval by the holders of at least 50% of the then-outstanding Public Warrants. As a result, the exercise price of your Warrants could be increased, the exercise period could be shortened and the number of shares of our Common Stock purchasable upon exercise of a Warrant could be decreased, all without your approval.

Our Warrants are issued in registered form under the Warrant Agreement between the warrant agent and us. The Warrant Agreement provides that the terms of the Warrants may be amended without the consent of any holder to cure any ambiguity or correct any defective provision, but requires the approval by the holders of at least 50% of the then-outstanding Public Warrants to make any change that adversely affects the interests of the registered holders of Public Warrants. Accordingly, we may amend the terms of the Public Warrants in a manner adverse to a holder if holders of at least 50% of the then-outstanding Public Warrants approve of such amendment. Although our ability to amend the terms of the Public Warrants with the consent of at least 50% of the then-outstanding Public Warrants is unlimited, examples of such amendments could be amendments to, among other things, increase the exercise price of the Warrants, convert the Warrants into cash or stock (at a ratio different than initially provided), shorten the exercise period or decrease the number of shares of our Common Stock purchasable upon exercise of a Warrant.

We may redeem unexpired Warrants prior to their exercise at a time that is disadvantageous to warrant holders, thereby making such Warrants worthless.

We have the ability to redeem outstanding Warrants at any time after they become exercisable and prior to their expiration, at a price of $0.01 per Warrant, provided that the last reported sales price of our Common Stock equals or exceeds $18.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) for any 20 trading days within a 30 trading-day period ending on the third trading day prior to the date on which we give proper notice of such redemption and provided certain other conditions are met. If and when the Warrants become redeemable by us, we may exercise our redemption right even if we are unable to register or qualify the underlying securities for sale under all applicable state securities laws. Redemption of the outstanding Warrants could force you (a) to exercise your Warrants and pay the exercise price therefor at a time when it may be disadvantageous for you to do so, (b) to sell your Warrants at the then-current market price when you might otherwise wish to hold your Warrants or (c) to accept the nominal redemption price which, at the time the outstanding Warrants are called for redemption, is likely to be substantially less than the market value of your Warrants.

In addition, we may redeem your Warrants after they become exercisable for a number of shares of Common Stock determined based on the redemption date and the fair market value of our Common Stock. Any such redemption may have similar consequences to a cash redemption described above. In addition, such redemption may occur at a time when the Warrants are "out-of-the-money," in which case, you would lose any potential embedded value from a subsequent increase in the value of our Common Stock had your Warrants remained outstanding.

We may issue additional shares of Common Stock or other equity securities without shareholder approval, which would dilute shareholders' ownership interests and may depress the market price of the Common Stock.

As of December 31, 2023 we have Warrants outstanding to purchase an aggregate of 35,476,627 shares of Common Stock. Pursuant to the Merger Agreement, we may issue up to 25,000,000 shares of our Common Stock as Earnout Shares. In addition, pursuant to the 2021 EIP Plan and the ESPP, we may issue an aggregate of up to 30,004,203 shares of Common Stock, which amount is subject to increase from time to time. We may also issue additional shares of Common Stock or other equity securities of equal or senior rank in the future in connection with, among other things, future acquisitions or repayment of outstanding indebtedness, without stockholder approval, in a number of circumstances. The issuance of additional shares or other equity securities of equal or senior rank would have the following effects:

- existing stockholders' proportionate ownership interest in us will decrease;
- the amount of cash available per share, including for payment of dividends in the future, may decrease;
- the relative voting strength of each previously outstanding share of Common Stock may be diminished; and
- the market price of the Common Stock may decline.

Item 1B. Unresolved Staff Comments

None.

Item 1C. Cybersecurity

Risk management and strategy

We have implemented and maintain information security processes designed to identify, assess, and manage material risks from cybersecurity threats to our critical computer networks, third-party hosted services, communications systems, hardware and software, and our critical data, including intellectual property and confidential information that is proprietary, strategic, or competitive in nature ("Information Systems and Data").

The Director of IT and General Counsel are responsible for helping to identify, assess and manage the Company's cybersecurity threats and risks by monitoring and evaluating our threat environment using, among other things, manual processes, automated tools, internal audits, threat and vulnerability assessments, evaluating threats reported to us, evaluating our and our industry's risk profile, and subscribing to reports and services that identify cybersecurity threats.

Depending on the environment, we implement and maintain various technical, physical, and organizational measures, processes, standards, and policies designed to manage and mitigate material risks from cybersecurity threats to our Information Systems and Data. These include, for example, an incident response plan and team, data encryption, risk assessments, network security and access controls, physical security, asset management, tracking, and disposal, systems monitoring, employee training including tabletop exercises and other simulated cybersecurity threats, and cybersecurity insurance. In addition, to oversee and identify any risks associated with our use of third-party service providers, we review Service Organization Controls ("SOC") reports of such third-party service providers when onboarding the provider and annually thereafter. We also maintain proper essential information sharing and access controls, aiding in the secure exchange of information between us and our third-party service providers.

Assessment and management of material risks from cybersecurity threats are integrated into the Company's overall risk management processes. For example, the Director of IT coordinates with our General Counsel and representatives of the Company's departments and teams to evaluate the Company's risk profile and identify and mitigate cybersecurity threats. Our General Counsel evaluates material risks from cybersecurity threats and reports to both the Company's executive management team and the Audit Committee of the Board of Directors. We also use third-party service providers to assist us from time to time to identify, assess, and manage material risks from cybersecurity threats, including for example cybersecurity consultants, data backup and recovery providers, cyber insurers, and legal counsel.

For a description of the risks from cybersecurity threats that may materially affect the Company and how they may do so, see our risk factors under Part 1. Item 1A. Risk Factors in this Annual Report on Form 10-K.

Governance

Our Board of Directors addresses the Company's cybersecurity risk management as part of its general oversight function and has delegated to the Audit Committee primary responsibility for monitoring the Company's cybersecurity risk management processes, including mitigation of cybersecurity threats.

Our cybersecurity risk assessment and management processes are implemented and maintained by certain members of the Company's management. In particular, the Director of IT and General Counsel are responsible for hiring appropriate personnel, helping to integrate cybersecurity risk considerations into the Company's overall risk management strategy, and communicating key priorities to relevant personnel, helping prepare for cybersecurity incidents, approving cybersecurity processes and technologies, and reviewing security assessments and other security-related reports. In addition, the General Counsel provides regular reports to the Audit Committee concerning the Company's cybersecurity posture and significant threats and risks and the processes to address them.

Our security incident response plan ("SIRP") is designed to escalate certain cybersecurity incidents to members of the Company's executive management team depending on the circumstances. The General Counsel, Director of IT, and relevant department heads work with our incident response team to help the Company mitigate and remediate cybersecurity incidents of which they are notified. The SIRP provides for escalation of potentially material cybersecurity incidents to the Audit Committee.

Item 2. Properties

Our corporate headquarters, pilot-scale plant and research and development laboratories are located in West Sacramento, California, where we occupy approximately 41,443 square feet of office, plant and laboratory space. Our leases for this facility were amended in August 2023 and will expire on December 31, 2033. We believe that the facility that we currently lease is adequate for our needs for the immediate future and that, should it be necessary, we can lease additional space to accommodate any future growth.

We also own a production facility in Sarnia, Ontario, Canada. This facility, Origin 1, is on approximately two acres of land and contains a construction trailer complete with approximately 15,476 square feet of office space. The land is owned and the offices are leased by our wholly owned subsidiary, Origin Materials Canada Pioneer Limited.

We completed the purchase of approximately 183 acres in Geismar, Louisiana for Origin 2 in third quarter 2022 in the amount of $8.5 million.

Item 3. Legal Proceedings

Not applicable.

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 Information

Our Common Stock and Public Warrants are listed on NASDAQ under symbols "ORGN" and "ORGNW", respectively. The following table sets forth the high and low sales price per share of our common stock as reported in the consolidated transaction reporting system.

Holders

As of close of business on February 23, 2024, there were 37 holders of record of our Common Stock and 1 holder of record for our Public Warrants. The actual number of holders of our Common Stock and Public Warrants is greater than the number of record holders, and includes holders who are beneficial owners, but whose shares or warrants are held in street name by brokers or other nominees.

Dividend Policy

We have never declared or paid any dividends and do not anticipate paying any dividends on our common stock in the foreseeable future.

Securities Authorized for Issuance Under Equity Compensation Plans

Information about our equity compensation plans in Item 12 of Part III of this Annual Report is incorporated by reference to the information to be set forth in our Proxy Statement.

Recent Sales of Unregistered Equity Securities

None.

Issuer Purchases of Equity Securities

None.

Item 6. Reserved

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

Overview

Origin is an innovative materials company with a mission to enable the world's transition to sustainable materials. We have pioneered a technology that has the potential to replace petroleum-based materials with decarbonized materials in a wide range of end products, such as food and beverage packaging, clothing, textiles, plastics, car parts, carpeting, tires, adhesives, soil amendments, fuels, and more. We have also developed other products that can enhance sustainability, such as our 100% polyethylene terephthalate ("PET") circular caps and closures that can enable fully-recyclable PET beverage containers and reduce waste through light-weighting, while providing enhanced performance such as greater oxygen and CO2 barrier properties that can increase shelf-life. These products complement our biomass conversion technology.

Our biomass conversion technology can convert sustainable feedstocks such as sustainably harvested wood residues, agricultural waste, wood waste, and even corrugated cardboard into materials and products that are currently made from fossil feedstocks such as petroleum and natural gas. The ability of our technology to use sustainable feedstocks that are not used in food production differentiates our technology from other sustainable materials companies that are limited to feedstocks used in food production such as vegetable oils or high fructose corn syrup and other sugars.

We believe that products made using Origin's biomass conversion technology at commercial scales can compete directly with petroleum-derived products on both performance and price while being sustainable. Due to abundant and renewable wood supplies that have historically stable pricing, our cost of production when using these feedstocks is expected to be more stable than potential competing platforms that use other types of feedstocks. We believe that end products made at commercial scale using our biomass conversion technology and wood feedstocks will have a significant unit cost advantage over products made from other low carbon feedstocks.

We have developed a proprietary biomass conversion technology to convert biomass, or plant-based carbon, into the versatile "building block" chemicals CMF and hydrothermal carbon ("HTC"), which we collectively refer to as Furanic Intermediates, as well as oils and extractives and other co-products. At commercial scale, our biomass conversion technology with wood feedstocks is expected to be able to produce CMF and HTC with a negative carbon footprint. We believe these chemicals can replace petroleum-based inputs, lowering the carbon footprint of a wide range of materials without increasing cost or sacrificing performance.

The following discussion and analysis should be read in conjunction with our consolidated financial statements and the related notes appearing elsewhere in this Annual Report. This discussion may contain forward-looking statements based upon current expectations that involve risks and uncertainties. Our actual results may differ materially from those anticipated in these forward-looking statements as a result of various factors, including those set forth in the sections titled "Cautionary Note Regarding Forward-Looking Statements" and "Risk Factors" as set forth elsewhere in this Annual Report. Unless the context otherwise requires, references in this section to "Legacy Origin", "Origin", "the Company", "we", "us" and "our" refer to the business and operations of Legacy Origin and its consolidated subsidiaries prior to the Business Combination and to Origin Materials, Inc. and its consolidated subsidiaries, following the Closing.

Business Environment and Trends

Our business and financial performance depend on worldwide economic conditions. We face global macroeconomic challenges, particularly in light of increases and volatility in interest rates, uncertainty in markets, inflationary trends, navigating complex and evolving regulatory frameworks, and the dynamics of the global trade environment. In addition to any lingering economic impacts of the COVID-19 pandemic, we have observed market uncertainty, civil unrest, global sanctions resulting from geopolitical conflicts, bank failures, increasing inflationary pressures, supply constraints and labor shortages in the past few quarters. These market dynamics, which we expect will continue into the foreseeable future, have and may continue to impact our business and financial results, including costs and revenues.

We believe demand for our products, which our signed offtake agreements and capacity reservations have shown to be strong and broad based, is likely to continue to exceed supply for the foreseeable future. Our commercial strategy has, accordingly, evolved from demand generation to revenue generation and the development of higher margin products.

We continue to see favorable tailwinds for our technology and business model. We are actively exploring several federal programs funded by the Inflation Reduction Act, including the Department of Energy's Advanced Industrial Facilities Deployment Program, or AIFD, and the Section 48C Advanced Manufacturing Tax Credit. These and other programs, many of which include climate and supply chain related directives, could provide positive momentum for us in securing additional funding for building plants and deploying our platform.

Product development progress remains strong. We continue to expand our IP position and engage in developmental activities with technical, strategic, and supply chain partners. We have demonstrated a significant performance milestone in our carbon black program, validating the suitability of our HTC-derived carbon black for automotive tires and mechanical rubber goods. Our carbon black blends were shown to meet or exceed fossil-based N660 performance for these applications and the results suggest they may be used more broadly, as well. With our first commercial plant, Origin 1, which commenced commercial-scale production in October 2023, we expect our ability to make production samples to increase, further bolstering our ability to advance product development objectives, including through funded joint development programs.

Key Factors and Trends Affecting Origin's Operating Results

We are in the early stages of generating revenue. We believe that our performance and future success depend on several factors that present significant opportunities for us but also pose risks and challenges, including those discussed below and under "Risk Factors" appearing elsewhere in this Annual Report.

Basis of Presentation

We currently conduct our business through one operating segment and our historical results are reported under accounting principles generally accepted in the United States of America ("U.S. GAAP") and in U.S. Dollars. Upon commencement of commercial operations, we expect to expand our operations substantially, including in the United States and Canada, and as a result, we expect Origin's future results to be sensitive to foreign currency transaction and translation risks and other financial risks that are not reflected in Origin's historical financial statements.

Components of Results of Operations

We are in the early stages of recognizing revenue and our historical results may not be indicative of our future results for reasons that may be difficult to anticipate. Accordingly, the drivers of our future financial results, as well as the components of such results, may not be comparable to our historical or projected results of operations.

Revenues

We evaluate financial performance and make resource allocation decisions based upon the results of our single operating and reportable segment. We generally procure, will produce, and sell product to be utilized in the manufacturing of finished products, for which we recognize revenue upon shipment. Our service contracts generally pay us at the commencement of the agreement and then at additional intervals as outlined in each contract. We recognize revenue as we satisfy the related performance obligations.

Cost of Revenues

Cost of revenues for product sales consists primarily of cost associated with the purchase of finished goods. Cost of revenues for service agreements is based on the actual cost incurred, which mainly consists of the direct cost from vendors and overhead costs such as payroll and benefit related to our employees who provide the services to customers.

Research and Development Expenses

To date, our research and development expenses have consisted primarily of development of CMF, HTC, levulinic acid, furfural, and oils and extractives, and the conversion of those chemical building blocks into products familiar to and desired by our customers, such as carbon black, furandicarboxylic acid ("FDCA"), polyethylene furanoate ("PEF"), paraxylene ("PX"), polyethylene terephthalate ("PET"), and PETF, which is a PET co-polyester incorporating FDCA and offering performance advantages over traditional PET plastic. Our research and development expenses also include personnel-related costs like stock-based compensation and professional fees, investments associated with the operations of the Origin 1 plant and planning and project development of the Origin 2 plant, including the material and supplies to support product development and process engineering efforts.

General and Administrative Expenses

General and administrative expenses consist primarily of personnel-related costs, including stock-based compensation and professional fees, including, the costs of accounting, audit, legal, regulatory and tax compliance.

Gain in Fair Value of Common Stock Warrants Liability

The gain in fair value of common stock warrants liability consists of the change in fair value of the Warrants (the Public Warrants together with the Private Placement Warrants, the "Common Stock Warrants" or "Warrants"). We expect to incur incremental income (expenses) for the fair value adjustments for the outstanding common stock warrants liability at the end of each reporting period or through the exercise of the warrants.

Gain in Fair Value of Earnout Liability

The gain in fair value of earnout liability consists of the change in fair value of the future contingent equity shares related to the Business Combination. We recognize incremental income (expense) for the fair value adjustments of the outstanding liability at the end of each reporting period.

Other Income (Expenses)

Our other income (expenses) consists of income from governmental grant programs, interest expenses for notes payable and other liabilities, interest income on marketable securities, realized gain or loss on marketable securities, investment fee, and income or expenses related to changes in the fair value of derivative assets and liabilities. We expect to incur incremental income (expenses) for the fair value adjustments of these assets and liabilities at the end of each reporting period.

Income Tax Expenses

Our income tax expenses consist of an estimate for U.S. federal, state, and foreign income taxes based on enacted rates, as adjusted for allowable credits, deductions, uncertain tax positions, changes in deferred tax assets and liabilities, and changes in the tax law. We maintain a valuation allowance against the full value of our U.S. federal and state, net deferred tax assets and certain foreign net deferred tax assets because we believe the recoverability of the tax assets is not more likely than not. We have released the valuation allowance previously recorded against some of the foreign net deferred tax assets as we believe it is more likely than not they will be recovered.

Results of Operations

Comparison of the year ended December 31, 2023 and 2022

The following table summarizes the Company's results of operations with respect to the items set forth in such table for the year ended December 31, 2023 and 2022 together with the change in such items in dollars and as a percentage.

(in thousands)	Year Ended December 31, 2023	Year Ended December 31, 2022	Variance $	Variance %
Revenues:				
Products	$ 23,896	$ —	$ 23,896	NA
Services	4,909	—	4,909	NA
Total revenues	28,805	—	28,805	NA
Cost of revenues (exclusive of depreciation and amortization shown separately below)	23,591	—	23,591	NA
Operating expenses				
Research and development	21,351	14,141	7,210	51 %
General and administrative	35,382	24,095	11,287	47 %
Depreciation and amortization	3,363	711	2,652	373 %
Total operating expenses	60,096	38,947	21,149	54 %
Loss from operations	(54,882)	(38,947)	(15,935)	41 %
Other income (expenses)				
Interest income	6,303	8,825	(2,522)	(29)%
Interest expenses	(131)	—	(131)	NA
Gain (loss) in fair value of derivatives	69	(443)	512	(116)%
Gain in fair value of common stock warrants liability	29,531	21,988	7,543	34 %
Gain in fair value of earnout liability	40,983	85,437	(44,454)	(52)%
Other income, net	838	1,709	(871)	(51)%
Total other income, net	77,593	117,516	(39,923)	(34)%
Income before income tax benefits	$ 22,711	$ 78,569	$ (55,858)	(71)%

Revenues

Revenues increased $28.8 million during the year ended December 31, 2023 compared to 2022. The increase in revenue is primarily attributable to our supply chain activation program. The Company did not recognize any revenue prior to 2023.

Cost of Revenues

Cost of revenues increased $23.6 million during the year ended December 31, 2023 compared to 2022. The increase is primarily attributable to the purchases associated with the Company's supply chain activation program. The Company had no cost of revenues prior to 2023.

Research and Development Expenses

Research and development expenses increased $7.2 million, or 51%, in 2023 compared to 2022. The increase is attributable to additional efforts in technical business development, patent advancement, product development and general research, mainly generated from additional headcount and related payroll costs.

General and Administrative Expenses

General and administrative expenses increased $11.3 million, or 47%, in 2023 compared to 2022. The increase is primarily driven by additional headcount, as well as facilities costs and external professional services related to legal, audit and regulatory compliance. In addition, the Company expensed the costs for process improvement associated with Origin 1 and is no longer capitalizing those expenses after Origin 1 was completed during the fourth quarter of 2023.

Depreciation and Amortization Expenses

Depreciation and amortization expenses increased $2.7 million, or 373%, in 2023 compared to 2022. The increase is mainly driven by the completion of Origin 1 during fourth quarter when we moved the assets from construction in process to the proper categories and began depreciating.

Interest income

Interest income decreased $2.5 million, or (29)%, in 2023 compared to 2022. The decrease is mainly driven by the amortization of premiums and discounts on marketable securities.

Gain (Loss) in fair value of derivatives, common stock warrants liability, and earnout liability

The Company recognized an aggregate gain related to the gain (loss) in fair values of derivatives, common stock warrants liability, and earnout liability of $70.6 million during year ended December 31, 2023 compared to an aggregate gain of $107.0 million during 2022. The aggregate gain related to the change in fair values decreased $36.4 million during year ended December 31, 2023. The decrease in the gain related to the change in fair value of earnout liability of $44.4 million is the result of the revaluation of the earnout liability with the fair value of such liability decreasing less in 2023 as compared to 2022. The $7.5 million increase in the gain from change in fair value of common stock warrants liability is the result of a larger decrease in the underlying fair value of common stock warrants in 2023 as compared to 2022. The fair values are driven by the value of the Company's stock price. The increase of $0.5 million in the gain from change in fair value of derivative liabilities was associated with our foreign currency exchange purchases or sales.

Non-GAAP Measures

To provide investors with additional information in connection with our results as determined in accordance with U.S. GAAP, we disclose Adjusted Earnings before Interest, Taxes, Depreciation, and Amortization ("Adjusted EBITDA") as a non-GAAP measure. Adjusted EBITDA is a key metric used by management and our board of directors (the "Board") to assess our financial performance. Adjusted EBITDA is also frequently used by analysts, investors, and other interested parties to evaluate companies in our industry, when considered alongside other U.S. GAAP measures. We use Adjusted EBITDA to supplement U.S. GAAP measures of performance to evaluate the effectiveness of our business strategies, make budgeting decisions and compare our performance against that of other companies using similar measures. This measure is not a financial measure calculated in accordance with U.S. GAAP, and it should not be considered as a substitute for net income, operating income, or any other measure calculated in accordance with U.S. GAAP, and may not be comparable to similarly titled measures reported by other companies.

Adjusted EBITDA

We believe that the presentation of Adjusted EBITDA is appropriate to provide additional information to investors about our operating profitability adjusted for certain non-cash items, non-routine items that we do not expect to continue at the same level in the future, as well as other items that are not core to our operations. Further, we believe Adjusted EBITDA provides a meaningful measure of operating profitability because we use it for evaluating our business performance, making budgeting decisions, and comparing our performance against that of other peer companies using similar measures.

We define Adjusted EBITDA as net income or loss adjusted for certain non-cash and non-recurring items, including (i) stock-based compensation expense, (ii) depreciation and amortization, (iii) interest income, (iv)interest expenses, (v) change in fair value of derivative, (vi) change in fair value of common stock warrants liability, (vii) change in fair value of earnout liability, (viii) other income, net, (ix) income tax benefits, and (x) cash severance.

(in thousands)	Year ended December 31, 2023	2022
Net income	$ 23,798	$ 78,569
Stock based compensation [1]	9,400	7,235
Depreciation and amortization	3,363	711
Interest income	(6,303)	(8,825)
Interest expenses	131	—
(Gain) loss in fair value of derivatives	(69)	443
Gain in fair value of common stock warrants liability	(29,531)	(21,988)
Gain in fair value of earnout liability	(40,983)	(85,437)
Other income, net	(838)	(1,709)
Income tax benefits	(1,087)	—
Cash severance [1]	484	—
Adjusted EBITDA	$ (41,635)	$ (31,001)

(1) Please see Note 15- Stockholder's Equity to the consolidated financial statements in Item 8 of this Annual Report for further details.

Liquidity and Capital Resources

Sources of Liquidity

Since inception, we have financed our operations principally from the sales and issuances of common stock, and governmental grant programs. Origin had $158.3 million in cash, cash equivalents, and marketable securities as of December 31, 2023. Our cash equivalents are invested primarily in U.S. Treasury money market funds and our marketable securities are primarily U.S. government and agency securities, corporate bonds, asset-backed securities, foreign government and agency securities, and municipal bonds.

We recently began generating revenue from our business operations. Our ability to successfully develop the products, commence commercial operations and expand the business will depend on many factors, including our ability to meet the working capital needs, the availability of equity or debt financing and, over time, our ability to generate cash flows from operations.

We will require a significant amount of cash for capital expenditures as we invest in the operation of Origin 1 and development of the Origin 2 plant, and additional research and development. In addition to our cash on hand, we anticipate that we will need substantial additional project financing, including from strategic partners, and government incentives to meet our financial projections, execute our growth strategy and expand our manufacturing capability. We anticipate that we will also enter into additional strategic partnerships to finance the construction of our Origin 2 plant. Our ability to obtain financing for the construction of future plants may depend in part on our ability to first enter into customer agreements sufficient to demonstrate adequate demand to justify the construction of such plants. We may also raise additional capital through equity offerings or debt financings, as well as through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties. Our future capital requirements will depend on many factors, including actual construction costs of the Origin 2 plant and the operation cost of Origin 1, changes in the costs in our supply chain, expanded operating activities and our ability to secure customers. If our financial projections are inaccurate, we may need to seek additional equity or debt financing from outside sources, which may not be available on acceptable terms, if at all. If we are unable to raise additional capital when required, our business, financial condition and results of operations would be harmed.

We expect to continue to incur operating losses in the near term as our operating and capital expenses are needed to support the growth of the business. We expect that our general and administrative expenses will continue to increase as we develop our all-PET cap and closure business, increase our spending on strategic partnerships, increase our sales and marketing activities, produce materials and operate as a public company.

Indebtedness

As of December 31, 2023 and 2022, we had $7.3 million and $7.2 million of indebtedness under a Canadian government program, respectively, of which zero and $0.8 million was received during the year ended December 31, 2023 and 2022, respectively. Additionally, as of December 31, 2023, we had liability balances consisting of $3.5 million notes payable, long-term, $1.7 million notes payable, short-term, $0.8 million unpaid accrued interest recorded in other liabilities, current,

$5.7 million other liabilities, long-term with unpaid accrued interest and a $2.5 million customer prepayment recorded in other liabilities, long-term. As of December 31, 2022, we had liability balances consisting of $5.8 million notes payable with unpaid accrued interest, $5.4 million other liabilities, long-term with unpaid accrued interest and a $2.5 million customer prepayment recorded in other liabilities, long-term.

In November 2016, Legacy Origin received a $5.0 million prepayment from a legacy stockholder for product from Origin 1 pursuant to an "Offtake Agreement," a type of agreement that generally provided for binding take-or-pay commitments to purchase certain annual volumes of product from our planned manufacturing facilities at specified prices, subject to satisfaction of certain conditions precedent. The prepayment was to be credited against the purchase of products over the term of the agreement. The prepayment was secured by a promissory note to be repaid in cash in the event that the prepayment could not be credited against the purchase of product, for example, if Origin 1 were never constructed. The promissory note was collateralized substantially by Origin 1 and other assets of Origin Materials Canada Pioneer Limited. In May 2019, Legacy Origin and the legacy stockholder amended the Offtake Agreement and promissory note. The amendment added accrued interest of $0.2 million to the principal balance of the prepayment and provided for the prepayment amount to be repaid in three annual installments rather than being applied against the purchase of product from Origin 1. On August 1, 2022, Legacy Origin and the legacy stockholder amended the note to provide for repayment in three installments consisting both principal and interest of $2.7 million on September 1, 2024, $1.9 million on September 1, 2025, and $1.8 million on September 1, 2026 and to allow the legacy stockholder to offset amounts owed for the purchase of product from Legacy Origin's Origin 1 facility against amounts due under the note. At December 31, 2023, the outstanding note principal balance was $5.2 million of which $3.5 million was included in notes payable, long-term and $1.7 million was included in notes payable, short-term and the outstanding accrued interest of $0.8 million was included in other liabilities, current. At December 31, 2022, the note principal balance was $5.2 million with outstanding accrued interest of $0.6 million.

Prepayments

In November 2016, Legacy Origin received a $5.0 million prepayment from a legacy stockholder for product from Origin 1 pursuant to an Offtake Agreement. The prepayment was to be credited against the purchase of products from Origin 1 over the term of the Offtake Agreement, specifically by applying a credit to product purchases each month over the first five years of operation of Origin 1 up to 150% of the prepayment amount—i.e., $7.5 million. The application of the credit to purchases would continue until the foregoing amount was fully repaid. The prepayment is secured by a note to be repaid in cash in the event the prepayment cannot be credited against the purchase of product, for example, if Origin 1 were never constructed. The note is collateralized substantially by Origin 1 and other assets of Origin Materials Canada Pioneer Limited. If repaid in cash, the note bears an annual interest rate of the three-month Secured Overnight Financing Rate ("SOFR") plus 0.25% (5.61% at December 31, 2023) and matures five years from the commercial operation date of Origin 1. In February 2024, Legacy Origin and the customer amended the agreement to provide for repayment in three installments consisting of approximately $2.2 million on March 1, 2024, $1.6 million on September 1, 2024, and $2.1 million on March 1, 2025 instead of applying a credit to product purchases under the Offtake Agreement. At December 31, 2023 and December 31, 2022 the total amount outstanding was $5.1 million plus accrued interest of $0.6 million and $0.3 million, respectively, was recorded in other liabilities, long-term.

In September 2019, Legacy Origin entered into a $5.0 million prepayment agreement with a counterparty for the purchase of products from Origin 2. The prepayment is to be made in two equal installments: the first $2.5 million was in October 2019 and the remaining $2.5 million is due within 30 days of the customer confirming that a sample from Origin 1 meets the customer's specifications. Origin and the customer agreed to work in good faith to execute an Offtake Agreement, the agreed terms of which are set forth in the prepayment agreement, whereby 100% of the prepayment will be applied against future purchases. The prepayment agreement provides the customer a capacity reservation of up to a specified annual volume of product from Origin 1 for a term of ten years, pursuant to the terms of an Offtake Agreement. At December 31, 2023 and 2022, the total amount outstanding on this agreement was $2.5 million was recorded in other liabilities, long-term. On February 5, 2024, the parties entered into a memorandum of understanding by which they agreed that the counterparty would be released from its obligation to pay the remaining $2.5 million of the prepayment and that Legacy Origin would refund the first $2.5 million within a certain period after reporting in its Quarterly Report on Form 10-Q that its cash on hand has crossed a specified threshold.

Cash Flows for the year ended December 31, 2023 Compared to the year ended December 31, 2022

The following table shows a summary of cash flows for the year ended December 31, 2023 and 2022:

(in thousands)	Year ended December 31, 2023	2022
Net cash used in operating activities	$ (60,355)	$ (26,092)
Net cash provided by investing activities	26,232	88,847
Net cash provided by financing activities	146	1,248
Effects of foreign exchange rate changes on the balance of cash and cash equivalents, and restricted cash held in foreign currencies	1,131	(2,782)
Net (decrease) increase in cash and cash equivalents, and restricted cash	$ (32,846)	$ 61,221

Cash Used in Operating Activities

Net cash used in operating activities for the year ended December 31, 2023 was $60.4 million. Non-cash income recognized for the $41.0 million change in the fair value of earnout liability and $29.5 million for the change in fair value of common stock warrants liability were deducted from net income of $23.8 million, in addition to the $15.2 million increase in accounts and other receivables and the $12.8 million increase in other long-term assets. These adjustments were partially offset by additions for non-cash charges of $9.4 million for stock-based compensation and $3.4 million for depreciation and amortization, as well as $5.9 million for the increase in accrued expenses.

Net cash used in operating activities for the year ended December 31, 2022 was $26.1 million. Non-cash income recognized for the $85.4 million change in the fair value of earnout liability and $22.0 million for the change in fair value of common stock warrants liability were deducted from net income of $78.6 million, in addition to the $1.7 million increase in accounts and other receivables and the $5.0 million increase in other long-term assets. These adjustments were partially offset by additions for non-cash charges of $7.2 million for stock-based compensation and $0.7 million for depreciation and amortization.

Cash Provided by Investing Activities

Net cash provided by investing activities was $26.2 million for the year ended December 31, 2023, compared to net cash provided by investing activities of $88.8 million in 2022. Our cash flows from investing activities, to date, have been comprised of purchases of property and equipment, intangible assets, and purchases and maturities of our marketable securities. We expect the costs to acquire property, plant and equipment to decrease substantially following completion of construction of Origin 1. The change was primarily related to increased purchases of property, plant and equipment of $18.5 million in 2023 compared to 2022. We also made deposits of $7.9 million in 2023 included in other long-term assets to secure a license to technologies that can be used to produce high margin downstream products. The increased net purchases of marketable securities of $13.5 million, offset by a decrease in maturities of marketable securities of $22.9 million in 2023 as compared to 2022.

The Company had substantial activities related to the development of Origin 1 prior to its completion in fourth quarter 2023, which is the main driver of the variation in cash used in investing activities between the two periods.

Material Cash Requirements from Known Contractual and Other Obligations

Our material cash requirements from known contractual and other obligations as of December 31, 2023, consisted of:

- The operating cost of Origin 1 and project development cost of Origin 2, plus the ongoing operating loss of the Company is expected to be funded through a combination of Company cash and marketable securities in addition to substantial project financing and government incentives. We also expect to secure funding for plant construction under potential collaborations, strategic alliances or marketing, distribution or licensing arrangements or debt financings, which have not yet been secured.
- Operating lease liabilities that are included in our consolidated balance sheets consists of future non-cancelable minimum rental payments under operating leases for our office space, research and development space, and leases of various office equipment, warehouse space, and temporary fencing. Operating lease liabilities of $0.4 million is short term and the remaining $4.2 million is related to long-term. For additional information regarding our

operating lease liabilities, see Note 17-Leases to the consolidated financial statements in Item 8 of this Annual Report.

- In the near-term, the Company also expects to make payments related to the repayment agreement associated with the notes payable. The repayment in the amount of $2.7 million is due on September 1, 2024, $1.9 million is due on September 1, 2025, and $1.8 million is due on September 1, 2026 (inclusive of accrued but unpaid interest). However, the prepayment could be used to credit against the purchase of products over the term of the Offtake Agreement. For additional information regarding this repayment, see Note 10- Notes Payable to the consolidated financial statements in Item 8 of this Annual Report.
- Additionally, the Company is anticipated to make payment related to the amended repayment agreements associated with the prepayment recorded in the other liabilities, long-term. The repayment amount including both principal and accrued interest of $2.2 million is due on March 1, 2024, $1.6 million is due on September 1, 2024, and $2.1 million is due on March 1, 2025. Unlike the repayment agreement above, this prepayment cannot be used to credit against the purchase of products. For additional information regarding this repayment, see Note 11- Other Liabilities, Long-term to the consolidated financial statements in Item 8 of this Annual Report
- Furthermore, the Company has a prepayment agreement with a counterparty with $2.5 million due within 30 days of the customer confirming that a sample from Origin 1 meets the customer's specifications. On February 5, 2024, the parties to the prepayment agreement entered into a memorandum of understanding by which they agreed that the counterparty would be released from its obligation to pay the remaining $2.5 million of the prepayment and that Legacy Origin would refund the first $2.5 million within a certain period after reporting in its Quarterly Report on Form 10-Q that its cash on hand has crossed a specified threshold. For additional information regarding this repayment, see Note 11- Other Liabilities, Long-term to the consolidated financial statements in Item 8 of this Annual Report.

Critical Accounting Policies and Estimates

Our financial statements have been prepared in accordance with U.S. GAAP. In the preparation of these consolidated financial statements, we are required to use judgment in making estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities as of the date of the financial statements, as well as the reported expenses incurred during the reporting periods. On an ongoing basis, we evaluate our estimates and assumptions. Our actual results may differ from these estimates under different assumptions or conditions.

We consider an accounting judgment, estimate or assumption to be critical when (1) the estimate or assumption is complex in nature or requires a high degree of judgment and (2) the use of different judgments, estimates and assumptions could have a material impact on the consolidated financial statements. Our significant accounting policies are described in Note 2 to our consolidated financial statements included elsewhere in this Annual Report. We have the critical accounting policies and estimates which are described below.

Earnout Liability

The Company has recorded an earnout liability related to future contingent equity shares related to the Business Combination. The Company recorded these instruments as liabilities on the consolidated balance sheets at fair value, with subsequent changes in their respective fair values recognized in earnings at each reporting date. The determination of the fair value involves certain judgments and estimates. These judgments include, but are not limited to, the probability of achievement of the market conditions, expected volatility of the Company's common stock, and the appropriate discount rate. Therefore, the Company considers this is a critical accounting estimate. For additional information regarding an earnout liability, see Note 12- Earnout Liability to the consolidated financial statements in Item 8 of this Annual Report.

Revenue Recognition

The Company recognizes revenue in accordance with ASC 606, *Revenue from Contracts with Customers (“ASC 606”)*. The core principle of ASC 606 requires that an entity recognize revenue to depict the transfer of promised goods or service to customers in an amount that reflects the consideration to which the Company expects to be entitled in exchange for those goods or services. In determining the appropriate amount of revenue to be recognized as we fulfill our obligations under our product revenue and service agreements, we perform the following steps:

1. Identifying the contract with a customer;
2. Identifying the performance obligations in the contract;
3. Determining the transaction price;
4. Allocating the transaction price to the performance obligations; and
5. Recognizing revenue when, or as, the performance obligations are satisfied.

We account for a contract with a customer when there is approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance and collectability of consideration is probable. Non-cancellable purchase orders received from customers to deliver a specific quantity of product, when combined with our order confirmation, in exchange for future consideration, create enforceable rights and obligations on both parties and constitute a contract with a customer.

Our service agreements are customized, specified, and often include various stages at which transaction prices are agreed to. These service agreements often include multiple performance obligations within each stage. We identify each performance obligation at contract inception and allocate the consideration to each distinct performance obligation based on the stand-alone selling price of each performance obligation. Our services are tailored to each individual customer and the stand-alone selling prices are not directly observable. As our service agreements include customers that are not in similar geographic markets and for different services, therefore the Company uses the expected cost plus margin approach to estimate the stand-alone selling price for each of our performance obligations. We recognize revenue from the service agreements over the period during which the services are performed and recognize the associated costs as they are incurred.

In general, we recognize revenue when, or as, our performance obligations under the terms of a contract with our customer are satisfied. The Company considers this is a critical accounting policy and estimate.

Recent Accounting Pronouncements

See Note 3 to the consolidated financial statements in this Annual Report for more information about recent accounting pronouncements, the timing of their adoption, and our assessment, to the extent we have made one, of their potential impact on our financial condition and results of operations and cash flows.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to a variety of market and other risks, including the effects of changes in interest rates, inflation and foreign currency translation and transaction risks, as well as risks to the availability of funding sources, hazard events and specific asset risks.

Interest Rate Risk

The market interest risk in our financial instruments and our financial positions represents the potential loss arising from adverse changes in interest rates. As of December 31, 2023 and 2022, we had cash and cash equivalents and marketable securities of $158.3 million and $323.8 million, respectively, consisting of interest-bearing money market accounts and marketable securities, for which the fair market value would be affected by changes in the general level of U.S. interest rates. However, due to the short-term maturities and the low-risk profile of our investments, an immediate 10% change in the interest rate would not have a material effect on the fair market value of our cash and cash equivalents and marketable securities. As such, management believes that the Company is not exposed to significant interest rate risk.

Foreign Currency Risk

Our functional currency is the U.S. dollar, while our Canadian subsidiaries’ functional currency is the Canadian dollar. This can expose us to both currency transaction and translation risk. To date, we have not had material exposure to foreign currency fluctuations and have not hedged such exposure, although we may do so in the future.

Certain marketable debt securities may be denominated in foreign currencies. At December 31, 2023, we had marketable debt securities denominated in U.S. dollar, Australian dollar, and British pound sterling. We pursue our objective of limiting foreign currency exposure by utilizing foreign currency forward contracts to offset foreign exchange risk. Our foreign currency forward contracts are generally short-term in duration. We neither use these foreign currency forward contracts for trading purposes nor do we currently designate these forward contracts as hedging instruments pursuant to Accounting Standards Codification Topic 815, *Derivatives and Hedging*. Accordingly, we record the fair values of these contracts as of the end of our reporting period to our consolidated balance sheets with changes in fair values recorded to our consolidated statements of operations and comprehensive income. Given the short duration of the forward contracts, the amount recorded is not significant. Our ultimate realized gain or loss with respect to foreign currency exposures will generally depend on the size and type of cross-currency transactions that we enter into, the currency exchange rates associated with these exposures and changes in those rates, the net realized gain or loss on our foreign currency forward contracts and other factors.

Inflation Risk

Inflation rates continue to have an effect on worldwide economies. Inflation generally affects us by increasing our cost of labor and may also increase transportation and construction costs due, for example, to higher fuel prices. We believe that inflation has not had a material effect on our audited consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Item 8. Financial Statements

INDEX TO CONSOLIDATED FINANCIAL INFORMATION

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of Origin Materials, Inc.

Opinion on the Financial Statements

We have audited the accompanying Consolidated Balance Sheet of Origin Materials, Inc. and subsidiaries (the "Company") as of December 31, 2023, the related Consolidated Statements of Operations and Comprehensive Income, Stockholders’ Equity and Cash Flows, for year ended December 31, 2023, 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, 2023, and the results of its operations and its cash flows for the year ended December 31, 2023, 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 audit. 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 audit 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 audit, 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 audit 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 audit 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 audit provides a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Revenues — Service Agreements — Refer to Notes 3 and 4 to the financial statements

Critical Audit Matter Description

The Company recognizes revenue in accordance with ASC 606, *Revenue from Contracts with Customers* (“ASC 606”). The Company generates revenue from product sales and service agreements. For service agreements, transaction prices are agreed to at the stage level and often include more than one performance obligation per stage. The Company identifies each performance obligation at contract inception and allocates the consideration to each distinct performance obligation based on the stand-alone selling price of each performance obligation. The accounting for these agreements involves judgement, particularly as it relates to the process of estimating total costs and profit for the performance obligation. The Company recognizes revenue when, or as, the performance obligations under the terms of a contract with customers are satisfied.

Given the judgments necessary to estimate total costs and profit for each performance obligation used to recognize revenue for service agreements, auditing such estimates required a high degree of auditor judgement and subjectivity and increased extent of effort. Accordingly, we identified the estimation of total costs and profit for each performance obligation used to recognize revenue in service agreements as a critical audit matter.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the estimation of total costs and profit for each performance obligation used to recognize revenue in service agreements included the following, among others:

- We performed the following on the Company’s single service agreement for which revenue was recognized for the year ended December 31, 2023:
    - Obtained the executed contract, obtained an understanding of the contract through inquiries with management, and evaluated whether management properly documented the terms of the contract in accordance with ASC 606.
    - Compared the transaction prices allocated to each stage with the executed contract.
    - Evaluated the estimates of total cost and profit for the performance obligation by comparing costs incurred to date to the costs management estimated to be incurred to date.
    - Tested the mathematical accuracy of the Company’s calculation of revenue for the allocation of the transaction price to the performance obligations that were satisfied during the year ended December 31, 2023.
    - Inspected completed deliverables for stages which performance obligations were satisfied as of December 31, 2023 and performed corroborating inquiry with the Company’s project manager regarding the costs associated with each of these completed performance obligations and forecasted costs for incomplete performance obligations.

/s/ DELOITTE & TOUCHE LLP

Sacramento, California
March 4, 2024

We have served as the Company's auditor since 2023.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Origin Materials, Inc.

Opinion on the financial statements

We have audited the accompanying consolidated balance sheets of Origin Materials, Inc. (a Delaware corporation) and subsidiaries (the "Company") as of December 31, 2022, the related consolidated statements of operations and comprehensive income, stockholders' equity, and cash flows for year ended December 31, 2022, 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, 2022 and the results of its operations and its cash flows in the period ended December 31, 2022, 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 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. 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.

/s/ GRANT THORNTON LLP

We served as the Company's auditor from 2020 to 2023.

San Jose, California
February 23, 2023

ORIGIN MATERIALS, INC.
CONSOLIDATED BALANCE SHEETS

(In thousands, except share and per share data)	December 31, 2023	December 31, 2022
ASSETS		
Current assets		
Cash and cash equivalents	$ 75,502	$ 107,858
Restricted cash	—	490
Marketable securities	82,761	215,464
Accounts receivable and unbilled receivable, net	16,128	—
Other receivables	3,449	4,346
Inventory	912	—
Prepaid expenses and other current assets	8,360	3,341
Total current assets	187,112	331,499
Property, plant, and equipment, net	243,118	154,183
Operating lease right-of-use asset	4,468	2,779
Intangible assets, net	121	160
Deferred tax assets	1,261	—
Other long-term assets	25,754	5,079
Total assets	**$ 461,834**	**$ 493,700**
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities		
Accounts payable	$ 1,858	$ 10,384
Accrued expenses	7,689	8,414
Operating lease liabilities, current	367	619
Notes payable, short-term	1,730	—
Other liabilities, current	918	51
Derivative liability	300	344
Total current liabilities	12,862	19,812
Earnout liability	1,783	42,533
Canadian Government Research and Development Program liability	7,348	7,185
Common stock warrants liability	1,341	30,872
Notes payable, long-term	3,459	5,847
Operating lease liabilities	4,207	2,249
Other liabilities, long-term	8,327	8,297
Total liabilities	39,327	116,795
Commitments and contingencies (See Note 18)		
STOCKHOLDERS' EQUITY		
Preferred stock, $0.0001 par value, 10,000,000 shares authorized; no shares issued and outstanding as of December 31, 2023 and 2022	—	—
Common stock, $0.0001 par value, 1,000,000,000 shares authorized; 145,706,531 and 143,034,225, issued and outstanding as of December 31, 2023 and 2022, respectively (including 4,500,000 Sponsor Vesting Shares)	15	14
Additional paid-in capital	382,854	371,072
Retained earnings	45,570	21,772
Accumulated other comprehensive loss	(5,932)	(15,953)
Total stockholders' equity	422,507	376,905
Total liabilities and stockholders' equity	**$ 461,834**	**$ 493,700**

The accompanying notes are an integral part of these consolidated financial statements.

ORIGIN MATERIALS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME

(In thousands, except share and per share data)	Year Ended December 31, 2023	Year Ended December 31, 2022
Revenues:		
Products	$ 23,896	$ —
Services	4,909	—
Total revenues	28,805	—
Cost of revenues (exclusive of depreciation and amortization shown separately below)	23,591	—
Operating expenses		
Research and development	21,351	14,141
General and administrative	35,382	24,095
Depreciation and amortization	3,363	711
Total operating expenses	60,096	38,947
Loss from operations	(54,882)	(38,947)
Other income (expenses)		
Interest income	6,303	8,825
Interest expenses	(131)	—
Gain (loss) in fair value of derivatives	69	(443)
Gain in fair value of common stock warrants liability	29,531	21,988
Gain in fair value of earnout liability	40,983	85,437
Other income, net	838	1,709
Total other income, net	77,593	117,516
Income before income tax benefits	22,711	78,569
Income tax benefits	1,087	—
Net income	$ 23,798	$ 78,569
Other comprehensive income (loss)		
Unrealized gain (loss) on marketable securities, net of tax	$ 6,355	$ (8,014)
Foreign currency translation adjustment, net of tax	3,666	(6,688)
Total other comprehensive income (loss)	10,021	(14,702)
Total comprehensive income	$ 33,819	$ 63,867
Net income per share, basic	$ 0.17	$ 0.57
Net income per share, diluted	$ 0.17	$ 0.55
Weighted-average common shares outstanding, basic	139,718,385	137,563,877
Weighted-average common shares outstanding, diluted	142,658,423	142,146,767

The accompanying notes are an integral part of these consolidated financial statements.

ORIGIN MATERIALS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In Thousands, Except Share Amounts)

	Common Stock		Additional Paid-in Capital	Retained Earnings (Accumulated Deficit)	Accumulated Other Comprehensive loss	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2021	141,301,569	$ 16	$ 361,542	$ (56,797)	$ (1,251)	$ 303,510
Common stock issued upon exercise of stock options	1,412,226	—	401	—	—	401
Vested common stock awards	320,430	(2)	—			(2)
Stock-based compensation	—	—	9,129	—	—	9,129
Net income	—	—	—	78,569	—	78,569
Other comprehensive loss	—	—	—	—	(14,702)	(14,702)
Balance at December 31, 2022	143,034,225	14	371,072	21,772	(15,953)	376,905
Common stock issued upon exercise of stock options	959,143	—	146	—	—	146
Vested common stock awards	1,713,163	1	—	—	—	1
Stock-based compensation	—	—	11,636	—	—	11,636
Net income	—	—	—	23,798	—	23,798
Other comprehensive income	—	—	—	—	10,021	10,021
Balance at December 31, 2023	145,706,531	$ 15	$ 382,854	$ 45,570	$ (5,932)	$ 422,507

The accompanying notes are an integral part of these consolidated financial statements.

ORIGIN MATERIALS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS

(in thousands)	Year Ended December 31, 2023	2022
Cash flows from operating activities		
Net income	$ 23,798	$ 78,569
Adjustments to reconcile net income to net cash used in operating activities:		
Depreciation and amortization	3,363	711
Amortization on right-of-use asset	615	582
Stock-based compensation	9,400	7,235
Realized gain on marketable securities	(1,018)	—
Amortization of premium and discount of marketable securities, net	3,750	—
Change in fair value of derivative	(69)	443
Change in fair value of common stock warrants liability	(29,531)	(21,988)
Change in fair value of earnout liability	(40,983)	(85,437)
Deferred tax benefits	(1,246)	—
Changes in operating assets and liabilities:		
Accounts and other receivables	(15,230)	(1,734)
Inventory	(912)	—
Prepaid expenses and other current assets	(4,994)	432
Other long-term assets	(12,761)	(5,017)
Accounts payable	909	26
Accrued expenses	4,985	485
Operating lease liability	(534)	(572)
Other liabilities, current	65	(329)
Other liabilities, long-term	38	502
Net cash used in operating activities	(60,355)	(26,092)
Cash flows from investing activities		
License prepayment within other long-term assets	(7,913)	—
Purchases of property, plant, and equipment	(102,188)	(83,691)
Purchases of marketable securities	(3,626,305)	(3,823,407)
Sales of marketable securities	3,605,216	3,815,859
Maturities of marketable securities	157,422	180,331
Capitalized interest on plant construction	—	(245)
Net cash provided by investing activities	26,232	88,847
Cash flows from financing activities		
Proceeds from Canadian Government Research and Development Program	—	849
Proceeds from exercise of stock options	146	399
Net cash provided by financing activities	146	1,248
Effects of foreign exchange rate changes on the balance of cash and cash equivalents, and restricted cash held in foreign currencies	1,131	(2,782)
Net (decrease) increase in cash and cash equivalents, and restricted cash	(32,846)	61,221
Cash and cash equivalents, and restricted cash, beginning of the period	108,348	47,127
Cash and cash equivalents, and restricted cash, end of the period	$ 75,502	$ 108,348
Supplemental disclosure of cash flow information		
Operating lease right-of-use assets obtained in exchange for lease obligations	$ 2,308	$ 1,687
Stock-based compensation capitalized into property, plant, and equipment	$ 2,236	$ 1,894
Purchases of fixed assets included in accounts payable and accrued expenses	$ 1,939	$ 17,085
Accrued interest capitalized into property, plant, and equipment	$ 367	$ —
Cash paid during the period:		
Income taxes payment	$ 129	$ —

The accompanying notes are an integral part of these consolidated financial statements.

ORIGIN MATERIALS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Organization and Business

Unless the context otherwise requires, references in these notes to “Origin”, “the Company”, “we”, “us” and “our” and any related terms are intended to mean Origin Materials, Inc. and its consolidated subsidiaries.

In June 2021, Artius Acquisition Inc. (“Artius”), a special purpose acquisition company, completed a business combination and merger with Micromidas, Inc., a Delaware corporation (now known as Origin Materials Operating Inc., (“Legacy Origin”)), Pursuant to the terms of the Merger Agreement (a business combination between Artius and Legacy Origin, the “Merger Agreement”) under which Legacy Origin became a wholly-owned subsidiary of Artius (the “Merger”) and Artius changed its name to Origin Materials, Inc. (collectively with its subsidiaries, the “Company”). The Company's mission to help enable the world’s transition to sustainable materials. Our innovative technologies include all-PET caps and closures that bring recycling circularity and enhanced performance to a greater than $65 billion market, specialty materials, and our patented biomass conversion platform that transforms carbon into sustainable materials for a wide range of end products addressing a ~$1 trillion market including food and beverage packaging, clothing, textiles, plastics, car parts, carpeting, tires, adhesives, soil amendments and more. The Company’s biomass conversion technology can transform sustainable feedstocks, such as sustainably harvested wood, agricultural waste, wood waste and corrugated cardboard, into materials and products that are currently made from fossil feedstocks, such as petroleum and natural gas.

The Company achieved the mechanical completion of its first manufacturing plant in Ontario, Canada (“Origin 1”), the world’s first commercial chloromethylfurfural (“CMF”) plant, and the plant is currently fully operational. The Company is also currently in the planning phase for the construction of a significantly larger manufacturing plant (“Origin 2”).

2. Summary of Significant Accounting Policies

Basis of Presentation

The Company’s consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America (“U.S. GAAP”) as determined by the Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC”) and pursuant to the regulations of the U.S. Securities and Exchange Commission (“SEC”).

Use of Estimates

The preparation of the consolidated financial statements in accordance with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of commitments and contingencies at the date of the financial statements as well as reported amounts of revenues, costs and expenses during the reporting periods. Estimates made by the Company include, but are not limited to, valuation of the earnout liability, carrying amount and useful lives of property and equipment and intangible assets, impairment assessments, probabilities of achievement of performance conditions on performance stock awards. The Company bases these estimates on historical experience and on various other assumptions that it believes are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying amounts of assets and liabilities that are not readily apparent from other sources. Actual results could differ materially from those estimates.

Principles of Consolidation

The consolidated financial statements have been prepared in accordance with U.S. GAAP and applicable rules and regulations of the SEC and include the accounts of the Company and its wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk are primarily cash, cash equivalents, marketable securities and accounts receivable. The Company maintains its cash, cash equivalents, and marketable securities accounts with financial institutions where, at times, deposits exceed federal insurance limits. Management believes that the Company is not currently exposed to significant credit risk as the Company’s deposits are held at financial institutions that management believes to be of high credit quality. While the Company has not experienced losses of these deposits to date, future disruptions of financial institutions where we bank or have credit arrangements, or disruptions of the financial services industry in general, could adversely affect our ability to access our cash and cash equivalents. If we are unable to access our cash and cash equivalents as needed, our financial position and ability to operate our business could be adversely affected. For accounts receivable, as of December 31, 2023, our top two customers from product sales, in the aggregate, accounted for approximately 67% of total accounts receivable outstanding balances and accounted for approximately 77% of total revenue for the year ended December 31, 2023.

Cash and Cash Equivalents and Restricted Cash

The Company considers all highly liquid investments with an initial maturity of three months or less at the date of purchase to be cash equivalents. The Company maintains such funds in cash deposits and money market accounts.

Restricted cash consists of cash held in a control account as collateral for the Company's escrow services and standby letter of credit. These restricted cash balances have been excluded from cash and cash equivalents balance in the consolidated balance sheets based on the contractual terms.

The Company entered into an escrow agreement on September 27, 2019 for $1.3 million, whereby the funds would be used for construction and transportation services in connection with Origin 1. At December 31, 2023 and 2022, the escrow account had a balance of zero and $0.3 million, respectively. On June 27, 2023, the Company began startup of the Origin 1 facility. Therefore, those funds are no longer restricted and have been released.

The Company had a standby letter of credit, whereby the funds were used for the completion of work, services, and improvements in connection with Origin 1. The standby letter of credit matured and automatically renewed in October of each year. At December 31, 2023 and 2022, the standby letter of credit was zero and $0.2 million, respectively. On June 27, 2023, the Company began startup of the Origin 1 facility. Therefore, those funds are no longer restricted and have been released.

Cash, cash equivalents, and restricted cash consisted of the following (in thousands):

	December 31, 2023	December 31, 2022
Cash and cash equivalents	$ 75,502	$ 107,858
Restricted cash	—	490
Total cash, cash equivalents, and restricted cash	$ 75,502	$ 108,348

Marketable Securities

The Company's investment policy requires the Company to purchase investments that are consistent with the classification of available-for-sale securities. The Company does not buy and hold securities principally for the purpose of selling them in the near future. The Company's policy is focused on the preservation of capital, liquidity, and return. The Company considers all of its marketable debt securities as available for use in current operations, including those with maturity dates beyond one year, and therefore classifies these securities within current assets on the consolidated balance sheets. Securities are classified as available for sale and are carried at fair value, with the change in unrealized gains and losses, net of tax, reported as a separate component in the consolidated statements of operations and comprehensive income until realized. Fair value is determined based on quoted market rates when observable or utilizing data points that are observable, such as quoted prices, interest rates and yield curves. Securities with an amortized cost basis in excess of estimated fair value are assessed to determine what amount of the excess, if any, is caused by expected credit losses. Expected credit losses on securities are recognized in other income, net in the consolidated statements of operations and comprehensive income, and any remaining unrealized gains and losses, net of taxes, are included in accumulated other comprehensive loss in the consolidated statements of stockholders' equity. For the purposes of computing realized and unrealized gains and losses, the cost of securities sold is based on the specific-identification method. Amortization of discounts and premiums, net, and interest on securities classified as available for sale are included as a component of interest income within other income (expenses).

The nature of these financial instruments include instruments for which quoted prices are available but traded less frequently, instruments whose fair value has been derived using a model where inputs to the model are directly observable in the market, or can be derived principally from or corroborated by observable market data, and instruments that are fair valued using other financial instruments, the parameters of which can be directly observed. Level 2 financial instruments include agency mortgage-backed securities, corporate fixed income securities infrequently traded, and other securities, which primarily consist of sovereign debt, U.S. government agency securities, loans, and state and municipal securities.

Derivative Financial Instruments

The Company enters into foreign currency derivative contracts with financial institutions to reduce foreign exchange risk related to marketable securities. The Company uses forward currency derivative contracts to minimize the Company's exposure to balances primarily denominated in the British Pound Sterling and Australian Dollar. The Company's foreign currency derivative contracts, which are not designated as hedging instruments, are used to reduce the exchange rate risk associated primarily with marketable securities. The Company's derivative financial instruments program is not designated for trading or speculative purposes. Outstanding foreign currency derivative contracts are recorded at fair value on the consolidated balance sheets.

Foreign currency derivative contracts are marked-to-market at the end of each reporting period with gains and losses recognized in the change in fair value of derivatives within other income (expenses). While the contract or notional amount is often used to express the volume of foreign currency derivative contracts, the amounts potentially subject to credit risk are generally limited to the amounts, if any, by which the counterparties' obligations under the agreements exceed the obligations of the Company to the counterparties.

Fair Value of Financial Instruments

The Company applies the fair value measurement accounting standard whenever other accounting pronouncements require or permit fair value measurements. Fair value is defined in the accounting standard 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. The fair value hierarchy under current accounting guidance prioritizes the inputs to valuation techniques used to measure fair value into three broad levels (Level 1, Level 2, and Level 3).

Level 1 inputs are unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access at the measurement date. Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. Level 3 inputs are unobservable inputs for the asset or liability and reflect the Company's own assumptions about the assumptions that market participants would use in pricing the asset or liability (including assumptions about risk) in a principal market.

The carrying amounts of working capital balances approximate their fair values due to the short maturity of these items. Unless otherwise noted, it is management's opinion that the Company is not exposed to significant interest rate, currency, or credit risks arising from its financial instruments.

The fair values of cash equivalents and the Common Stock Warrants which are publicly traded are level 1 inputs. The fair value of the Common Stock Warrants which are not publicly traded, marketable securities, and foreign currency derivative contracts are level 2 inputs as the Company uses quoted market prices or alternative pricing sources and models utilizing observable market inputs. The earnout liability was estimated using Level 3 inputs.

Accounts Receivable and unbilled services, net

We record accounts receivable at the stated amount of the transactions with our customers, and we do not charge interest. The allowance for credit losses, known as the Current Expected Credit Losses ("CECL") model, is our best estimate of the amount of probable credit losses associated with our accounts receivable. We determine the allowance based on current conditions, and reasonable and supportable forecasts. Past-due balances are reviewed individually for collectability. We charge off account balances against the allowance after we have exhausted all means of collection and we consider the potential for recovery to be remote. Our accounts receivable generally have net 30 to net 90-day payment terms, and we usually receive consideration in accordance with the payment terms of the contract. As of December 31, 2023 and 2022, we do not have any allowance for credit losses. Unbilled receivables arise when the timing of cash collected from customers differs from the timing of revenue recognition for the obligations performed.

	December 31, 2023	December 31, 2022
Accounts receivable, gross	$ 15,204	$ —
Allowance for credit loss	—	—
Unbilled receivable	924	—
Accounts receivable, net	$ 16,128	$ —

Other Receivables

Other receivables consist of amounts due from foreign governmental entities related to the Canadian harmonized sales tax (“HST”) and goods and services tax (“GST”) for goods and services transacted in Canada, and amounts due from cash collateral held by others for foreign currency derivative contracts.

Inventory

Inventory is stated at the lower of cost or net realizable value. Cost is determined using a weighted-average cost approach, assuming full absorption of direct and indirect manufacturing costs, or based on cost of purchasing from our vendors. If inventory costs exceed expected net realizable value due to obsolescence or lack of demand, valuation adjustments are recorded for the difference between the cost and the expected net realizable value.

Property, Plant, and Equipment

Additions to property, plant, and equipment are recorded at cost and depreciated or amortized using the straight-line method over the estimated economic useful lives of the respective assets. The estimated useful lives of assets are as follows:

Computer equipment and software	3 years
Lab equipment	5 years
Furniture, fixtures, and machinery	5 years
Land improvements and infrastructure	20 years
Manufacturing equipment and pilot plant	25 years
Buildings	40 years

Land is non-amortizing. Computer equipment and software includes an immaterial amount of internal use software. Major additions and improvements are capitalized, while replacements, repairs, and maintenance that do not extend the life of an asset are charged to expenses.

Upon retirement or sale, the cost of assets disposed and the related accumulated depreciation or amortization are removed from the accounts and any resulting gain or loss is charged to income or loss from operations. Costs incurred to acquire, construct or install property, plant, and equipment during the construction stage of a capital project and costs capitalized in conjunction with major improvements that have not yet been placed in service are recorded as construction in progress, and accordingly are not currently being depreciated. The Company capitalizes stock-based compensation expenses and interest cost incurred on funds used to construct property, plant and equipment.

Intangible Assets

Intangible assets are recorded at cost and are amortized using the straight-line method over the estimated useful lives of the respective assets, ranging from 7 to 15 years. The cost of servicing the Company’s patents is expensed as incurred. Upon retirement or sale, the cost of intangible assets is disposed of and the related accumulated amortization is removed from the accounts.

Impairment of Long-Lived Assets

The Company reviews its long-lived assets, including property, equipment, software and intangibles, for impairment whenever events or changes in circumstances indicate that the carrying amounts of the assets may not be fully recoverable. If indicators of impairment exist, management identifies the asset group which includes the potentially impaired long-lived asset, at the lowest level at which there are separate, identifiable cash flows. If the total of the expected undiscounted future net cash flows for the asset group is less than the carrying amount of the asset, a loss is recognized for the difference between the fair value and carrying amount of the asset. For the year ended December 31, 2023 and 2022, no impairment was identified.

Common Stock Warrants Liability

The Company assumed 24,149,960 public warrants (the “Public Warrants”) and 11,326,667 private placement warrants (the “Private Placement Warrants”, and the Public Warrants together with the Private Placement Warrants, the “Common Stock Warrants” or “Warrants”) upon the Merger, all of which were issued in connection with Artius’ initial public offering and entitle each holder to purchase one share of Class A common stock at an exercise price of at $11.50 per share.

As of December 31, 2023, 24,149,960 Public Warrants and 11,326,667 Private Placement Warrants are outstanding. The Public Warrants are publicly traded and are exercisable for cash unless certain conditions occur, such as the failure to have an effective registration statement related to the shares issuable upon exercise or redemption by the Company under certain conditions, at which time the Public Warrants may be cashless exercised. The Private Placement Warrants are transferable, assignable or salable in certain limited exceptions. The Private Placement Warrants are exercisable for cash or on a cashless basis, at the holder's option, and are non-redeemable so long as they are held by the initial purchasers or their permitted transferees. If the Private Placement Warrants are held by someone other than the initial purchasers or their permitted transferees, the Private Placement Warrants will cease to be Private Placement Warrants, and become Public Warrants and be redeemable by the Company and exercisable by such holders on the same basis as the other Public Warrants. There were no Private Placement Warrants that became Public Warrants as of Dec 31, 2023.

The Company evaluated the Common Stock Warrants under ASC 815-40, *Derivatives and Hedging-Contracts in Entity's Own Equity ("ASC 815-40")*, and concluded they do not meet the criteria to be classified in stockholders' equity. Specifically, the exercise of the Common Stock Warrants may be settled in cash upon the occurrence of a tender offer or exchange that involves 50% or more of our Class A stockholders. Because not all of the voting stockholders need to participate in such tender offer or exchange to trigger the potential cash settlement and the Company does not control the occurrence of such an event, the Company concluded that the Common Stock Warrants do not meet the conditions to be classified in equity. Since the Common Stock Warrants meet the definition of a derivative under ASC 815, the Company recorded these Warrants as liabilities on the consolidated balance sheets at fair value, with subsequent changes in their respective fair values recognized in the gain in fair value of common stock warrant liabilities within the consolidated statements of operations and comprehensive income at each reporting date. The Public Warrants were publicly traded and thus had an observable market price to estimate fair value, and the Private Placement Warrants were effectively valued similar to the Public Warrants, as described in Note 5.

Earnout Liability

The Company has recorded an earnout liability related to future contingent equity shares related to the Merger (Note 12). The Company recorded these instruments as liabilities on the consolidated balance sheets at fair value, with subsequent changes in their respective fair values recognized in earnings at each reporting date.

Leases

We determine if an arrangement is a lease at inception. Where an arrangement is a lease, we determine if it is an operating lease or a finance lease. The Company has leases for office space and equipment, some of which have escalating rentals during the initial lease term and during subsequent optional renewal periods. The Company accounts for its leases under ASC 842, *Leases*. The Company recognizes a right-of-use ("ROU") asset and lease liability for leases based on the net present value of future minimum lease payments. Lease expense is recognized on a straight-line basis over the non-cancelable lease term and renewal periods that are considered reasonably certain to be exercised.

Revenue Recognition

The Company began to recognize revenue in 2023. Our revenues are from product sales and service agreements. The majority of our contracts with customers typically contain multiple products and services. We account for individual products and services separately if they are distinct—that is, if a product or service is separately identifiable from other items in the contract and if a customer can benefit from it on its own or with other resources that are readily available to the customer.

The Company recognizes revenue in accordance with ASC 606, *Revenue from Contracts with Customers (“ASC 606”)*. The core principle of ASC 606 requires that an entity recognize revenue to depict the transfer of promised goods or service to customers in an amount that reflects the consideration to which the Company expects to be entitled in exchange for those goods or services. In determining the appropriate amount of revenue to be recognized as we fulfill our obligations under our product revenue and service agreements, we perform the following steps:

1. Identifying the contract with a customer;
2. Identifying the performance obligations in the contract;
3. Determining the transaction price;
4. Allocating the transaction price to the performance obligations; and
5. Recognizing revenue when, or as, the performance obligations are satisfied.

We account for a contract with a customer when there is approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance and collectability of consideration is probable. Non-cancellable purchase orders received from customers to deliver a specific quantity of product, when combined with our order confirmation, in exchange for future consideration, create enforceable rights and obligations on both parties and constitute a contract with a customer.

Our service agreements are customized, specified, and often include various stages at which transaction prices are agreed to. These service agreements often include multiple performance obligations within each stage. We identify each performance obligation at contract inception and allocate the consideration to each distinct performance obligation based on the stand-alone selling price of each performance obligation. Our services are tailored to each individual customer and the stand-alone selling prices are not directly observable. As our service agreements include customers that are not in similar geographic markets and for different services, therefore the Company uses the expected cost plus margin approach to estimate the stand-alone selling price for each of our performance obligations. We recognize revenue from the service agreements over the period during which the services are performed and recognize the associated costs as they are incurred.

In general, we recognize revenue when, or as, our performance obligations under the terms of a contract with our customer are satisfied. For product sales, this happens when we transfer control of our products and risk of loss to the customer or when title passes upon shipment. Revenue is measured as the amount of consideration we expect to receive in exchange for transferring our products. Taxes collected from customers and remitted to governmental authorities are excluded from revenues. The Company recognizes its revenue from direct product sales which is recognized at a point in time when the performance obligation is satisfied upon delivery of the product.

For service agreements, the timing of satisfying performance obligations may differ from the timing of the invoicing of customers and the receipt of customer payments. The Company records a receivable prior to payment if there is an unconditional right to payment. Alternatively, when payment precedes the provision of the related services, the Company records contract liability (deferred income) until the performance obligations are satisfied.

Revenue is recorded in an amount that reflects that consideration we expect to be entitled to in exchange for those goods or services. We have elected to treat shipping and handling activities as fulfillment costs.

Cost of revenues

Cost of revenues for product sales consists primarily of cost associated with the purchase of finished goods. Cost of revenues for service agreements is based on the actual cost incurred, which mainly consists of the direct cost from vendors and overhead costs such as payroll and benefit related to our employees who provide the services to customers.

Research and Development Cost

Costs related to research and development are expensed as incurred.

Stock-Based Compensation

The Company has issued common stock awards under three equity incentive plans. Origin measures stock options and other stock-based awards granted to employees, directors and other service providers based on their fair value on the date of grant and recognizes compensation expenses of those awards over the requisite service period, which is generally the vesting period of the respective award. In addition, the Company capitalizes stock-based compensation related to employees whose costs are necessary to bring the asset to its intended use. For awards with performance conditions, compensation is recorded once there is sufficient objective evidence the performance conditions are considered probable of being met. Origin applies the straight-line method of expense recognition to all awards with only service-based vesting conditions. Origin estimates the fair value of each stock option grant on the date of grant using the Black-Scholes option-pricing model and the grant date closing stock price for RSU awards and performance awards. The Black-Scholes option-pricing model requires the use of highly subjective assumptions including:

- *Expected term* – The expected term of the options is based on the simplified method, which takes into consideration the grant's contractual life and vesting period and assumes that all options will be exercised between the vesting date and the contractual term of the option which averages an award's vesting term and its contractual term.
- *Expected volatility* – The Company uses the trading history of various companies in its industry sector in determining an estimated volatility factor.
- *Expected dividend* – The Company has not declared common stock dividends and does not anticipate declaring any common stock dividends in the foreseeable future.
- *Forfeiture* – The Company estimates forfeitures based on historical activity and considers voluntary and involuntary termination behavior as well as analysis of actual historical option forfeitures, netting the estimated expense by the derived forfeiture rate.
- *Risk-free interest rate* – The Company bases the risk-free interest rate on the implied yield currently available on U.S. Treasury zero-coupon issues with the same or substantially equivalent remaining term.

Workforce Reduction Costs

In November 2023, we announced a plan for a workforce reduction of approximately 30% of our total workforce to realign and optimize our workforce requirements in alignment with our refined corporate strategy. The Company aims to focus on cash conservation and affected an organizational realignment to reflect the deferral of research programs with longer-term economic impacts and the acceleration of higher margin revenue opportunities. Workforce reduction costs primarily consisted of severance and benefits costs associated with the workforce reduction in November 2023 (see Note 15). As of December 31, 2023, we do not expect to record any significant future charges related to the workforce reduction plan.

Income Taxes

Deferred income taxes are determined using the asset and liability method. Under this method, deferred income tax assets and liabilities are determined based on differences between the financial reporting and tax bases of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. A valuation allowance is recorded when the expected recognition of a deferred income tax asset is considered to be unlikely.

The Company recognizes the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by the tax authorities, based on the technical merits of the position. The tax benefit is measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. The Company recognizes interest and penalties related to income tax matters as a component of income tax expense.

Functional Currency Translation

The functional currency of the Company's wholly-owned Canadian subsidiaries is the Canadian dollar, whereby their assets and liabilities are translated at period-end exchange rates except for non-monetary capital transactions and balances, which are translated at historical rates. All income and expense amounts of the Company are translated at average exchange rates for the respective period. Translation gains and losses are not included in determining net income but are accumulated in a separate component of stockholders' equity. Foreign currency transaction gains and losses are included in the determination of net income in the period in which they occur. These amounts are included in other income, net, of the consolidated statements of operations and comprehensive income.

Comprehensive Income (Loss)

The Company's comprehensive income (loss) consists of net income (loss) and other comprehensive income (loss). Foreign currency translation gains or losses and unrealized gains or losses on available-for-sale marketable debt securities are included in the Company's other comprehensive income (loss).

Basic and Diluted Net Income Per Share

Basic net income per common share is calculated by dividing the net income attributable to common stockholders by the weighted-average number of common shares outstanding during the period, without consideration of potentially dilutive securities. Diluted net income per share is computed by dividing the net income attributable to common stockholders by the weighted-average number of common stock and potentially dilutive securities outstanding for the period. For the purposes of the diluted net income per share calculation, common stock options, RSU awards, performance stock awards, warrants, earnout shares, and Sponsor Vesting Shares (as defined in Note 12) are considered to be potentially dilutive securities. For the periods presented that the Company has reported a net loss, diluted net loss per common share is the same as basic net loss per common share for those periods.

Reclassifications

Certain amounts on the consolidated balance sheets as of December 31, 2022 have been condensed to conform with the current presentation for the year ended December 31, 2023.

Segment Reporting

The Company operates in a single segment. Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker ("CODM") in making decisions regarding resource allocation and assessing performance. The Company has determined that its Co-Chief Executive Officers are the CODM. As of and for the year ending December 31, 2023, the Company's CODM has made such decisions and assessed performance at the Company level.

As of December 31, 2023 and 2022, the Company had $206.1 million and $157.2 million, respectively, of assets located outside of the United States.

3. Recent Accounting Pronouncements

Recently Adopted Accounting Pronouncements

In March 2022, the FASB issued ASU 2022-01, *Derivatives and Hedging ("Topic 815")*. This update clarifies the guidance in Topic 815 on fair value hedge accounting of interest rate risk for portfolios and financial assets. Among other things, the amended guidance established the "last-of-layer" method for making the fair value hedge accounting for these portfolios more accessible and renamed that method the "portfolio layer" method. ASU 2022-01 is effective January 1, 2023. The Company adopted the new standard as of January 1, 2023. The adoption of the standard had no material impact on the Company's financial results.

Recently Issued Accounting Pronouncements Not Yet Adopted

In November 2023, the FASB issued ASU 2023-07, *Segment Reporting ("Topic 280") - Improvements to Reportable Segment Disclosures*, which updates disclosures about a public entity's reportable segments, including more detailed information about a reportable segment's expenses. The amendments in this update require that we disclose (i) on an annual and interim basis, significant segment expenses that are regularly provided to the chief operating decision maker ("CODM") and included within each reported measure of segment profit or loss (collectively referred to as the "significant expense principle"), (ii) on an annual and interim basis, an amount for other segment items by reportable segment and a description of its composition. The other segment items category is the difference between segment revenue less the segment expenses disclosed under the significant expense principle and each reported measure of segment profit or loss, (iii) annual disclosures about a reportable segment's profit or loss and assets currently required by Topic 280 in interim periods, (iv) clarify that if the CODM uses more than one measure of a segment's profit or loss in assessing segment performance and deciding how to allocate resources, we may report one or more of those additional measures of segment profit. However, at least one of the reported segment profit or loss measures (or the single reported measure, if only one is disclosed) should be the measure that is most consistent with the measurement principles used in measuring the corresponding amounts in the public entity's consolidated financial statements, (v) the title and position of the CODM and an explanation of how the CODM uses the reported measure(s) of segment profit or loss in assessing segment performance and deciding how to allocate resources, and (vi) requires that a public entity that has a single reportable segment provide all the disclosures required by the amendments in this Update and all existing segment disclosures in Topic 280. This guidance is required to be applied retrospectively to all prior periods presented in the financial statements. This guidance is effective for the Company for fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024. Early adoption is permitted. The Company does not expect that the adoption of this guidance will have a material impact on its consolidated financial statements, other than additional disclosures in our notes to the consolidated financial statements.

In December 2023, the FASB issued ASU 2023-09, *Income Taxes ("Topic 740") - Improvements to Income Tax Disclosures,* to provide information to better assess how an entity's operations and related tax risks and tax planning and operational opportunities affect its tax rate and prospects for future cash flows. The amendments in this update require that on an annual basis we (i) disclose specific categories in the rate reconciliation, (ii) provide additional information for reconciling items that meet a quantitative threshold (if the effect of those reconciling items is equal to or greater than 5 percent of the amount computed by multiplying pretax income [or loss] by the applicable statutory income tax rate), (iii) disclose additional information about income taxes paid and expensed disaggregated by federal, state, and foreign taxes, and (iv) disclose income (loss) from continuing operations before income tax expense disaggregated between domestic and foreign. The guidance should be applied on a prospective basis however a retrospective application is permitted. The guidance is effective for the Company for annual periods beginning after December 15, 2024. Early adoption is permitted for annual financial statements that have not yet been issued or made available for issuance. The Company does not expect that the adoption of this guidance will have a material impact on its consolidated financial statements, other than additional disclosures in our notes to the consolidated financial statements.

The Company has determined that all other recently issued accounting pronouncements will not have a material impact on the Company's consolidated financial statements or do not apply to its operations.

4. Revenue

The Company began to recognize revenue during the year ended December 31, 2023. We recognize revenue when, or as, our performance obligations under the terms of a contract with our customer are satisfied. We generally procure, will produce, and sell product to be utilized in the manufacturing of finished products, for which we recognize revenue upon shipment. Our service contracts generally pay us at the commencement of the agreement and then at additional intervals as outlined in each contract. We recognize contract liabilities for such payments and then recognize revenue as we satisfy the related performance obligations. To the extent collectible revenue recognized under this method exceeds the consideration received, we recognize contract assets for such unbilled consideration. We recognize revenue from the service agreements over the period during which the services are performed.

The Company did not receive payment before the provision of services during the year ended December 31, 2023 and 2022. Therefore, deferred income is zero as of December 31, 2023 and 2022.

5. Fair Value Measurement

The Company's financial assets and liabilities subject to fair value measurements on a recurring basis and the level of inputs used for such measurements were as follows:

	Fair Value as of December 31, 2023			
(in thousands)	Level 1	Level 2	Level 3	Total
Assets:				
Cash and cash equivalents	$ 75,502	$ —	$ —	$ 75,502
Marketable securities	—	82,761	—	82,761
Total fair value	$ 75,502	$ 82,761	$ —	$ 158,263
Liabilities:				
Common stock warrants (Public)	$ 913	$ —	$ —	$ 913
Common stock warrants (Private Placement)	—	428	—	428
Earnout liability	—	—	1,783	1,783
Derivative liability	—	300	—	300
Total fair value	$ 913	$ 728	$ 1,783	$ 3,424

(in thousands)	Fair Value as of December 31, 2022 Level 1	Level 2	Level 3	Total
Assets:				
Cash, cash equivalents and restricted cash	$ 108,348	$ —	$ —	$ 108,348
Marketable securities	—	215,464	—	215,464
Total fair value	$ 108,348	$ 215,464	$ —	$ 323,812
Liabilities:				
Common stock warrants (Public)	$ 21,015	$ —	$ —	$ 21,015
Common stock warrants (Private Placement)	—	9,856	—	9,856
Earnout liability	—	—	42,533	42,533
Derivative liability	—	344	—	344
Total fair value	$ 21,015	$ 10,200	$ 42,533	$ 73,748

The Company performs routine procedures such as comparing prices obtained from independent sources to ensure that appropriate fair values are recorded. The cash, cash equivalents and public common stock warrants are categorized as Level 1 instruments as the fair value was determined based on the unadjusted quoted prices are available in active markets for identical assets or liabilities as of the reporting date. The marketable securities and derivative liability are categorized as Level 2 instruments as the estimated fair value was determined based on the estimated or actual bids and offers of the marketable securities in an over-the-counter market on the last business day of the year. The common stock warrants are classified within Level 1 or Level 2 because the transfer of Private Placement Warrants to anyone outside of certain permitted transferees of Artius Acquisition Partners LLC (the "Sponsor") would result in the Private Placement Warrants having substantially the same terms as the Public Warrants, the Company determined that the fair value of each Private Placement Warrant is consistent with that of a Public Warrant. Accordingly, the Private Placement Warrants are classified as Level 2 financial instruments.

The value of the earnout liability is classified as Level 3 measurements under the fair value hierarchy, as these liabilities have been valued based on significant inputs not observable in the market (see Note 12). A gain of $41.0 million and $85.4 million during the year ended December 31, 2023 and 2022, respectively, was recorded on the consolidated statements of operations and comprehensive income in the gain in fair value of earnout liability.

The following table summarized the activities for the earnout liability:

	December 31, 2023	December 31, 2022
Balance at beginning of period	$ 42,533	$ 127,757
Changes in fair value of earnout liability	(40,983)	(85,437)
Other	233	213
Balance at end of period	$ 1,783	$ 42,533

As of December 31, 2023 and 2022, the carrying values of accounts receivable, accounts payable, accrued liabilities and deferred income approximate their respective fair values due to their short-term nature. We have determined the fair value of notes payable approximates the carrying value due to the standard terms of the arrangement including but not limited to the amount borrowed, the term, and the interest rate.

Marketable Securities

The Company's marketable securities that are measured at fair value on a recurring basis and are categorized using the fair value hierarchy. Amortized cost net of unrealized gain (loss) is equal to fair value. The following table summarized the marketable securities by major security type as follows:

(in thousands)	As of December 31, 2023 Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Corporate bonds	$ 21,869	$ 26	$ (847)	$ 21,048
Asset-backed securities	52,199	26	(2,289)	49,936
U.S. government and agency securities	11,706	—	(270)	11,436
Foreign government and agency securities	372	—	(31)	341
Total marketable securities	$ 86,146	$ 52	$ (3,437)	$ 82,761

(in thousands)	As of December 31, 2022 Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Commercial paper	$ 17,568	$ 38	$ —	$ 17,606
Corporate bonds	115,134	—	(4,923)	110,211
Asset-backed securities	70,825	8	(3,885)	66,948
U.S. government and agency securities	19,308	—	(917)	18,391
Foreign government and agency securities	375	—	(37)	338
Municipal/provincial bonds and other	2,000	—	(30)	1,970
Total marketable securities	$ 225,210	$ 46	$ (9,792)	$ 215,464

The realized gains and losses are included in other income, net in the consolidated statements of operations and comprehensive income.

We sold marketable securities for proceeds of $3,605.2 million and $3,815.9 million during the year ended December 31, 2023 and 2022, respectively. As a result of those sales, we realized a gain of $1.0 million and a loss of $1.0 million during the year ended December 31, 2023 and 2022, respectively. We regularly review our available-for-sale marketable securities in an unrealized loss position and evaluate the current expected credit loss by considering factors such as historical experience, market data, issuer-specific factors, and current economic conditions. The aggregate fair value of the marketable securities in unrealized loss position was $73.2 million and $193.5 million as of December 31, 2023 and 2022, respectively. The unrealized losses were attributable to changes in interest rates that impacted the value of the investments, and not related to increased credit risk. Accordingly, we have not recorded an allowance for credit losses associated with these investments.

The contractual maturities of the investments classified as marketable securities are as follows:

(in thousands)	As of December 31, 2023 Mature within one year	Mature after one year through two years	Mature over two years	Fair Value
Corporate bonds	$ 20,756	$ 292	$ —	$ 21,048
Asset-backed securities	238	1,806	47,892	49,936
U.S. government and agency securities	8,929	—	2,507	11,436
Foreign government and agency securities	341	—	—	341
Total marketable securities	$ 30,264	$ 2,098	$ 50,399	$ 82,761

(in thousands)	As of December 31, 2022 Mature within one year	Mature after one year through two years	Mature over two years	Fair Value
Commercial paper	$ 17,606	$ —	$ —	$ 17,606
Corporate bonds	74,797	35,414	—	110,211
Asset-backed securities	1,907	4,833	60,207	66,947
U.S. government and agency securities	7,719	7,480	3,192	18,391
Foreign government and agency securities	—	338	—	338
Municipal/provincial bonds and other	1,971	—	—	1,971
Total marketable securities	$ 104,000	$ 48,065	$ 63,399	$ 215,464

Derivative Asset and Liabilities

The Company entered into foreign currency derivative contracts with financial institutions to reduce foreign exchange risk related to certain marketable securities denominated in foreign currency. Foreign currency derivative contracts are marked-to-market at the end of each reporting period with gains and losses recognized as other income (expenses). During the year ended December 31, 2023 and 2022, the Company recognized a net gain of $0.1 million and a net loss of $0.4 million, respectively, on the fair value adjustment of the foreign currency derivative contracts. The notional amount of foreign currency derivative contracts as of December 31, 2023 and 2022 was $14.7 million and $21.2 million, respectively.

6. Property, Plant and Equipment

Property, plant, and equipment consisted of the following:

(in thousands)	Estimated useful lives	December 31, 2023	December 31, 2022
Land		$ 11,356	$ 11,358
Land improvements and infrastructure	20 years	62,930	—
Manufacturing equipment and pilot plant	25 years	116,754	4,599
Computer equipment and software	3 years	1,629	598
Lab equipment	5 years	3,468	2,526
Furniture, fixtures, and machinery	5 years	1,094	948
Total		197,231	20,029
Less accumulated depreciation and amortization		(8,136)	(4,693)
Construction in process		54,023	138,847
Total property, plant, and equipment, net		$ 243,118	$ 154,183

For the year ended December 31, 2023 and 2022, depreciation and amortization expense totaled $3.3 million and $0.7 million, respectively.

During the year ended December 31, 2023 and 2022, the Company capitalized $1.5 million and $1.1 million, respectively, of interest cost into property, plant and equipment related to Origin 1. Interest capitalization ceased during the fourth quarter of the current year as Origin 1 was completed. During the year ended December 31, 2023 and 2022, the Company capitalized into property, plant and equipment, $2.3 million and $1.9 million, respectively, of stock-based compensation related to employees whose costs were necessarily incurred to bring the asset to its intended use. The stock-based compensation expense in 2023 includes a portion of the expense associated with the accelerated vesting of certain equity awards as part of the workforce reduction affected in November 2023.

7. Intangible Assets

Intangible assets consisted of the following:

(in thousands)	December 31, 2023	December 31, 2022
Patents	$ 413	$ 404
Less accumulated amortization	(292)	(244)
Total intangible assets	$ 121	$ 160

The weighted average remaining useful life of the patents was 3.41 years. For the year ended December 31, 2023 and 2022, amortization expense was immaterial and annual amortization expense over the remaining useful life is not expected to be material.

8. Consortium Agreement

In December 2016, the Company entered into a consortium agreement with two Legacy Origin Series B preferred stock investors to collaborate on development of a process to commercialize bio-based, decarbonizing materials for application on an industrial scale at a competitive price. Under the consortium agreement, the Company received $0.5 million. The agreement expires once performance of the research and development program has been completed.

In August 2018, the agreement was amended, whereby a Legacy Origin Series C preferred stock investor (the “Legacy Origin Series C Investor”, and collectively with the two Legacy Origin Series B investors, the “Legacy Origin Investors”) was added to the agreement and committed to invest $1.5 million of research and development in the consortium. As of December 31, 2023, the Legacy Origin Series C Investor had not invested any funds in the consortium.

In 2020, an additional counterparty was added to the consortium agreement. During the year ended December 31, 2023 and 2022, the Company did not receive any funds under the consortium agreement.

9. Inventory

Inventory balances consist of the following:

(in thousands)	December 31, 2023	December 31, 2022
Finished goods	$ 24	$ —
Raw materials	888	—
Total	$ 912	$ —

10. Notes Payable

The Company maintains eight separate offtake supply agreements (the “Offtake Agreements”). Two of the eight Offtake Agreements are with the same customer and pertain to supply of product from Origin 1 and Origin 2, respectively.

Legacy Origin received a $5.0 million prepayment from a customer for product from Origin 1 pursuant to one of these Offtake Agreements, which Legacy Origin entered into in November 2016. The prepayment was to be credited against the purchase of products over the term of the Offtake Agreement. The prepayment was secured by a promissory note (the "Promissory Note") to be repaid in cash in the event that the prepayment could not be credited against the purchase of product, for example, if Origin 1 was never constructed. The Promissory Note was collateralized substantially by Origin 1 and other assets of Origin Materials Canada Pioneer Limited. In May 2019, Legacy Origin and the customer amended the Offtake Agreement and Promissory Note. The amendment added accrued interest of $0.2 million to the principal balance of the prepayment and provided for the prepayment amount to be repaid in three annual installments rather than being applied against the purchase of product from Origin 1. On August 1, 2022, the Company and the customer further amended and restated the Promissory Note with an aggregate principal amount of $5.2 million, which is the sum of the original principal with accrued interest prior to the amendment. As a result of the amendment, the repayment dates were revised and to allow the customer to offset amounts owed for the purchase of product from the Company's Origin 1 facility against amounts due under the Promissory Note. The repayment in the amount of $2.7 million is due on September 1, 2024, $1.9 million is due on September 1, 2025, and $1.8 million is due on September 1, 2026 (inclusive of accrued but unpaid interest of 3.5% per annum). At December 31, 2023 the total note principal outstanding was $5.2 million of which $3.5 million was included in notes payable, long-term, $1.7 million notes payable, short-term, and $0.8 million unpaid accrued interest recorded in other liabilities, current. At December 31, 2022, the note principal balance was $5.2 million with outstanding accrued interest of $0.6 million was included in notes payable, long-term. In addition, the amendment reflected the customer's exercise of its option to enter into a new Offtake Agreement to buy a specified annual amount of product from Origin 2 for an initial term of up to 10 years.

11. Other Liabilities, Long-term

In September 2019, Legacy Origin entered into a $5.0 million prepayment agreement with a counterparty for the purchase of products from Origin 1. The prepayment is to be made in two equal installments: the first $2.5 million was paid in October 2019 and the remaining $2.5 million is due within 30 days of the customer confirming that a sample from Origin 1 meets the customer's specifications. The Company and customer agreed to work in good faith to execute an Offtake Agreement, the agreed terms of which are set forth in the prepayment agreement, whereby 100% of the prepayment will be applied against future purchases. The prepayment agreement provides the customer a capacity reservation of up to a specified annual volume of product from Origin 1 for a term of ten years, pursuant to the terms of an Offtake Agreement. At December 31, 2023 and 2022, the total amount outstanding on this agreement was $2.5 million. On February 5, 2024, the parties entered into a memorandum of understanding by which they agreed that the counterparty would be released from its obligation to pay the remaining $2.5 million of the prepayment and that Legacy Origin would refund the first $2.5 million within a certain period after reporting in its Quarterly Report on Form 10-Q that its cash on hand has crossed a specified threshold.

Legacy Origin received a $5.0 million prepayment from a customer for product from Origin 1 pursuant to an Offtake Agreement entered into in November 2016. The agreement was amended in 2019 and added the accrued interest of $0.1 million to the principal balance. As a result, the aggregate principal amount became $5.1 million. The prepayment was to be credited against the purchase of products from Origin 1 over the term of the Offtake Agreement, specifically, by applying a credit to product purchases each month over the first five years of operation of Origin 1 up to $7.5 million, which is equal to 150% of the prepayment amount. If product purchases were not sufficient to recover the advances, the application of the credit to purchases as payment of the advances would continue until fully repaid. The prepayment is secured by an agreement that was to be repaid in cash in the event the prepayment cannot be credited against the purchase of product, for example, if Origin 1 were never constructed. The agreement is collateralized substantially by Origin 1 and other assets of Origin Materials Canada Pioneer Limited. If repaid in cash, the agreement bears an annual interest rate of the three-month Secured Overnight Financing Rate ("SOFR") plus 0.25% (5.61% at December 31, 2023) and matures five years from the commercial operation date of Origin 1, which is defined by the plant's actual production of a certain volume of product as well as its capacity to produce a certain annual volume of product. In February 2024, Legacy Origin and the customer amended the agreement to provide for repayment in three installments consisting of approximately $2.2 million on March 1, 2024, $1.6 million on September 1, 2024, and $2.1 million on March 1, 2025 instead of applying a credit to product purchases under the Offtake Agreement. At December 31, 2023 and 2022, the total amount outstanding was $5.1 million and accrued interest outstanding was $0.6 million and $0.3 million, respectively.

12. Earnout Liability

As additional consideration for the Merger, within ten business days after the occurrence of a "Triggering Event," as defined below, the Company shall issue or cause to be issued to each Legacy Origin stockholder a certain number of shares of the Company Class A Common Stock. The number of such shares is equal to the product of (i) the number of shares of Company Common Stock, Company Series A Preferred Stock, Company Series B Preferred Stock, Company Series C Preferred Stock, and the net number of shares of Company Capital Stock that would be issuable in respect of "Vested Company Options" in the event such options were exercised (on a net exercise basis with respect to only the applicable exercise price, immediately prior to the "Closing" and settled in the applicable number of shares of Company Common Stock, rounded down to the nearest whole share) held by such Legacy Origin stockholder as of immediately prior to the "Effective Time"; and (ii) the "Earnout Exchange Ratio" (such issued shares of Artius Class A Common Stock, collectively, the "Earnout Shares"), where "Vested Company Options," "Closing," "Effective Time," and "Earnout Exchange Ratio" have the meanings set forth in the Merger Agreement. The Company cannot be required to issue more than 25,000,000 Earnout Shares in the aggregate. A Triggering Event is defined as the following:

(a) the volume weighted average price of Common Stock ("VWAP") equaling on exceeding $15.00 for ten consecutive trading days during the three year period following the Closing Date;

(b) the VWAP equaling or exceeding $20.00 for ten consecutive trading days during the four year period following the Closing Date; or

(c) the VWAP equaling or exceeding $25.00 for ten consecutive trading days during the five year period following the Closing Date.

A Sponsor Letter Agreement was delivered in connection with the Merger such that 4.5 million of the shares held by Sponsor ("Sponsor Vesting Shares") shall be subject to forfeiture based on the same vesting requirements as the Earnout Shares. These shares shall not be transferred prior to the date in which they vest. Dividends and other distributions with respect to Sponsor Vesting Shares shall be set aside by the Company and shall be paid to the Sponsor upon the vesting of such Sponsor Vesting Shares.

The Company evaluated the earnout liability under ASC 815-40, *Derivatives and Hedging-Contracts in Entity's Own Equity ("ASC 815-40")*, and concluded they do not meet the criteria to be classified in stockholders' equity. Specifically, there are contingent exercise provisions and settlement provisions that exist. Holders may receive differing amounts of shares depending on the company's stock price or the price paid in a change of control. All remaining shares would be issuable (or the forfeiture provisions would lapse) upon any change of control involving the Company and all remaining shares would be issuable (or the forfeiture provisions would lapse) upon a bankruptcy or insolvency of the company. This means that settlement is not solely impacted by the share price of the Company (that is, the share price observed in or implied by a qualifying change-in-control event), but also by the occurrence of a qualifying change-in-control event. This causes the arrangement to not be indexed to the Company's own shares and liability classification is appropriate. The Company records these instruments as liabilities on the consolidated balance sheets at fair value, with subsequent changes in their respective fair values recognized in earnings at each reporting date. The earnout liability was fair valued using a Monte Carlo open-ended model. The inputs used for the model were a dividend yield of 0% and 0%, volatility of 108% and 70%, and interest rate of 4.04% and 4.08% at December 31, 2023 and 2022, respectively. At December 31, 2023 and 2022 the balance of the earnout liability was $1.8 million and $42.5 million, respectively. A gain of $41.0 million and $85.4 million for the year ended December 31, 2023 and 2022, respectively, was recorded on the consolidated statements of operations and comprehensive income in the change in the fair value of earnout liability.

13. Canadian Government Research and Development Program Liability

In April 2019, the Company entered into a contribution agreement related to the research and development and construction associated with the operation of Origin 1 in which the Company will participate in a Canadian government research and development program (the "R&D Agreement"). Pursuant to the R&D Agreement, the Company will receive funding for eligible expenditures incurred through March 31, 2023 up to the lesser of approximately 18.48% of eligible costs and $23.0 million (in Canadian dollars).

The funding will be repaid over 15 years after completion of Origin 1, commencing no sooner than the third fiscal year of consecutive revenues from a commercial plant, but no later than March 2028. The maximum amount to be repaid by the Company under the R&D Agreement is 1.25 times the actual funding received, subject to the following repayment ceiling formula. Repayment of the funding will be reduced by 50% if the Company begins construction before December 31, 2024 of one or more commercial plants that operate in Canada, with costs exceeding $500.0 million (in Canadian dollars), and the plants being constructed and operational within 30 months of the final investment decision, as defined in the R&D Agreement. Once begun, repayments will be paid annually by April of each year through March 31, 2037. Payments will be determined by a formula of the funded amount based on the fiscal year gross business revenue, as defined in the R&D Agreement. At December 31, 2023 and 2022, the Company recorded a liability for the amount received of $7.3 million and $7.2 million, respectively, on the consolidated balance sheets in Canadian government research and development program liability.

14. Common Stock Warrants

As of December 31, 2023 and 2022, there are 35,476,627 warrants outstanding.

As part of Artius's initial public offering, 24,149,960 Public Warrants were sold. The Public Warrants entitle the holder thereof to purchase one share of Common Stock at a price of $11.50 per share, subject to adjustments. The Public Warrants may be exercised only for a whole number of shares of Common Stock. No fractional shares will be issued upon exercise of the Public Warrants. The Public Warrants will expire on June 25, 2026 at 5:00p.m., New York City time, or earlier upon redemption or liquidation. The Public Warrants are listed on the Nasdaq under the symbol "ORGNW."

The Company may redeem the Public Warrants when exercisable, in whole and not in part, at a price of $0.01 per warrant, so long as the Company provides not less than 30 days' prior written notice of redemption to each warrant holder, and if, and only if, the reported last sale price of the Common Stock equals or exceeds $18.00 per share for any 20 trading days within a 30-trading day period ending on the third trading day prior to the date the Company sends the notice of redemption to the warrant holders.

Simultaneously with Artius's initial public offering, Artius consummated a private placement of 11,326,667 Private Placement Warrants with the Sponsor. The Private Placement Warrant is exercisable for one share of Class A Common Stock at a price of $11.50 per share, subject to adjustment. The Private Placement Warrants are identical to the Public Warrants, except that: (1) the Private Placement Warrants and the shares of Class A Common Stock issuable upon exercise of the Private Placement Warrants are not transferable, assignable or salable until the earliest to occur of: (i) 365 days after the date of the Closing; (ii) the first day after the date on which the closing price of the Public Shares (or any successor securities thereto) equals or exceeds $12.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) for any 20 trading days within any 30-trading day period commencing at least 150 days after the date of the Closing; or (iii) the date on which Artius completes a liquidation, merger, capital stock exchange, reorganization or other similar transaction that results in all of Artius's Public Shareholders having the right to exchange their Public Shares (or any successor securities thereto) for cash, securities or other property, subject to certain limited exceptions, (2) the Private Placement Warrants will be exercisable on a cashless basis and be non-redeemable, except if the reference value equals or exceeds $10.00 and is less than $18.00 (as described above), so long as they are held by the initial purchasers or their permitted transferees, and (3) the Private Placement Warrants and the Class A ordinary shares issuable upon exercise of the Private Placement Warrants will be entitled to registration rights. If the Private Placement Warrants are held by someone other than the initial purchasers or their permitted transferees, the Private Placement Warrants will be redeemable under all redemption scenarios by the Company and exercisable by such holders on the same basis as the Public Warrants.

The Company concluded the Public Warrants and Private Placement Warrants, or Common Stock Warrants, meet the definition of a derivative under ASC 815 and are recorded as liabilities. Upon consummation of the Merger, the fair value of the Common Stock Warrants was recorded on the consolidated balance sheets. The fair value of the Common Stock Warrants was remeasured on the December 31, 2023 and 2022 consolidated balance sheets at $1.3 million and $30.9 million, respectively, and a gain of $29.5 million and $22.0 million, respectively, was recorded on the consolidated statements of operations and comprehensive income.

15. Stockholders' Equity

As of December 31, 2023 and 2022, 1,010,000,000 shares, $0.0001 par value per share are authorized, of which, 1,000,000,000 shares are designated as Common Stock and 10,000,000 shares are designated as Preferred Stock.

Common Stock

Holders of the Common Stock are entitled to dividends when, as, and if, declared by the Board, subject to the rights of the holders of all classes of stock outstanding having priority rights to dividends. As of December 31, 2023, the Company had not declared any dividends. The holder of each share of Common Stock is entitled to one vote. There were 145,706,531 and 143,034,225 shares of Common Stock (including 4,500,000 Sponsor Vesting Shares not indexed to equity) outstanding as of December 31, 2023 and 2022, respectively.

Employee Stock Purchase Plan

The Company maintains an Employee Stock Purchase Plan ("ESPP"). The ESPP permits participants to purchase shares of our Common Stock with the purchase price of the shares at a price determined by our Board, which shall not be less than 85% of the lower of the fair market value of our Common Stock on the first day of an offering or on the date of purchase.

Initially, following adoption of the ESPP, the maximum number of shares of our Common Stock that may be issued under the ESPP was 1,846,710. The ESPP contains an "evergreen" share reserve feature that automatically increases the number of shares of Common Stock reserved for issuance under the plan on January 1 of each year for a period of ten years commencing on January 1, 2022 and ending on (and including) January 1, 2031 in an amount equal to the lesser of (1) one percent (1%) of the fully-diluted shares of our Common Stock on December 31st of the preceding calendar year, (2) 3,693,420 of Common Stock, or (3) such lesser number of shares as determined by our Board. As of December 31, 2023, the number of shares available for issuance under the ESPP was 5,639,944. Our Board made the decision not to increase the number of shares of Common Stock reserved for issuance under the ESPP as of January 1, 2024 as no stock has been offered or issued to employees under the ESPP to date. Shares subject to purchase rights granted under the ESPP that terminate without having been exercised in full will not reduce the number of shares available for issuance under the ESPP.

Equity Incentive Plans

The Company maintains the following equity incentive plans: the 2010 Stock Incentive Plan, the 2020 Equity Incentive Plan, and the 2021 Equity Incentive Plan, each as amended (together, the "Stock Plans"). Upon closing of the Merger, awards under the 2010 Stock Incentive Plan and 2020 Equity Incentive Plan were converted at the Exchange Ratio, which has the meaning set forth in the Merger Agreement, and the 2021 Equity Incentive Plan was adopted and approved.

Origin may grant a wide variety of equity securities under the Stock Plans, including incentive stock options, nonstatutory stock options, stock appreciation rights, restricted stock awards, RSU awards, performance-based stock awards, and other awards. The Company has granted incentive stock options, RSU awards, and performance awards under the Stock Plans. Under the Stock Plans, options must be issued at exercise prices no less than the estimated fair value of the stock on the date of grant and are exercisable for a period not exceeding 10 years from the date of grant. Options granted to employees under the Stock Plans generally vest 25% one year from the vesting commencement date and 1/36th per month thereafter, although certain arrangements call for vesting over other periods. Options granted to non-employees under the Stock Plan vest over periods determined by the Board (generally immediate to four years). RSU awards granted to employees under the 2021 Equity Incentive Plan require a service period of three years and generally vest 33.3% annually over the three-year service period. Under the Stock Plans, the fair value of RSU awards and performance-based stock awards are determined to be the grant date closing stock price. For awards with performance-based conditions, compensation is recorded once there is sufficient objective evidence the performance conditions are considered probable of being met. The performance-based stock awards are subject to vesting based on a performance-based condition and a service-based condition. The performance-based stock awards will vest in a percentage of the target number of shares between 0% and 300%, depending on the extent the performance conditions are achieved.

Initially, following adoption of the 2021 Equity Incentive Plan, there were 18,467,109 shares of Common Stock reserved for issuance under the Stock Plans. The 2021 Equity Incentive Plan contains an "evergreen" share reserve feature that automatically increases the number of shares of Common Stock reserved for issuance under the plan on January 1 of each year for a period of ten years commencing on January 1, 2022 and ending on (and including) January 1, 2031 in an amount equal to five percent (5%) of the fully-diluted Common Stock on December 31 of the preceding year unless our board acts prior to January 1 to increase the share reserve by a lesser amount. The number of shares added to the share reserve on January 1 of a given year is reduced automatically to the extent necessary to avoid causing the share reserve to exceed fifteen percent (15%) of the fully-diluted Common Stock on December 31 of the preceding year. As of December 31, 2023, the number of shares available for issuance under the 2021 Equity Incentive Plan was 28,761,816, and there were 10,244,412 shares available for grant. On January 1, 2024, the number of shares of Common Stock reserved for issuance under the 2021 Equity Incentive Plan was automatically increased by 1,242,387 shares pursuant to the 2021 Plan's "evergreen" provision to a total of 30,004,203 shares.

The following tables summarize stock option activity under the Stock Plans:

	Outstanding Options		Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in years)		Aggregate intrinsic value (in thousands)
Balance as of December 31, 2022	6,471,062	$	0.17	7.29		
Granted	—		—			
Exercised	(959,143)		0.15			
Forfeited / canceled	(33,909)		0.14			
Balance as of December 31, 2023	5,478,010	$	0.17	6.05		
Vested and expected to vest at December 31, 2023	5,478,010	$	0.17	6.05	$	3,638
Vested and exercisable at December 31, 2023	3,501,925	$	0.19	5.62	$	2,263

During the years ended December 31, 2023 and 2022, the Company did not grant any stock options. As of December 31, 2023, there were 3,501,925 options exercisable. The total intrinsic value of the options exercised during the year ended December 31, 2023 and 2022 was $2.5 million and $8.5 million, respectively. The intrinsic value of options exercised during each fiscal year is calculated as the difference between the market value of the stock at the time of exercise and the exercise price of the stock option. As of December 31, 2023, the Company had stock-based compensation of $1.7 million, related to unvested stock options not yet recognized that is expected to be recognized over an estimated weighted average period of 0.8 years.

The Company issued 2,920,732 of performance and market-based stock options during 2020. During the quarter ended March 31, 2021, the Company modified the vesting schedule of 529,119 of these performance and market-based stock options such that vesting of 1/48th per month would commence upon signing of the Business Combination. The Company entered into the Merger Agreement on February 16, 2021 resulting in the commencement of expense recognition related to these 529,119 options during the quarter ended March 31, 2021. For the remaining 2,391,613 performance and market-based stock options, expense commenced on the close date of the Merger, June 25, 2021, as that is the date when the performance condition was achieved.

The following table summarizes the RSU award and performance-based stock award activity:

	Outstanding		Weighted-average grant date fair value
Unvested balance at December 31, 2022	6,371,950	$	6.24
Granted - RSU awards	9,374,125		1.19
Granted - performance-based stock awards	455,368		0.93
RSU awards vested and converted to shares	(1,919,853)		5.49
Vested - performance-based stock awards	—		—
Forfeited - RSU awards	(680,036)		4.89
Forfeited - performance-based stock awards	(555,450)		6.81
Unvested balance at December 31, 2023	13,046,104	$	2.54
Expected to vest	10,927,261		

The RSU awards entitle the holder upon vesting to be issued on a future date the number of shares of Common Stock that is equal to the number of restricted stock units subject to the RSU awards. The total fair value of shares vested during the year ended December 31, 2023 and 2022 was $2.7 million and $3.6 million, respectively. The number of RSU awards vested during 2023 totaled 1,919,853, of which the issuance of 165,956 common shares has been deferred at the election of the participant. The common shares for the deferred RSUs will be released sixty days following the participant's departure from the Company. The common shares for an additional 40,734 RSU awards vested during 2023 will be issued in 2024.

The Company issued 455,368 performance-based stock awards during 2023. During the year ended December 31, 2023, the performance conditions for all of the outstanding performance-based stock awards were not probable of being met, therefore no performance award stock compensation has been recorded. During the year ended December 31, 2022, one performance condition for the granted performance-based stock awards was met, therefore performance-based award stock compensation of $2.8 million was recorded. As of December 31, 2023, there were 1,202,434 unvested performance-based awards subject to certain performance criteria for vesting. The vesting period for RSU awards is generally three years. Total remaining compensation expense for RSU awards to be recognized under the 2021 Equity Incentive Plan is $19.3 million as of December 31, 2023, and will be amortized on a straight-line basis over an estimated weighted average period of 2.2 years. The maximum amount of stock-based compensation expense for the unvested performance-based stock awards, assuming maximum performance, is $11.4 million. Total remaining compensation expense for performance-based stock awards will be recognized over the requisite service periods once the performance-based conditions are deemed to be probable.

The Company effected a workforce reduction in November 2023 of which approximately 30% of total employees were impacted. This reduction, as part of our organizational realignment, reflects the deferral of research programs with longer-term economic impacts and the acceleration of higher-margin revenue opportunities. The Board authorized certain changes to the stock-based awards in connection with the workforce reduction plan to allow accelerated vesting of a portion of affected employees' unvested equity awards. The Company recorded a total workforce reduction charge of $0.2 million in the fourth quarter of 2023. The charge consists of severance and benefits costs, inclusive of cash expenditures for employee separation costs of $0.5 million and non-cash charges of $(0.3) million for stock based compensation expense. $0.4 million associated with the modification of certain equity awards, offset by $(0.7) million related to equity awards forfeited by the affected employees. The cash expenditures and non-cash stock based compensation expense for employee separation costs was recorded in general and administrative and research and development expenses on the consolidated statements of operations and comprehensive income and a portion was capitalized within construction in progress on the consolidated balance sheets.

During the year ended December 31, 2023 and 2022, stock compensation expense of $6.5 million and $4.7 million, respectively, was recognized in general and administrative expenses in the consolidated statements of operations and comprehensive income. During the year ended December 31, 2023 and 2022 stock compensation expense of $2.9 million and $2.5 million, respectively, was recognized in research and development expenses in the consolidated statements of operations and comprehensive income.

16. Income Taxes

Income before income tax expenses consisted of the following for the year ended:

(in thousands)	December 31, 2023	December 31, 2022
United States	$ 22,481	$ 81,269
Foreign	230	(2,700)
Income before income tax expenses	$ 22,711	$ 78,569

The federal, state, and foreign income and deferred tax expenses are summarized as follows for the year ended:

(in thousands)	December 31, 2023	December 31, 2022
Current		
Federal	$ —	$ —
State	20	3
Foreign	139	—
Total current tax expenses	$ 159	$ 3
Deferred		
Federal	$ —	$ —
State	—	—
Foreign	(1,246)	—
Total deferred tax benefits	$ (1,246)	$ —
Total tax expenses	$ (1,087)	$ 3

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, and operating losses and tax credit carryforwards.

The tax effects of significant items comprising the Company's deferred taxes are as follows for the year ended:

(in thousands)	December 31, 2023	December 31, 2022
Deferred tax assets		
Net operating loss carryforwards	$ 34,076	$ 27,210
Available for sale marketable securities	825	2,064
Lease liabilities	1,050	532
Other	51	36
Fixed assets and intangibles	445	25
Capitalized research and development costs	4,456	1,929
Stock Compensation	2,806	1,544
Total deferred tax assets	$ 43,709	$ 33,340
Deferred tax liabilities		
ROU asset	$ (1,012)	$ (515)
Other	(16)	—
Fixed assets and intangibles	—	(479)
Total deferred tax liabilities	$ (1,028)	$ (994)
Valuation allowance	$ (41,420)	$ (32,346)
Net deferred taxes	$ 1,261	$ —

ASC 740 requires that the tax benefit of net operating losses, temporary differences and credit carryforwards be recorded as an asset to the extent that management assesses that realization is more likely than not. Realization of the future tax benefits is dependent on the Company's ability to generate sufficient taxable income within the carryforward period. Regarding the Origin US entities, the Company is in a significant cumulative loss position and has provided a valuation allowance against the US net deferred tax assets. Origin Canada is recognizing income and is projecting future taxable income sufficient to offset all its deferred tax assets. Therefore, some of the deferred tax assets in Canada are being recognized in 2023.

The valuation allowance increased by $9.1 million and $6.7 million for the years ended December 31, 2023 and 2022, respectively.

At December 31, 2023, we had federal net operating loss carryforwards of approximately $139.7 million to offset future federal taxable income, with $42.0 million available through 2037 and $97.7 million available indefinitely. We have state net operating loss carryforward of $42.8 million, available through 2043. We had foreign net operating loss carryforwards of approximately $7.2 million that may offset future foreign taxable income through 2043.

At December 31, 2023, the Company has research and experimentation credit carryforwards of $0.03 million for foreign tax purposes that expire after 2038. The Company plans to evaluate its R&D credits in the future and amend prior year federal an California tax returns to claim credits, which will carryforward to offset future income tax liability.

The effective tax rate of the Company's provision (benefit) for income taxes differs from the federal statutory rate as follows for the year ended:

	December 31, 2023	December 31, 2022
Statutory rate	21.0 %	21.0 %
State tax	(12.2)	1.1
Foreign tax	0.6	—
Warrants and other equity items	(65.3)	(28.7)
Valuation allowance	46.8	6.4
Other	0.5	0.7
Foreign rate differential	0.6	(0.2)
Stock-based compensation	3.2	(0.3)
Total	(4.8)%	— %

The effective tax rate of the Company's provision (benefit) for income taxes differs from the federal statutory rate as follows for the year ended:

	December 31, 2023	December 31, 2022
Statutory rate	$ 4,769	$ 16,500
State tax	(2,761)	875
Foreign tax	139	—
Warrants and other equity items	(14,808)	(22,559)
Valuation allowance	10,629	5,040
Other	98	502
Foreign rate differential	128	(148)
Stock-based compensation	719	(207)
Total	$ (1,087)	$ 3

Under certain provisions of the Internal Revenue Code of 1986, as amended, a portion of the federal and state net operating loss carryforwards may be subject to an annual utilization limitation as a result of a change in ownership of the Company. Federal and California tax laws impose significant restrictions on the utilization of net operating loss carryforwards in the event of a change in ownership of the Company, as defined by Internal Revenue Code Section 382 ("Section 382"). The Company has experienced ownership changes as defined by IRC Section 382 and the impact of those changes has been reflected in the consolidated financial statements. In addition, in the future the Company may experience ownership changes, which may limit the utilization of net operating loss carryforwards or other tax attributes.

There were no unrecognized tax benefits in the years ended December 31, 2023 and 2022. The Company files income tax returns in the United States, various US states, and Canada. All tax years remain open in all jurisdictions. The Company is not currently under examination by income tax authorities in federal, state or other foreign jurisdictions. The Company does not anticipate any significant changes within 12 months of this reporting date of its uncertain tax positions.

17. Leases

The Company leases office space and research and development space in Sacramento, California and Sarnia, Ontario under non-cancelable lease agreements and leases various office equipment, and warehouse space. Certain operating leases contain options to extend the lease. The Company included the periods covered by these options as we are reasonably certain to exercise the options for all leases. For leases with the option to extend on a month-to-month basis after the defined extension periods, the Company is reasonably certain to extend for the same term as related leases. As such, lease terms for all leased assets located at the same locations have the same end dates. Rent deposits relating to leases are included within other long-term assets on the consolidated balance sheets. Variable lease costs include operating expenses for the shared common area, and the amount is based on an annual estimate of the actual common area expenses from the preceding year and are payable monthly. Certain leases were extended during the period ended September 30, 2023. The lease modifications were not accounted for as a separate contract and we remeasured our lease liabilities and ROU assets on the modification date. Our operating leases have remaining lease terms of one to ten years.

The Company elected the accounting policy election to account for lease and nonlease components as a single lease component for all asset classes. Further, the Company elects to recognize lease payments on short-term leases in profit or loss on a straight-line basis over the lease term for all asset classes, excluding such leases from recognition requirements under ASC 842.

The components of lease cost were as follows for the year ended:

(in thousands)	December 31, 2023	December 31, 2022
Operating lease cost	$ 807	$ 671
Variable lease cost	109	107
Total lease cost	$ 916	$ 778

Other information related to leases is as follows:

(in thousands)	December 31, 2023	December 31, 2022
Operating lease ROU asset	$ 4,468	$ 2,779
Weighted average remaining lease term (in years):		
Operating leases	9.49	5.28
Weighted average discount rate:		
Operating leases	7.4 %	3.4 %

(in thousands)	December 31, 2023	December 31, 2022
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	$ 726	$ 572
Operating lease ROU assets obtained in exchange for lease obligations	$ 2,308	$ 1,687

To calculate the ROU assets and lease liabilities, the Company uses the discount rate implicit in lease agreements when available. When the implicit discount rates are not readily determinable, the Company uses the incremental borrowing rate, determined as of the later of the date of adoption for ASC 842, date of lease inception or date of lease modification. This rate is determined for individual leases based on available information regarding jurisdiction, lease term, and asset class. Further, the interest environment was considered, including analysis of benchmark rates from promissory notes, credit curve yields for bonds, and synthetic curves based on discount margin spreads.

Maturities of operating lease liabilities as of December 31, 2023 were as follows:

(in thousands)		December 31
2024	$	687
2025		636
2026		607
2027		595
2028		612
Thereafter		3,348
Total lease payments		6,485
Less: imputed interest		(1,911)
Less: operating lease liabilities, current		(367)
Operating lease liabilities, non-current	$	4,207

18. Commitments and Contingencies

Commitments

In connection with the closing of the Merger, the Company entered into the Investor Rights Agreement on June 25, 2021 (the "Investor Rights Agreement"), pursuant to which the holders of Registrable Securities (as defined therein) became entitled to, among other things, customary registration rights, including demand, piggy-back and shelf registration rights. The Investor Rights Agreement also provides that the Company will pay certain expenses relating to such registrations and indemnify the registration rights holders against (or make contributions in respect of) certain liabilities which may arise under the Securities Act. On July 15, 2021, the Company registered the Registrable Securities for resale pursuant to a Registration Statement on Form S-1, as amended (File No. 333-257931), which became effective on July 30, 2021. The Company filed Post-Effective Amendment No. 2 to the Registration Statement on Form S-1 on Form S-3 (File No. 333-257931), which became effective on August 8, 2022.

In May 2018, the Company executed the agreements for certain services, to facilitate the development and thus bring Origin 1 to the condition necessary for its intended use, commencing in different periods between July 2018 and September 2019, and all generally for five years periods. The agreements are generally automatically extended for one year periods thereafter. The agreements include annual fixed payments subject to escalation clauses at the beginning of each calendar year, as defined in the agreement. The minimum fixed payments are $0.4 million per year over the fixed term. Certain of the agreements include quantities that are based on volumes, as defined in the applicable agreements. The Company is also responsible for applicable taxes under these agreements. The total amount capitalized into property, plant and equipment, net under the agreement was $0.6 million and $1.5 million during the year ended December 31, 2023 and 2022, respectively.

In April 2023, the Company entered into an agreement for conversion of materials produced by Origin 1 into certain derivatives. Pursuant to the agreement, the Company agreed to purchase conversion services for a certain minimum quantity of product on a take-or-pay basis for a term of 5 years beginning in 2025 for an aggregate total cost of $33.0 million. Accordingly the Company is obligated to purchase not less than $5.0 million during 2025 and a minimum of $7.0 million each of 2026 through 2029. The Company made advance payments totaling $11.5 million to the counterparty as of December 31, 2023, which is included in the foregoing aggregate total, and the agreement provides for the Company to be fully reimbursed for the advance payments in the form of a discount on conversion services over the term. The agreement gives the Company the right, but not the obligation, to purchase conversion services for an additional quantity of product in 2024 and stipulates a reduction in the take-or-pay commitment under certain circumstances including the counterparty's inability to meet the required product specification. The agreement automatically renews for an additional year unless either party gives advance notice of an intention not to renew. In addition, either party may terminate the agreement in the event of the other party's insolvency or breach of a material term. The Company recorded the advance payments as other long-term assets on the consolidated balance sheets.

In February 2023, the Company entered into a nonexclusive patent license agreement for use in connection with production at a specific licensed facility. The license expires upon cessation of production at that facility. The Company made a nonrefundable $5.0 million deposit in 2022 toward securing the license and, as a result of signing the license agreement, made an additional nonrefundable payment of $7.9 million during 2023 and may make additional payments depending on the achievement of certain milestones. The total payment is included in other long-term assets. In connection with this license, the Company entered into a conditional offtake agreement under which the licensor will supply the Company with a certain amount of the same type of products to be produced at the licensed facility in order to accelerate market development for these products and related applications.

In July 2017, the Company entered into a nonexclusive patent license agreement for $0.1 million, which expires upon expiration of the last to expire of the licensed patents. Under this agreement, the Company will pay less than $0.1 million minimum royalty payments per year and, if the Company develops and sells certain products based on the licensed patents. Certain products that Origin is currently developing and anticipates selling are expected to utilize these patents.

In December 2016, the Company entered into a patent license agreement for $0.5 million, which expires upon expiration of the last to expire of the licensed patents. Under this agreement, if the Company develops and sells specific products based on the patents, the Company would pay a royalty up to a cumulative $0.5 million from Origin 1, whereby no further payments will be due for any production at Origin 1. If production of those products occurs at subsequent facilities, the Company will pay an upfront license fee royalty and a variable royalty based on production at that subsequent facility, capped at an aggregate $10 million per facility. Certain products that the Company is currently developing and anticipates selling are expected to utilize these patents. No payments were made during the year ended December 31, 2023 and 2022.

In November 2016, the Company entered into a nonexclusive patent license agreement, which expires upon expiration of the patent. Under this agreement, if the Company produces products based on the patent, the Company will pay an annual royalty upon commencement of operations on Origin 1 which will not exceed $1.0 million cumulatively. The pipeline of Company products and sales are not currently expected to be subject to this patent. The annual royalty payments are less than $0.1 million.

In September 2011, the Company entered into a nonexclusive patent license agreement, which expires upon expiration of the patent. Under this agreement, if the Company develops and sells specific products based on the patent, the Company would pay a royalty up to $2.0 million per year and $10.0 million in the aggregate. Certain products that the Company is currently developing and anticipates selling are expected to utilize these patents. No payments were made during the year ended December 31, 2023 and 2022.

In June 2011, the Company entered into a nonexclusive patent license agreement, which expires upon expiration of the licensed patent. Under this agreement, the Company pays less than $0.1 million royalty fee annually and if the Company develops and sells specific products based on the patent, 0.4% of net sales. The pipeline of Company products and sales are not currently expected to be subject to this patent.

We enter into supply and service arrangements in the normal course of business. Supply arrangements are primarily for fixed-price manufacture and supply. Service agreements are primarily for the development of manufacturing processes and certain studies. Commitments under service agreements are subject to cancellation at our discretion which may require payment of certain cancellation fees. The timing of completion of service arrangements is subject to variability in estimates of the time required to complete the work.

Contingencies

At times there may be claims and legal proceedings generally incidental to the normal course of business that are pending or threatened against the Company. For instance, in August 2023, a shareholder filed a putative securities class action complaint in the Eastern District of California against the Company and certain of its officers, alleging violations of the federal securities laws. An additional complaint, alleging the same claims against the same defendants, was filed in October 2023. Both cases allege a class period of February 23, 2023 to August 9, 2023, and seek as relief, among other things, unspecified damages and fees and costs. The two cases have since been consolidated into *In re Origin Materials, Inc. Sec. Litig.*, No. 2:23-cv-01816-WBS-JDP (E.D. Cal.). A lead plaintiff was appointed for the consolidated case on December 14, 2023 and filed an amended complaint on March 1, 2024. At this preliminary stage in the litigation, the Company cannot predict any particular outcome or financial impact thereof, if any.

19. Basic and Diluted Net Income Per Share

The following table sets forth the computation of basic and diluted net income per share attributable to common stockholders. Basic net income per share is computed by dividing net income for the period by the weighted-average number of common shares outstanding during the period, which excludes Sponsor Vesting Shares which are legally outstanding, but subject to return to the Company. Diluted net income per share is computed by dividing net income for the period by the weighted-average common shares outstanding during the period, plus the dilutive effect of the stock options and RSU awards, as applicable pursuant to the treasury stock method. The following table sets forth the computation of basic and diluted net income per share:

(In thousands, except for share and per share amounts)	Year Ended December 31, 2023	Year Ended December 31, 2022
Numerator:		
Net income attributable to common stockholders—Basic	$ 23,798	$ 78,569
Net income attributable to common stockholders—Diluted	$ 23,798	$ 78,569
Denominator:		
Weighted-average common shares outstanding—Basic (1)	139,718,385	137,563,877
Stock options	2,872,491	4,571,301
RSU awards	67,547	11,589
Weighted-average common shares outstanding—Diluted (1)	142,658,423	142,146,767
Net income per share—Basic	$ 0.17	$ 0.57
Net income per share—Diluted	$ 0.17	$ 0.55

(1) Excludes weighted-average Sponsor Vesting Shares subject to return of 4,500,000 shares for the year ended December 31, 2023 and 2022.

Diluted earnings per share reflect the potential dilution of securities that could share in the earnings of an entity. The following potentially dilutive securities for common stock were outstanding and excluded from diluted earnings per share as they are subject to performance or market conditions that were not probable of being achieved as follows:

	Year Ended December 31, 2023	Year Ended December 31, 2022
Options to purchase common stock	1,481,531	1,481,531
Performance-based stock awards	2,018,934	2,218,925
Earnout shares	25,000,000	25,000,000
Sponsor vesting shares	4,500,000	4,500,000

The following outstanding shares of out-of-the-money options and potentially dilutive warrants were excluded from the computation of diluted net income per share attributable to common stockholders for the periods presented because including them would have been antidilutive:

	Year Ended December 31, 2023	Year Ended December 31, 2022
Options to purchase common stock	41,357	—
Warrants to purchase common stock	35,476,667	35,476,667

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosures

None.

Item 9A. Controls and Procedures

Limitations on Effectiveness of Controls and Procedures

In designing and evaluating our "disclosure controls and procedures," as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and "internal control over financial reporting," as such term is defined in Rule 13a-15(f) under the Exchange Act, our management, including our Co-Chief Executive Officers and Chief Financial Officer, believe that our disclosure controls and procedures and our internal control over financial reporting are designed to provide reasonable assurance of achieving their objectives and are effective at the reasonable assurance level. Our management does not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent all errors and all instances of fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control deficiencies and instances of fraud, if any, have been detected. The design of any system of controls also is based partly on certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Evaluation of Disclosure Controls and Procedures

Our management, under the direction of our Co-Chief Executive Officers and Chief Financial Officer, has evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of the period covered by this Annual Report on Form 10-K. Based on this evaluation, our management, including our Co-Chief Executive Officers and Chief Financial Officer, has concluded that, as of December 31, 2023, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Our management, under the supervision and with the participation of our Co-Chief Executive Officers and Chief Financial Officer, conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2023. In making this evaluation, our management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control—Integrated Framework (2013). Based upon the results of its evaluation, our management concluded that, as of December 31, 2023, our internal control over financial reporting was effective.

This annual report does not include an attestation report of the Company's registered public accounting firm regarding internal control over financial reporting. The Company's internal control over financial reporting was not subject to attestation by the Company's registered public accounting firm as we are a non-accelerated filer.

Our management will continue to monitor and evaluate the effectiveness of its disclosure controls and procedures, as well as its internal control over financial reporting, on an ongoing basis, and is committed to taking further action and implementing additional improvements, as necessary and as funds allow. Our management believes that there are no material inaccuracies or omissions of material fact and, to the best of its knowledge, believes that the consolidated financial statements included in this annual report present fairly, in all material respects, our financial position, results of operations, and cash flows for the periods presented in conformity with accounting principles generally accepted in the United States.

Changes in Internal Control Over Financial Reporting

There has been no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the fourth quarter of the fiscal year ended December 31, 2023 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

Rich Riley, Co-CEO and Director, entered into a prearranged stock trading plan on December 15, 2023. Mr. Riley's plan provides for the sale of up to 600,000 shares of the Company's common stock between March 15, 2024 and December 31, 2024. This trading plan was entered into during an open trading window and is intended to satisfy the affirmative defense of Rule 10b5-1(c) under the Securities Exchange Act of 1934, as amended, and the Company's policies regarding transactions in the Company's securities.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not applicable.

Part III

Item 10. Directors, Executive Officers and Corporate Governance

Our Code of Business Conduct and Ethics applies to all of our employees, officers and directors. This includes our principal executive officer, principal financial officer and principal accounting officer or controller, or persons performing similar functions. The full text of our Code of Business Conduct and Ethics may be viewed at the investors relations portion of our website at https://investors.originmaterials.com/, in the section entitled "Investors—Governance—Governance Documents." We intend to satisfy the disclosure requirements under Item 5.05 of the SEC Form 8-K regarding an amendment to, or waiver from, a provision of our Code of Business Conduct and Ethics by posting such information on our website at the website address and location specified above.

Other information required by this item is incorporated by reference to the information to be set forth in our Proxy Statement.

Item 11. Executive Compensation

The information required by this item is incorporated by reference to the information to be set forth in our Proxy Statement.

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 the information to be set forth in our Proxy Statement.

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

The information required by this item is incorporated by reference to the information to be set forth in our Proxy Statement.

Item 14. Principal Accounting Fees and Services

The information required by this item is incorporated by reference to the information to be set forth in our Proxy Statement.

Part IV

Item 15. Exhibit and Financial Statement Schedules

(a) Exhibits.

The exhibits listed below are filed as part of this Annual Report on Form 10-K (or are incorporated by reference herein):

			Incorporated by Reference		
Exhibit No.	Description	Form	File No.	Exhibit	Filing Date
2.1+	Agreement and Plan of Merger, dated as of February 16, 2021.	S-4/A	333-254012	2.1	May 25, 2021
2.2	Letter Agreement, dated as of March 5, 2021.	S-4/A	333-254012	2.2	May 25, 2021
3.1	Amended and Restated Certificate of Incorporation of the Company.	8-K	001-39378	3.3	July 1, 2021
3.2	Bylaws of the Company.	8-K	001-39378	3.2	June 29, 2021

3.3	Amendment No. 2 to Offtake Supply Agreement (Origin 2) by and between Origin Materials Operating, Inc. and Pepsi-Cola Advertising and Marketing, Inc., dated May 10, 2023.	10-Q	001-39378	3.3	May 10, 2023
3.4	Transition, Separation and Advisory Agreement between the Company and Nate Whaley dated June 14, 2023	8-K	001-39378	NA	June 13, 2023
4.1	Specimen Common Stock Certificate of the Company.	S-4/A	333-254012	4.5	May 25, 2021
4.2	Specimen Warrant Certificate of the Company.	S-1/A	333-239421	4.3	July 2, 2020
4.3	Warrant Agreement between the Company and Continental Stock Transfer & Trust Company, dated July 13, 2020.	8-K	001-39378	4.1	July 16, 2020
4.4	Certificate of Corporate Domestication of Artius.	S-4/A	333-254012	4.6	May 25, 2021
4.5	Description of Securities.	10-K	001-39378	4.5	March 1, 2022
10.1#	Form of Performance Stock Unit Agreement under the Origin Materials 2021 Equity Incentive Plan	10-Q	001-39378	10.1	November 12, 2021
10.2#	Form of Restricted Stock Unit Agreement under the Origin Materials 2021 Equity Incentive Plan	10-Q	001-39378	10.2	November 12, 2021
10.3#	Form of Director Stock Unit Agreement under the Origin Materials 2021 Equity Incentive Plan	10-Q	001-39378	10.3	November 12, 2021
10.4*	Amendment No. 1 to Offtake Supply Agreement by and between Origin Materials Inc. and Danone Asia Pte Ltd. dated August 1, 2022	10-K	001-39378	10.4	February 23, 2023
10.5	Investor Rights Agreement, by and between the Company and certain stockholders, dated June 25, 2021.	8-K	001-39378	10.5	June 25, 2021
10.6#	Form of Indemnification Agreement.	8-K	001-39378	10.6	June 25, 2021
10.7#*	Amended and Restated Non-Employee Director Compensation Policy.				
10.8#	Micromidas, Inc. 2010 Stock Incentive Plan, as amended.	S-4/A	333-254012	10.1	May 25, 2021
10.9#	Forms of Incentive Stock Option Award Notice, Incentive Stock Option Award Agreement, Exercise Notice and Investment Representation Statement under the 2010 Stock Incentive Plan.	S-4/A	333-254012	10.2	May 25, 2021
10.10#	Micromidas, Inc. 2020 Equity Incentive Plan.	S-4/A	333-254012	10.3	May 25, 2021
10.11#	Forms of Stock Option Grant Notice, Option Agreement and Exercise Notice under the 2020 Equity Incentive Plan.	S-4/A	333-254012	10.4	May 25, 2021
10.12#	Origin Materials 2021 Equity Incentive Plan.	8-K	001-39378	10.12	June 25, 2021
10.13#	Form of Stock Option Grant Notice, Stock Option Agreement, Restricted Stock Unit Grant Notice and Restricted Stock Unit Award Agreement under the 2021 Equity Incentive Plan.	8-K	001-39378	10.13	June 25, 2021
10.14#	Origin Materials 2021 Employee Stock Purchase Plan.	8-K	001-39378	10.14	June 25, 2021
10.15#	Offer Letter, dated October 28, 2020, by and between Micromidas, Inc. and Rich Riley.	S-4/A	333-254012	10.7	May 25, 2021
10.16#	Offer Letter, dated January 9, 2018, by and between Micromidas, Inc. and Joshua Lee.	S-4/A	333-254012	10.8	May 25, 2021
10.17#	Offer Letter, dated August 11, 2020, by and between Micromidas, Inc. and Nate Whaley.	S-4/A	333-254012	10.9	May 25, 2021

10.18	Standard Industrial/Commercial Multi-Tenant Lease for 930 Riverside Parkway, Suites 10-30, West Sacramento, CA 95605, by and between Harsch Investment Properties, LLC and Micromidas, Inc., dated May 22, 2020.	S-4/A	333-254012	10.10	May 25, 2021
10.19	Standard Industrial/Commercial Multi-Tenant Lease for 970 Riverside Parkway, Suite 40, West Sacramento, CA 95605, by and between Harsch Investment Properties, LLC and Micromidas, Inc., dated February 28, 2013.	S-4/A	333-254012	10.11	May 25, 2021
10.20	Second Amendment to Lease for 970 Riverside Parkway, Suite 40, West Sacramento, CA 95605, by and between Harsch Investment Properties, LLC and Micromidas, Inc., dated May 11, 2015.	S-4/A	333-254012	10.12	May 25, 2021
10.21	Third Amendment to Lease for 970 Riverside Parkway, Suite 40, West Sacramento, CA 95605, by and between Harsch Investment Properties, LLC and Micromidas, Inc., dated May 22, 2020.	S-4/A	333-254012	10.13	May 25, 2021
10.22	Form of Sponsor Letter Agreement.	S-4/A	333-254012	10.16	May 25, 2021
10.23	Private Placement Warrants Purchase Agreement between the Company and Artius Acquisition Partners LLC.	8-K	001-39378	10.3	July 16, 2020
10.24	Amended and Restated Secured Promissory Note, by and among Micromidas, Inc., Origin Materials Canada Holding Limited, Origin Materials Canada Pioneer Limited and Danone Asia Pte Ltd, dated May 17, 2019.	S-4/A	333-254012	10.33	May 25, 2021
10.25	First Amendment to Amended and Restated Secured Promissory Note, by and among Micromidas, Inc., Origin Materials Canada Holding Limited, Origin Materials Canada Pioneer Limited and Danone Asia Pte Ltd, dated November 8, 2019.	S-4/A	333-254012	10.34	May 25, 2021
10.26	Second Amendment to Amended and Restated Secured Promissory Note, by and among Micromidas, Inc., Origin Materials Canada Holding Limited, Origin Materials Canada Pioneer Limited and Danone Asia Pte Ltd, dated May 21, 2020.	S-4/A	333-254012	10.35	May 25, 2021
10.27	Third Amendment to Amended and Restated Secured Promissory Note, by and among Micromidas, Inc., Origin Materials Canada Holding Limited, Origin Materials Canada Pioneer Limited and Danone Asia Pte Ltd, dated January 22, 2021.	S-4/A	333-254012	10.36	May 25, 2021
10.28+^	Offtake Supply Agreement, by and between Micromidas, Inc. and Pepsi-Cola Advertising and Marketing, Inc., dated August 3, 2018.	S-4/A	333-254012	10.42	May 25, 2021
10.29^	Amendment No. 1 to Offtake Supply Agreement, by and between Micromidas, Inc. and Pepsi-Cola Advertising and Marketing, Inc., dated October 24, 2019.	S-4/A	333-254012	10.43	May 25, 2021
10.30+^	Amended and Restated Offtake Supply Agreement, by and between Micromidas, Inc. and Danone Asia Pte Ltd, dated May 17, 2019.	S-4/A	333-254012	10.44	May 25, 2021
10.31+^	Offtake Supply Agreement, by and between Micromidas, Inc. and Packaging Equity Holdings, LLC, dated December 13, 2020.	S-4/A	333-254012	10.46	May 25, 2021

10.32+^	Offtake Supply Agreement (Origin 2) by and between Origin Materials Operating, Inc. and Danone Asia Pte Ltd, dated August 1, 2022.	POS-AM	333-257931	10.51	August 3, 2022
10.33+^	Fourth Amendment to Amended and Restated Secured Promissory Note by and between Origin Materials Operating, Inc. and Danone Asia Pte Ltd, Origin Materials Canada Holding Limited, and Origin Materials Canada Pioneer Limited, dated August 1, 2022.	POS-AM	333-257931	10.52	August 3, 2022
10.34^	Second Amendment to the Offtake Supply Agreement by and between Danone Asia Pte Ltd. and the Company, dated as of July 10, 2023.	10-Q	001-39378	10.1	August 9, 2023
10.35^	First Amendment to Lease for 930 Riverside Parkway, Suite 40-60, West Sacramento, CA 95605, by and between Schnitzer Properties, LLC and Origin Materials Operating, Inc., dated August 1, 2023.	10-Q	001-39378	10.2	August 9, 2023
10.36^	First Amendment to Lease for 930 Riverside Parkway, Suite 70, West Sacramento, CA 95605, by and between Schnitzer Properties, LLC and Origin Materials Operating, Inc., dated August 1, 2023.	10-Q	001-39378	10.3	August 9, 2023
10.37^	Second Amendment to Lease for 930 Riverside Parkway, Suite 10-30, West Sacramento, CA 95605, by and between Schnitzer Properties, LLC and Origin Materials Operating, Inc., dated August 1, 2023.	10-Q	001-39378	10.4	August 9, 2023
10.38^	Fifth Amendment to Lease for 970 Riverside Parkway, Suite 40, West Sacramento, CA 95605, by and between Schnitzer Properties, LLC and Origin Materials Operating, Inc., dated August 1, 2023.	10-Q	001-39378	10.5	August 9, 2023
10.39^	Offer Letter, dated September 25, 2023, by and between Origin Materials, Inc. and Matthew Plavan.	8-K	001-39378	10.1	October 1, 2023
19.1*	Insider Trading Policy.				
16.1	Letter of Grant Thornton LLP, dated March 9, 2023				March 9, 2023
23.1*	Consent of Deloitte & Touche LLP, independent registered public accounting firm.				
23.2*	Consent of Grant Thornton LLP, independent registered public accounting firm.				
24.1*	Power of Attorney (included on signature page).				
31.1*	Certification of Co-Principal Executive Officer pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended.				
31.2*	Certification of Co-Principal Executive Officer pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended.				
31.3*	Certification of Principal Financial Officer pursuant to Rules 13a-14(a) and 15d-14(a) promulgated under the Securities Exchange Act of 1934, as amended.				

32.1*+	Certification of Co-Principal Executive Officers and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
97.1*	Incentive Compensation Recoupment Policy.
101.INS*	Inline XBRL Instance Document
101.SCH*	Inline XBRL Taxonomy Extension Schema Document
101.CAL*	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	Inline XBRL Taxonomy Extension Definitions Linkbase Document
101.LAB*	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	Inline XBRL Taxonomy Extension Label Linkbase Document
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)

* Filed herewith.

^ Certain confidential portions (indicated by brackets and asterisks) have been omitted from this exhibit in accordance with the rules of the Securities and Exchange Commission.

\+ Schedules and exhibits have been omitted pursuant to Items 601(a)(5) and 601(b)(2) of Regulation S-K. The Company agrees to furnish supplementally a copy of any omitted schedule or exhibit to the SEC upon request.

\# Indicates a management or compensatory plan

\+ Furnished herewith and not deemed to be "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and shall not be deemed to be incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended.

(b) Financial Statement Schedules.

Schedules not listed above have been omitted because the information required to be set forth therein is not applicable or is shown in the financial statements or notes thereto.

Item 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements 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.

ORIGIN MATERIALS, INC.

Date: March 4, 2024

By: /s/ John Bissell
John Bissell
Co-Chief Executive Officer
(Co-Principal Executive Officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints John Bissell, Rich Riley and Matt Plavan, and each of them, his or her true and lawful attorneys-in-fact and agents, each with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to do any and all things and execute any and all instruments that such attorney may deem necessary or advisable under the Securities Exchange Act of 1934, as amended, and any rules, regulations and requirements of the Securities and Exchange Commission in connection with this Annual Report and any and all amendments hereto, as fully and for all intents and purposes as he or she might do or could do in person, and hereby ratifies and confirms all that each of said attorneys-in-fact and agents, or his or her substitute or substitutes may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Annual Report has been signed below by the following persons, being a majority of the Board of Directors of Origin Materials, Inc., on behalf of the registrant on the dates indicated.

Signature	Title	Date
/s/ John Bissell John Bissell	Co-Chief Executive Officer and Director (Co-Principal Executive Officer)	March 4, 2024
/s/ Rich Riley Rich Riley	Co-Chief Executive Officer and Director (Co-Principal Executive Officer)	March 4, 2024
/s/ Matthew Plavan Matthew Plavan	Chief Financial Officer (Principal Financial and Accounting Officer)	March 4, 2024
/s/ R. Tony Tripeny R. Tony Tripeny	Chairperson of the Board	March 4, 2024
/s/ Pia Heidenmark Cook Pia Heidenmark Cook	Director	March 4, 2024
/s/ Kathleen B. Fish Kathleen B. Fish	Director	March 4, 2024
/s/ William J. Harvey William J. Harvey	Director	March 4, 2024
John Hickox	Director	March 4, 2024
/s/ Craig A. Rogerson Craig A. Rogerson	Director	March 4, 2024
/s/ Jim Stephanou Jim Stephanou	Director	March 4, 2024

Exhibit 10.7

ORIGIN MATERIALS, INC.
SECOND AMENDED AND RESTATED
NON-EMPLOYEE DIRECTOR COMPENSATION POLICY

Each member of the Board of Directors (the "***Board***") who is not (i) also serving as an employee of, or consultant to, Origin Materials, Inc. (the "***Company***") or any of its subsidiaries, or (ii) affiliated with Artius Acquisition Partners LLC (each such member, an "***Eligible Director***") will receive the compensation described in this Second Amended and Restated Non-Employee Director Compensation Policy (as amended or amended and restated from time to time, this "***Policy***") for his or her Board service.

An Eligible Director may decline all or a portion of his or her compensation by giving notice to the Company prior to the date quarterly cash payments are to be paid, or equity awards are to be granted, subject to compliance with applicable laws.

This Policy is effective as of February 13, 2023 (the "***Effective Date***") and may be amended at any time in the sole discretion of the Board.

I. Annual Cash Compensation

The annual cash compensation set forth below will be payable in arrears to Eligible Directors in equal quarterly installments. If an Eligible Director joins the Board or a committee of the Board at a time other than effective as of the first day of a fiscal quarter, each annual retainer set forth below will be pro-rated based on days served in the applicable fiscal quarter, with the pro-rated amount paid for the first fiscal quarter in which the Eligible Director provides the service and regular full quarterly payments thereafter. All annual cash fees are vested upon payment.

1. Annual Cash Service Retainer:
   a. All Eligible Directors: $50,000

2. Annual Committee Chair Service Retainer:
   a. Chair of the Audit Committee: $20,000
   b. Chair of the Compensation Committee: $15,000
   c. Chair of the Nominating & Corporate Governance Committee: $15,000

3. Annual Committee Member Service Retainer (not applicable to Committee Chairs):
   a. Member of the Audit Committee: $10,000
   b. Member of the Compensation Committee: $5,000
   c. Member of the Nominating & Corporate Governance Committee: $5,000

II. Expenses

The Company will reimburse Eligible Directors for ordinary, necessary and reasonable out-of-pocket travel expenses to cover in-person attendance at, and participation in, Board and committee meetings; provided, that the Eligible Director timely submits to the Company appropriate documentation substantiating such expenses in accordance with the Company's travel and expense policy, as in effect from time to time.

III. Equity Compensation

The equity compensation set forth below will be granted under the Company's 2021 Equity Incentive Plan (the "***Plan***"). All equity awards granted under this Policy will be documented on the applicable form of equity award agreement most recently approved for use by the Board or the Compensation Committee for Eligible Directors.

1. Initial Grants: For each Eligible Director who is first elected or appointed to the Board following the Effective Date, on the date of such Eligible Director's initial election or appointment to the Board (or, if such date is not a market trading day, the first market trading day thereafter), the Eligible Director will automatically, and without further action by the Board, be granted a number of restricted stock units ("***RSUs***") with a grant date fair value of $150,000 (the "***Initial Grant***"). The Initial Grant will vest in substantially equal installments on each of the first three anniversaries of the date of grant, subject to the Eligible Director's continuing service on the Board through each such vesting date. In addition to the Initial Grant, any Eligible Director who is first appointed or elected by the Board on a date other than an annual stockholder meeting of the Company will automatically, and without further action by the Board, be granted an additional number of RSUs with a grant date fair value of $130,000 (or, in the case of the Chairman of the Board, $205,000) (the "***Prorated Annual Grant***"); provided, that such grant date fair value will be prorated to reflect the Eligible Director's partial year of service, with such proration calculated by multiplying $130,000 (or, in the case of the Chairman of the Board, $205,000) by a fraction (the numerator of which will equal the number of calendar months during the period beginning with the month in which the Eligible Director's election or appointment date occurs and ending with the month in which the next annual stockholder meeting will occur (or, if such month is unknown, the month in which the first anniversary of the most recent annual stockholder meeting will occur) and the denominator of which will equal 12). The Prorated Annual Grant will vest in full on the first anniversary of the date of grant, subject to the Eligible Director's continuing service on the Board through such vesting date; provided, that the Prorated Annual Grant will in any case be fully vested on the date of the Company's next annual stockholder meeting, subject to the Eligible Director's continuing service on the Board through such vesting date.

2. Annual Grants: On the date of each annual stockholder meeting of the Company held after the Effective Date, each Eligible Director who continues to serve as a non-employee member of the Board following such stockholder meeting (including any Eligible Director who is first appointed or elected by the Board at such meeting) will automatically, and without further action by the Board, be granted RSUs with a grant date fair value of $130,000 (or, in the case of the Chairman of the Board, $205,000) (the "***Annual Grant***"). The Annual Grant will vest in full on the first anniversary of the date of grant, subject to the Eligible Director's continuing service on the Board through such vesting date; provided, that the Annual Grant will in any case be fully vested on the date of the Company's next annual stockholder meeting, subject to the Eligible Director's continuing service on the Board through such vesting date.

3. Change in Control: Notwithstanding the foregoing, for each Eligible Director who remains in continuous service on the Board until immediately prior to the closing of a Change in Control (as defined in the Plan), the RSUs and any Cash Award (as defined below) that were granted pursuant to this Policy will become fully vested and, as applicable, due and payable immediately prior to the closing of such Change in Control.

4. Calculation of RSU Awards: The number of shares of Common Stock (as defined in the Plan) subject to each Initial Grant, each Prorated Annual Grant, and each Annual Grant shall be determined based on the Fair Market Value (as defined in the Plan) per share on the grant date, rounded down to the nearest whole share.

IV. Elections

1. Deferral Elections. Unless and until otherwise determined by the Board and subject to the terms of this Policy, each Eligible Director may elect to defer the delivery of shares in settlement of any RSUs granted pursuant to this Policy that would otherwise be delivered to such Eligible Director on or following the date such RSUs vest (a "***Deferral Election***").

2. Retainer Grant Elections. Unless and until otherwise determined by the Board and subject to the terms of this Policy, an Eligible Director may elect to forego receiving payment of all (but not less than all) of the compensation the Eligible Director is otherwise eligible to receive in cash under the Article I of this Policy and instead receive fully vested RSUs (such RSUs, the "***Retainer Grant***" and such election, a "***Retainer Grant Election***"). If an Eligible Director timely makes a Retainer Grant Election, such Eligible Director will be automatically, and without any further action by the Board or the Compensation Committee, granted a Retainer Grant on the last trading day of each applicable fiscal quarter. Each Retainer Grant will cover a number of RSUs equal to (a) the aggregate amount of cash compensation under Article I of this Policy that such Eligible Director is eligible to receive for the applicable fiscal quarter divided by (b) the Fair Market Value (as defined in the Plan) per share on the grant date, rounded down to the nearest whole share. An Eligible Director who does not make a timely Retainer Grant Election will not receive a Retainer Grant and instead will receive the cash compensation under Article I of this Policy.

3. Cash in Lieu of Annual Grant Election. Unless and until otherwise determined by the Board and subject to the terms of this Policy, an Eligible Director may elect to forego receiving the Annual Grant (but not less than the full amount of the Annual Grant) the Eligible Director is eligible to receive under Article III.2 of this Policy and shall instead receive a cash amount equal to the applicable grant date fair value of the Annual Grant set forth above (such election, a "***Cash Election***" and each such cash award, a "***Cash Award***"). The Cash Award shall automatically, and without any further action by the Board or the Compensation Committee, be granted on the date the Annual Grant, in respect of which such election relates, would have been granted absent such Cash Election. The Cash Award will vest and be payable on the first anniversary of the date of grant, subject to the Eligible Director's continuing service on the Board through such vesting date; provided, that the Cash Award will in any case be fully vested on the date of the Company's next annual stockholder meeting, subject to the Eligible Director's continuing service on the Board through such vesting date. Notwithstanding anything to the contrary herein, unless the Board or the Compensation Committee determines otherwise, as an additional

condition to receiving a Cash Award, the Eligible Director shall use all cash the Eligible Director receives as a payment in connection with vesting of a Cash Award to purchase shares of Common Stock as soon as practicable following payment of such cash but no earlier than the first date the Eligible Director would be permitted to both (i) purchase such shares without violating the Company's Insider Trading Policy and (ii) purchase such shares without violating Section 16(b) of the Securities Exchange Act of 1934, as amended (the "***Exchange Act***"). The Eligible Director shall not be required to use such cash payment (or any portion thereof) to purchase any shares of Common Stock that would cause the Eligible Director to hold more than the applicable number of Required Shares (as defined below). An Eligible Director who does not have an effective Cash Election in place on the date of an annual meeting of the Company's stockholders will not receive a Cash Award and instead will be eligible to receive the Annual Grant under and subject to the terms of Article III.2.

4. Election Procedures. Unless otherwise determined by the Board, for any such Deferral Election, Retainer Grant Election or Cash Election (each, an "***Election***") to be effective, it must be submitted to the Company's General Counsel (or such other individual as the Company designates) no later than: (a) with respect to a Deferral Election or Retainer Grant Election, on or prior to the last day of the calendar year immediately prior to the calendar year in which the compensation to which the Election relates is earned or granted, or within 30 days after the applicable Eligible Director first becomes eligible to participate in the Policy; provided, that such Deferral Election or Retainer Grant Election will be applicable only to the portion of the compensation earned after the date such election is irrevocable (consistent with the requirements of Section 409A (as defined in the Plan)) and (b) with respect to a Cash Election, prior to the date of the annual meeting of the stockholders of the Company at which the Annual Grant that is covered by such election would be granted absent the Cash Election being properly and timely submitted. Further, an Eligible Director may only make a Retainer Grant Election and Cash Election during a period in which the Company is not in a quarterly or special blackout period and the Eligible Director is not aware of any material non-public information. As further conditions to making a Cash Election, an Eligible Director may not make a Cash Election unless (a) the Eligible Director resides outside the U.S. and (b) such election is made for non-U.S. tax planning purposes, as determined by the Company's General Counsel (or such other individual as the Company designates) in his or her sole discretion, and may not make a Cash Election if he or she is in violation of the Guidelines (as defined below). A Retainer Grant Election will be effective beginning with the first fiscal quarter following the fiscal quarter in which the Retainer Grant Election is made. A Cash Election will be effective on the date it is properly and timely submitted to the Company, provided that a Cash Election shall not be deemed effective on, and shall be deemed to have terminated immediately prior to, the date of any annual meeting of stockholders of the Company if the Eligible Director is not in compliance with the Guidelines as of such date, notwithstanding anything to the contrary herein. An Election will be irrevocable, and will be subject to such rules, conditions and procedures as shall be determined by the Board in its sole discretion, which rules, conditions and procedures shall at all times comply with the requirements of Section 409A (as defined in the Plan), unless otherwise specifically determined by the Board. Elections shall be made pursuant to a form of election approved by the Board. Elections will continue in effect and will be applicable to the applicable compensation paid or granted pursuant to this Policy in all subsequent calendar years, unless and until such Election is modified or terminated pursuant to this Policy. An Eligible Director may modify an Election by submitting a new Election to the Company's General Counsel (or such other individual as the

Company designates) before the first day of any subsequent calendar year or, in the case of a Cash Election, before the date of the annual meeting of stockholders of the Company at which the Annual Grant that the new Cash Election would first cover would be granted, provided that any such modified Retainer Grant Election or Cash Election may only be made during a period in which the Company is not in a quarterly or special blackout period and the Eligible Director is not aware of any material non-public information. Any modified Election will commence effective with respect to such subsequent calendar year or, in the case of a Cash Election, on the date it is properly and timely submitted to the Company, but subject to the conditions of effectiveness for a Cash Election set forth above in this paragraph.

V. Non-Employee Director Compensation Limit

Notwithstanding the foregoing, the aggregate value of all compensation granted or paid, as applicable, to any individual for service as a Non-Employee Director (as defined in the Plan) shall in no event exceed the limits set forth in Section 3(d) of the Plan.

VI. Share Ownership Guidelines

1. Purpose. These share ownership guidelines (these "***Guidelines***") are intended to align the interests of Eligible Directors with the interests of the stockholders of the Company and to further promote the Company's commitment to sound corporate governance.

2. Calculation of Required Shares. The number of Eligible Shares (as defined below) that an Eligible Director must hold to satisfy these Guidelines shall be calculated by dividing (a) the dollar amount equal to five times the Eligible Director's annual cash compensation under this Policy as of the Effective Date (or, if later, the calendar year of the Eligible Director's election or appointment) by (b) the average closing price of a share of Common Stock for the 30 consecutive trading days preceding December 31, 2022 (or, if later, the 30 consecutive trading days preceding December 31st of the calendar year of the Eligible Director's election or appointment) (such number of shares rounded up to the nearest whole share, "***Required Shares***"). Except as provided in Section 7 below, the applicable number of Required Shares shall not be recalculated and no Eligible Director shall be required to hold more Eligible Shares than the number of Required Shares by virtue of any decrease in the price of the Eligible Shares used to calculate the applicable number of Required Shares.

3. Compliance Period. Each Eligible Director must hold the applicable number of Required Shares by the fifth anniversary of such Eligible Director's election or appointment to the Board (the "***Compliance Period***"). During the Compliance Period, Eligible Directors are expected to make reasonable progress toward the applicable number of Required Shares on an annual basis.

4. Tracking Compliance with these Guidelines. An Eligible Director's ownership shall be reviewed annually by the Compensation Committee of the Board (the "***Compensation Committee***") based on the number of such Eligible Director's Eligible Shares as of the last day of each calendar year to determine if such Eligible Director continues to hold the applicable number of Required Shares (or, during the Compliance Period, to assess progress towards

meeting these Guidelines). If these Guidelines are deemed met for such year, the Eligible Director shall be deemed to comply with these Guidelines for the entire following year.

5. Eligible Shares. The following shares of Common Stock are "***Eligible Shares***" that shall be included in the calculation of an Eligible Director's share ownership, whether or not purchased on the open market or obtained through the exercise of options or vesting of equity awards granted by the Company to such Eligible Director:

a. shares owned outright by the Eligible Director and by members of his or her immediate family (as defined in Rule 16a-1(e) under the Exchange Act) ("***Family Member***");
b. shares held in trust for the benefit of the Eligible Director or for the benefit of a Family Member of such Eligible Director;
c. shares owed by an entity for which the Eligible Director serves as a partner or is otherwise materially affiliated with (as determined in the sole discretion of the Compensation Committee); and
d. vested RSUs and unvested RSUs provided such RSUs are subject only to time-based vesting.

6. Failure to Comply with these Guidelines. If an Eligible Director fails to hold the applicable number of Required Shares by the end of the Compliance Period or, following the Compliance Period, on the last day of each calendar year, as applicable, the Compensation Committee may take the actions it determines appropriate.

7. Exceptions. These Guidelines may be temporarily suspended, at the discretion of the Compensation Committee (with any affected Eligible Director recusing himself or herself), if compliance would create severe hardship or prevent an Eligible Director from complying with a court order or applicable law.

8. Administration. The Compensation Committee shall administer these Guidelines and may delegate to members of management to assist it in carrying out its administrative functions hereunder, such as making calculations and tracking compliance.

Exhibit 19.1

ORIGIN MATERIALS, INC.

INSIDER TRADING POLICY

APPROVED BY THE BOARD OF DIRECTORS

JUNE 25, 2021

INTRODUCTION

This policy determines acceptable transactions in the securities of Origin Materials, Inc. (the "***Company***" or "***Origin***") by our employees, directors and consultants ("***team members***"). During the course of your employment, directorship or consultancy with the Company, you may receive important information that is not yet publicly available ("***material non-public information***" or "***MNPI***"), about the Company or about other publicly-traded companies with which the Company has business dealings. Because of your access to this material non-public information, you may be in a position to profit financially by buying or selling, or in some other way dealing, in the Company's stock, or stock of another publicly-traded company, or to disclose such information to a third party who does so profit (a "***tippee***").

INSIDER TRADING POLICY

Securities Transactions

Use of material non-public information by someone for personal gain, or to pass on, or "tip," the inside information to someone who uses it for personal gain, is illegal, regardless of the quantity of shares, and is therefore prohibited. You can be held liable both for your own transactions and for transactions effected by a tippee, or even a tippee of a tippee. Furthermore, it is important that the appearance of insider trading in securities be avoided. The only exception is that transactions directly with the Company, *e.g.,* option exercises for cash or purchases under the Company's employee stock purchase plan, are permitted. However, the subsequent sale (including the sale of shares in a cashless exercise program) or other disposition of such stock is fully subject to these restrictions.

Material Non-public Information

As a practical matter, it is sometimes difficult to determine whether you possess material non-public information. The key to determining whether nonpublic information you possess about a public company is material non-public information is whether dissemination of the information would likely affect the market price of the company's stock or would likely be considered important, or "material," by investors who are considering trading in that company's stock. Certainly, if the information makes you want to trade, it would probably have the same effect on others. Remember, both positive and negative information can be material. If you possess material non-public information, you may not trade in a company's stock, advise anyone else to do so or communicate the information to anyone else until you know that the information has been publicly disseminated. This policy also applies to all family members and other household members of those covered by this policy and all companies controlled by those covered by this policy. You may never recommend to another person that he or she buy, hold or sell our stock. This means that in some circumstances, you may have to forego a proposed transaction in a company's securities even if you planned to execute the transaction prior to learning of the material non-public information and even though you believe you may suffer an economic loss or sacrifice an anticipated profit by waiting. "***Trading***" includes engaging in short sales, transactions in put or call options, hedging transactions and other inherently speculative transactions.

You may not participate in "chat rooms" or other electronic discussion groups or contribute to blogs, bulletin boards or social media forums on the Internet concerning the activities of Origin or other companies with which Origin does business, even if you do so anonymously, unless doing so is part of your job responsibilities and you have explicit authorization from either of the Company's Chief Executive Officers (or either Chief Executive Officer, if there are more than one).

Although by no means an all-inclusive list, information about the following items may be considered to be material non-public information until it is publicly disseminated:

(a) financial results or forecasts;

(b) major new products or processes;

(c) acquisitions or dispositions of assets, divisions, companies, etc.;

(d) pending public or private sales of debt or equity securities;

(e) declaration of stock splits, dividends or changes in dividend policy;

(f) major contract awards or cancellations;

(g) top management or control changes;

(h) possible tender offers or proxy fights;

(i) significant writeoffs;

(j) significant litigation;

(k) impending bankruptcy;

(l) gain or loss of a significant license agreement or other contracts with customers or suppliers;

(m) pricing changes or discount policies;

(n) corporate partner relationships; and

(o) notice of issuance of patents.

For information to be considered publicly disseminated, it must be widely disclosed through a press release or SEC filing, and a sufficient amount of time must have passed to allow the information to be fully disclosed. Generally speaking, information will be considered publicly disseminated after two full trading days have elapsed since the date of public disclosure of the information. For example, if an announcement of material non-public information of which you were aware was made prior to trading on Wednesday, then you may execute a transaction in the Company's securities on Friday.

STOCK TRADING BY TEAM MEMBERS

We require that all team members limit their transactions in the Company's stock to defined time periods following public dissemination of quarterly and annual financial results. In addition, Specified Personnel (as defined below) are required to notify, and receive approval from, the Company's Chief Financial Officer ("***CFO***") prior to engaging in transactions in the Company's stock and observe other restrictions designed to minimize the risk of apparent or actual insider trading. Generally, any entities or family members or others whose trading activities are controlled or influenced by any of such persons should be considered to be subject to the same restrictions. "Specified Personnel" shall be defined to mean all Origin directors, officers and Origin team members within the Sales and/or Marketing and Finance functions at or above the director level.

Window Period

Generally, except as set forth in this policy, all team members may buy or sell securities of the Company only during a "window period" that opens after two full trading days have elapsed after the public dissemination of the Company's annual or quarterly financial results and closes two weeks before the end of the next quarter, or as otherwise determined by the CFO. This window period may be closed early or may not open if, in the judgment of the CFO, there exists undisclosed information that would make trades by the team members inappropriate. It is important to note that the fact that the window period has closed early or has not opened should be considered material non-public information. A director, employee or consultant who believes that special circumstances require him or her to trade outside the window period should consult with the Company's CFO who will consult with the Company's outside counsel. Permission to trade outside the window period will be granted only where the circumstances are extenuating and there appears to be no significant risk that the trade may subsequently be questioned.

Exceptions to Window Period

1. *ESPP/Option Exercises.* Employees who are eligible to do so may purchase stock under the Company's Employee Stock Purchase Plan ("***ESPP***") on periodic designated dates in accordance with the ESPP without restriction to any particular period. Team members may exercise options for cash granted under the Company's stock option plans without restriction to any particular period. However, the subsequent sale of the stock (including sales of stock in a cashless exercise) acquired upon the exercise of options or pursuant to the ESPP is subject to all provisions of this policy.

2. *10b5-1 Automatic Trading Programs.* In addition, purchases or sales of the Company's securities made pursuant to, and in compliance with, a written plan established by a director or executive officer or other member of management that meets the requirements of Rule 10b5-1 under the Securities Exchange Act of 1934, as amended (the "***Exchange Act***") (a "***Trading Plan***") may be made without restriction to any particular period provided that (i) the Trading Plan was established in good faith, in compliance with the requirements of Rule 10b5-1, at the time when such individual was not in possession of material non-public information about the Company and the Company had not imposed any trading blackout period, (ii) the Trading Plan was reviewed by the Company prior to establishment, solely to confirm compliance with this policy and the securities laws. The Company must be notified of the establishment of any such Trading Plan, any amendments to such Trading Plan and the termination of such Trading Plan.

Pre-Clearance and Advance Notice of Transactions

In addition to the requirements of above, directors and executive officers may not engage in any transaction in the Company's securities, including any purchase or sale in the open market, loan, pledge, hedge or other transfer of beneficial ownership. Officers and directors must first obtain pre-clearance of the transaction from the Company's Chief Financial Officer (the "***Clearing Officer***") at least two business days in advance of the proposed transaction. The Clearing Officer will then determine whether the transaction may proceed and, if so, will direct the Compliance Coordinator (as identified in the Company's Section 16 Compliance Program) to assist in complying with the reporting requirements under Section 16(a) of the Exchange Act, if any. Pre-cleared transactions not completed within five business days shall require new pre-clearance under the provisions of this paragraph. The Company may, at its discretion, shorten such period of time.

Advance notice of gifts or an intent to exercise an outstanding stock option shall be given to a Clearing Officer. To the extent possible, advance notice of upcoming transactions to be effected pursuant to an established Trading Plan shall also be given to a Clearing Officer. Upon completion of any transaction, the directors, employees or consultants must immediately notify the Compliance Coordinator and any other individuals identified in Section 3 of the Company's Section 16 Compliance Program so that the Company may assist in any Section 16 reporting obligations.

Prohibition of Speculative or Short-term Trading

No director, employee or consultant to Origin may engage in short sales, transactions in put or call options, hedging transactions, margin accounts, pledges, or other inherently speculative transactions with respect to the Company's stock at any time.

Short-Swing Trading/Control Stock/Section 16 Reports

Officers and directors subject to the reporting obligations under Section 16 of the Exchange Act should take care not to violate the prohibition on short-swing trading (Section 16(b) of the Exchange Act) and the restrictions on sales by control persons (Rule 144 under the Securities Act of 1933, as amended), and should file all appropriate Section 16(a) reports (Forms 3, 4 and 5), which are enumerated and described in the Company's Section 16 Compliance Program, and any notices of sale required by Rule 144.

DURATION OF POLICY'S APPLICABILITY

This policy continues to apply to your transactions in the Company's stock or the stock of other public companies engaged in business transactions with the Company even after your employment, directorship or consultancy with the Company has terminated. If you are in possession of material non-public information when your relationship with the Company concludes, you may not trade in the Company's stock or the stock of such other company until the information has been publicly disseminated or is no longer material.

PENALTIES

Anyone who effects transactions in the Company's stock or the stock of other public companies engaged in business transactions with the Company (or provides information to enable others to do so) on the basis of material non-public information is subject to both civil liability and criminal penalties, as well as disciplinary action by the Company. An employee, director or consultant who has questions about this policy should contact his or her own attorney or our Chief Financial Officer at nwhaley@originmaterials.com. Please also see Frequently Asked Questions attached hereto as **EXHIBIT A**.

EXHIBIT A

FREQUENTLY ASKED QUESTIONS

1. *What is insider trading?*

A: Insider trading is the buying or selling of stocks, bonds, futures, or other securities by someone in possession of material, nonpublic information. Insider trading also includes trading in options (puts and calls) the price of which is linked to the underlying price of a company's stock. It does not matter how many shares you buy or sell, or whether it has an effect on the stock price – if you have material, nonpublic information and you trade, you have broken the law.

2. *Why is insider trading illegal?*

A: If company insiders are able to use their confidential knowledge to their financial advantage, other investors would not have confidence in the fairness and integrity of the marketplace. Requiring those who have such information to disclose (the information to the public) or abstain (from trading) ensures an even playing field.

3. *What is material, nonpublic information?*

A: Information is material if it would influence a reasonable investor to buy or sell a stock, bond or other security. This could mean many things – financial results, potential mergers, major contracts, etc. Information is nonpublic if it has not yet been released and disseminated to the public.

4. *Who can be guilty of insider trading?*

A: Anyone who buys or sells a security while in possession of material, nonpublic information. It does not matter if you are not an executive officer or director, or even if you do not work at Origin– if you know something material about the value of a security that not everyone else does, regardless of who you are, you can be found guilty of insider trading.

5. *Does Origin have an insider trading policy?*

A: Yes.

6. *What if I work in a foreign office?*

A: There is no difference. The policy and law applies to you. Because our common stock trades on a United States securities exchange, the insider trading laws of the U.S. apply. The U.S. Securities and Exchange Commission (the SEC) (a U.S. government agency in charge of investor protection) and the Financial Industry Regulatory Authority (FINRA) (a private regulator that oversees U.S. exchanges) routinely investigate trading in a company's securities conducted by internationally-based individuals and firms. In addition, as an Origin employee, our policies apply to you no matter where in the world you work.

7. *What if I don't buy or sell anything, but I tell someone else the information and they buy or sell?*

A: That is called "tipping." You are the "tipper" and the other person is called the "tippee". If the tippee buys or sells based on that material, nonpublic information, you might still be guilty of insider trading. In fact, if you tell family members who tell others and those people then trade on the information, those family members might be guilty of insider trading too. As a result, you may not discuss material, non-public information about Origin with anyone outside Origin, including spouses, family members, friends, or business associates. This includes anonymous discussion on the Internet about Origin or companies with which Origin does business.

8. *What if I don't tell them the information itself, I just tell them whether they should buy or sell?*

A: That is still tipping, and you can still be found guilty of insider trading. According to our policies, you may never recommend to another person that they buy, hold or sell our common stock or any derivative security related to our common stock.

9. *What are the penalties if I trade on material non-public information, or tip off someone else?*

A: Anyone found liable in a civil case for trading on material non-public information may need to pay the U.S. government an amount equal to any profit made or any loss avoided and may also face a penalty of up to three times this amount. Persons found liable for tipping material non-public information, even if they did not trade themselves, may face a penalty of up to three times the amount of any profit gained or loss avoided by everyone in the chain of tippees. In addition, anyone convicted of criminal insider trading can face prison terms and additional fines.

10. *What is "loss avoided"?*

A: If you sell a common stock or a related derivative security before the negative news is publicly announced, and as a result of the announcement the stock price declines, you have avoided the loss caused by the negative news.

11. *Am I restricted from trading securities of any companies except Origin (for example a customer or competitor of Origin)?*

A: Yes. U.S. insider trading laws restrict everyone from trading in a company's securities based on material nonpublic information about that company, regardless of whether the person is directly connected with that company. Therefore, if you obtain material nonpublic information about another company, you should not trade in that company's securities. You should be particularly conscious of this restriction if, through your position at Origin, you sometimes obtain sensitive, material information about other companies and their business dealings with Origin.

12. *So if I do not trade Origin securities when I have material nonpublic information, and I don't "tip" other people, I am in the clear, right?*

A: Not necessarily. Even if you do not violate U.S. law, you may still violate our policies. Our policies are stricter than the law requires, so that we and our employees can avoid even the appearance of wrongdoing. Therefore, please review the entire policy carefully.

13. *If I am aware of new product or service developments that have not been announced to the public, do I possess material non-public information?*

A: In most circumstances, Origin does not consider new product and service developments to be material information that would require the closing of the trading window with respect to those individuals that are aware of these developments. However, there are circumstances where a new product or service in development or issues with respect to current or past products or services could be so significant that it constitutes material non-public information. In these circumstances, you will be notified by email if the trading window is closed for you.

14. *So when can I buy or sell my Origin securities?*

A: According to our policies, if you have material, nonpublic information, you may not buy or sell our common stock until the third trading day after that information is released or announced to the public. At that point, the information is considered public. **Even if you do not have material, nonpublic information, you may not trade in our common stock during any trading "blackout" period**. (A list of current blackout periods can be obtained from the Company's Chief Financial Officer and additional trading blackout periods may be announced by email.)

15. *If I have an open order to buy or sell Origin securities on the date the trading window closes, my broker will cancel the open order and won't execute the trade, right?*

A: No. If you have any open orders at the time the trading window closes, it is your responsibility to cancel these orders with your broker. If you have an open order and it executes after the trading window closes, it is a violation of our insider trading policy and may also be a violation of the insider trading laws.

16. *Am I allowed to trade derivative securities of Origin? Or, short Origin common stock?*

A: No. Under our policies, you may not trade in derivative securities related to our common stock, which includes, but is not limited to publicly-traded call and put options. In addition, under our policies, you may not engage in short selling of our common stock at any time.

"Derivative securities" are securities other than common stock that are speculative in nature because they permit a person to leverage his or her investment using a relatively small amount of money. Examples of derivative securities include (but are not limited to) "put options" and "call options". These are different from employee stock options, which are not derivative securities.

"Short selling" is profiting when you expect the price of the stock to decline, and includes transactions in which you borrow stock from a broker, sell it, and eventually buy it back on the market to return the borrowed shares to the broker. Profit is made through the expectation that the stock price will decrease during the period of borrowing.

17. *Why does Origin prohibit trading in derivative securities and short selling?*

A: Many companies with volatile stock prices have adopted such policies because of the temptation it represents to try to benefit from a relatively low cost method of trading on short-term swings in stock prices (without actually holding the underlying common stock) and encourages speculative trading. For this reason, we have decided to prohibit employees from such trading. As we are dedicated to building stockholder value, short selling our common stock is adverse to our stated values and would not be received well by our stockholders.

18. *Can I purchase Origin securities on margin or hold them in a margin account?*

A: Under our policies, you may not purchase our common stock on margin or hold it in a margin account at any time.

"Purchasing on margin" is the use of borrowed money from a brokerage firm to purchase our securities. Holding our securities in a margin account includes holding the securities in an account in which the shares can be sold to pay a loan to the brokerage firm.

19. ***Why does Origin prohibit me from purchasing Origin securities on margin or holding them in a margin account?***

A: Margin loans are subject to a margin call whether or not you possess insider information at the time of the call. If your margin call were called at a time when you had insider information and you could not or did not supply other collateral, you and Origin could be subject to litigation based on your insider trading activities: the sale of the stock (through the margin call) when you possessed material nonpublic information. The sale would be attributed to you even though the lender made the ultimate determination to sell. The U.S. Securities and Exchange Commission takes the view that you made the determination to not supply the additional collateral and you are therefore responsible for the sale.

20. ***Can I exercise stock options during a trading blackout period or when I possess material nonpublic information?***

A: Yes. You may exercise the option and receive shares, but you may not sell the shares (even to pay the exercise price or any taxes due) or otherwise settle the option during a trading blackout period or any time that you have material, nonpublic information. Also note that if you choose to exercise and hold the shares, you will be responsible at that time for any taxes due.

21. ***Am I subject to the trading blackout period if I am no longer an employee of Origin?***

A: It depends. If your employment with Origin ends on a day that the trading window is closed, you will be subject to the trading blackout period then in effect. If your employment with Origin ends on a day that the trading window is open, you will not be subject to the next trading blackout period. However, even if you are not subject to our trading blackout period after you leave Origin, you should not trade in Origin securities if you possess material non-public information. That restriction stays with you as long as the information you possess is material and not released by Origin.

22. ***Can I gift stock while I possess material nonpublic information or during a trading blackout period?***

A: Because of the potential for the appearance of impropriety, you may not make gifts, whether to charities, to a trust or otherwise, of our common stock when you possess material nonpublic information or during a trading blackout period.

23. ***What if I purchased publicly-traded options or other derivative securities before I became an Origin employee (or contractor or consultant)?***

A: The same rules apply as for employee stock options. You may exercise the publicly-traded options at any time, but you may not sell such securities during a trading blackout period or at any time that you have material, nonpublic information. When you become an Origin employee, you must report to our Chief Financial Officer that you hold such publicly traded options or other derivative securities.

24. ***May I own shares of a mutual fund that invests in Origin?***

A: Yes.

25. ***Are mutual fund shares holding Origin subject to the trading blackout periods?***

A: No. You may trade in mutual funds holding our common stock at any time.

26. ***May I use a "routine trading program" or "10b5-1 plan"?***

A: Yes, subject to the requirements discussed in our Insider Trading and Trading Window Policy. A routine trading program, also known as a 10b5-1 plan, allows you to set up a highly structured program with your stock broker through which you specify ahead of time the date, price, and amount of securities to be traded. If you wish to create a 10b5-1 plan, you must contact our Chief Financial Officer for approval.

27. ***What happens if I violate our insider trading policy?***

A: Violation of our policies may result in severe personnel action, including a memo to your personnel file and up to and including termination of your employment or other relationship with Origin. In addition, you may be subject to criminal and civil enforcement actions by the government.

28. ***Who should I contact if I have questions about our insider trading policy?***

A: You should contact our Chief Financial Officer, Nate Whaley, at nwhaley@originmaterials.com.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement Nos. 333-269952, 333-264798 and 333-259147 on Form S-8 and Registration Statement No. 333-257931 on Form S-3, of our report dated March 4, 2024, relating to the financial statements of Origin Materials, Inc. appearing in this Annual Report on Form 10-K of Origin Materials, Inc. for the year ended December 31, 2023.

/s/ Deloitte & Touche LLP

Sacramento, California

March 4, 2024

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our report dated February 23, 2023, with respect to the consolidated financial statements included in the Annual Report of Origin Materials, Inc. on Form 10-K for the year ended December 31, 2023. We consent to the incorporation by reference of said report in the Registration Statements of Origin Materials, Inc. on Forms S-8 (File No. 333-259147, File No. 333-264798, and File No. 333-269952), Form S-4 (File No. 333-254012), and on Form S-3 (File No. 333-257931).

/s/ GRANT THORNTON LLP

San Jose, California

March 4, 2024

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, John Bissell, certify that:

1. I have reviewed this Annual Report on Form 10-K of Origin Materials, 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(s) 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(s) 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 4, 2024

By: /s/ John Bissell
John Bissell
Co-Chief Executive Officer
(Co-Principal Executive Officer)

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Rich Riley, certify that:

1. I have reviewed this Annual Report on Form 10-K of Origin Materials, 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(s) 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(s) 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 4, 2024

By: /s/ Rich Riley
Rich Riley
Co-Chief Executive Officer
(Co-Principal Executive Officer)

Exhibit 31.3

**CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Matthew Plavan, certify that:

1. I have reviewed this Annual Report on Form 10-K of Origin Materials, 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(s) 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(s) 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 4, 2024

By: /s/ Matthew Plavan
Matthew Plavan
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to the requirement set forth in Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”) and Section 1350 of Chapter 63 of Title 18 of the United States Code (18 U.S.C. § 1350), John Bissell, Co-Chief Executive Officer of Origin Materials, Inc. (the “Company”), Rich Riley, Co-Chief Executive Officer of the Company, and Matthew Plavan, Chief Financial Officer of the Company, each hereby certifies, that, to the best of their knowledge:

1. The Company’s Annual Report on Form 10-K for the fiscal year ended December 31, 2023, to which this Certification is attached as Exhibit 32.1 (the “Annual Report”), fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act; and

2. The information contained in the Annual Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 4, 2024

By: /s/ John Bissell
John Bissell
Co-Chief Executive Officer
(Co-Principal Executive Officer)

By: /s/ Rich Riley
Rich Riley
Co-Chief Executive Officer
(Co-Principal Executive Officer)

By: /s/ Matthew Plavan
Matthew Plavan
Chief Financial Officer
(Principal Financial Officer)

This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Origin Materials, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-K), irrespective of any general incorporation language contained in such filing.

Exhibit 97.1

ORIGIN MATERIALS, INC.

INCENTIVE COMPENSATION RECOUPMENT POLICY

(AS APPROVED OCTOBER 30, 2023)

1. INTRODUCTION

The Compensation Committee (the "***Compensation Committee***") of the Board of Directors (the "***Board***") of Origin Materials, Inc., a Delaware corporation (the "***Company***"), has determined that it is in the best interests of the Company and its stockholders to adopt this Incentive Compensation Recoupment Policy (this "***Policy***") providing for the Company's recoupment of Recoverable Incentive Compensation that is received by Covered Officers of the Company under certain circumstances. Certain capitalized terms used in this Policy have the meanings given to such terms in Section 3 below.

This Policy is designed to comply with, and shall be interpreted to be consistent with, Section 10D of the Exchange Act, Rule 10D-1 promulgated thereunder ("***Rule 10D-1***") and Nasdaq Listing Rule 5608 (the "***Listing Standards***").

2. EFFECTIVE DATE

This Policy shall apply to all Incentive Compensation that is received by a Covered Officer on or after October 2, 2023 (the "***Effective Date***"). Incentive Compensation is deemed "***received***" in the Company's fiscal period in which the Financial Reporting Measure specified in the Incentive Compensation award is attained, even if the payment or grant of such Incentive Compensation occurs after the end of that period.

3. DEFINITIONS

"***Accounting Restatement***" means an accounting restatement that the Company is required to prepare due to the material noncompliance of the Company with any financial reporting requirement under the securities laws, including any required accounting restatement to correct an error in previously issued financial statements that is material to the previously issued financial statements, or that would result in a material misstatement if the error were corrected in the current period or left uncorrected in the current period.

"***Accounting Restatement Date***" means the earlier to occur of (a) the date that the Board, a committee of the Board authorized to take such action, or the officer or officers of the Company authorized to take such action if Board action is not required, concludes, or reasonably should have concluded, that the Company is required to prepare an Accounting Restatement, or (b) the date that a court, regulator or other legally authorized body directs the Company to prepare an Accounting Restatement.

"***Administrator***" means the Compensation Committee or, in the absence of such committee, the Board.

"***Code***" means the U.S. Internal Revenue Code of 1986, as amended, and the regulations promulgated thereunder.

"***Covered Officer***" means each current and former Executive Officer.

"***Exchange***" means the Nasdaq Stock Market.

"***Exchange Act***" means the U.S. Securities Exchange Act of 1934, as amended.

"***Executive Officer***" means the Company's president, principal financial officer, principal accounting officer (or if there is no such accounting officer, the controller), any vice-president of the Company in charge of a principal business unit, division, or function (such as sales, administration, or finance), any other officer who performs a policy-making function, or any other person who performs similar policy-making functions for the Company. Executive officers of the Company's parent(s) or subsidiaries are deemed executive officers of the Company if they perform such policy-making functions for the Company. Policy-making function is not intended to include policy-making functions that are not significant. Identification of an executive officer for purposes of this Policy would include at a minimum executive officers identified pursuant to Item 401(b) of Regulation S-K promulgated under the Exchange Act.

"***Financial Reporting Measures***" means measures that are determined and presented in accordance with the accounting principles used in preparing the Company's financial statements, and any measures derived wholly or in part from such measures, including Company stock price and total stockholder return ("***TSR***"). A measure need not be presented in the Company's financial statements or included in a filing with the SEC in order to be a Financial Reporting Measure.

"***Incentive Compensation***" means any compensation that is granted, earned or vested based wholly or in part upon the attainment of a Financial Reporting Measure.

"***Lookback Period***" means the three completed fiscal years immediately preceding the Accounting Restatement Date, as well as any transition period (resulting from a change in the Company's fiscal year) within or immediately following those three completed fiscal years (except that a transition period of at least nine months shall count as a completed fiscal year). Notwithstanding the foregoing, the Lookback Period shall not include fiscal years completed prior to the Effective Date.

"***Recoverable Incentive Compensation***" means Incentive Compensation received by a Covered Officer during the Lookback Period that exceeds the amount of Incentive Compensation that would have been received had such amount been determined based on the Accounting Restatement, computed without regard to any taxes paid (*i.e.*, on a gross basis without regarding to tax withholdings and other deductions). For any compensation plans or programs that take into account Incentive Compensation, the amount of Recoverable Incentive Compensation for purposes of this Policy shall include, without limitation, the amount contributed to any notional account based on Recoverable Incentive Compensation and any earnings to date on that notional amount. For any Incentive Compensation that is based on stock price or TSR, where the Recoverable Incentive Compensation is not subject to mathematical recalculation directly from the information in an Accounting Restatement, the Administrator will determine the amount of Recoverable Incentive Compensation based on a reasonable estimate of the effect of the Accounting Restatement on the stock price or TSR upon which the Incentive Compensation was received. The Company shall maintain documentation of the determination of that reasonable estimate and provide such documentation to the Exchange in accordance with the Listing Standards.

"***SEC***" means the U.S. Securities and Exchange Commission.

4. RECOUPMENT

(a) Applicability of Policy. This Policy applies to Incentive Compensation received by a Covered Officer (i) after beginning services as an Executive Officer, (ii) who served as an Executive Officer at any time during the performance period for such Incentive Compensation, (iii) while the Company had a class of securities listed on a national securities exchange or a national securities association, and (iv) during the Lookback Period.

(b) Recoupment Generally. Pursuant to the provisions of this Policy, if there is an

Accounting Restatement, the Company must reasonably promptly recoup the full amount of the Recoverable Incentive Compensation, unless the conditions of one or more subsections of Section 4(c) of this Policy are met and the Compensation Committee, or, if such committee does not consist solely of independent directors, a majority of the independent directors serving on the Board, has made a determination that recoupment would be impracticable. Recoupment is required regardless of whether the Covered Officer engaged in any misconduct and regardless of fault, and the Company's obligation to recoup Recoverable Incentive Compensation is not dependent on whether or when any restated financial statements are filed.

(c) Impracticability of Recovery. Recoupment may be determined to be impracticable if, and only if:

(i) the direct expense paid to a third party to assist in enforcing this Policy would exceed the amount of the applicable Recoverable Incentive Compensation; provided that, before concluding that it would be impracticable to recover any amount of Recoverable Incentive Compensation based on expense of enforcement, the Company shall make a reasonable attempt to recover such Recoverable Incentive Compensation, document such reasonable attempt(s) to recover, and provide that documentation to the Exchange in accordance with the Listing Standards; or

(ii) recoupment of the applicable Recoverable Incentive Compensation would likely cause an otherwise tax-qualified retirement plan, under which benefits are broadly available to employees of the Company, to fail to meet the requirements of Code Section 401(a)(13) or Code Section 411(a) and regulations thereunder.

(d) Sources of Recoupment. To the extent permitted by applicable law, the Administrator shall, in its sole discretion, determine the timing and method for recouping Recoverable Incentive Compensation hereunder, provided that such recoupment is undertaken reasonably promptly. The Administrator may, in its discretion, seek recoupment from a Covered Officer from any of the following sources or a combination thereof, whether the applicable compensation was approved, awarded, granted, payable or paid to the Covered Officer prior to, on or after the Effective Date: (i) direct repayment of Recoverable Incentive Compensation previously paid to the Covered Officer; (ii) cancelling prior cash or equity-based awards (whether vested or unvested and whether paid or unpaid); (iii) cancelling or offsetting against any planned future cash or equity-based awards; (iv) forfeiture of deferred compensation, subject to compliance with Code Section 409A; and (v) any other method authorized by applicable law or contract. Subject to compliance with any applicable law, the Administrator may effectuate recoupment under this Policy from any amount otherwise payable to the Covered Officer, including amounts payable to such individual under any otherwise applicable Company plan or program, *e.g.*, base salary, bonuses or commissions and compensation previously deferred by the Covered Officer. The Administrator need not utilize the same method of recovery for all Covered Officers or with respect to all types of Recoverable Incentive Compensation.

(e) No Indemnification of Covered Officers. Notwithstanding any indemnification agreement, applicable insurance policy or any other agreement or provision of the Company's certificate of incorporation or bylaws to the contrary, no Covered Officer shall be entitled to indemnification or advancement of expenses in connection with any enforcement of this Policy by the Company, including paying or reimbursing such Covered Officer for insurance premiums to cover potential obligations to the Company under this Policy.

(f) Indemnification of Administrator. Any members of the Administrator, and any other members of the Board who assist in the administration of this Policy, shall not be personally liable for any action, determination or interpretation made with respect to this Policy and shall be indemnified by the

Company to the fullest extent under applicable law and Company policy with respect to any such action, determination or interpretation. The foregoing sentence shall not limit any other rights to indemnification of the members of the Board under applicable law or Company policy.

(g) No "Good Reason" for Covered Officers. Any action by the Company to recoup or any recoupment of Recoverable Incentive Compensation under this Policy from a Covered Officer shall not be deemed (i) "good reason" for resignation or to serve as a basis for a claim of constructive termination under any benefits or compensation arrangement applicable to such Covered Officer, or (ii) to constitute a breach of a contract or other arrangement to which such Covered Officer is party.

5. ADMINISTRATION

Except as specifically set forth herein, this Policy shall be administered by the Administrator. The Administrator shall have full and final authority to make any and all determinations required under this Policy. Any determination by the Administrator with respect to this Policy shall be final, conclusive and binding on all interested parties and need not be uniform with respect to each individual covered by this Policy. In carrying out the administration of this Policy, the Administrator is authorized and directed to consult with the full Board or such other committees of the Board as may be necessary or appropriate as to matters within the scope of such other committee's responsibility and authority. Subject to applicable law, the Administrator may authorize and empower any officer or employee of the Company to take any and all actions that the Administrator, in its sole discretion, deems necessary or appropriate to carry out the purpose and intent of this Policy (other than with respect to any recovery under this Policy involving such officer or employee).

6. SEVERABILITY

If any provision of this Policy or the application of any such provision to a Covered Officer shall be adjudicated to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provisions of this Policy, and the invalid, illegal or unenforceable provisions shall be deemed amended to the minimum extent necessary to render any such provision or application enforceable.

7. NO IMPAIRMENT OF OTHER REMEDIES

Nothing contained in this Policy, and no recoupment or recovery as contemplated herein, shall limit any claims, damages or other legal remedies the Company or any of its affiliates may have against a Covered Officer arising out of or resulting from any actions or omissions by the Covered Officer. This Policy does not preclude the Company from taking any other action to enforce a Covered Officer's obligations to the Company, including, without limitation, termination of employment and/or institution of civil proceedings. This Policy is in addition to the requirements of Section 304 of the Sarbanes-Oxley Act of 2002 ("***SOX 304***") that are applicable to the Company's Chief Executive Officer and Chief Financial Officer and to any other compensation recoupment policy and/or similar provisions in any employment, equity plan, equity award, or other individual agreement, to which the Company is a party or which the Company has adopted or may adopt and maintain from time to time; provided, however, that compensation recouped pursuant to this Policy shall not be duplicative of compensation recouped pursuant to SOX 304 or any such compensation recoupment policy and/or similar provisions in any such employment, equity plan, equity award, or other individual agreement except as may be required by law.

8. AMENDMENT; TERMINATION

The Administrator may amend, terminate or replace this Policy or any portion of this Policy at any time and from time to time in its sole discretion. The Administrator shall amend this Policy as it deems necessary to comply with applicable law or any Listing Standard.

9. SUCCESSORS

This Policy shall be binding and enforceable against all Covered Officers and, to the extent required by Rule 10D-1 and/or the applicable Listing Standards, their beneficiaries, heirs, executors, administrators or other legal representatives.

10. REQUIRED FILINGS

The Company shall make any disclosures and filings with respect to this Policy that are required by law, including as required by the SEC.

*   *   *   *   *

ORIGIN MATERIALS, INC.

INCENTIVE COMPENSATION RECOUPMENT POLICY

FORM OF EXECUTIVE ACKNOWLEDGMENT

I, the undersigned, agree and acknowledge that I am bound by, and subject to, the Origin Materials, Inc. Incentive Compensation Recoupment Policy, as may be amended, restated, supplemented or otherwise modified from time to time (the "***Policy***"). In the event of any inconsistency between the Policy and the terms of any employment agreement, offer letter or other individual agreement with Origin Materials, Inc. (the "***Company***") to which I am a party, or the terms of any compensation plan, program or agreement, whether or not written, under which any compensation has been granted, awarded, earned or paid to me, the terms of the Policy shall govern.

In the event that the Administrator (as defined in the Policy) determines that any compensation granted, awarded, earned or paid to me must be forfeited or reimbursed to the Company pursuant to the Policy, I will promptly take any action necessary to effectuate such forfeiture and/or reimbursement. I further agree and acknowledge that I am not entitled to indemnification, and hereby waive any right to advancement of expenses, in connection with any enforcement of the Policy by the Company.

Agreed and Acknowledged:

____

Name: ______________________________

Title: ______________________________

Date: ______________________________