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, 2021**

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Commission file number: **001-34487**

LIGHTBRIDGE CORPORATION

(Exact name of registrant as specified in its charter)

Nevada	**91-1975651**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

11710 Plaza America Drive, Suite 2000 Reston, VA 20190
(Address of principal executive offices) (Zip Code)

(571) 730-1200
(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, $0.001 par value	**LTBR**	**The Nasdaq Capital Market**

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

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

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

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

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

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

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

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

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

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

At June 30, 2021, the aggregate market value of shares held by non-affiliates of the registrant (based upon the closing sale price of such shares on the Nasdaq Capital Market on June 30, 2021) was $46,796,095.

At March 1, 2022 there were 10,588,674 shares of the registrant's common stock issued and outstanding.

Documents Incorporated by Reference

Portions of the registrant's definitive proxy statement to be filed with the Securities and Exchange Commission in connection with its 2022 Annual Meeting of Stockholders are incorporated by reference into Part III of this Form 10-K.

LIGHTBRIDGE CORPORATION
FORM 10-K
FOR THE FISCAL YEAR ENDED DECEMBER 31, 2021
TABLE OF CONTENTS

FORWARD-LOOKING STATEMENTS

In addition to historical information, this Annual Report on Form 10-K, including, but not limited to, the sections entitled “Risk Factors,” “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Business,” contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. All statements other than statements of historical fact are statements that could be deemed forward-looking statements. We use words such as “believe”, “expect”, “anticipate”, “project”, “target”, “plan”, “optimistic”, “intend”, “aim”, “will”, or similar expressions, which are intended to identify forward-looking statements. Such statements include, among others:

- those concerning market and business segment growth, demand, and acceptance of our nuclear fuel technology and other steps to commercialization of Lightbridge Fuel™;
- any projections of sales, earnings, revenue, margins, or other financial items;
- any statements of the plans, strategies, and objectives of management for future operations and the timing and outcome of the development of our nuclear fuel technology;
- any statements regarding future economic conditions or performance;
- any statements about future financings and liquidity;
- the Company’s anticipated financial resources and position; and
- all assumptions, expectations, predictions, intentions, or beliefs about future events and other statements that are not historical facts.

You are cautioned that any such forward-looking statements are not guarantees of future performance and involve risks and uncertainties, as well as assumptions that if they were to ever materialize or prove incorrect, could cause the results of the Company to differ materially from those expressed or implied by such forward-looking statements. Such risks and uncertainties, among others, include:

- our ability to commercialize our nuclear fuel technology, including risks related to the design and testing of nuclear fuel incorporating our technology and the degree of market adoption of the Company’s product and service offerings;
- dependence on strategic partners;
- our ability to fund our future operations, including general corporate overhead and outside research and development costs, and continue as a going concern;
- the demand for our fuel for nuclear reactors, including small modular reactors (SMRs), and our ability to attract customers;
- our ability to manage the business effectively in a rapidly evolving market;

- our ability to employ and retain qualified employees and consultants that have experience in the nuclear industry;
- competition and competitive factors in the markets in which we compete, including from accident tolerant fuels;
- the availability of nuclear test reactors and the risks associated with unexpected changes in our nuclear fuel development timeline;
- the increased costs associated with metallization of our nuclear fuel;
- uncertainties related to conducting business in foreign countries;
- risks associated with the further spread and uncertainty of COVID-19, including the ultimate impact of COVID-19 on people, economies, our ability to access capital markets, the Company's financial position, results of operations or liquidity;
- public perception of nuclear energy generally;
- changes in laws, rules, and regulations governing our business;
- changes in the political environment;
- development and utilization of, and challenges to, our intellectual property; and
- the other risks and uncertainties identified in Item 1A. Risk Factors included herein.

Most of these factors are beyond our ability to predict or control and you should not put undue reliance on any forward-looking statement. Future events and actual results could differ materially from those set forth in, contemplated by or underlying the forward-looking statements. Forward-looking statements speak only as of the date on which they are made. The Company assumes no obligation and does not intend to update these forward-looking statements for any reason after the date of the filing of this report, to conform these statements to actual results or to changes in our expectations, except as required by law.

PART I

ITEM 1. BUSINESS

When used in this Annual Report on Form 10-K, the terms “Lightbridge”, the “Company”, “we”, “our”, and “us” refer to Lightbridge Corporation together with its wholly-owned subsidiaries Lightbridge International Holding LLC and Thorium Power Inc. Lightbridge’s principal executive offices are located at 11710 Plaza America Drive, Suite 2000, Reston, Virginia 20190 USA.

Overview

At Lightbridge we are developing the next generation of nuclear fuel to impact, in a meaningful way, the world’s climate and energy problems. Our nuclear fuel could significantly improve the economics, safety, and proliferation resistance of nuclear fuel in existing and new nuclear reactors, large and small, with a meaningful impact on addressing climate change, and air pollution, all while benefiting national security. We project that the world’s energy and climate needs can only be met if nuclear power’s share of the energy-generating mix grows substantially in the coming decades. We are developing our nuclear fuel to enable that to happen. In particular, we are focusing on the potential of small modular reactors that we believe can benefit from our fuel with improved economics and load following when included on an electric grid with renewables. According to the World Nuclear Association (WNA), there are 437 operable power reactors worldwide and an additional 57 reactors under construction. We expect slow net growth in this number as old reactors close and fewer new large reactors are built, due to the inherent challenges facing new build large reactors, including regulatory and political challenges, financing difficulties, and the inability for large reactors to be profitable without running constantly.

We believe our metallic fuel will offer significant economic and safety benefits over traditional nuclear fuel, primarily because of the superior heat transfer properties of all-metal fuel and the resulting lower operating temperature of the fuel. We also believe that uprating a reactor with Lightbridge Fuel™ will add incremental electricity at a lower levelized cost than any other means of generating baseload electric power, including any renewable, fossil, or hydroelectric energy source, or any traditional nuclear fuel.

Emerging nuclear technologies that many in the industry believe have the potential to generate significant amounts of power include SMRs, which are now in the development and licensing phases. We expect that Lightbridge Fuel™ can provide SMRs with all the benefits our technology brings to large reactors, with the benefits being more meaningful to the economic case for deployment of SMRs. Lightbridge Fuel™ is expected to generate more power in SMRs than traditional nuclear fuels, which will help decarbonize sectors that are now powered by fossil fuels. We expect that our ongoing research and development (R&D) initiatives will be compatible with Lightbridge Fuel™ powering SMRs for multiple purposes. The first SMRs that could use our fuel are expected to begin operations as early as 2028.

We have built a significant portfolio of patents reflecting years of R&D, and we anticipate testing our nuclear fuel through third party vendors and others, including the United States Department of Energy (DOE) national laboratories. Currently, we are performing the majority of our R&D activities with DOE national laboratories and are working on additional contracts with them for future scopes of R&D work.

Our Nuclear Fuel

Since 2008, we have been engaged in the design and development of proprietary, innovative nuclear fuels to improve the cost competitiveness, safety, proliferation resistance and performance of nuclear power generation. In 2010, we announced the concept of all-metal fuel (i.e., non-oxide fuel) for use in currently operating and new-build reactors. Our focus on metallic fuel is based on listening to the voices of prospective customers, as nuclear utilities have expressed interest in the improved economics and enhanced safety that we believe metallic fuel will provide. We are also now listening to industrial companies that are expressing interest in SMRs to power their own industrial facilities.

The fuel in a nuclear reactor generates energy in the form of heat. That heat is then converted through steam into electricity that is delivered to the transmission and distribution grid. We have designed our innovative, proprietary metallic fuels to be capable of significantly higher burnup and power density compared to conventional oxide nuclear fuels. Burnup is the total amount of electricity generated per unit mass of nuclear fuel consumed and is a function of the power density of a nuclear fuel and the amount of time the fuel operates in the reactor. Power density is the amount of heat power generated per unit volume of nuclear fuel. Conventional oxide fuel used in existing commercial reactors is nearing the limit of its design and licensed burnup and power density capability. As a result, further optimization to (i) increase power output from the same core size and (ii) improve the economics and safety of nuclear power generation using conventional oxide fuel technologies is limited. A new fuel is needed to bring enhanced performance to reactors large and small. We are working to develop Lightbridge Fuel™ to meet that goal.

As the nuclear industry prepares to meet the increasing global demand for electricity production, longer operating cycles and higher reactor power outputs have become a much sought-after solution for the current and future reactor fleet. We believe our proprietary nuclear fuel designs have the potential to improve the nuclear power industry's economics by:

- enabling increased reactor power output via a power uprate (potentially up to a 30% increase) or a longer operating cycle without changing the core size in new build pressurized water reactors (PWRs), including SMRs; or

- providing an increase in power output of potentially up to 10% while simultaneously extending the operating cycle length from 18 to 24 months in existing PWRs, including in Westinghouse-type four-loop PWR plants, which are currently constrained to an 18-month operating cycle by oxide fuel enriched up to 5% in the isotope uranium-235, or increasing the power potentially up to 17% while retaining an 18-month operating cycle.

We believe our fuel designs will allow current and new build nuclear reactors to safely increase power production and reduce operations and maintenance costs on a per kilowatt-hour basis. New build nuclear reactors could also benefit from the reduced upfront capital investment per kilowatt of generating capacity in the case of implementing a power uprate. In addition to projected electricity production cost savings, we believe our technology can result in utilities or countries needing to deploy fewer new reactors to generate the same amount of electricity (in the case of a power uprate), resulting in significant capital cost savings. For utilities or countries that already have operating reactors, we expect that our nuclear fuel could be utilized to both increase the power output of those reactors as well as enable them to load follow with electric grid demands, which have become increasingly variable with large additions of intermittent renewable generation.

Nuclear Industry and Addressable Market

Overview of the Nuclear Power Industry

According to the U.S. Energy Information Administration, nuclear power provided 4.6% of the world's total energy from all sources in 2020, including approximately 10.5% of global electricity generation. According to the WNA, as of January 2022 there were currently 437 operable nuclear power reactors worldwide, mostly light water reactors, with the most common types being PWRs, including Russian-designed water-cooled, water-moderated energetic reactors (VVERs), and boiling-water reactors (BWRs). Nuclear power provides a non-fossil fuel, low-carbon energy solution that can meet baseload electricity needs.

Of the world's existing reactors currently in operation, PWRs account for approximately 70% of the net operating capacity, with BWRs being the second most prevalent and accounting for approximately 14%. Of the nuclear reactors currently under construction, approximately 70% are PWRs with a rated electric power output of 1,000 megawatts or greater.

Almost all the new build reactors currently under construction are either Generation III or Generation III+ type reactors. The primary difference from second-generation designs is that many Generation III or Generation III+ reactors incorporate passive or inherent safety features, which require no active controls or operational intervention to avoid accidents in the event of malfunction. Many of these passive systems rely on a combination of gravity, natural convection, and/or resistance to high temperatures.

We initially focused our fuel design on existing U.S. PWRs because they represent a large market segment for which Lightbridge Fuel™ could provide significant economic and safety benefits through a power uprate up to 10% along with an operating cycle extension from 18 to 24 months, or a power uprate of 17%, as described below, without extending the cycle length. We estimate that in order to produce all the clean energy that the world will need in 2050 (the seminal year for climate change according to the Intergovernmental Panel on Climate Change) using nuclear power, it would require the equivalent of about an additional 20,000 reactors with generating capacities of 1,000 megawatts of electricity each. Realistically, the industry will not grow from approximately 440 to over 20,000 of these reactors during this timeframe. We expect that the net worldwide growth in the number of large reactors between now and 2050 will be fewer than 200, with most new plants built by China and Russia, making them difficult for Lightbridge Fuel™ to reach. Existing large reactors can present an additional market opportunity for Lightbridge Fuel™ but cannot by themselves move the needle on climate change.

In contrast, SMRs can be pivotal contributors to preventing further climate change, while providing the necessary energy capacity to meet global energy needs. Large reactors have considerable capital costs and must operate at full power 24/7 to be profitable. Due to their modular construction and smaller size, SMRs are expected to have much lower capital costs per unit, thus making their deployment easier to finance by private and government sectors. Furthermore, one of the limiting factors relating to existing large reactors is their inability to load follow efficiently. Load following means increasing or decreasing power as other electricity sources, mostly wind and solar power, come on and off the electric grid. Natural gas plants are currently used to back up wind and solar generation since these plants can easily increase or decrease the energy they generate based on need. SMRs are expected to have the ability to reduce their power (i.e., by shutting down or reducing the power output of some units while running the other units at full power) while the wind is blowing, or the sun is shining. We believe that Lightbridge Fuel™ will allow SMRs greater flexibility in changing power levels, making it easier for SMRs to replace natural gas to load follow with renewables, helping to expand markets for renewables and SMRs together as countries seek to decarbonize energy generation. Other components of the reactor would also need to be designed to handle the changes in power, and we believe that it is feasible, with fuel power ramp or transient capability being one of the current limiting factors to nuclear power plants balancing with wind and solar.

We expect that Lightbridge Fuel's™ most significant economic benefit will be its ability to provide a 30% power uprate. However, the existing large reactors cannot realize that benefit because their systems are not designed to handle that much of an increase in power. The most additional power existing large PWRs could take from Lightbridge Fuel™ is estimated at approximately 17%. Only newly designed large reactors may benefit from the full 30% greater power available from Lightbridge Fuel™. While we believe that only a limited number of new, large reactors will be built, we expect that much larger numbers of SMRs will be deployed in the future.

Target Market for Lightbridge Fuel™

Our target market segments include water-cooled commercial power reactors, such as PWRs, BWRs, VVER reactors, CANDU heavy water reactors, water-cooled SMRs, as well as water-cooled research reactors. We are currently focused on prioritizing opportunities with SMRs in the near-term. In 2021, our SMR target market saw an increase in interest in North America and Europe, as evidenced by Ontario Power Generation selecting the BWRX-300 SMR for the Darlington new nuclear site, which will work with GE Hitachi Nuclear Energy to deploy the reactor. Canada's first commercial, grid-scale, SMR could be completed as early as 2028. In addition, according to WNA, a subsidiary of Synthos, a chemical manufacturing company headquartered in Poland, began screening sites for SMRs in Poland and has signed agreements related to SMR development with GE Hitachi Nuclear Energy, Tractebel, and Ultra Safe Nuclear Corporation, which could ultimately replace coal units at the Pątnów power plant.

Nuclear Power as Clean and Low Carbon Emissions Energy Source

Nuclear power provides clean, reliable baseload electricity. According to the WNA, nuclear reactors produce no greenhouse gas emissions during operation, and over the course of their lifecycles, nuclear power plants produce about the same amount of CO2 equivalent emissions per unit of electricity as wind. The WNA further notes that almost all proposed pathways to achieving significant decarbonization suggest an increased role for nuclear power, including those published by the International Energy Agency, Massachusetts Institute of Technology Energy Initiative, U.S. Energy Information Administration, and World Energy Council.

We believe that deep cuts to CO2 emissions are only possible with electrification of most of the transportation and industrial sectors globally and powering them and the current electricity needs of the world with non-emitting or low-emitting power or no-carbon liquid fuels. We believe this can be done only with a large increase in nuclear power, several times the amount that is generated globally today. We believe that our nuclear fuel technology will be an essential element of reaching this goal, for electricity generation and potentially to produce hydrogen for zero-carbon liquid fuels.

Influence of the Accident at Fukushima, Japan and New International Nuclear Build

The accident at the Fukushima Daiichi nuclear power plant in Japan following the strong earthquake and destructive tsunami that occurred on March 11, 2011, increased public concerns related to nuclear power, resulting in a slowdown in, or in some cases, a complete halt to, new construction of nuclear power plants as well as the early shut down of existing power plants in certain countries. As a result, some countries that were considering launching new domestic nuclear power programs before the Fukushima accident have delayed or cancelled preparatory activities they were planning to undertake as part of such programs. The Fukushima accident appears to have shrunk the projected size of the global nuclear power market in 2025-2030 as reflected in the most recent reference case projections published by the WNA. At the same time, the event has brought a greater emphasis on safety to the forefront that may be beneficial to us because our metallic fuel provides improved safety and fuel performance during normal operation and design-basis accidents.

Anticipated Safety Benefits of Lightbridge Fuel™

The expected safety benefits of Lightbridge Fuel™ are as follows:

- Operates at lower operating temperatures than current conventional nuclear fuel, contributing to lower stored thermal energy in the fuel rods;

- Is not expected to generate explosive hydrogen gas under design-basis accidents when there is a loss of coolant in the reactor;

- Enhances structural integrity of the nuclear fuel rods;

- Has lighter and stiffer fuel assembly, which may contribute to improved seismic performance; and

- May buy more time to restore active cooling in the reactor during Beyond Design-Basis events, defined by the U.S. Nuclear Regulatory Commission (US-NRC) as “accident sequences that are possible but were not fully considered in the design process because they were judged to be too unlikely.”

Due to the significantly lower fuel operating temperature and higher thermal conductivity, our metallic nuclear fuel rods are expected to provide major improvements to safety margins during certain off-normal events. The US-NRC licensing processes require engineering analysis of a large break loss-of-coolant accident (LOCA), as well as other scenarios. The LOCA scenario assumes failure of a large water pipe in the reactor coolant system. Under LOCA conditions, the fuel and cladding temperatures rise due to reduced cooling capacity. Preliminary analytical modeling shows that under a design-basis LOCA scenario, unlike conventional uranium dioxide fuel, the cladding of the Lightbridge-designed metallic fuel rods would stay at least 200 degrees below the 850-900 degrees Celsius temperature at which steam begins to react with the zirconium cladding to generate hydrogen gas. Build-up of hydrogen gas in a nuclear power plant can lead to a hydrogen explosion, which contributed to the damage at the Fukushima Daiichi nuclear power plant. Lightbridge Fuel™ is designed to mitigate hydrogen gas generation in design-basis LOCA situations. This is a major safety benefit.

Lightbridge Spent Fuel - Proliferation Resistance

The April 2018 issue of Nuclear Engineering and Design, a technical journal affiliated with the European Nuclear Society, included an article stating that after analyzing Lightbridge’s fuel, the authors concluded that any plutonium extracted from Lightbridge’s spent fuel would not be useable for weapon purposes. We anticipate the following proliferation resistance advantages for our metallic fuel:

- One-half of the amount of plutonium produced and remaining in the spent fuel as compared to conventional uranium dioxide fuels; and

- Lower Plutonium-239 fraction compared to uranium dioxide fuel; therefore, our spent fuel would be unsuitable as a source for weapon purposes.

We are currently exploring potential plutonium disposition benefits of our metallic nuclear fuel technology.

Development of Lightbridge Fuel™

Recent Developments

GAIN Vouchers

- DOE awarded the Company a Gateway for Accelerated Innovation in Nuclear (GAIN) voucher in 2019 for the experiment design for irradiation of material samples of Lightbridge metallic fuel in the Advanced Test Reactor (ATR) at Idaho National Laboratory (INL). On April 22, 2020, we entered into a Cooperative Research and Development Agreement (CRADA) with Battelle Energy Alliance, LLC, the DOE’s operating contractor at INL and the project commenced in the second quarter of 2020 and was completed during the third quarter of 2021. This experiment design forms the basis of our current and future efforts with the INL. The total project value provided by the DOE was approximately $0.5 million.

- The DOE awarded us a second voucher from the GAIN program to support development of Lightbridge Fuel™ in collaboration with Pacific Northwest National Laboratory (PNNL). The scope of the project is to demonstrate Lightbridge's nuclear fuel casting process using depleted uranium, a key step in the manufacture of Lightbridge Fuel™. On July 14, 2021, the Company executed a CRADA with the Battelle Memorial Institute, Pacific Northwest Division, the operating contractor of the PNNL, in collaboration with the DOE. The project commenced in the third quarter of 2021 and is expected to be completed by the third quarter of 2022. The total project value is approximately $0.7 million, with three-quarters of this amount provided by DOE for the scope performed by PNNL.

On May 11, 2021, we announced successful demonstration of the co-extrusion process for three-lobe, six-foot rods using nuclear-grade zirconium alloy in the cladding and in the displacer, and surrogate metallic materials that mimic important characteristics of uranium and zirconium alloy contained in our metallic nuclear fuel rods. This demonstration of Lightbridge's proprietary manufacturing process uses an internally developed and patented high-temperature coextrusion process. The six-foot length of the surrogate rods is the typical length of the fuel rods used by the SMRs now in development and licensing. Future fabrication of high-assay low-enriched uranium (HALEU) rodlets for loop irradiation testing in the Advanced Test Reactor, and ultimately commercial-length HALEU fuel rods, will use similar processing techniques to create Lightbridge Fuel™. Performing these initial fabrication development activities with surrogate materials allows Lightbridge to use a broader range of suppliers and is a cost-effective approach as it does not require uranium material.

We expanded our patent portfolio by successfully obtaining 7 new patents in 2021 in the United States and other key foreign countries. The new patents will help safeguard the Company's intellectual property, which is an integral component of the Company's plans to monetize the Lightbridge Fuel™ technology.

Future Steps Toward Our Fuel Development and Timeline For The Commercialization of Our Nuclear Fuel Assemblies

We anticipate near-term fuel development milestones for Lightbridge Fuel™ over the next 2-3 years will consist of the following.

- Complete the scope of work relating to the recent second GAIN Voucher award in collaboration with PNNL.
- Enter into an agreement to manufacture our nuclear fuel material samples for test reactor irradiation.
- Continue to develop and optimize our nuclear fuel manufacturing processes using depleted or natural uranium.
- Initiate the design and manufacturing of a multi-lobe fuel rod with enriched uranium for irradiation experiments in a test reactor.

The long-term milestones towards development and commercialization of nuclear fuel assemblies include, among other things, irradiating nuclear material samples and prototype fuel rods in test reactors, conducting post-irradiation examination of irradiated material samples and/or prototype fuel rods, performing thermal-hydraulic experiments, performing seismic and other out-of-reactor experiments, performing advanced computer modeling and simulations to support fuel qualification, designing a lead test assembly (LTA), entering into a lead test rod/assembly agreement(s) with a host reactor(s), demonstrating the production of lead test rods and/or lead test assemblies at a pilot-scale fuel fabrication facility and demonstrating the operation of lead test rods and/or lead test assemblies in commercial reactors.

There are inherent uncertainties in the cost and outcomes of the many steps needed for successful deployment of our fuel in commercial nuclear reactors, which makes it difficult to predict the timing of the commercialization of our nuclear fuel technology with any accuracy. However, based on our best estimate and assuming adequate R&D funding levels, we expect to begin demonstration of lead test rods and/or possibly lead test assemblies with our metallic fuel in commercial reactors by the early 2030s and begin receiving purchase orders for initial fuel reload batches from utilities 15-20 years from now, with final qualification (i.e., deployment of our nuclear fuel in the first reload batch) in a commercial reactor taking place approximately two years thereafter. We are exploring ways of shortening this timeframe that may include securing access to expanded irradiation test loop capacity in existing or new research reactor facilities both within the United States and overseas.

Please see Item 1A. *Risk Factors* in this Annual Report on Form 10-K for a discussion of certain risks that may delay or impair such developments including without limitation the availability of financing and the many risks inherent in developing a new type of nuclear fuel.

Impact of COVID-19 to our Business

The recent COVID-19 pandemic has continued to impact our business operations for the year ended December 31, 2021. The future impacts of the COVID-19 pandemic on our financial position, results of operations and future liquidity and capital resources availability is unknown and uncertain.

In an effort to protect the health and safety of our employees, we took proactive, aggressive action from the earliest signs of the outbreak in China, including working from home and curtailing employee travel. In an effort to contain COVID-19 or slow its spread, governments around the world had also enacted various measures, including orders to close all businesses not deemed “essential,” isolate residents to their homes or places of residence, and practice social distancing when engaging in essential activities.

We will continue to actively monitor the COVID-19 pandemic and may take further actions altering our business operations that we determine are in the best interests of our employees and stakeholders, or as required by federal, state, or local authorities. It is not clear what the potential effects any such alterations or modifications may have on our financial position, results of operations or liquidity, including the effects on our employees and future prospects, including our R&D activities for the fiscal year 2022 and beyond.

Future Potential Collaborations and Other Opportunities

In the ordinary course of business, we engage in periodic reviews of opportunities to invest in or acquire companies or units within companies to leverage operational synergies and establish new streams of revenue. We will be opportunistic in this regard and may also partner or contract with entities that could be synergistic to our fuel business or present an attractive stable business and/or growth opportunity in the nuclear space.

Competition

Currently, competition with respect to the design of commercially viable nuclear fuel products is limited to conventional uranium dioxide fuels, which are reaching the limits in terms of their capability to provide increased power output or longer fuel cycles. We believe that the industry needs fuel products that can provide these additional benefits. While we believe conventional uranium dioxide fuel may be capable of achieving power up-rates of up to 10% in existing PWRs or extending the fuel cycle length from 18 to 24 months, doing so would require uranium-235 enrichment levels above 5% (as is also the case with our metallic fuel), higher reload batch sizes, or a combination thereof. The alternative route of increasing reload batch sizes while keeping uranium enrichment levels below 5% for power uprates up to 10% using conventional uranium dioxide fuel would raise the cost and reduce the efficiency of each fuel reload, resulting in a significant fuel cycle cost penalty to the nuclear utility. The cost penalty could have a dramatic adverse impact on the economics of existing plants whose original capital cost has already been fully depreciated, which includes most U.S. nuclear power plants.

In addition to conventional uranium dioxide fuel, potential competition to our metallic fuel technology can come from so-called Accident Tolerant Fuels (ATF). We regard ATF as part of a series of relatively small changes to conventional uranium dioxide fuel over time. ATF uses uranium dioxide with added substances and/or changes to the cladding tube. After the accident at the Fukushima Daiichi nuclear power plant in March 2011, the U.S. Congress directed the DOE to investigate every aspect of nuclear plant operation including the existing uranium dioxide fuel pellets contained in zirconium-based alloy tubes (cladding). According to the February 2019 Nuclear Energy Institute technical report on ATF titled “Safety and Economic Benefits of Accident Tolerant Fuel”, advanced fuel design concepts (such as ATF) were accelerated by combining recent operating experience with worldwide research and development. Over the past several years, the ATF program has received significant DOE funding support and initial interest from utility customers seeking ATF demonstration programs in their operating reactors. For example, in January 2022, Southern Nuclear has agreed to load four lead test assemblies with a chromia and alumina doped ATF design. Similar ATF concepts are being tested by GE Nuclear, TVEL, and others.

When the DOE originally launched the ATF program, the program was focused solely on achieving enhanced safety benefits, such as extra “coping time” during severe accidents. Over the past year, many ATF vendors concluded that the unexpectedly small accident tolerance benefits their ATF fuel concepts offered (such as several extra hours of coping time during severe accidents rather than their original goal of approximately 72 hours) were not enough of an incentive for nuclear utilities to adopt ATF designs, which would cost more and have reduced the efficiency relative to conventional uranium dioxide fuels. As a result, ATF vendors have begun exploring opportunities for extending the operating cycle length from 18 to 24 months in existing PWRs by going to higher enrichments (i.e., from approximately 5% to 7-8% enrichments) with ATF designs. If they are successful in extending the cycle length to 24 months in a cost-effective way, this could give sufficient economic incentive for nuclear utilities to switch to the ATF designs in the coming years. This recent shift in positioning by many ATF vendors represents a competitive threat to Lightbridge for use in existing large PWRs, as ATF vendors are now trying to encroach into a critical element of Lightbridge’s value proposition, i.e., the ability of Lightbridge Fuel™ to extend the cycle length from 18 to 24 months in existing large PWRs. While it is not certain that the ATF vendors will be successful in this approach, if ATF could provide for two-year cycles, it could severely weaken or undermine our economic value proposition in existing large PWRs. That said, we believe Lightbridge Fuel™ remains the only advanced light-water reactor fuel in development that can provide power uprates, cycle length extensions, improved safety, and load following in a single product as desired by the utilities.

The above developments make prioritizing existing large PWRs less attractive than we had previously expected. Depending on the ultimate outcome of ATF technologies and government funding available to support advanced fuel technologies for existing large PWRs, this market segment could become more accessible again in the future. However, in the near-term, we believe that a realignment of our corporate initiatives with a focus on SMRs could lead to more beneficial, valuable, nearer-term opportunities for Lightbridge.

We believe the 30% power uprate our fuel could provide to a new SMR designed to accommodate the full power uprate could reduce the upfront capital investment per kilowatt and generate positive incremental profit margin for SMR plants. At the same time, due to fuel design constraints, we do not expect ATF technologies to achieve the same power uprate capability in SMRs. This could give Lightbridge strong competitive advantages over ATF in this market segment.

Nuclear power faces competition from other sources of electricity as well, including natural gas, which in recent years has been the cheapest option for power generation in the U.S. and has resulted in some utilities abandoning nuclear initiatives. Other sources of electricity, such as renewables like wind and solar, may also be viewed as safer than nuclear power, although we believe that generating nuclear energy with Lightbridge Fuel™ is the safest way to produce baseload electricity in suitable power reactors. To the extent demand for electricity generated by nuclear power decreases, the potential market for our nuclear fuel technology will decline.

Raw Materials

We do not plan to utilize any raw materials directly in the conduct of our operations (except for potential purchases of certain raw materials in small quantities for testing and demonstration efforts). Fuel fabricators, which will ultimately fabricate fuel products incorporating our nuclear fuel technology, will acquire the zirconium and uranium, and additional raw materials that are required for the production of nuclear fuel assemblies that go into the reactor core. Uranium and zirconium are available from various suppliers at market prices. However, the availability of uranium metal enriched to 19.75% in the isotope uranium 235 is currently limited to small quantities sufficient only for research and testing purposes. Deployment of our fuel will necessitate increasing enrichment level from 5% up to 19.75% at enrichment facilities, as well as deployment of de-conversion/metallization capability at a commercial scale, as well as the design and licensing of a shipping container capable of accommodating fuel assemblies with uranium metal enriched up to 19.75%. We expect that utilities will contract with nuclear fuel fabricators to order nuclear fuel assemblies, and then ship the completed nuclear fuel assemblies to the reactor sites.

Government Support/Approvals Needed, Relationships with Critical Development Partners/Vendors and Other Government Regulation

Due to our long fuel development timelines to commercialization and the significant amount of R&D funding required to bring our next generation nuclear fuel technology to market, substantial U.S. government funding and political support will be essential to the success of our nuclear fuel development program. Without significant U.S. government funding and cost sharing contributions toward our fuel development activities, it will be unfeasible for the Company to fund all of its future fuel development efforts on its own.

The Biden administration’s energy policy includes proposals for advanced nuclear as part of “critical clean energy technologies.” We understand that the administration is prioritizing advanced nuclear technologies, including advanced fuels and SMRs, as part of its nuclear energy policy. President Biden has brought the U.S. back into the Paris Agreement on climate change, with the goal that the U.S. electricity sector be carbon neutral by 2035, just 13 years from now. We believe Lightbridge Fuel’s™ coupling with SMRs can enhance the already strong case for SMRs and attract more private and government investment.

In addition to U.S. government funding, political support for our project is similarly important. The sales and marketing of our services and technology internationally may be subject to U.S. export control regulations, including 10 C.F.R. Part 810 and 10 C.F.R. Part 110, and the export control laws of other countries. Governmental authorizations may be required before we can export our services or technology or collaborate with foreign entities. US-NRC regulations at 10 C.F.R. Part 110 govern the export and import of nuclear equipment and material. Part 810 generally governs the exports of technology for development, production, or use (see 10 C.F.R. §810.3 for definitions of these terms) of reactors, equipment and material subject to Part 110. If authorizations are required and not granted, our international business could be materially affected. Furthermore, the export authorization process is often time consuming and any delays could impact our fuel development and commercialization timelines. Violation of export control regulations could subject us to fines and other penalties, such as losing the ability to export for a period of years, which would limit our revenue growth opportunities and significantly hinder our attempts to expand our business internationally.

The testing, fabrication and use of nuclear fuels by our future partners, licensees and nuclear power generators will be heavily regulated. The test facilities and other locations where our fuel designs may be tested before commercial use require governmental approvals from the host country's nuclear regulatory authority. The responsibility for obtaining the necessary regulatory approvals will lie with our research and development contractors that conduct such tests and experiments. Nuclear fuel fabricators, which will ultimately fabricate fuel using our technology under commercial licenses from us, are similarly regulated. Utilities that operate nuclear power plants that may utilize the fuel produced by these fuel fabricators require specific licenses relating to possession and use of nuclear materials as well as numerous other governmental approvals for the ownership and operation of nuclear power plants.

Certain Challenges and Uncertainties

1. U.S. government funding support

Presently, our ability to fund our fuel development program at a level necessary to adhere to our projected fuel development timelines is severely limited due to internal funding constraints. This is in addition to our corporate overhead and other fixed costs, such as in-house project management and R&D personnel. As a result, we believe seeking and securing significant U.S. government funding to support our fuel development program is essential for us to be successful in our fuel development and commercialization efforts. Prioritization of SMRs over existing large reactors, along with the significant government funding opportunities we expect to go toward SMRs in the coming years, may help accelerate our projected fuel development timelines by up to a few years for SMR applications.

2. Availability of suitable test loops in the ATR

After the Halden research reactor was shut down in 2018, we embarked on a global search for an alternative for loop irradiation testing of our metallic fuel rods. Ultimately, we settled on the ATR at INL and applied to DOE for and won two GAIN Vouchers. Our initial understanding was that we would have access to a government funded PWR water test loop in the ATR to generate sufficient data to support our LTA testing and potentially eliminate the need for lead test rod (LTR) testing in a large commercial reactor.

However, availability of irradiation test loops for fuel in the ATR has become limited and highly competitive, limiting how much fuel material can be inserted into the reactor as well as its duration in the reactor.

If new test loops are not added to the ATR, loop irradiation testing in the ATR may not provide sufficient data to justify regulatory approval for LTA testing in a large commercial PWR in a commercially feasible timeframe. This would likely necessitate an extra fuel development step of LTR testing in a large commercial PWR in addition to the ATR loop testing before LTA testing could commence. As a result, our fuel development timelines are 15-20 years before we expect to secure our first orders for fuel batch reloads in large commercial PWRs, unless we can access significantly increased test loop capacity. Consequently, the projected fuel development costs make it unfeasible for Lightbridge to fund this fuel development effort on our own.

3. Partnerships with fuel vendor and nuclear utility

The ability to design and fabricate the LTAs and engagement with a nuclear utility that is willing to accept our LTAs, is required to demonstrate our nuclear fuel in a commercial reactor. In the U.S., the fabricator and the utility will be primarily responsible for securing necessary regulatory licensing approvals for the LTA operation. With a shift in focus toward SMRs, we plan to build additional relationships with SMR reactor and fuel vendors, as well as existing and/or potential SMR utility customers.

4. Supply chain infrastructure for HALEU

Establishment of required supply chain infrastructure to support high-assay low-enriched uranium metallic fuel is a necessary step in the commercialization of our nuclear fuel. Existing commercial nuclear infrastructure, including conversion facilities, enrichment facilities, de-conversion facilities, fabrication facilities, fuel storage facilities, fuel handling procedures, fuel operation at reactor sites, used fuel storage facilities and shipping containers, were designed and are in most cases currently licensed to handle uranium in oxide form with enrichment up to 5% in the isotope uranium-235. Our fuel designs are expected to use uranium metal with uranium enrichment levels up to 19.75% and would therefore require certain modifications to existing commercial nuclear infrastructure to enable commercial nuclear facilities to receive and handle our fuels. Those nuclear facilities will need to complete a regulatory licensing process and obtain regulatory approvals in order to be able to process, handle, or ship uranium metal with enrichment levels up to 19.75% and operate commercial reactors and spent fuel storage facilities using our metallic fuel.

5. Need for experimental data on our metallic fuel

There is a lack of publicly available experimental data on our metallic fuel. We will need to conduct various irradiation experiments to confirm fuel performance under normal and off-normal reactor conditions. Loop irradiation in a test reactor environment prototypic of commercial reactor operating conditions and other experiments on unirradiated and irradiated metallic fuel samples will be essential to demonstrate the performance and advantages of our metallic fuel. We are planning loop irradiation testing of our metallic fuel samples in the ATR at INL as part of this effort.

6. Need for development of new analytical models to support our metallic fuel

Existing analytical models may be inadequate to fully analyze our metallic fuel. New analytical models, capable of accurately predicting the behavior of our metallic fuel during normal operation and off-normal events, may be required. Experimental data measured from our planned irradiation demonstrations will help to identify areas where new analytical models, or modifications to existing ones, may be required.

7. Need for development and demonstration of qualified fabrication process for our metallic fuel rods

Demonstration of a fabrication process both for semi-scale irradiation fuel samples and subsequently for full-length (12-14 feet) metallic fuel rods for large PWR LTAs and shorter length for SMRs (~6 feet) is required. Past operating experience in icebreaker reactors with differently shaped fuel rods with a similar metallic fuel composition involved fabrication of metallic fuel rods up to 3 feet in length. Fabrication of full-length (approximately 12 to 14 feet) PWR metallic fuel rods for large PWRs has yet to be fully demonstrated. In 2021, we demonstrated co-extrusion of full-length rods using surrogate materials (i.e., rods which replaced the uranium component with a suitable physical analogue).

Settlement of Arbitration

On February 11, 2021, the Company entered into a settlement agreement (the “Settlement Agreement”) with Framatome SAS and Framatome Inc. (together, “Framatome”), resolving the pending claims and counterclaims between the parties in arbitration and judicial proceedings related to the parties’ inactive joint venture, Enfission, LLC. Under the terms of the Settlement Agreement, all joint venture agreements were terminated and the joint venture was dissolved. Lightbridge paid Framatome approximately $4.2 million for outstanding invoices for work performed by Framatome and other expenses incurred by Framatome. Enfission was dissolved on March 23, 2021 and a certificate of cancellation was filed with the state of Delaware on December 17, 2021. See Part I. Item 3. *Legal Proceedings*, for more information.

Our Intellectual Property

Our intellectual property rights include multiple U.S. and international patents and patent applications, trade secrets, trademark rights, and contractual agreements. Our patent applications are directed to our proprietary nuclear fuel technology and we seek additional patent protection for our fuel designs, development, and related alternatives by filing patent applications in the U.S. and other countries as appropriate.

We received 7 new patents in 2021 and currently have 15 pending patent applications. As of December 31, 2021, we held 5 U.S. patents and more than 140 foreign patents. The expiration dates of these patents, unless it's a divisional patent filing, are generally 20 years from their application dates. Our U.S. patents begin to expire in 2027.

We ensure that we own intellectual property created for us by employees, independent contractors, consultants, companies, and any other third party by signing agreements with them that assign any intellectual property rights to us.

We have established business procedures designed to maintain the confidentiality of our proprietary information, including the use of confidentiality agreements with employees, independent contractors, consultants and entities with which we conduct business.

In addition to our patent portfolio, we also own trademarks to the Lightbridge corporate name and the Lightbridge logo.

Human Capital Management

As of December 31, 2021, we had six full-time employees and utilized a network of independent contractors, outside agencies and technical facilities with specific skills to assist with various business functions including, but not limited to, corporate, financial, personnel, research and development, and communications. This allows us to draw upon resources that are specifically tailored to our internal and client needs. The Company's headquarters are in Reston, Virginia. We continue to conduct business with substantial modifications to employee travel and work locations due impacts of COVID-19.

Our Culture

Our mission is to help the world combat climate change and meet its energy goals. We are passionate about understanding the needs of our society, and we work hard to develop our next generation nuclear fuel. We also believe that supporting our team with a wonderful work environment supports and powers us to accomplish our goals. The Company's human resource professional is a resource available for employees regarding the development of their careers and training. We also have physical and mental health programs that are available to our employees. We believe that our relationship with our employees and contractors is satisfactory.

Diversity and Inclusion

To truly help the world combat climate change, we need to work with a diversity of partners as well as have a diverse workforce. We also must operate with a high degree of awareness of evolving social conditions and social justice and create policy accordingly. We acknowledge that these measures evolve over time and we are committed to improving our policies as awareness of social inequities or injustice arise. We believe an equitable and inclusive environment with diverse teams produces more creative solutions and results in better outcomes for our employees and stakeholders. We strive to attract, retain and promote diverse talent at all levels of the organization.

Available Information

We make available, free of charge on our website, www.ltbridge.com, our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, including exhibits, and amendments to those reports filed or furnished pursuant to Sections 13(a) and 15(d) of the Securities Exchange Act of 1934, as amended, as soon as reasonably practicable after such reports are electronically filed with, or furnished to, the Securities and Exchange Commission (SEC). The SEC also maintains an internet site that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC at www.sec.gov. The information posted on our website is not incorporated into this Annual Report on Form 10-K, and any reference to our website is intended to be inactive textual references only.

ITEM 1A. RISK FACTORS

Our business faces significant risks. You should carefully consider all the information set forth in this annual report and in our other filings with the SEC, including the following risk factors which we face, and which are faced by our industry. Our business, financial condition, and results of operations could be materially and adversely affected by any of these risks. In that event, the trading price of our common stock would likely decline, and you might lose all or part of your investment. This report also contains forward-looking statements that involve risks and uncertainties. Our results could materially differ from those anticipated in these forward-looking statements, as a result of certain factors including the risks described below and elsewhere in this report and our other SEC filings. See also “Forward-Looking Statements” above.

Risks Related to Our Business

There has been historically and continues to be substantial doubt as to our ability to continue as a going concern.

As described in Note 1. Basis of Presentation, Summary of Significant Accounting Policies, and Nature of Operations of the Notes to the Consolidated Financial Statements included in Part II. Item 8. *Financial Statements and Supplementary Data*, of this Annual Report on Form 10-K, we have concluded that substantial doubt exists as to the Company’s ability to continue as a going concern. This means that there is substantial doubt that we can continue as an ongoing business for the next twelve months. Our financial statements have been prepared assuming we will continue as a going concern. We have experienced substantial and recurring losses from operations, which has created an accumulated deficit of $137.0 million as of December 31, 2021.

At December 31, 2021, the Company had approximately $24.7 million in cash and had a working capital surplus of approximately $24.7 million. The Company’s net cash used in operating activities during the year ended December 31, 2021 was approximately $11.0 million, and current projections indicate that the Company will have continued negative cash flows for the foreseeable future. There are inherent uncertainties in forecasting future expenditures, especially forecasting for uncertainties such as future R&D costs and other cash outflows and as well as how the COVID-19 outbreak, including the emergence and spread of variant strains of the virus, may affect future costs and operations. Also, the cash requirements of the Company’s future planned operations to commercialize its nuclear fuel, including any additional expenditures that may result from unexpected developments, requires it to raise significant additional capital, including receiving government support. Net losses incurred for the years ended December 31, 2021 and 2020 amounted to approximately $7.8 million and $14.4 million, respectively.

Our ability to successfully raise sufficient funds, primarily through the sale of equity securities, is uncertain and subject to general market conditions, the market for our common stock and other risks. There can be no assurances as to the availability or terms upon which needed capital might be available to the Company. These factors, among others, raise substantial doubt about our ability to continue as a going concern for the next twelve months. If we are unable to meet our financial obligations, we could be forced to delay, reduce, or cease our operations, including substantially decrease or suspend our R&D activities, or otherwise impede our ongoing business efforts, which could have a material adverse effect on our business, operating results, financial condition, and long-term prospects, and, investors may lose their entire investment in the Company. Our financial statements do not include any adjustments that might result from the outcome of this uncertainty.

We will need to raise significant additional capital in the future to expand our operations and continue our R&D activities and we may be unable to raise such funds when needed on acceptable terms. Any capital raises may cause significant dilution to our shareholders.

As of December 31, 2021, we had $24.7 million in cash and cash equivalents. We will need to raise significant additional capital (up to several hundred million dollars) in order to continue our R&D activities and fund our operations through the commercialization of our nuclear fuel. Our current plan is to maximize external funding from third party sources, including the DOE, to support the remaining development, testing and demonstration activities relating to our metallic nuclear fuel technology.

When we elect to raise additional funds or additional funds are required, we may raise such funds from time to time through public or private equity offerings, debt financings or other financing alternatives. Additional equity or debt financing, or other alternative sources of capital may not be available to us on acceptable terms, if at all. In addition, if we are unable to demonstrate meaningful progress to further the development of our fuel products, it may be difficult for us to raise additional capital on terms acceptable to us or at all.

When we raise additional funds by issuing equity securities, our stockholders will experience dilution. Sales of substantial amounts of our common stock may cause the trading price of our common stock to decline in the future. New investors may have rights superior to existing securityholders. Debt financing, if available, would result in substantial fixed payment obligations and may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, or declaring dividends. Any debt financing or additional equity that we raise may contain terms, such as liquidation and other preferences, which are not favorable to us or our stockholders. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may not be able to fully develop our nuclear fuel designs, our future operations will be limited, and our ability to generate revenues and achieve or sustain future profitability will be substantially harmed. In particular, we may be required to delay, reduce the scope of or terminate one or more of our research projects, sell rights to our nuclear fuel technology or license the rights to such technologies on terms that are less favorable to us than might otherwise be available.

We are dependent upon significant U.S. government funding and political support for nuclear power in order to complete our fuel development efforts and commercialize our nuclear fuel technology.

Our projected fuel development timeline is dependent upon significant funding from the U.S. government to not only support our ongoing R&D efforts, but to provide confidence to our investors and reduce the need to raise funds through the issuance of additional dilutive equity securities. Government funding of R&D is subject to the political process, which is inherently unpredictable and highly competitive. The funding of government programs is dependent on budgetary limitations, congressional appropriations and administrative allotment of funds, all of which are uncertain and may be affected by changes in U.S. government policies resulting from various political developments. If political support for the prioritization of the development of nuclear energy decreases, including due to policy changes by the Biden administration and future administrations and changing congressional funding priorities, it may affect our ability to secure government funding which would adversely affect our business, fuel development timeline, financial condition, and results of operations.

The amount of time and funding needed to bring our nuclear fuel to market may greatly exceed our projections.

The development of our nuclear fuel will take a significant amount of time and funding, and any shortfall in R&D funding levels or a delay in achieving fuel development milestones, or uncertainty in regulatory licensing timelines could result in significant delays and cost overruns. We cannot at this stage accurately predict the amount of funding or the time required to successfully manufacture and sell our nuclear fuel in the future. However, our best estimate at this time is that our metallic fuel development program is expected to take 15-20 years and cost several hundred million U.S. dollars before we can secure our initial commercial order for a batch reload. The actual cost and time required to commercialize our fuel technology may vary significantly depending on, among other things, the results of our research and product development efforts; the cost of developing or licensing our nuclear fuel; changes in the focus and direction of our research and product development programs; access to test loops; competitive and technological advances; the cost of filing, prosecuting, defending and enforcing claims with respect to patents; the regulatory approval process; fuel manufacturing process; availability of metallic high assay low enriched uranium, and marketing and other costs associated with commercialization of these technologies. Because of this uncertainty, even if financing is available to us, we may need significantly more capital than anticipated, which may not be available on terms acceptable to us or at all, and the expected revenues and other expected benefits from our nuclear fuel technology may be delayed or never realized.

Our current economic model for selling our nuclear fuel may prove to be inaccurate and subject to competition and our nuclear fuel technology products may not be cost effective.

Although our preliminary economic model concludes that our nuclear fuel technology may provide a significant payback to utilities, it is based upon a number of assumptions that may not prove to be accurate. If our model is inaccurate, our nuclear fuel product may not provide nuclear utility customers with sufficient economic incentive to switch from existing nuclear fuels, and we could lose or fail to develop customers. For example, if ATF fuel is successful in extending the cycle length from 18 to 24 months in existing PWRs, it could severely weaken or undermine the anticipated economic value of our nuclear fuel for large PWRs.

Separately, our economic model for SMRs is in the development stage and its viability is subject to favorable wholesale power prices in the markets in which our nuclear fuel may be used, the necessary upfront capital investment to enable a 30% power uprate in future SMRs using our nuclear fuel and the future costs of uranium metallization and fabrication of our fuel rods and fuel assemblies at commercial scale, all of which are inherently unpredictable.

A failure of our current and future economic models, or a failure to find a strategic alternative, such as a potential business combination partner, would adversely affect our business, financial condition, and results of operations and may result in the failure of the Company.

Development of our nuclear fuel technology is dependent upon the availability of a test reactor.

Our fuel designs are still in the research and development stage and further research, development, and demonstration will be required in test facilities. We had intended to conduct further testing of our fuel designs at the Halden research reactor located in Halden, Norway. However, the Halden research reactor, which became operational in 1958, was shut down in June 2018 and will not reopen. The Company has identified alternative options to generate the irradiation data we need to support regulatory licensing of our LTA operation in a commercial reactor but pursuing such alternatives to the Halden research reactor may significantly delay further testing of our fuel designs. We may not be able to contractually secure another reactor in which to test our fuel designs. As a result, commercialization of our nuclear fuel technology may be significantly delayed, perhaps indefinitely, which would adversely affect our business, financial condition, and results of operations.

Our current R&D plan includes the use of research reactors made available by the U.S. government and the DOE, including but not limited to the ATR at INL. These reactors are limited in terms of technical capabilities, operating cycles, and prior reservations for similar research and development services. While the ATR has enough space for four loops where fuel rods can be irradiated, the reactor currently has only one such loop available, limiting how much fuel rod material that can be inserted into the reactor as well as its duration in the reactor. If new loops are not added to the ATR, loop irradiation testing in the ATR may not provide sufficient data to justify regulatory approval for LTA testing in a large commercial PWR in a commercially feasible timeframe. This would likely necessitate an extra fuel development step of LTR testing in a large commercial PWR in addition to the ATR loop testing before LTA testing could commence.

Funding for any improvement of capabilities or continued operations of these reactors is subject to the priorities of the U.S. government, as well as the appropriation of funding by the U.S. Congress, and cannot be assured. Changes in these factors are outside of the Company's control and could cause significant delays and/or cost increases in our R&D programs.

Our fuel designs have never been tested in an existing commercial reactor and actual fuel performance, as well as the willingness of commercial reactor operators and fuel fabricators to adopt a new design, is uncertain.

Nuclear power research and development entails significant technological risk. New designs must undergo extensive development and testing necessary for regulatory approval. Our fuel designs are still in the research and development stage and, while certain testing on our fuel technologies has been completed, further testing and experiments will be required in order to achieve commercialization. For example, our proposed metallic fuel uses a helical cruciform form to increase its surface area and shorten the distance for heat generated in the fuel rod to reach water, resulting in an improved ability to cool the fuel. However, this proposed shape may also result in non-uniform distribution of heat flux that may have an adverse impact on the critical heat flux and limit power uprate capabilities of our metallic fuel. Additional testing and development may result in changes to the design of our proposed metallic fuel, which could decrease its realizable benefits and impair the ability of nuclear utilities to utilize nuclear fuel incorporating our technology.

Furthermore, the fuel technology has yet to be sufficiently demonstrated in operating conditions equivalent to those found in an existing commercial reactor. Until we are able to successfully demonstrate operation of our fuel designs in commercial reactor conditions, we cannot confirm the ability of our nuclear fuel to perform as expected, including its ability to enable a power uprate, a longer operating cycle, or other anticipated performance and safety benefits. In addition, there is also a risk that suitable testing or manufacturing facilities may not be available to us on a timely basis or at a reasonable cost, which could cause development program schedule delays.

There is also a risk that fuel fabricators that manufacture and supply commercial nuclear fuel assemblies to nuclear utility customers may not enter into a commercial arrangement with us relating to our metallic nuclear fuel designs. A failure to enter into a commercial arrangement with one or more of existing nuclear fuel fabricators could adversely affect our business, financial condition, and results of operations and may result in the failure of the Company.

If our fuel designs do not perform as anticipated in commercial reactor conditions, we will not realize revenues from licensing or other use of our fuel designs.

Existing commercial nuclear infrastructure in many countries is limited to uranium material in dioxide form with enrichments limited to 5%. Our nuclear fuel will be in a metallic form and will be enriched to higher levels, which will require modifications to existing commercial nuclear infrastructure and could impede commercialization of our technology.

Existing commercial nuclear infrastructure, including conversion facilities, enrichment facilities, fabrication facilities, fuel storage facilities, fuel handling procedures, fuel operation at reactor sites, used fuel storage facilities and shipping containers, were in most cases designed and are currently licensed to handle uranium in oxide form with enrichment up to 5% of the isotope Uranium 235. Our fuel designs are expected to use uranium metal with uranium enrichment levels up to 19.75% and would therefore require certain modifications to existing commercial nuclear infrastructure to enable commercial nuclear facilities to handle our fuels. Those nuclear facilities will need to complete a regulatory licensing process and obtain regulatory approvals to be able to process, handle, or ship uranium metal with enrichment levels up to 19.75% and operate commercial reactors using our metallic fuel. There is significant risk that some relevant entities within the nuclear power industry may be slow in making any required facility infrastructure modifications or obtaining required licenses or approvals to enable enrichment to 19.75%, de-conversion to metallic uranium, fabrication of metallic fuel rods and assemblies, shipment of fresh and irradiated metallic fuel assemblies, interim storage of fresh and irradiated fuel assemblies in spent fuel pools or dry cask storage facilities at reactor sites, or permanent disposal of spent metallic fuel at a high-level repository, or may not make the necessary modifications at all. There is also a risk associated with possible negative perception of uranium enrichment greater than 5% that could potentially delay or hinder regulatory approval of our nuclear fuel designs.

Our nuclear fuel designs rely on fabrication technologies that in certain material ways are different from the fabrication techniques presently utilized by existing commercial fuel fabricators. In particular, our metallic fuel rods must be produced using a co-extrusion fabrication process. Presently, most commercial nuclear fuel is produced using a pellet fabrication technology, whereby uranium dioxide is formed into small pellets which are stacked and sealed inside metallic tubes. Our co-extrusion fabrication technology involves co-extrusion of a composite solid fuel rod from a metallic matrix containing uranium and zirconium alloy. Fabrication of full-length (approximately 12 to 14 feet) PWR metallic fuel rods for large reactors and shorter length for SMRs has yet to be sufficiently demonstrated for our uranium-zirconium fuel. There is a risk that the fuel fabrication process utilized to date to produce our metallic fuel rods may not be feasibly adapted to the fabrication of full-length metallic fuel rods usable in commercial reactors.

The cost of production of our nuclear fuel could be prohibitively expensive.

In order for our metallic fuel to succeed, we will need to be able to produce our nuclear fuel at a price that is economically viable. We have received estimates that production of our nuclear fuel could be achieved at a commercial scale for approximately $5,000 to $10,000 per kilogram using known metallization/de-conversion technologies. To bring the cost of metallization/de-conversion further down, we estimate that it would require a new government-funded research and development program that could take 15-20 years or longer and cost several billion dollars. There can be no assurance that we will be able to produce our nuclear fuel at a price that is economically feasible or that future research efforts will lower the cost of production. If we are unable to produce our nuclear fuel at a price that is economically viable, the market for our nuclear fuel may never develop and our current business model will fail.

We are part of the nuclear power industry, which is highly regulated. Our fuel designs differ from fuels currently licensed and used by commercial nuclear power plants. The regulatory licensing and approval process for nuclear power plants to operate with our nuclear fuels may be delayed and made more costly, and industry acceptance of our nuclear fuels may be hampered.

The nuclear power industry is a highly regulated industry. All entities that operate nuclear facilities and transport nuclear materials are subject to the jurisdiction of the US-NRC or its counterparts around the world. Our fuel designs differ significantly in some aspects from the fuel used today by commercial nuclear power plants. These differences will likely result in more prolonged and extensive review by the US-NRC and its counterparts around the world that could cause fuel development program delays and delays in commercialization. Entities within the nuclear industry may be hesitant to be the first to use our nuclear fuel, which currently has no history of commercial use. Furthermore, our fuel development timeline relies on the relevant nuclear regulator to accept and approve technical information and documentation about our nuclear fuel that is generated during the fuel qualification program. There is a risk that regulators may require additional information regarding the fuel's behavior or performance which necessitates additional, unplanned analytical and/or experimental work which could cause program schedule delays and require more research and development funding.

Successful execution of our business model is dependent upon public support for nuclear power and overcoming public opposition to nuclear energy.

Successful execution of our business model is dependent upon public support for nuclear power in the United States and other countries. Nuclear power faces strong opposition from certain competitive energy sources, individuals, and organizations. The accident that occurred at the Fukushima nuclear power plant in Japan beginning on March 11, 2011 increased public opposition to nuclear power in some countries, resulting in a slowdown in or, in some cases, a complete halt to new construction of nuclear power plants, early shut down of existing power plants, or dampening of the favorable regulatory climate needed to introduce new nuclear technologies. In addition, the Fukushima accident appears to have shrunk the projected size of the global nuclear power market in 2025-2030 as reflected in the most recent reference case projections published by the WNA. As a result of the Fukushima accident, some countries that were considering launching new domestic nuclear power programs have delayed or cancelled preparatory activities they were planning to undertake as part of such programs. Furthermore, nuclear fuel fabrication and the use of new nuclear fuels in reactors must be licensed by the US-NRC and equivalent governmental authorities around the world. In many countries, the licensing process includes public hearings in which opponents of the use of nuclear power might be able to cause the issuance of required licenses to be delayed or denied.

Our nuclear fuel fabrication process is dependent on outside suppliers of nuclear and other materials and any difficulty by a fuel fabricator in obtaining these materials could be detrimental to our ability to eventually market our nuclear fuel through a fuel fabricator.

Production of fuel assemblies using our nuclear fuel designs is dependent on the ability of fuel fabricators to obtain supplies of nuclear material utilized in our fuel assembly design. Our proposed nuclear fuel products require HALEU in metallic form, enriched between 5% and 19.75% in the isotope uranium-235, with presently no commercial supply of HALEU available in the U.S. Currently HALEU can only be sourced in limited quantities from the DOE.

Fabricators will also need to obtain metal for components, particularly zirconium or its alloys. These materials are regulated and can be difficult to obtain or may have unfavorable pricing terms. Any difficulties in obtaining these materials by fuel fabricators could have a material adverse effect on their ability to market fuel based on our technology.

Labor shortages and supply chain disruptions could prevent us from meeting our R&D timelines and have a negative impact on our financial results.

Shipping delays exist worldwide, as there is much greater demand for shipping and reduced capacity due to the ongoing COVID-19 pandemic and related travel and health restrictions. Additionally, certain material and equipment prices are expected to remain at historically high levels in 2022 due to inflationary cost pressures and global transportation complexities. We may experience supply chain disruptions related to third-party vendors negatively impacted by the availability of qualified labor, restrictions on employees' ability to work, facility closures, disruptions to ports and other shipping infrastructure, border closures and other travel or health-related restrictions. These disruptions may impact our supply chain and delay the development of our nuclear fuel technology, which could negatively impact our financial results and our ability to execute timely on our R&D strategy, should they persist.

If the price of non-nuclear energy sources falls, whether as the result of government policy or otherwise, there could be an adverse impact on nuclear energy, which would have a material adverse effect on our operations.

In certain markets with a diversified energy base, decisions on new build power plants are largely affected by the economics of various energy sources. If prices of non-nuclear energy sources fall, it could limit the deployment of new build nuclear power plants in such markets. This could reduce the size of the potential markets for our nuclear fuel technology.

In addition, the U.S. federal government and many states have adopted a variety of government subsidies and utility incentives to allow renewable energy sources, such as biofuels, wind and solar energy, to compete with conventional sources of energy that have historically been less expensive, such as fossil fuels and nuclear power. We may face additional indirect competition from providers of renewable energy sources, particularly in wind and solar energy, if government subsidies and utility incentives for those sources of energy remain or increase or if such sources of energy are mandated. Additionally, the availability of subsidies and other incentives from utilities or government agencies to install alternative renewable energy sources may negatively impact our potential customers' desire to purchase our products and services, or may be utilized by our existing or new competitors to develop a competing business model or products or services that may be potentially more attractive to customers than ours, any of which could have a material adverse effect on our results of operations or financial condition.

We may be adversely affected by uncertainty in the global financial markets and by a potential worldwide economic downturn caused by the COVID-19 outbreak or future pandemics.

Our future results may be adversely affected by the worldwide economic downturn resulting from the COVID-19 pandemic, continued volatility or further deterioration in the debt and equity capital markets, inflation, deflation, or other adverse economic conditions that may negatively affect us.

The outbreak of COVID-19 in the United States and globally resulted in the United States and other countries halting or sharply curtailing the movement of people, goods, and services. These measures caused extended shutdowns of businesses and the prolonged economic impact remains uncertain. We experienced and may continue to experience a reduction of our R&D expenses and an increase in our general and administrative expenses. Other than such changes, we believe the conditions have not had a material adverse effect on our business, but given the rapidly changing developments, we cannot accurately predict what effects these conditions will have on our financial position, results of operations and liquidity, including our R&D activities, which will depend on, among other factors, the ultimate geographic spread of the virus and its variants, the duration of the outbreak and travel restrictions and business closures imposed by the United States and various other governments. COVID-19 may have a material adverse effect on our ability to obtain financing, which is needed to generate sufficient cash flows to conduct our businesses activities in the future.

We rely upon certain members of our senior management, including Seth Grae, Andrey Mushakov, and Larry Goldman and the loss of any of Mr. Grae, Dr. Mushakov, or Mr. Goldman or any of our management team would have an adverse effect on the Company.

Our success depends upon certain members of our senior management, including Seth Grae, our Chief Executive Officer, Andrey Mushakov, our Executive Vice President - Nuclear Operations, and Larry Goldman, our Chief Financial Officer. Mr. Grae's and Dr. Mushakov's knowledge of the nuclear power industry, their network of key contacts within that industry and in governments and, in particular, their expertise in the potential markets for our technologies, are critical to the implementation of our business model. Mr. Grae, Dr. Mushakov, and Mr. Goldman are likely to be significant factors in our future growth and success. The loss of services by any of Mr. Grae, Dr. Mushakov, or Mr. Goldman could have a material adverse effect on our business, results of operations or financial condition. Also, we rely heavily on other members of our management team and our inability to hire, retain, and motivate adequate numbers of consultants and managers could adversely affect our ability to meet customer needs and to continue the development of our fuel designs.

Competition for highly qualified technical personnel is intense in our industry.

Our future success depends in part on our ability to contract with, hire, integrate, and retain engineers and scientists, and other qualified personnel with a focus in our nuclear fuel technology and products. Competition for these skilled professionals is intense. If we are unable to adequately anticipate our needs for certain key competencies and implement human resource solutions to recruit or improve these competencies, our business, results of operations and financial condition would suffer. In addition, a loss of the service of any of our existing skilled employees or contractors could have a significant negative effect on our ability to operate.

We may not be able to receive or retain authorizations that may be required for us to sell or license our technology internationally.

The sales and marketing of our technology internationally may be subject to U.S. export control regulations and the export control laws of other countries. Governmental authorizations may be required before we can export our technology. If authorizations are required and not granted, our international business could be materially affected. The export authorization process is often time consuming. Violation of export control regulations could subject us to fines and other penalties, such as losing the ability to export for a period of years, which would limit our revenue growth opportunities and significantly hinder our attempts to expand our business internationally.

Potential competitors could limit opportunities to license our technology.

Other companies may develop new nuclear fuel designs that can be used in the same types of reactors as those that we target. These nuclear fuel designs include, but are not limited to, the ATFs currently being developed and tested by several U.S. and international nuclear fuel suppliers, with the support of the DOE, which could undermine our nuclear fuel's economic value proposition if ATFs are proven to extend the operating cycle length from 18 to 24 months. Some of these companies have existing long-term commercial contracts with nuclear power utilities that we do not have. If another company were to successfully develop a new nuclear fuel that competes with our nuclear fuel design technology, opportunities to commercialize our technology would be limited, and our business would suffer.

Moreover, many of these other companies have substantially greater financial, technological, managerial and research and development resources and experience than we do. These larger companies may be better able to handle the corresponding long-term financial requirements to successfully develop new nuclear fuel and bring it to market.

If the DOE were to successfully assert that an invention claimed within our 2007 or 2008 Patent Cooperation Treaty, or PCT, patent applications was first conceived or actually reduced to practice under a contract with the DOE, then our intellectual property rights in that invention could become compromised and our business model could become significantly impeded.

Work on finite aspects and/or testing of some subject matter disclosed in our 2007 and 2008 Russian PCT patent applications was done under a government contract with the DOE. If the DOE asserted that an invention claimed in the 2007 and/or 2008 Russian PCT applications was first conceived or actually reduced to practice under such a contract, and a U.S. court agreed, the DOE could gain an ownership interest in such an invention outside of the Russian Federation and our intellectual property rights in that claimed invention could become compromised and our business model may then be significantly impeded.

If we are unable to obtain or maintain intellectual property rights and trade secrets relating to our technology, the commercial value of our technology may be adversely affected, which could in turn adversely affect our business, financial condition, and results of operations.

Our success and ability to compete depends in part upon our ability to obtain protection in the United States and other countries for our nuclear fuel designs by establishing and maintaining intellectual property rights relating to or incorporated into our fuel technologies and products. We own a variety of patents and patent applications in the United States, as well as corresponding patents and patent applications in several other jurisdictions. We have not obtained patent protection in each market in which we plan to compete. We do not know how successful we would be should we choose to assert our patents against suspected infringers. Our pending and future patent applications may not issue as patents or, if issued, may not issue in a form that will be advantageous to us. Even if issued, patents may be challenged, narrowed, invalidated, or circumvented, which could limit our ability to stop competitors from marketing similar products or limit the length of term of patent protection we may have for our products. Changes in patent laws or in interpretations of patent laws in the United States and other countries may diminish the value of our intellectual property or narrow the scope of our patent protection, which could in turn adversely affect our business, financial condition, and results of operations.

We intend to apply for additional patents for our nuclear fuel technologies as we deem appropriate. We may, however, fail to apply for patents on important technologies or products in a timely fashion, if at all. Our existing patents and any future patents we obtain may not be sufficiently broad to prevent others from practicing our technologies or from developing competing products and technologies. In addition, in general the patent positions of energy technology companies are highly uncertain and involve complex legal and factual questions for which important legal principles remain unresolved. As a result, the validity and enforceability of our patents cannot be predicted with certainty.

We also rely on trade secrets to protect some of our technology, especially where it is believed that patent protection is undesirable for the Company or unobtainable. We generally require our employees, consultants, advisors, and collaborators to execute appropriate agreements with us regarding the safeguarding of confidential information. If any of these agreements are violated, or if any of our employees, consultants, advisors or collaborators unintentionally or willfully disclose our proprietary information to competitors, we may not be able to fully perfect our rights to the technologies in question, and in some instances, we may not have an appropriate remedy available for the damages that we may incur as a result of any such violation. Enforcement of claims that a third party has illegally obtained and is using trade secrets is expensive, time consuming and uncertain. In addition, non-U.S. courts are sometimes less willing than U.S. courts to protect trade secrets. If our competitors independently develop equivalent knowledge, methods, and know-how, we would not be able to assert our trade secrets against them and our business could be harmed.

If we infringe or are alleged to infringe intellectual property rights of third parties, our business, financial condition, and results of operations could be adversely affected.

Our nuclear fuel designs may infringe, or be claimed to infringe, patents or patent applications under which we do not hold licenses or other rights. Third parties may own or control these patents and patent applications in the United States and elsewhere. Third parties could bring claims against us that would cause us to incur substantial expenses and, if successfully asserted against us, could cause us to pay substantial damages. If a patent infringement suit were brought against us, we could be forced to stop or delay commercialization of the fuel design or a component thereof that is the subject of the suit. As a result of patent infringement claims, or in order to avoid potential claims, we may choose or be required to seek a license from the third party and be required to pay license fees, royalties, or both. These licenses may not be available on acceptable terms, or at all. Even if we were able to obtain a license, the rights may be nonexclusive, which could result in our competitors gaining access to the same intellectual property. Ultimately, we could be forced to cease some aspect of our business operations if, as a result of actual or threatened patent infringement claims, we are unable to enter into licenses on acceptable terms. This could significantly and adversely affect our business, financial condition, and results of operations. In addition to infringement claims against us, we may become a party to other types of patent litigation and other proceedings, including interference proceedings declared by the United States Patent and Trademark Office regarding intellectual property rights with respect to our nuclear fuel designs. The cost to us of any patent litigation or other proceeding, even if resolved in our favor, could be substantial. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace. Patent litigation and other proceedings may also absorb significant management time.

Applicable Russian intellectual property law may be inadequate to protect some of our intellectual property, which could have a material adverse effect on our business.

Intellectual property rights are evolving in Russia, and are trending towards international norms, but are still developing. We have worked closely with employees in Russia and other Russian contractors and entities to develop some of our material intellectual property. Some of our earlier intellectual property rights originate from our patent filings in Russia. Our worldwide rights in some of this intellectual property, therefore, may be affected by Russian intellectual property laws. If the application of Russian laws to some of our intellectual property rights proves inadequate, or if the rights of foreign holders of intellectual property in Russia adversely change as a result of hostilities between Russia and other countries or otherwise, then we may not be able to fully avail ourselves of all of our intellectual property, and our business model may be impeded.

The laws of certain foreign jurisdictions do not protect intellectual property rights to the same extent as the laws of the United States, and many companies have encountered significant challenges in protecting and defending such rights in such foreign jurisdictions. The legal systems of certain countries, particularly developing countries, do not favor the enforcement of patents and other intellectual property protection, which could make it difficult for us to stop the infringement of our patents. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial cost and divert our efforts and attention from other aspects of our business.

We are exposed to risks related to cybersecurity and protection of confidential information.

We retain highly confidential information in our systems and databases on third party network providers. Although we maintain security features in our systems designed to protect proprietary information and prevent data loss and other security breaches, such measures cannot provide absolute security and our operations may be susceptible to breaches on our third party networks, including from circumvention of security systems, denial of service attacks or other cyber-attacks, hacking, computer viruses or malware, technical malfunction, employee error, malfeasance, physical breaches, system disruptions or other disruptions. We outsource certain functions, including IT functions, and these relationships allow for the storage and processing of our information, as well as customer, counterparty, and employee information. While we engage in actions to reduce our exposure resulting from outsourcing, ongoing threats may result in unauthorized access, loss, exposure or destruction of data, or other cybersecurity incidents, with increased costs and other consequences, including those described below.

Disruptions from cybersecurity events may jeopardize the security of information stored in and transmitted through our systems or the systems of outsourcing parties. An increasing number of websites, including those owned by several other large Internet and offline companies, have disclosed breaches of their security, some of which have involved sophisticated and highly targeted attacks on portions of their websites or infrastructure. The techniques used to obtain unauthorized access, disable, or degrade service, or sabotage systems, change frequently, may be difficult to detect for a long time, and often are not recognized until launched against a target. Certain efforts may be state sponsored and supported by significant financial and technological resources and therefore may be even more difficult to detect. We may not anticipate these techniques or implement adequate preventive measures. We currently expend and may be required to expend significant additional capital and other resources to protect against such security breaches or to alleviate problems caused by such breaches. Our insurance coverage may be inadequate to compensate us for any related losses we incur.

These issues are likely to become more difficult as we expand our operations. Any breach of our security measures, or even a perceived breach of our security measures, could cause us to lose potential customers and governmental approvals; suffer material harm to our business, financial condition, operating results and reputation; or be subject to regulatory actions, litigation, sanctions or other statutory penalties.

Technological changes could render our technology and products uncompetitive or obsolete, which could prevent us from achieving market share and sales.

Our failure to refine or advance our fuel technologies could cause our nuclear fuel to become uncompetitive or obsolete, which could prevent us from achieving market share and sales. We may need to invest significant financial resources in research and product development to keep pace with technological advances in the industry and to compete in the future; we may be unable to secure such financing. A variety of competing alternative technologies may be in development by other companies that could result in lower manufacturing costs and/or higher fuel performance than those expected for our fuel products. Our development efforts may be rendered obsolete by the technological advances of others, and other technologies may prove more advantageous for commercialization.

We may acquire other companies or technologies, which could divert our managements' attention, result in dilution to our stockholders and otherwise disrupt our operations and adversely affect our operating results.

We may in the future seek to acquire or invest in businesses, applications and services or technologies that we believe could complement or expand our Company, enhance our technical capabilities or otherwise offer growth opportunities. The pursuit of potential acquisitions may divert the attention of management and cause us to incur various expenses in identifying, investigating and pursuing suitable acquisitions, whether or not they are consummated.

If we acquire additional businesses, we may not be able to integrate the acquired personnel, operations and technologies successfully, or effectively manage the combined business following the acquisition. We also may not achieve the anticipated benefits from the acquired business due to a number of factors, including:

- inability to integrate or benefit from acquired technologies or services in a profitable manner;
- unanticipated costs or liabilities associated with the acquisition;
- difficulty integrating the accounting systems, operations and personnel of the acquired business;
- diversion of management's attention from other business concerns;
- adverse effects to our existing business relationships with business partners as a result of the acquisition;
- the potential loss of key employees;
- use of resources that are needed in other parts of our business; and
- use of substantial portions of our available cash to consummate the acquisition.

In addition, a significant portion of the purchase price of companies we acquire may be allocated to acquired goodwill and other intangible assets, which must be assessed for impairment at least annually. In the future, if our acquisitions do not yield expected returns, we may be required to take charges to our operating results based on this impairment assessment process, which could adversely affect our results of operations.

Acquisitions could also result in dilutive issuances of equity securities or the incurrence of debt, which could adversely affect our operating results. In addition, if an acquired business fails to meet our expectations, our operating results, business and financial position may suffer.

Risks Related to the Ownership of Our Common Stock

We may issue preferred stock with rights senior to our common stock.

We can issue preferred stock in one or more series and can set the terms of the preferred stock without seeking any further approval from the holders of our common stock. Any preferred stock that we issue may rank ahead of our common stock in terms of dividend priority or liquidation premiums, may have greater voting rights than our common stock, and may have consent rights over certain fundamental transactions. The interests of the holders of the preferred stock may as a consequence be different from the interests of the holders of our common stock, including in certain fundamental transactions in which the preferred stockholders would receive distributions before any distributions may be made to our common stockholders. In addition, such preferred stock may contain provisions allowing it to be converted into shares of common stock, which could dilute the value of our common stock to then current stockholders and could adversely affect the market price of our common stock.

There may be volatility in our stock price, which could negatively affect investments, and our stockholders may not be able to resell their shares at or above the value they originally purchased such shares.

The market price of our common stock may fluctuate significantly in response to a number of factors, some of which are beyond our control, including:

- trading volume of our common stock;
- quarterly variations in operating results;

- actual or anticipated variations in our results of operations or those of our competitors;
- failure to obtain or maintain analyst coverage of our common stock, changes in earnings estimates or recommendations by securities analysts, or our failure to achieve analyst earnings estimates;
- future sales of our common stock or other securities by us or our stockholders;
- general market conditions and other factors unrelated to our operating performance or the operating performance of our competitors; and
- the risks discussed elsewhere in this Annual Report on Form 10-K.

The stock market may experience extreme volatility that is often unrelated to the performance of particular companies. These market fluctuations may cause our stock price to fall regardless of the Company's performance.

If we are unable to comply with the listing requirements of the Nasdaq Capital Market, it would result in our common stock being delisted, which could affect its market price and liquidity and reduce our ability to raise capital.

If we fail to maintain compliance with, or otherwise fail to comply with, all applicable continued requirements, Nasdaq may determine to delist our common stock, which could substantially decrease trading in our common stock and adversely affect the market liquidity of our common stock and cause the market price of our common stock to decline. In addition, our ability to raise additional capital, including through future at-the-market offerings and other offerings utilizing short-form registration statements on Form S-3, would be substantially impaired.

The issuance of additional stock in connection with financings, acquisitions, investments, our stock incentive plans or otherwise will dilute all other stockholders.

Our amended and restated certificate of incorporation authorizes the Company to issue up to 13,500,000 shares of common stock and up to 10,000,000 shares of preferred stock with such rights and preferences as may be determined by our board of directors. Subject to compliance with applicable rules and regulations, we may seek to expand the number of authorized common shares, and issue shares of common stock or securities convertible into our common stock from time to time in connection with a financing, acquisition, investment, our stock incentive plans or otherwise. Any such issuance could result in substantial dilution to our existing stockholders and cause the trading price of our common stock to decline.

Shareholder activism could cause us to incur significant expense, hinder execution of our business strategy and impact our stock price.

Shareholder activism, which can take many forms and arise in a variety of situations, could result in substantial costs and divert management and our board's attention and resources from our business. Additionally, such shareholder activism could give rise to perceived uncertainties as to our future, adversely affect our relationships with our employees or service providers and make it more difficult to attract and retain qualified personnel. Also, we may be required to incur significant fees and other expenses related to activist shareholder matters, including for third-party advisors. Our stock price could be subject to significant fluctuation or otherwise be adversely affected by the events, risks and uncertainties of any shareholder activism.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable.

ITEM 2. PROPERTIES

Our office space is located at 11710 Plaza America Drive, Suite 2000 Reston, VA 20190 USA. The term of the lease extends through December 31, 2022. We are obligated to pay approximately $8,000 per month for office rent. This space is used by our executives, employees, and contractors for administrative purposes, consulting work, and research and development activities.

ITEM 3. LEGAL PROCEEDINGS

From time to time, we may become involved in various lawsuits and legal proceedings, which arise in the ordinary course of business. However, litigation is subject to inherent uncertainties, and an adverse result in these or other matters may arise from time to time that may harm our business. To its knowledge, the Company does not have any current pending legal issues or proceedings. For a description of legal proceedings that were resolved by the Company, see the information set under Litigation in Note 4. Commitments and Contingencies of the Notes to our consolidated financial statements in Part II. Item 8. *Financial Statements and Supplementary Data,* of this Annual Report on Form 10-K.

Settlement of Arbitration

These legal actions are fully described in Note 4 Commitments and Contingencies of the Notes to the Consolidated Financial Statements included in Part II. Item 8. *Financial Statements and Supplementary Data*, of this Annual Report on Form 10-K. On February 11, 2021, the Company entered into a Settlement Agreement with Framatome SAS and Framatome Inc., resolving the pending claims and counterclaims between the parties in arbitration and judicial proceedings related to the parties' inactive joint venture, Enfission, LLC. Under the terms of the Settlement Agreement, all joint venture agreements were terminated, and the joint venture was dissolved on March 23, 2021. The Company accrued $4.2 million related to the Settlement Agreement at December 31, 2020. The Company paid Framatome approximately $4.2 million for outstanding invoices for work performed by Framatome and other expenses incurred by Framatome on March 15, 2021. Additionally, the Company recorded an approximate $34,000 foreign currency transaction gain related to the settlement payment for the year ended December 31, 2021. The Company received approximately a $120,000 distribution relating to the dissolution and wind-down of Enfission. A certificate of cancellation was filed with the state of Delaware with respect to Enfission on December 17, 2021.

Mediation Settlement

A former Chief Financial Officer of the Company filed a complaint against the Company with the U.S. Occupational Safety and Health Administration on March 9, 2015. The complaint was mediated on May 13, 2021, and the parties subsequently reached an agreement to resolve all claims for the total monetary sum of approximately $675,000 in exchange for a dismissal of the pending litigation, full release of all claims against the Company, and other conditions. On July 13, 2021, the settlement agreement was finalized by both parties and the Company applied for court approval by the administrative law judge (OALJ) assigned to this matter. The settlement was approved by the OALJ on July 22, 2021. The Company made the settlement payment and the insurers reimbursed the Company for the settlement payment. The case was final and conclusive.

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

Our common stock is quoted on the Nasdaq Capital Market under the symbol "LTBR".

Holders

As of March 1, 2022, our common stock was held by approximately 75 stockholders of record, including Cede & Co., the nominee for the Depository Trust & Clearing Corporation, and consequently that number does not include beneficial owners of our common stock who hold their stock in "street name" through their brokers.

Dividends

We have never paid dividends. While any future dividends will be determined by our directors after consideration of the earnings and financial condition of the Company and other relevant factors, it is currently expected that available cash resources will be utilized in connection with our ongoing operations for the foreseeable future.

Transfer Agent

Our transfer agent and registrar for our common stock is Computershare Trust Company, 6200 S. Quebec Street, Greenwood Village, CO 80111. Its telephone number is 800-962-4284 and facsimile is 303-262-0604.

Recent Sales of Unregistered Securities

On October 29, 2021, the Company entered into an exchange agreement with General International Holdings, Inc., the holder of all of the outstanding Series A Preferred Stock, pursuant to which General International Holdings, Inc. delivered to the Company all of the outstanding Series A Preferred Stock in exchange for 262,910 shares of the Company's common stock, without any cash payments by either party. The exchange was effected without registration under the Securities Act of 1933, as amended, pursuant to the exemption from registration set forth in Section 3(a)(9) of the Securities Act.

Otherwise, we did not sell any securities without registration under the Securities Act during the fiscal year ended December 31, 2021 other than as previously disclosed in the Company's quarterly reports on Form 10-Q and current reports on Form 8-K.

ITEM 6. [RESERVED]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following Management's Discussion and Analysis of Financial Condition and Results of Operations, or MD&A, is intended to help the reader understand Lightbridge Corporation, our operations, and our present business environment. MD&A is provided as a supplement to, and should be read in conjunction with, our Consolidated Financial Statements and the accompanying Notes thereto, which are contained in Part II. Item 8. *Financial Statements and Supplementary Data*, of this report. This discussion contains forward-looking statements that are based on our management's current expectations, estimates, and projections for our business, which are subject to a number of risks and uncertainties. Our actual results may differ materially from those anticipated in these forward-looking statements as a result of many factors, including those set forth under "Forward-Looking Statements" and Part I. Item 1A. *Risk Factors*.

This MD&A consists of the following sections:

- Overview of Our Business and Recent Developments - a general overview of our business and updates.
- Operations Review - an analysis of our consolidated results of operations for the two years presented in our consolidated financial statements. Except to the extent that differences are material to an understanding of our business as a whole, we present the discussion in the MD&A on a consolidated basis.
- Liquidity, Capital Resources, and Financial Position - an analysis of our cash flows, and an overview of our financial position.
- Critical Accounting Policies, and Estimates - a discussion of accounting policies that require critical judgments and estimates.

Overview of Our Business and Recent Developments

Our Business

Our Company's goal is to impact in a meaningful way the world's climate and energy problems. We are developing and plan to commercialize innovative, proprietary nuclear fuel designs, which we expect will significantly enhance the nuclear power industry's economics due to higher power output and improved safety margins. We are an early-stage technology company in the product development phase and are pre-revenue. Our ongoing operations are currently being financed primarily by raising new equity capital.

The Department of Energy's (DOE) Office of Nuclear Energy has established the Gateway for Accelerated Innovation in Nuclear (GAIN) program to provide the nuclear community with access to the technical, regulatory, and financial support necessary to expedite moving new or advanced nuclear technologies toward commercialization, while ensuring the continued safe, reliable, and economic operation of the existing nuclear reactor fleet.

We were awarded a GAIN voucher in 2019 for the experiment design for irradiation of material samples of Lightbridge metallic fuel in the Advanced Test Reactor (ATR) at the Idaho National Laboratory (INL). On April 22, 2020, we entered into a Cooperative Research and Development Agreement (CRADA) with Battelle Energy Alliance, LLC, the DOE's operating contractor at INL (see Recent Developments section below). The project commenced in the second quarter of 2020 and was originally expected to be completed in the second quarter of 2021. However, because of project staffing issues at INL related to the laboratory's COVID-19 restrictions and U.S. export control matters, the project was completed during the third quarter of 2021. The total project amount recorded as contributed services – research and development was approximately $0.5 million. This experiment design forms the basis of our current and future efforts with the INL.

DOE awarded us a second GAIN voucher to support development of Lightbridge Fuel™ in collaboration with the Pacific Northwest National Laboratory (PNNL). The scope of the project is to demonstrate Lightbridge's nuclear fuel casting process using depleted uranium, a key step in the manufacture of Lightbridge Fuel™. On July 14, 2021, the Company executed a CRADA with the Battelle Memorial Institute, Pacific Northwest Division, the operating contractor of the PNNL, in collaboration with the DOE. The project commenced in the third quarter of 2021 and we expect it to be completed by the third quarter of 2022. The total project value is approximately $0.7 million, with three-quarters of this amount provided by DOE for the scope performed by PNNL.

Our metallic fuel can be used in different types of water-cooled commercial power reactors, such as pressurized water reactors (PWRs), boiling-water reactors (BWRs), Russian-designed water-cooled, water-moderated energetic reactors (VVERs), CANDUs, water-cooled SMRs, and water-cooled research reactors.

We have obtained patent validation in key countries and will continue to seek patent validation in countries that either currently operate or are expected to build and operate a large number of nuclear power reactors compatible with our fuel technology.

We currently expect to invest a total of $4.0 million to $6.0 million in the research and development of our nuclear fuel over the next 12 to 15 months.

We have incurred net losses and negative cash flows from operations and expect this to continue for the foreseeable future. In 2022, we will continue to evaluate spending to reduce expenses with the overall goal of commercializing our nuclear fuel with the lowest research and development (R&D) cost, in order to maximize our shareholders' value. Our only source of funding in 2021 was our at-the-market (ATM) financing arrangement with Stifel, Nicolaus & Company. Although we expect this ATM facility to continue to be a significant source of working capital for the Company in 2022, there is no assurance that an ATM financing arrangement will be available to us in the future (see liquidity outlook section below). Please also see Note 7. Stockholders' Equity and Stock-Based Compensation of the Notes to the Consolidated Financial Statements included in Part II. Item 8. *Financial Statements and Supplementary Data*, of this Annual Report on Form 10-K for information regarding our ATM and prior financings.

Fuel Development Strategy

Lightbridge originally focused on existing U.S. PWRs because they represented a large market segment for which Lightbridge Fuel™ could provide significant economic and safety benefits through a power uprate up to 10% along with an operating cycle extension from 18 to 24 months or a power uprate of 17% without extending the cycle length. However, with technological advances towards small modular reactors (SMRs), the escalating costs associated with new build reactors, along with the need to operate large reactors at a constant 24/7 pace to achieve profitability, we estimate that these older types of large reactors will decrease in utilization going forward. In fact, we expect the net worldwide growth in the number of large reactors between now and 2050 to be fewer than 200, compared with the approximately 440 operable reactors worldwide.

Emerging nuclear technologies that many in the nuclear power industry believe have the potential to generate significant amounts of power include potential deployment of large numbers of SMRs that are now in the development and licensing phase. We expect that Lightbridge Fuel™ may provide SMRs all the benefits our technology brings to large reactors, but the benefits may be more meaningful to the economic case for deploying SMRs. Lightbridge Fuel™ is expected to generate more power in SMRs than traditional nuclear fuels, which will help decarbonize sectors that are now powered by electricity. We also plan to explore using Lightbridge Fuel™ in new SMRs to produce hydrogen for liquid non-carbon fuels for use in other, hard-to-decarbonize sectors such as aviation and shipping. Our ongoing R&D initiatives are entirely compatible with Lightbridge Fuel™ powering SMRs for multiple purposes.

We believe we are seeing an overall shift in focus by government and the private sector from large PWRs to SMRs and other advanced reactor technologies. As a result, we intend to increase our focus on opportunities that are likely to attract financing, both currently and in the future. The first SMRs that could use our fuel are expected to begin operations in 2028.

Our fuel development strategy, which focuses on SMRs, includes several major development activities or key steps. In certain cases, it may be possible to conduct development work relating to multiple key steps in parallel, resulting in some overlap in timelines between two or more such major development activities. Additional government funding expected to be directed towards the development of SMRs has the potential to reduce the amount of funding Lightbridge would need to raise on its own for its fuel development efforts. We anticipate that the improved competitive position of Lightbridge Fuel™ versus Accident Tolerant Fuels (ATF) in the SMR market segment, with government support, would generate sustainable economic benefits, including the 30% potential power uprates that may be achieved with Lightbridge Fuel™.

For a typical power system, base load power is usually about 35-40 percent of the maximum load during the year. Demand spikes are handled by intermediate and then peak power plants. Base load power plants include coal and nuclear facilities due to low fuel costs and steady power production. In some regions, geothermal and hydroelectric can also be used as base load power. Intermediate plants include natural gas, and some peak plants run on light oil. We see the push for clean energy, particularly renewables, changing this structure fairly rapidly. The existing plant structure is being replaced by wind and solar power backed up by other power, usually natural gas, when the sun is not shining or the wind is not blowing. To replace the carbon-emitting natural gas plants with something non-emitting and economical, to balance with renewables, is one of the greatest challenges in decarbonizing the energy supply. We are designing Lightbridge Fuel™ for use in SMRs to combine with renewables globally to decarbonize the energy supply, with SMRs providing base load power with high interoperability with intermittent renewables. We believe that the potential 30% power uprate from Lightbridge Fuel™ will uniquely provide a lower levelized cost of electricity than uranium dioxide fuel (including ATF) and will allow SMRs to replace natural gas plants to balance with renewables. We believe Lightbridge Fuel™ in SMRs will align with the energy and climate strategy of the U.S. and other governments. We do not expect that economical grid-level battery storage or large-scale carbon capture will be available at large enough scale to help with climate change. We believe that large-scale SMR production in factories and shipyards can meet a significant portion of the global energy supply. The world is currently on a path towards having most of its energy in 2050 produced by fossil fuels without carbon capture. We believe our nuclear fuel in SMRs combined with renewables on the grid can change that future energy mix.

Below is a brief description of each key fuel development step leading up to a lead test assembly (LTA) operation in an SMR.

a. Fuel Fabrication

We expect the development of the fabrication processes for Lightbridge Fuel™ to be performed utilizing existing facilities and equipment within the DOE national laboratory complex and other facilities. Discussions are currently ongoing with the INL and PNNL to perform process development activities and establish the capability to manufacture development quantities of fuel rods for loop irradiation testing, and possibly an initial lead test assembly.

Fabrication of multiple LTAs and batch reload quantities of fuel will require a dedicated pilot-scale fuel fabrication facility. We estimate the major scopes of work to establish a manufacturing capability for LTAs would take 5-8 years to complete, with batch reload capability achieved within 8 years from the start of pilot-scale fuel fabrication facility design and construction work. These estimates assume sufficient funding availability and that the project receives prioritization by the DOE and U.S. Nuclear Regulatory Commission (US-NRC).

b. Nuclear Material/Coupon Sample Irradiation Test

Lightbridge’s irradiation testing program includes coupon irradiation of material samples of its uranium-zirconium fuel alloy which will allow characterization of the underlying thermophysical behavior of the fuel alloy. The design of this program is currently underway, and we expect it to yield results in approximately four years. The data obtained from this program will be a fundamental component of Lightbridge’s accelerated fuel qualification approach described below as it will be used to inform and develop the physics-based models and simulations of the fuel rod behaviors.

c. Loop Irradiation Testing

The purpose of the loop irradiation testing of Lightbridge's metallic fuel rod is to demonstrate the performance and behavior of the fuel rod under prototypic commercial reactor operating conditions typical of PWRs at a power level and burnup accumulation higher than the fuel would experience in normal operation in a commercial power plant. This will provide a physical demonstration of the capabilities of the fuel rod in order to ensure reactor safety. Such testing is expected to provide information of sufficient detail to validate the performance of individual fuel rods such that their behavior in normal operating conditions of a regulated nuclear power plant would be sufficiently well understood to request a license amendment from the US-NRC for operation of a lead test assembly.

We expect execution of such a loop irradiation test to be performed in the ATR at INL. The ATR currently has limited irradiation loop test facilities and the performance of the above-mentioned test for Lightbridge Fuel™ may require installation of a new test loop with increased heat removal capability to enable the desired test conditions. Preliminary discussions with INL personnel have indicated that installation of such a loop would take approximately three years (one year for design and safety evaluation and two years for installation and startup). We assume an additional year of time is required, making the loop potentially available in four years.

We expect the performance of the irradiation test to take three years of in-reactor time plus an additional one year for post-irradiation examination (PIE), wherein analysis of the fuel rod performance and behavior is performed.

These estimates result in a total time for completion of the loop irradiation test of 7-8 years.

d. Preparation for Lead Test Assembly Operation

Insertion of an LTA with Lightbridge's fuel rods in a nuclear power plant requires the power plant owner to obtain approval from the US-NRC based on a safety evaluation and justification that the LTA will not be detrimental to the plant's licensed operations. This justification must address numerous technical areas (e.g. neutronics design, mechanical design, thermal hydraulic design, materials science, reactor operations, etc.) and include considerations of the performance of the LTA itself as well as its interaction with other fuel assemblies in the reactor core which may be impacted by the presence of the LTA. The safety evaluation must result in confirmation that the plant's ability to ensure plant worker and public safety is not compromised due to the operation of the LTA. This safety justification will require cooperation between Lightbridge, the fuel manufacturer, and the power plant owner.

With historical approaches, the development and qualification of a nuclear fuel system can take 20-30 years as the approach has been driven largely by a cycle of physical testing and design changes based on the results of those physical tests. Computer modeling and simulation has increasingly been used in support of fuel qualification efforts, but the cyclical approach continues to be the default methodology.

In order to shorten the timeframe for fuel qualification, advanced nuclear fuel developers are now taking an approach that leverages significant improvements in computational capability in a methodology referred to as Accelerated Fuel Qualification (AFQ). The AFQ approach combines physics-informed modeling and simulation coupled with targeted physical testing such that the overall fuel qualification effort is reduced in terms of cost and time, with a goal of fuel qualification taking 10-15 years. Lightbridge intends to leverage the AFQ methodologies to qualify its advanced fuels.

Along with leveraging the AFQ approach, uranium-zirconium (U-Zr) fuel technology has the benefits of being previously demonstrated in operating icebreaker reactors and several aspects of the performance of the fuel have been demonstrated. This enables Lightbridge to begin designing an LTA and developing the necessary computer models of the fuel behavior, prior to obtaining the results of the loop irradiation testing of the fuel rod.

Along with the irradiation testing and computer simulations, some physical testing of the fuel assembly design will be required. Lightbridge anticipates that such 'out-of-pile' testing to justify the LTA performance will take no more than four years.

We expect that the LTA design effort, development of computer modeling and simulation capabilities, and performance of the LTA safety justification will take 8 years. The US-NRC review and approval of the license amendment for LTA insertion is expected to require two years after the license amendment is submitted.

Based on these activities and time estimates, Lightbridge expects to have LTAs of its fuel ready for insertion in a commercial reactor in the early 2030s.

The above fuel development strategy is based on the following key assumptions:

- Funding requirements are met with U.S. government providing most of the necessary fuel development costs;
- Time estimates for irradiation loop design and construction at ATR can be achieved by the national laboratory complex;
- Partnership with nuclear power plant and fuel manufacturer for LTA demonstration purposes is achieved in a timely manner and does not delay the assumed start of work;
- Accelerated fuel qualification methodology developed for Lightbridge Fuel™ is accepted by the US-NRC as sufficient for the safety justification of the LTAs;
- Execution of out-of-reactor fuel development activities can be performed in parallel with LTA design;
- Facilities and personnel for completion of the fuel development work are available when necessary and do not delay the execution of our research and development activities;
- By implementation of accelerated burn-up techniques, the irradiation loop at ATR is capable of 50% reduction in irradiation time compared to operating commercial reactor fuel cycle; and
- The pilot fabrication facility will be capable of manufacturing up to one batch reload per year.

Recent Developments

GAIN Vouchers

- The DOE awarded us a GAIN voucher in 2019 for the experiment design for irradiation of material samples of Lightbridge metallic fuel in the ATR at INL. On April 22, 2020, we entered into a CRADA with Battelle Energy Alliance, LLC, the DOE's operating contractor at INL, and the project commenced in the second quarter of 2020 and was completed during the third quarter of 2021. This experiment design forms the basis of our current and future efforts with the INL. The total project value provided by the DOE was approximately $0.5 million.

- On March 25, 2021, we were awarded a second voucher from the DOE's GAIN program to support development of Lightbridge Fuel™ in collaboration with PNNL. The scope of the project was to demonstrate Lightbridge's nuclear fuel casting process using depleted uranium, a key step in the manufacture of Lightbridge Fuel™. On July 14, 2021, the Company executed a CRADA with the Battelle Memorial Institute, Pacific Northwest Division, the operating contractor of the PNNL, in collaboration with the DOE. The project commenced in the third quarter of 2021 and we expect it to be completed by the third quarter of 2022. The total project value is approximately $0.7 million, with three-quarters of this amount provided by DOE for the scope performed by PNNL. This second GAIN voucher demonstrates the DOE's support of Lightbridge's development of its advanced nuclear fuel technologies.

Lightbridge demonstrated in 2021 the co-extrusion process for the three-lobed variant of its U-Zr fuel technology for use in certain SMRs by producing several SMR-length surrogate rods (i.e., non-uranium bearing).

We expanded our patent portfolio by successfully obtaining 7 new patents in 2021, in the United States and other key foreign countries. The new patents will help safeguard the Company's intellectual property.

Operations Review

Consolidated Results of Operations

The following table presents our operating results as a percentage of revenues for the years indicated (rounded to millions):

	Years Ended December 31,		Increase (Decrease)	Increase (Decrease)
	2021	2020	Change $	Change %
Operating Expenses				
General and administrative	$ 7.1	$ 8.3	$ (1.2)	(14)%
Research and development	$ 1.4	$ 0.9	$ 0.5	56%
Legal settlement costs	$ —	$ 4.2	$ (4.2)	(100)%
Patents write-off and impairment loss	$ —	$ 1.2	$ (1.2)	(100)%
Total Operating Expenses	$ 8.5	$ 14.6	$ (6.1)	(42)%
Other Operating Income				
Distribution from joint venture	$ 0.1	$ —	$ 0.1	—
Contributed services – research and development	$ 0.5	$ 0.1	$ 0.4	400%
Total Other Operating Income	$ 0.6	$ 0.1	$ 0.5	500%
Total Operating Loss	$ (7.9)	$ (14.5)	$ 6.6	(46)%
Other Income	$ 0.1	$ 0.1	$ —	—
Net loss before Income Taxes	$ (7.8)	$ (14.4)	$ 6.6	(46)%
Net Loss	$ (7.8)	$ (14.4)	$ 6.6	(46)%

Operating Expenses

General and Administrative Expenses

General and administrative expenses consist mostly of compensation and related costs for personnel and facilities, stock-based compensation, finance, human resources, information technology, and fees for consulting and other professional services. Professional services are principally comprised of legal, audit, strategic advisory services, and outsourcing services.

Total general and administrative expenses decreased by approximately $1.2 million for the year ended December 31, 2021, as compared to the year ended December 31, 2020. There was a decrease in professional fees of approximately $2.2 million primarily due to a decrease in the legal and professional fees relating to the settlement to terminate the Enfission joint venture, a decrease in amortization expense of approximately $0.1 million due to patents costs being expensed in 2021 and a decrease in business development expenses of approximately $0.1 million. These decreases were offset by an increase of approximately $0.6 million in stock-based compensation expense due to the acceleration of the vesting of the remaining unvested 2020 RSU grants in 2021, an increase of $0.2 million in various consulting fees, an increase of approximately $0.2 million in insurance expense, due to the increased premiums in directors' and officers' insurance, and an increase of approximately $0.2 million in Directors' fees, due to the increase in the number of independent directors serving on our board of directors in 2021.

Total stock-based compensation included in general and administrative expenses was approximately $0.8 million and $0.1 million for the year ended December 31, 2021and 2020, respectively.

Research and Development

R&D expenses consist primarily of compensation and related fringe benefits including stock-based compensation and related allocable overhead costs for the research and development of our nuclear fuel, including work performed with the DOE's national laboratories.

Total R&D expenses increased by approximately $0.5 million for the year ended December 31, 2021, as compared to the year ended December 31, 2020. There was an increase of approximately $0.5 million in outside research and development work with the DOE's national laboratories related to the first GAIN voucher and an increase of approximately $0.2 million in patent expenses. These increases were offset by a decrease in allocated employee compensation and employee benefits to R&D of approximately $0.2 million. All other R&D expenses were primarily consistent period over period.

Due to the nature of our R&D expenditures, cost and schedule estimates are inherently uncertain and can vary significantly as new information and the outcome of these R&D activities become available. Our future business operations are dependent on budgetary constraints due primarily to market conditions and the uncertainty of future liquidity and capital resources available to us to conduct our future R&D activities.

Legal settlement costs

On February 11, 2021, the Company entered into a settlement agreement with our former joint venture partner in Enfission resolving the pending claims and counterclaims between the parties in arbitration and judicial proceedings and the Company paid approximately $4.2 million in legal settlement costs on March 15, 2021. This amount was recorded in operating expenses as legal settlement costs for the year ended December 31, 2020. Under the terms of the settlement agreement, all joint venture agreements were terminated, and the joint venture was dissolved on March 23, 2021. (See Note 4. Commitments and Contingencies of the Notes to the Consolidated Financial Statements included in Part II. Item 8. *Financial Statements and Supplementary Data*, of this Annual Report on Form 10-K for more information).

Patent write-off and impairment loss

As a result of a triggering event that required an impairment provision of the total carrying value of our patent costs, we recorded a total impairment loss and patent write-off of $1.2 million in the fourth quarter of 2020. All patent costs were expensed as incurred in 2021.

Other Operating Income

Total other operating income increased approximately $0.5 million for the year ended December 31, 2021, as compared to the year ended December 31, 2020. This increase was due to the final cash distribution from the dissolved Enfission joint venture of $0.1 million and an increase in contributed services – research and development from the GAIN voucher of approximately $0.4 million. Contributed services – research and development is recorded on a gross method with the contributed services – research and development shown as other operating income and the related costs as a charge to research and development expenses.

Other Income

Interest income generated from the interest earned from our treasury bills and from our bank savings account was not significant for both years ended December 31, 2021 and 2020.

Provision for Income Taxes

On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) was enacted in response to the COVID-19 pandemic. The CARES Act, among other things, permits net operating loss (NOL) carryovers and carrybacks to offset 100% of taxable income for taxable years beginning before 2021. In addition, the CARES Act allows NOLs incurred in 2018, 2019, and 2020 to be carried back to each of the five preceding taxable years to generate a refund of previously paid income taxes. The Company has evaluated the impact of the CARES Act and does not expect that the NOL carryback provision of the CARES Act will result in a material cash benefit. We incurred a pre-tax net loss for both 2021 and 2020. We reviewed all sources of income for purposes of recognizing the deferred tax assets and concluded a full valuation allowance for 2021 and 2020 was necessary. Therefore, we did not have a provision for taxes for both years ended December 31, 2021 and 2020. Prior period ownership changes, coupled with the Company's projections of taxable income for the foreseeable future, could substantially limit any future benefit to be derived from our NOLs.

See Note 6. Income Taxes of the Notes to our Consolidated Financial Statements included in Part II. Item 8. *Financial Statements and Supplementary Data*, of this Annual Report on Form 10-K for information regarding our income taxes and the limitations on the utilization and amount of our net operating loss carry-forwards.

Liquidity, Capital Resources and Financial Position

Liquidity Outlook

Our cash requirements for the future planned operations to develop and commercialize our nuclear fuel, including any additional expenditures that may result from unexpected developments, requires us to raise significant additional capital and receive government support. Our cash requirements are approximately $10 million of outside R&D expenditures per year over the next 10-15 years. Our cash balance at December 31, 2021 and as of the date of this filing does not exceed our anticipated cash requirements for the next 12 months or through the first quarter of 2023.

At December 31, 2021, we had cash and cash equivalents of approximately $24.7 million, as compared to approximately $21.5 million at December 31, 2020, an increase of approximately $3.2 million. The Company raised approximately $14.8 million from the sale of approximately 2.0 million shares of common stock during the year ended December 31, 2021. The Company's net cash used in operating activities for the year ended December 31, 2021 was approximately $11.0 million and current projections indicate that we will have continued negative cash flows for the foreseeable future. We are not profitable, and we cannot provide any assurance that we will become profitable in the future. We will continue to incur losses because we are in the early development stage of commercializing our nuclear fuel.

We have approximately $28.8 million of working capital as of the date of this filing. We currently project a negative cash flow from our current operations averaging approximately $1.0 to $1.2 million per month for our general and administrative and R&D expenses, for total expected expenditures of approximately $12 million to $18 million for the next 12 to 15 months. We believe, however, that our actual expenditures may exceed our current available working capital through the first quarter of 2023. There are inherent uncertainties in forecasting future required R&D or other expenditures, as we are currently working on establishing fuel development agreements with the DOE's national laboratories and others. Once many of these anticipated agreements are finalized or other future R&D agreements are entered into and the future R&D costs are known, we expect to forecast a significantly higher level of future required R&D expenses and higher negative monthly cash flows from operations in the future.

If sufficient funding becomes available to us, our R&D activities may significantly increase in the future. This funding is needed to continue our nuclear fuel development project and to achieve our future R&D milestones. COVID-19 may also affect costs and future operations by potentially delaying our work at the DOE's national laboratories. The actual amount of cash we will need to operate is subject to many factors, including, but not limited to, the timing, design and conduct of the R&D work at the DOE's national laboratories for our fuel along with cost to commercialize our nuclear fuel. Accordingly, there is high potential for budget variances in the current cost projections and fuel development timelines of our current planned operations over the fuel development period. We will continue to utilize our ATM to finance our future R&D and corporate activities.

We will also need to receive substantial U.S. government support throughout our nuclear fuel R&D period in order to fund our R&D efforts in the future. If we are unable to obtain this government funding that meets our future R&D cash requirements, we will need to seek other funding, which may include the issuance of additional shares of the Company's common stock, if available. This will result in dilution to our existing stockholders. If we can raise additional funds through the issuance of preferred stock, other equity or convertible securities, these securities could have rights or preferences senior to those of our common stock and could contain covenants that restrict our operations in the future. There can be no assurance that we will be able to obtain additional equity or debt financing on terms acceptable to us, if at all.

Considering the above-mentioned uncertainties and lack of financial resources to fund our current and long-term fuel development costs and corporate overhead expenses, substantial doubt exists about the Company's ability to continue as a going concern for the 12 months following the date of this filing. We have the ability to delay or reduce certain operating expenses, including R&D expenses in the next 12 to 15 months, which could reduce our cash flow shortfall. However, this delay would also extend our projected fuel development timeline discussed above.

The primary source of cash available to us for the next 12 months is the potential funding from equity issuances from our ATM equity offering sales agreement, as amended, with Stifel, Nicolaus & Company, Incorporated. The Company has an effective shelf registration statement on Form S-3 that was filed with the SEC on March 25, 2021, registering the sale of up to $75 million of the Company's securities and declared effective on April 5, 2021. Due to the offering limitations currently applicable under General Instruction I.B.6. of Form S-3 and the market valuation of our current public float, we may be limited on the amount of funding available under this Form S-3 shelf registration statement in the future. We filed a prospectus supplement dated April 9, 2021, with the Securities and Exchange Commission pursuant to which we offered and sold shares of common stock having an aggregate offering price of up to $9.0 million through our ATM. We filed a second prospectus supplement, dated November 19, 2021, with the Securities and Exchange Commission pursuant to which we may offer and sell shares of common stock having an aggregate offering price of up to up to $20.0 million from time to time under this prospectus supplement, through the ATM.

We have no debt or lines of credit and we have financed our operations to date through the sale of our preferred stock and common stock. Management believes that public or private equity investments may be available in the future, however adverse market conditions in our common stock price and trading volume, as well as other factors like COVID-19 could substantially impair our ability to raise capital in the future and to continue the nuclear fuel development project.

Short-Term and Long-Term Liquidity Sources

As discussed above, we will seek new financing bringing us additional sources of capital, depending on the capital market conditions of our common stock. There can be no assurance that these additional sources of capital will be made available to us. The primary potential sources of cash that may be available to us are as follows:

- Equity or debt investment from third party investors in Lightbridge;
- Collaboration with potential industry partners; and
- Strategic investment and U.S. government funding to support the remaining R&D activities required to continue the development of our fuel products and move them to a commercial stage.

In support of our long-term business with respect to our fuel technology business, we endeavor to create strategic alliances with other parties during the next three years, to support the remaining R&D activities that is required to further enhance and complete the development of our fuel products to a commercial stage. We may be unable to form such strategic alliances on terms acceptable to us or at all.

See Note 7. Stockholders' Equity and Stock-Based Compensation of the Notes to the Consolidated Financial Statements included in Part II. Item 8. *Financial Statements and Supplementary Data*, of this Annual Report on Form 10-K for information regarding our prior financings.

The following table provides detailed information about our net cash flows for the years ended December 31, 2021 and 2020:

Cash Flow

	Year Ended December 31,	
	2021	**2020**
	(rounded in millions)	
Net cash used in operating activities	$ (11.0)	$ (8.6)
Net cash used in investing activities	$ —	$ (0.2)
Net cash provided by financing activities	$ 14.2	$ 12.4
Net cash inflow	$ 3.2	$ 3.6

Operating Activities

Cash used in operating activities for the fiscal years 2021 and 2020 was $11.0 million and $8.6 million, an increase of $2.4 million. Fiscal year 2021 operating cash flows reflect our net loss of $7.8 million, noncash charges (stock-based compensation expense) of $1.1 million and a net decrease from changes in our working capital accounts of approximately $4.3 million. Decreases in operating cash flows caused by working capital changes include a net decrease in accounts payable and accrued expenses of $4.4 million, offset by a decrease in prepaid expenses and other current assets of $0.1 million. The decrease in accounts payable and accrued expenses is primarily related to the payment of the $4.2 million expense accrued in 2020 related to the arbitration settlement (see Note 4. Commitments and Contingencies of the Notes to the Consolidated Financial Statements included in Part II. Item 8. *Financial Statements and Supplementary Data*, of this Annual Report on Form 10-K).

Investing Activities

Net cash used in our investing activities for the year ended December 31, 2021, as compared to net cash used in our investing activities in 2020, decreased by approximately $0.2 million. The decrease was due primarily to a decrease in trademark costs.

Financing Activities

Cash provided by financing activities was $14.2 million and $12.4 million for fiscal years 2021 and 2020, an increase of $1.8 million. Cash provided by our ATM facility was $14.8 million (sale of approximately 2 million common shares). Cash provided by the exercise of stock options was $0.2 million. Cash used during fiscal year 2021 relates to the payment of withholding taxes on net share settlement of equity awards of $0.8 million.

Critical Accounting Policies and Estimates

Patent Costs

Beginning January 1, 2021, patent filing fees with patent granting agencies and legal fees directly relating to those filings, incurred to file patent applications are expensed as the Company believes that there is not a high likelihood that there will be a future economic benefit associated with the patents, due to the uncertainties in the current fuel development timelines and the patents being commercialized.

Contributed services – research and development

The Company concluded that its government grants were not within the scope of ASC Topic 606 as they did not meet the definition of a contract with a customer. Additionally, the Company concluded that the grants met the definition of a contribution, as the grants were a non-reciprocal transaction. As such, the Company determined that Subtopic 958-605, Not-for-Profit-Entities-Revenue Recognition applies for these contributed services, even though the Company is a business entity, as guidance in the contributions received subsections of Subtopic 958-605 applies to all entities (NFPs and business entities).

The Company has early adopted Accounting Standards Update 2020-07 which amends Subtopic 958-605 which further clarifies the presentation and disclosure about contributions.

Subtopic 958-605 requires that nonfinancial assets, which includes services, such as the research and development services provided under the GAIN vouchers described in Note 5, should be shown on a gross method at the fair value of the services contributed, with the contributed services – research and development shown as other operating income and the related costs as a charge to research and development expense, rather than depicting the contributed services – research and development as a reduction of research and development expense. The fair value of contributed services was determined by the cost of professional time and materials which were charged by the subcontractor who fulfilled the services contributed under the grant award.

Accounting for Stock-Based Compensation, Stock Options and Stock Granted to Employees and Non-employees

We adopted the requirements for stock-based compensation, where all forms of share-based payments to employees or non-employees, including stock options and stock purchase plans, are treated the same as any other form of compensation by recognizing the related cost in the consolidated statement of operations.

Under these requirements, stock-based compensation expense for employees is measured at the grant date based on the fair value of the award, and the expense is recognized ratably over the award's vesting period.

The stock-based compensation expense incurred in connection with our employees is based on the employee model of ASC 718. Under ASC 718 an employee is defined as "An individual over whom the grantor of a share-based compensation award exercises or has the right to exercise sufficient control to establish an employer-employee relationship based on common law as illustrated in case law and currently under U.S. tax regulations." The stock-based compensation expense for our consultants is accounted for under ASU 2018-07, which allows us to account for options issued to consultants in the same manner as they are issued to our employees. For all service-based grants made, we recognize compensation cost under the straight-line method.

We measure the fair value of service-based stock options on the measurement date using the Black-Scholes option-pricing model, which requires the use of several estimates, including:

- the volatility of our stock price;
- the expected life of the option;
- risk free interest rates; and
- expected dividend yield.

We use the historical volatility of our stock price over the number of years that matches the expected life of our stock option grants or we use the historical volatility of our stock price since January 5, 2006, the date we announced that we were becoming a public company, to estimate the future volatility of our stock. At this time, we do not believe that there is a better objective method to predict the future volatility of our stock. The expected life of options is based on internal studies of historical experience and projected exercise behavior. We estimate expected forfeitures of stock-based awards at the grant date and recognize compensation cost only for those awards expected to vest. The forfeiture assumption is ultimately adjusted to the actual forfeiture rate. Estimated forfeitures are reassessed in subsequent periods and may change based on new facts and circumstances. We utilize a risk-free interest rate, which is based on the yield of U.S. treasury securities with a maturity equal to the expected life of the options. We have not and do not expect to pay dividends on our common shares for the foreseeable future.

We use the Monte Carlo valuation model to determine the fair value of market-based and performance-based stock options at the date of grant, which requires us to make assumptions, including:

- expected term;
- volatility;
- dividend yield;
- risk-free interest rate; and
- forfeiture rates.

These assumptions are based on historical information and judgment regarding market factors and trends. If actual results differ from our assumptions and judgments used in estimating these factors, future adjustments to these estimates may be required.

Research and Development Expenses

Research expenses are recognized as expenses when incurred. Costs incurred on development projects are recognized as intangible assets as of the date as of which it can be established that it is probable that future economic benefits attributable to the asset will flow to us considering its commercial feasibility. This is generally the case when regulatory approval for commercialization is achieved and costs can be measured reliably. Given the current stage of the development of our products, no development expenditures have yet been capitalized.

Recent Accounting Standards and Pronouncements

Refer to Note 1. Basis of Presentation, Summary of Significant Accounting Policies, and Nature of Operations of the Notes to our Consolidated Financial Statements in Part II. Item 8. *Financial Statements and Supplementary Data,* of this Form 10-K for a discussion of recent accounting standards and pronouncements.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURE ABOUT MARKET RISK

The Company is not required to provide the information required by this Item as it is a “smaller reporting company,” as defined in Rule 12b-2 of the Exchange Act.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The full text of our audited consolidated financial statements as of and for the years ended December 31, 2021 and 2020 begins on page 52 of this Report.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We are required to maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in our reports filed under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission’s rules and forms, and that such information is accumulated and communicated to our management, including our chief executive officer (also our principal executive officer) and our chief financial officer (also our principal financial and accounting officer) to allow for timely decisions regarding required disclosure.

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer (our principal executive officer and principal financial officer, respectively), evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2021. Based on the evaluation of our disclosure controls and procedures as of December 31, 2021, our Chief Executive Officer and Chief Financial Officer concluded that, as of such date, our disclosure controls and procedures are effective.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f).

All internal control systems, no matter how well designed, have inherent limitations including the possibility of human error and the circumvention or overriding of controls. Further, because of changes in conditions, the effectiveness of internal controls may vary over time. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. Therefore, even those systems determined to be effective can provide us only with reasonable assurance with respect to financial statement preparation and presentation.

Our internal control system was designed to provide reasonable assurance to our management and Board regarding the preparation and fair presentation of published financial statements. Management evaluated the effectiveness of our internal control over financial reporting using the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control - Integrated Framework in 2013. Management, under the supervision and with the participation of our Chief Executive Officer and Chief Financial Officer, assessed the effectiveness of our internal control over financial reporting as of December 31, 2021 and concluded that it was effective, in providing reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with U.S. GAAP.

Changes in Internal Control over Financial Reporting

There were no changes in internal control over financial reporting that occurred during the fourth fiscal quarter that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None

ITEM 9C. Disclosure Regarding Foreign Jurisdictions That Prevent Inspections

Not applicable.

PART III

Item 10. Directors and Executive Officers of the Registrant

The information required by Item 10 of Part III will be included in our Proxy Statement relating to the 2022 Annual Meeting of Stockholders and is incorporated herein by reference.

Item 11. Executive Compensation

Summary Compensation Table

Information required by Item 11 of Part III will be included in our Proxy Statement relating to the 2022 Annual Meeting of Stockholders and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Shareholders The information required by

Information required by Item 12 of Part III will be included in our Proxy Statement relating to the 2022 Annual Meeting of Stockholders and is incorporated herein by reference.

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

Information required by Item 13 of Part III will be included in our Proxy Statement relating to the 2022 Annual Meeting of Stockholders and is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

Information required by Item 14 of Part III will be included in our Proxy Statement relating to the 2022 Annual Meeting of Stockholders and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) Documents filed as part of this report.

(1) The following financial statements of Lightbridge Corporation, supplemental information and report of independent registered public accounting firm are included in this Form 10-K:

- Consolidated Balance Sheets at December 31, 2021 and 2020
- Consolidated Statements of Operations for the Years Ended December 31, 2021 and 2020
- Consolidated Statements of Cash Flows for the Years Ended December 31, 2021 and 2020
- Consolidated Statements of Changes in Stockholders' Equity for the Years Ended December 31, 2021 and 2020
- Notes to Consolidated Financial Statements
- Report of BDO USA, LLP dated March 31, 2022 on the Company's financial statements filed as a part hereof for the fiscal years ended December 31, 2021 and 2020. The independent registered public accounting firm's consent with respect to this report appears in Exhibit 23 of this Annual Report on Form 10-K.

(2) All schedules have been omitted because they are not required, not applicable or the information is otherwise included.

(3) Exhibits.

Exhibit Number	Description
1.1	At-the-Market Equity Offering Sales Agreement, dated May 28, 2019, by and between Lightbridge Corporation and Stifel, Nicolaus & Company, Incorporated (incorporated by reference to Exhibit 1.1 to the Form 8-K filed by the Company on May 28, 2019).
1.2	Amendment No. 1 to the At-the-Market Equity Offering Sales Agreement, dated May 28, 2019, by and between Lightbridge Corporation and Stifel, Nicolaus & Company, Incorporated (incorporated by reference to Exhibit 1.1 to the Form 8-K filed by the Company on April 9, 2021).
3.1	Articles of Incorporation of the Company, as amended through July 26, 2021 (incorporated by reference to Exhibit 3.1 to the Form 10-Q filed by the Company on August 9, 2021).
3.2	Amended and Restated Bylaws of the Company as amended through November 4, 2021 (incorporated by reference to Exhibit 3.1 to the Form 10-Q filed by the Company on November 8, 2021).
4.1	Form of Common Stock Purchase Warrant, as amended (incorporated by reference to Exhibit 4.1 to the Form 8-K filed by the Company on July 7, 2016).
4.2*	Description of Securities.
4.3	Specimen Certificate for Company's Common Stock (incorporated by reference to Exhibit 4.1 to the Company's registration statement on Form S-3 filed on April 1, 2013, File No. 333-187659).
10.1**	Lightbridge Corporation 2006 Stock Plan (incorporated by reference to Exhibit 10.1 to the Form 8-K filed by the Company on February 21, 2006).
10.2**	Lightbridge Corporation 2015 Equity Incentive Plan, as amended (incorporated by reference to Appendix A to the definitive proxy statement filed on March 29, 2018, File No. 001-34487).

10.3**	Form of Incentive Stock Option Agreement for Employees under the 2015 Equity Incentive Plan (incorporated by reference to Exhibit 99.2 to the Company's Registration Statement on Form S-8, File No. 333-218796, filed on June 16, 2017).
10.4**	Form of Non-Qualified Stock Option Agreement for Employees under the 2015 Equity Incentive Plan (incorporated by reference to Exhibit 99.3 to the Company's Registration Statement on Form S-8, File No. 333-218796, filed on June 16, 2017).
10.5**	Form of Non-Qualified Stock Option Agreement for Non-Employee Directors under the 2015 Equity Incentive Plan (incorporated by reference to Exhibit 99.4 to the Company's Registration Statement on Form S-8, File No. 333-218796, filed on June 16, 2017)
10.6**	Amended Lightbridge Corporation 2020 Omnibus Incentive Plan (incorporated by reference to Appendix A to the definitive proxy statement filed on April 7, 2021).
10.7**	Form of Non-Statutory Stock Option Agreement for Employees under the 2020 Omnibus Incentive Plan. (incorporated by referenced to Exhibit 10.12 to the Form 10-K filed by the Company on March 25, 2021).
10.8**	Form of Restricted Stock Unit Award Agreement for Employees under the 2020 Omnibus Incentive Plan. (incorporated by referenced to Exhibit 10.13 to the Form 10-K filed by the Company on March 25, 2021).
10.9**	Form of Restricted Stock Unit Award Agreement for Non-Employee Directors under the 2020 Omnibus Incentive Plan. (incorporated by referenced to Exhibit 10.14 to the Form 10-K filed by the Company on March 25, 2021).
10.10**	Employment Agreement, dated August 8, 2018, between the Company and Seth Grae (incorporated by referenced to Exhibit 10.2 to the Form 10-Q filed by the Company on August 9, 2018).
10.11**	Employment Agreement, dated August 8, 2018, between the Company and Andrey Mushakov (incorporated by referenced to Exhibit 10.3 to the Form 10-Q filed by the Company on August 9, 2018).
10.12**	Employment Agreement, dated August 8, 2018, between the Company and Larry Goldman (incorporated by referenced to Exhibit 10.4 to the Form 10-Q filed by the Company on August 9, 2018).
10.13**	Form of Indemnification Agreement (August 2018) (incorporated by referenced to Exhibit 10.5 to the Form 10-Q filed by the Company on August 9, 2018).
10.14 *	Form of Restricted Stock Award Agreement under the 2020 Omnibus Incentive Plan.
21.1	Subsidiaries of the Company (incorporated by reference to Exhibit 21.1 to the Form 10-K filed by the Company on March 15, 2016).
23.1*	Consent of BDO USA, LLP.
24.1*	Power of Attorney (Included on the signature page hereto).
31.1*	Rule 13a-14(a)/15d-14(a) Certification - Principal Executive Officer.
31.2*	Rule 13a-14(a)/15d-14(a) Certification - Principal Financial Officer and Principal Accounting Officer.
32*	Section 1350 Certifications.
101	The following materials from Lightbridge Corporation's Annual Report on Form 10-K for the year ended December 31, 2021, formatted in Inline eXtensible Business Reporting Language (XBRL): (i) the Consolidated Balance Sheets; (ii) Consolidated Statement of Operations; (iii) Consolidated Statement of Cash Flows; (iv) Consolidated Statement of Changes in Stockholders' Equity; and (v) Notes to Consolidated Financial Statements
101.INS	Inline XBRL Instance Document (the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document).
101.SCH	Inline XBRL Taxonomy Extension Schema Document.
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.

101.LAB	Inline XBRL Taxonomy Extension Labels Linkbase Document.
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.
104*	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101).

_____

* Filed or furnished herewith

** Indicates management contract or compensatory plan or arrangement.

Item 16. Form 10-K Summary

None.

LIGHTBRIDGE CORPORATION
DECEMBER 31, 2021 and 2020

TABLE OF CONTENTS

Report of Independent Registered Public Accounting Firm

Shareholders and Board of Directors
Lightbridge Corporation
Reston, Virginia

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Lightbridge Corporation (the "Company") as of December 31, 2021 and 2020, the related consolidated statements of operations, changes in stockholders' equity, and cash flows for each of the years then ended, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2021 and 2020, and the results of its operations and its cash flows for the years then ended**,** in conformity with accounting principles generally accepted in the United States of America.

Going Concern Uncertainty

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the consolidated financial statements, the Company has suffered recurring losses from operations since its inception, has negative cash flows from operations, has an accumulated deficit of approximately $137 million as of December 31, 2021 and the Company expects to incur further net losses in the development of its business. These conditions raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated 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 consolidated 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 consolidated financial statements. We believe that our audits provide 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 consolidated 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 consolidated 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 consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Accounting for Contributed Services – Research and Development

As described in Notes 1 and 5 to the consolidated financial statements, the Company was awarded two vouchers from the U.S. Department of Energy's Gateway for Accelerated Innovation in Nuclear (GAIN) program to support the development of the Company's metallic nuclear fuels. During the year ended December 31, 2021, the Company recorded approximately $0.5 million of contributed services. The contributed research and administrative services received under these GAIN vouchers were evaluated for proper financial statement presentation and it was determined that the fair value of these contributed services should be presented as other operating income with an offsetting charge to research and development expenses on the consolidated statement of operations, rather than presenting contributed services as a reduction of research and development expenses.

We identified the accounting and presentation of contributed services as a critical audit matter. Our principal considerations included the existence of subjective judgments related to certain provisions of the GAIN voucher agreements in connection with the determination of the accounting and presentation. Auditing the Company's accounting and presentation of the contributed services was challenging given the significant audit effort to evaluate the application of the appropriate accounting guidance and the methods used by the Company in applying that guidance.

The primary procedures we performed to address this critical audit matter included:

- Reading the GAIN voucher agreements along with management's technical accounting memo to understand the facts and circumstances within the GAIN voucher agreements.
- Evaluating the appropriateness of management's interpretation on how to apply the relevant accounting guidance for presenting contributed services received under the GAIN vouchers.
- Evaluating the appropriateness of management's accounting policy for contributed services.

/s/ BDO USA, LLP

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

Philadelphia, Pennsylvania
March 31, 2022

LIGHTBRIDGE CORPORATION
CONSOLIDATED BALANCE SHEETS

	December 31, 2021	December 31, 2020
ASSETS		
Current Assets		
Cash and cash equivalents	$ 24,747,613	$ 21,531,665
Prepaid expenses and other current assets	113,452	172,460
Total Current Assets	24,861,065	21,704,125
Other Assets		
Trademarks	101,583	85,562
Total Assets	$ 24,962,648	$ 21,789,687
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current Liabilities		
Accounts payable and accrued liabilities	$ 171,521	$ 382,130
Accrued legal settlement costs	—	4,200,000
Total Current Liabilities	171,521	4,582,130
Commitments and contingencies - Note 4		
Stockholders' Equity		
Preferred stock, $0.001 par value, 10,000,000 authorized shares		
Convertible Series A preferred shares, 0 and 699,878 shares issued and outstanding at December 31, 2021 and 2020, respectively (liquidation preference $0 and $2,613,025 at December 31, 2021 and 2020, respectively)	—	699
Convertible Series B preferred shares, 0 and 2,666,667 shares issued and outstanding at December 31, 2021 and 2020 (liquidation preference $0 and $4,897,517 at December 31, 2021 and 2020, respectively)	—	2,667
Common stock, $0.001 par value, 13,500,000 authorized, 9,759,223 shares and 6,567,110 shares issued and outstanding at December 31, 2021 and 2020, respectively	9,759	6,567
Additional paid-in capital	161,772,641	146,353,232
Accumulated deficit	(136,991,273)	(129,155,608)
Total Stockholders' Equity	24,791,127	17,207,557
Total Liabilities and Stockholders' Equity	$ 24,962,648	$ 21,789,687

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

LIGHTBRIDGE CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS

	Years Ended December 31,	
	2021	**2020**
Revenue	$ —	$ —
Operating Expenses		
General and administrative	7,133,618	8,312,583
Research and development	1,366,496	891,626
Legal settlement costs	24,940	4,200,000
Patent write-off and impairment loss	—	1,169,644
Total Operating Expenses	8,525,054	14,573,853
Other Operating Income		
Distribution from joint venture	119,641	—
Contributed services – research and development	527,927	72,709
Total Other Operating Income	647,568	72,709
Total Operating Loss	$ (7,877,486)	$(14,501,144)
Other Income		
Interest income	8,127	83,878
Foreign currency transaction gain	33,694	—
Total Other Income	41,821	83,878
Net Loss Before Income Taxes	(7,835,665)	(14,417,266)
Income taxes	—	—
Net Loss	$ (7,835,665)	$(14,417,266)
Accumulated Preferred Stock Dividend	(477,991)	(512,953)
Additional deemed dividend on preferred stock due to the beneficial conversion feature	(213,720)	(222,196)
Deemed dividend upon induced conversions of Series A and Series B Preferred Stock to common stock	(3,509,328)	—
Net Loss Attributable to Common Shareholders	$(12,036,704)	$(15,152,415)
Net Loss Per Common Share		
Basic and diluted	$ (1.71)	$ (3.59)
Weighted Average Number of Common Shares Outstanding	7,035,510	4,216,568

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

LIGHTBRIDGE CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Years Ended December 31,	
	2021	**2020**
Operating Activities		
Net Loss	$ (7,835,665)	$(14,417,266)
Adjustments to reconcile net loss from operations to net cash used in operating activities:		
Common stock issued for services	254,994	17,000
Stock-based compensation	826,493	53,341
Patent write-off and impairment loss	—	1,169,645
Amortization of patents	—	100,117
Changes in operating working capital items:		
Other receivable from joint venture	—	400,000
Prepaid expenses and other current assets	59,008	(125,089)
Accounts payable and accrued liabilities	(140,919)	31,831
Accrued legal settlement costs	(4,200,000)	4,200,000
Net Cash Used in Operating Activities	(11,036,089)	(8,570,421)
Investing Activities		
Trademarks	(16,021)	(210,436)
Net Cash Used in Investing Activities	(16,021)	(210,436)
Financing Activities		
Net proceeds from the issuances of common stock	14,821,354	12,328,520
Net proceeds from the exercise of stock options	270,857	25,013
Payments for taxes related to net share settlement of equity awards	(824,153)	—
Net Cash Provided by Financing Activities	14,268,058	12,353,533
Net Increase in Cash and Cash Equivalents	3,215,948	3,572,676
Cash and Cash Equivalents, Beginning of Year	21,531,665	17,958,989
Cash and Cash Equivalents, End of Year	$ 24,747,613	$ 21,531,665
Supplemental Disclosure of Cash Flow Information		
Cash paid during the year:		
Interest paid	$ —	$ —
Income taxes paid	$ —	$ —
Non-Cash Financing Activities:		
Accumulated preferred stock dividend	$ 691,711	$ 735,149
Exchanges of preferred stock Series A and B to common stock	$ 3,366	$ —
Payment of accrued liabilities with common stock	$ 69,690	$ 17,000

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

LIGHTBRIDGE CORPORATION
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY
FOR THE YEARS ENDED DECEMBER 31, 2021 AND 2020

	Series A Preferred Stock		Series B Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Equity
	Shares	Amount	Shares	Amount	Shares	Amount			
Balance - December 31, 2019	757,770	$ 757	2,666,667	$ 2,667	3,252,371	$ 3,252	$133,932,615	$(114,738,342)	$ 19,200,949
Conversion of Preferred Stock to Common Stock	(57,892)	(58)	—	—	6,327	6	52	—	—
Common stock issued - registered offerings - net of offering costs and exercise of options	—	—	—	—	3,304,412	3,305	12,350,228	—	12,353,533
Common stock issued for services	—	—	—	—	4,000	4	16,996	—	17,000
Stock-based compensation	—	—	—	—	—	—	53,341		53,341
Net loss	—	—	—	—	—	—	—	(14,417,266)	(14,417,266)
Balance - December 31, 2020	699,878	$ 699	2,666,667	$ 2,667	6,567,110	$ 6,567	$146,353,232	$(129,155,608)	$ 17,207,557
Exchanges of Series A & B Preferred Stock to Common Stock	(699,878)	(699)	(2,666,667)	(2,667)	789,382	790	2,576	—	—
Shares issued, net of share settlement for withholding taxes paid upon vesting of restricted stock units	—	—	—	—	130,281	130	(824,283)	—	(824,153)
Common stock issued pursuant to restricted stock awards	—	—	—	—	188,588	188	(188)	—	—
Common stock issued - registered ATM offerings - net of offering costs	—	—	—	—	2,008,822	2,010	14,819,344	—	14,821,354
Common stock issued through the exercise of options	—	—	—	—	30,282	30	270,827	—	270,857
Common stock issued to directors and consultants for services	—	—	—	—	44,758	44	324,640	—	324,684

Stock-based compensation	—	—	—	—	—	—	826,493	—	826,493
Net loss	—	—	—	—	—	—	—	(7,835,665)	(7,835,665)
Balance - December 31, 2021	—	$ —	—	$ —	9,759,223	$ 9,759	$161,772,641	$(136,991,273)	$ 24,791,127

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

LIGHTBRIDGE CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1. Basis of Presentation, Summary of Significant Accounting Policies, and Nature of Operations

The Company was formed on October 6, 2006, when Thorium Power, Ltd., which was incorporated in the state of Nevada on February 2, 1999, merged with Thorium Power, Inc. (TPI), which was incorporated in the state of Delaware on January 8, 1992 (subsequently and collectively referred to as "we" or the "Company"). On September 29, 2009, the Company changed its name from Thorium Power, Ltd. to Lightbridge Corporation and began its focus on developing and commercializing metallic nuclear fuels. The Company is a nuclear fuel technology company developing its next generation nuclear fuel technology.

Basis of presentation

Going Concern, Liquidity and Management's Plan

The Company's available working capital at December 31, 2021 and as of the date of this filing, does exceed its currently anticipated expenditures through the first quarter of 2022. However, there are inherent uncertainties in forecasting future expenditures, especially forecasting for uncertainties such as future research and development (R&D) costs and other cash outflows, as well as how the COVID-19 outbreak, including the emergence and spread of variant strains of the virus may affect future costs and operations. Also, the cash requirements of the Company's future planned operations to commercialize its nuclear fuel, including any additional expenditures that may result from unexpected developments, requires it to raise significant additional capital, including receiving government support. These uncertainties include the projected fuel development timeline of 15-20 years to fuel commercialization, the operational costs required to keep the fuel development project on schedule and the various risks of developing and commercializing its nuclear fuel. These uncertainties combined, raise substantial doubt about the Company's ability to continue as a going concern for the 12 months following the date of this filing. To the extent any uncertainties reduce the Company's liquidity for the next 12 months, the Company will consider, if available, additional debt or equity raises and delaying certain expenditures, including delaying R&D expenses, until sufficient capital becomes available.

At December 31, 2021, the Company had approximately $24.7 million in cash and had a working capital surplus of approximately $24.7 million. The Company's net cash used in operating activities for the year ended December 31, 2021 was approximately $11.0 million, and current projections indicate that the Company will have continued negative cash flows from operations for the foreseeable future. Net losses incurred for the year ended December 31, 2021 and 2020 amounted to approximately $7.8 million and $14.4 million, respectively. As of December 31, 2021, the Company had an accumulated deficit of approximately $137.0 million, representative of recurring losses since inception. The Company will continue to incur losses because it is in the early research and development stage of developing its nuclear fuel.

The Company's plans to fund future operations include: (1) raising additional capital through future equity issuances or convertible debt financings; (2) additional funding through new relationships to help fund future R&D costs; and (3) seeking other sources of capital, including grants from the federal government. The Company may issue securities, including common stock, preferred stock, and stock purchase contracts through private placement transactions or registered public offerings, pursuant to current and future registration statements. The Company's current shelf registration statement on Form S-3 was filed with the SEC on March 25, 2021, registering the sale of up to $75 million of the Company's securities and declared effective on April 5, 2021. Due to the offering limitations currently applicable under General Instruction I.B.6. of Form S-3 and the market valuation of our current public float, we may be limited on the amount of funding available under this Form S-3 shelf registration statement in the future. There can be no assurance as to the future availability of equity capital or the acceptability of the terms upon which financing and capital might become available. The Company's future liquidity needs to develop its nuclear fuel are long-term, and the ability to address those needs and to raise capital will largely be determined by the success of the development of its nuclear fuel, key nuclear development and government regulatory events, and its business decisions in the future.

Basis of Consolidation

These consolidated financial statements include the accounts of Lightbridge, a Nevada corporation, and the Company's wholly-owned subsidiaries, TPI, a Delaware corporation, and Lightbridge International Holding LLC, a Delaware limited liability company. These wholly-owned subsidiaries are inactive. All significant intercompany transactions and balances have been eliminated in consolidation.

Segment Reporting

ASC Topic 280, "Segment Reporting," requires use of the "management approach" model for segment reporting. The management approach model is based on the way a company's management organizes segments within the company for making operating decisions and assessing performance. We report our results in a single reportable segment, which reflects how our chief operating decision maker allocates resources considering our core data which is managed centrally on a company-wide basis, and evaluates our financial results. Because we have a single reportable segment, all required financial segment information can be found directly in the Consolidated Financial Statements. We evaluate the performance of our reporting segment based on operating expenses and will evaluate additional segment disclosure requirements if and when the Company expands its operation.

Use of Estimates and Assumptions

The preparation of consolidated financial statements, in conformity with accounting principles generally accepted in the United States of America, requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

Significant Estimates

These accompanying consolidated financial statements include some amounts that are based on management's best estimates and assumptions. The most significant estimates relate to its patent impairment evaluation and undiscounted and discounted cash flow projections used for the impairment testing of its patents, valuation of stock options, the valuation allowance on deferred tax assets and contingent liabilities. It is reasonably possible that these above-mentioned estimates and others may be adjusted as more current information becomes available, and any adjustment could be significant in future reporting periods.

Fair Value of Financial Instruments

The Company's consolidated financial instruments consist principally of cash and cash equivalents, and accounts payable. The fair value of a financial instrument is the amount that would be received in an asset sale or paid to transfer a liability in an orderly transaction between unaffiliated market participants. Assets and liabilities measured at fair value are categorized based on whether the inputs are observable in the market and the degree that the inputs are observable. The categorization of financial instruments within the valuation hierarchy is based on the lowest level of input that is significant to the fair value measurement.

In accordance with the provisions of ASC 820, "Fair Value Measurements," the Company determines fair value 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 Company generally applies the income approach to determine fair value. This method uses valuation techniques to convert future amounts to a single present amount. The measurement is based on the value indicated by current market expectations with respect to the future amounts.

ASC 820 establishes a fair value hierarchy that prioritizes the inputs used to measure fair value. The hierarchy gives the highest priority to active markets for identical assets and liabilities (Level 1 measurement) and the lowest priority to unobservable inputs (Level 3 measurement). The Company classifies fair value balances based on the observability of those inputs. The three levels of the fair value hierarchy are as follows:

Level 1 - Observable inputs such as quoted prices in active markets for identical assets or liabilities

Level 2 - Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets, quoted prices for
identical or similar assets or liabilities in markets that are not active and inputs other than quoted prices that are observable for the asset or liability

Level 3 - Unobservable inputs that reflect management's assumptions

For disclosure purposes, assets and liabilities are classified in their entirety in the fair value hierarchy level based on the lowest level of input that is significant to the overall fair value measurement. The Company's assessment of the significance of a particular input to the fair value measurement requires judgment and may affect the placement within the fair value hierarchy levels.

Quoted market prices were applied to determine the fair value of U.S. Treasury Bill investments, therefore they were categorized as Level 1 on the fair value hierarchy. The Company buys and holds short-term U.S. Treasury Bills to maturity.

Certain Risks, Uncertainties and Concentrations

The Company will need additional funding by way of a combination of strategic alliances, government grants, further offerings of equity securities, or an offering of debt securities in order to support its future R&D activities required to further enhance and complete the development of its fuel products to a proof-of-concept stage and a commercial stage thereafter.

There can be no assurance that the Company will be able to successfully continue to conduct its operations if there is a lack of financial resources available in the future to continue its fuel development activities, and a failure to do so would have a material adverse effect on the Company's future R&D activities, financial position, results of operations, and cash flows. Also, the success of the Company's operations will be subject to other numerous contingencies, some of which are beyond management's control. These contingencies include general and regional economic conditions, contingent liabilities, potential competition with other nuclear fuel developers, including those entities developing accident tolerant fuels, changes in government regulations, support for nuclear power, changes in accounting and taxation standards, inability to achieve overall short-term and long-term research and development milestones toward commercialization, future impairment charges to its assets, and global or regional catastrophic events. The Company may also be subject to various additional political, economic, and other uncertainties.

On January 30, 2020, the World Health Organization (WHO) announced a global health emergency because of a new strain of coronavirus originating in Wuhan, China (the "COVID-19 outbreak") and the risk to the international community as the virus spread globally beyond its point of origin. In March 2020, the WHO classified the COVID-19 outbreak a pandemic, based on increased exposure globally. The current spread of COVID-19, including the emergence and spread of variant strains of the virus, that is impacting global economic activity and market conditions could lead to adverse changes in the Company's ability to conduct R&D activities with the United States national labs and others. The COVID-19 outbreak had impacted our business operations and results of operations for the years ended December 31, 2021 and 2020, which resulted in a delay of our R&D work and reduction of R&D expenses and an increase in general and administrative expenses due to severance payments to former employees. However, the effects of the pandemic are fluid and changing rapidly, including with respect to vaccine and treatment developments and deployment and potential mutations of COVID-19. While the Company continues to monitor the impact of COVID-19 on its business, the Company is unable to accurately predict the ultimate impact on future results of operations, financial condition and liquidity that COVID-19 will have due to various uncertainties, including the geographic spread of the virus, the severity of the disease, the duration of the outbreak, and actions that may be taken by governmental authorities and other third-parties.

On March 27, 2020, the "Coronavirus Aid, Relief, and Economic Security (CARES) Act." was signed into law. The CARES Act, among other things, includes provisions relating to refundable payroll tax credits, deferment of employer social security payment, net operating loss carryback period, alternative minimum tax credit refund, modification to the net interest deduction limitation, increased limitations on qualified charitable contributions, and technical corrections to tax depreciation method for qualified improvement property. It also appropriated funds for the SBA Paycheck Protection Program loans that are forgivable in certain situations to promote continued employment, as well as Economic Injury Disaster Loans to provide liquidity to small businesses harmed by COVID-19. Management decided not to apply for these funds. The CARES Act did not have an impact on the Company's results of operations, financial condition, and liquidity.

Cash and Cash Equivalents

The Company may at times invest its excess cash in interest bearing accounts and U.S. Treasury Bills. It classifies all highly liquid investments with original stated maturities of three months or less from date of purchase as cash equivalents and all highly liquid investments with stated maturities of greater than three months as marketable securities. The Company holds cash balances in excess of the federally insured limits of $250,000. It deems this credit risk not to be significant as cash is held by two prominent financial institutions in 2021 and 2020. The Company buys and holds short-term U.S. Treasury Bills to maturity. U.S. Treasury Bills totaled approximately $9.0 million and $13.0 million at December 31, 2021 and 2020, respectively. The remaining $15.7 million and $8.5 million at December 31, 2021 and 2020, respectively, are on deposit with two notable financial institutions.

Contributed services – research and development

The Company was awarded a grant from the United States Department of Energy which represented contributed services to further the Company's research and development activities. The Company concluded that its government grants were not within the scope of ASC Topic 606 as they did not meet the definition of a contract with a customer. Additionally, the Company concluded that the grants met the definition of a contribution, as the grants were a non-reciprocal transaction. As such, the Company determined that Subtopic 958-605, Not-for-Profit-Entities-Revenue Recognition applies for these contributed services, even though the Company is a business entity, as guidance in the contributions received subsections of Subtopic 958-605 applies to all entities (NFPs and business entities).

The Company has early adopted Accounting Standards Update 2020-07 in the fourth quarter of 2021, which amends Subtopic 958-605 which further clarifies the presentation and disclosure about contributions.

Subtopic 958-605 requires that nonfinancial assets, which includes services, such as the research and development services provided under the GAIN vouchers described in Note 5, should be shown on a gross method at the fair value of the services contributed, with the contributed services – research and development shown as other operating income and the related costs as a charge to research and development expense, rather than depicting the contributed services – research and development as a reduction of research and development expense. The fair value of contributed services was determined by the cost of professional time and materials which were charged by the subcontractor who fulfilled the services contributed under the grant award. The principal market used to arrive at fair value is the market in which the Company operates.

The Company recognized contributed services – research and development of approximately $0.5 million for the year ended December 31, 2021 and approximately $0.1 million for the year ended December 31, 2020.

Patents

Through September 30, 2020, patents were stated on the consolidated balance sheets at cost. Costs, such as filing fees with patent granting agencies and legal fees directly relating to those filings, incurred to file patent applications were capitalized when the Company believed that there was a high likelihood that the patent would be issued and there would be future economic benefit associated with the patent. These costs were amortized from the date of the patent application on a straight-line basis over the estimated useful life of 20 years, which is the legal life of the patent. All costs associated with abandoned patent applications were expensed. The Company expensed patent annuity fees as these fees were maintenance fees required by the patent office at certain points in time after a patent was granted in order to keep the patent legal rights in force. During the years ended December 31, 2021 and 2020, these patent annuity fees were insignificant.

We identified impairment indicators for our patents in the fourth quarter of 2020. We performed a recoverability test of the capitalized patents costs using an undiscounted cash flow method. The Company, after performing the recoverability test showing total negative cash flows, then determined the fair value of the patent costs using both the income approach and the cost approach methods. The fair value of our patent costs, under both these valuation methods, was zero. As a result, the Company recognized a total impairment charge of $1.1 million for the year ending December 31, 2020.

Beginning January 1, 2021, patent filing fees with patent granting agencies and legal fees directly relating to those filings, incurred to file patent applications were expensed as the Company believes that there is not a high likelihood that there will be a future economic benefit associated with the patents, due to the uncertainties in the current fuel development timelines and the patents being commercialized. The Company continues to expense patent annuity fees as these fees are maintenance fees required by the patent office at certain points in time after a patent is granted, in order to keep the patent legal rights in force. Therefore, as of December 31, 2021, and December 31, 2020 the carrying value of the patents on the balance sheets was zero.

Trademarks

Costs for filing and legal fees for trademark applications are capitalized. Trademarks are considered intangible assets with an indefinite useful life and therefore are not amortized. The Company performed an impairment test in the fourth quarter of 2021 and 2020 and no impairment of the trademarks was identified. As of December 31, 2021 and December 31, 2020, the carrying value of trademarks was approximately $0.1 million.

Leases

In accordance with ASU 2016-02, *Leases (Topic 842)*, which requires recognition of most lease arrangements on the balance sheet, the Company recognizes operating lease right of use assets and liabilities at commencement date based on the present value of the future minimum lease payments over the lease term. Leases with an initial term of 12 months or less are not recorded on the consolidated balance sheet in accordance with the short-term lease recognition exemption. The Company applies the practical expedient to non-separate and non-lease components for all leases that qualify. Lease expense is recognized on a straight-line basis over the lease term. The Company has only one lease for office rent and the lease is for a term of 12 months without renewal options. See Note 4 for additional information.

Common Stock Warrants

The Company accounts for common stock warrants as either equity instruments or derivative liabilities depending on the specific terms of the warrant agreement. Common stock warrants are accounted for as a derivative in accordance with ASC 815, *Derivatives and Hedging*, if the stock warrants contain terms that could potentially require “net cash settlement” and therefore, do not meet the scope exception for treatment as a derivative. Warrant instruments that could potentially require “net cash settlement” in the absence of explicit language precluding such settlement are initially classified as derivative liabilities at their estimated fair values, regardless of the likelihood that such instruments will ever be settled in cash.

Stock-Based Compensation

The stock-based compensation expense incurred by Lightbridge for employees and directors in connection with its equity incentive plan is based on the employee model of ASC 718, and the fair value of the options is measured at the grant date. In accordance with ASU 2018-07, *Compensation - Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting*, options granted to our consultants are accounted for in the same manner as options issued to employees.

Awards with service-based vesting conditions only - Expense recognized on a straight-line basis over the requisite service period of the award.

Awards with performance-based vesting conditions - Expense is not recognized until it is determined that it is probable the performance-based conditions will be met. When achievement of a performance-based condition is probable, a catch-up of expense is recorded as if the award had been vesting on a straight-line basis from the award date. The award will continue to be expensed on a straight-line over the requisite service period basis until a higher performance-based condition is met, if applicable.

Awards with market-based vesting conditions - Expense recognized on a straight-line basis over the requisite service period, which is the lesser of the derived service period or the explicit service period if one is present. However, if the market condition is satisfied prior to the end of the requisite service period, the Company accelerates all remaining expense to be recognized.

Awards with both performance-based and market-based vesting conditions - If an award vesting or exercisability is conditional upon the achievement of either a market condition or performance or service conditions, the requisite service period is generally the shortest of the explicit, implicit, and derived service period.

The Company elected to use the Black-Scholes pricing model to determine the fair value of stock options on the measurement date of the grant for service-based vesting conditions and the Monte-Carlo valuation method for performance-based or market-based vesting conditions for stock options. The Company estimates forfeitures at the time of grant and revises the estimate, if necessary, in subsequent periods if actual forfeitures differ from those estimates. The forfeiture rate estimate used for all equity awards was zero, based on the experience of the Company having an insignificant historical forfeiture rate. Shares that are issued to employees on the exercise dates of the stock options may be issued net of the required tax withholding requirements to be paid by the Company regarding its tax withholding obligations. As a result, the actual number of shares issued are fewer than the actual number of shares exercised under the stock option or on the dates of vesting of Restricted Stock Unit (RSU) grants.

A Restricted Stock Award (“RSA”) is an award of our shares that when they can vest based on service conditions, have full voting rights and dividend rights, but are restricted with regard to sale or transfer. As such, they are shown as shares issued and outstanding. These restrictions lapse over the vesting period, but the shares are forfeited and returned to the Company if they do not vest. The RSAs are included in common stock issued and outstanding, are considered contingently issuable in the calculation of weighted-average shares outstanding for purposes of calculating earnings per share. The consolidated statement of changes in stockholders’ equity shows the initial grant of RSAs as a reclassification from additional paid-in capital to common stock, with any compensation expense related to the RSAs included in stock-based compensation. Other RSAs have only performance conditions. These RSAs to not have voting and dividend rights until they vest as ordinary common shares.

Recent Accounting Pronouncements

In September 2020, the FASB issued ASU 2020-07, Not-for-Profit Entities (Topic 958) which is intended to update improve financial reporting by providing new presentation and disclosure requirements about contributed nonfinancial assets, including services, and includes additional disclosure requirements for recognized contributed services. The ASU is intended principally for Not-for-Profit entities, but do encompass these types of contributions received by business entities, such as Lightbridge. The amendments did not change the recognition and measurement requirements in Subtopic 958-605 and therefore did not change the Company’s recognition and presentation of the contributed services – research and development. ASU 2020-07 is effective for fiscal years beginning after December 15, 2021, and interim periods within annual periods beginning after June 15, 2022. Early adoption is permitted. As discussed above, the Company has elected to early adopt this standard in the fourth quarter of 2021, as disclosed.

In August 2020, the FASB issued ASU 2020-06, *Debt—Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging— Contracts in Entity’s Own Equity (Subtopic 815-40)*, which simplifies the complexity associated with applying U.S. GAAP for certain financial instruments with characteristics of liabilities and equity. This ASU (1) simplifies the accounting for convertible debt instruments and convertible preferred stock by removing the existing guidance in ASC 470-20, *Debt: Debt with Conversion and Other Options*, that requires entities to account for beneficial conversion features and cash conversion features in equity, separately from the host convertible debt or preferred stock; (2) revises the scope exception from derivative accounting in ASC 815-40 for freestanding financial instruments and embedded features that are both indexed to the issuer’s own stock and classified in stockholders’ equity, by removing certain criteria required for equity classification; and (3) revises the guidance in ASC 260, *Earnings Per Share*, to require entities to calculate diluted earnings per share for convertible instruments by using the if-converted method. ASU 2020-06 is effective for fiscal years beginning after December 15, 2021, including interim periods within those fiscal years. Early adoption is permitted, but no earlier than fiscal years beginning after December 15, 2020, including interim periods within those fiscal years. Adoption is either through a modified retrospective method or a full retrospective method of transition. The adoption of this standard will not materially impact the Company’s consolidated financial statements in 2022.

The FASB issued ASU No. 2016-13, *Financial Instruments - Credit Losses (Topic 326)*. This standard requires a financial asset to be presented at the net amount expected to be collected. The financial assets of the Company in scope of ASU 2016-13 will primarily be accounts receivable. The Company will estimate an allowance for expected credit losses on accounts receivable that result from the inability of customers to make required payments. In estimating the allowance for expected credit losses, consideration will be given to the current aging of receivables, historical experience, and a review for potential bad debts. The Company will adopt this guidance in the first quarter of fiscal 2023 and does not expect the adoption to have an impact on its results of operations, financial position, and disclosures.

In January 2017, the FASB issued ASU No. 2017-04, *Simplifying the Test for Goodwill Impairment*, which removes the requirement to compare the implied fair value of goodwill with its carrying amount as part of step 2 of the goodwill impairment test. The ASU permits an entity to perform its annual, or interim, goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount and to recognize an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value; however, the loss recognized should not exceed the total amount of goodwill allocated to that reporting unit. This ASU was effective beginning the first day of the 2021 fiscal year. The adoption of this ASU did not have an impact on the Company's consolidated financial statements.

Note 2. Net Loss Per Share

Basic net loss per share is computed using the weighted-average number of common shares outstanding during the year except that it does not include unvested common shares subject to repurchase or cancellation. Diluted net income per share is computed using the weighted-average number of common shares and, if dilutive, potential common shares outstanding during the period. Potential common shares consist of the incremental common shares issuable upon the exercise of stock options, warrants and convertible preferred shares (see Note 7. Stockholders' Equity and Stock-Based Compensation). The common stock equivalents of performance-based milestone compensation arrangements are included as potentially dilutive shares only if the performance condition has been met as of the end of the reporting period.

The treasury stock method is used in calculating diluted EPS for potentially dilutive stock options and share purchase warrants, which assumes that any proceeds received from the exercise of in-the-money stock options and share purchase warrants, would be used to purchase common shares at the average market price for the period, unless including the effects of these potentially dilutive securities would be anti-dilutive.

The following table sets forth the computation of the basic and diluted loss per share (dollars in millions, except share data):

	Years Ended December 31,	
	2021	2020
Basic		
Numerator:		
Net loss attributable to common stockholders	$ (12.0)	$ (15.2)
Denominator:		
Weighted-average common shares outstanding	7,035,510	4,216,568
Basic net loss per share	$ (1.71)	$ (3.59)
Diluted		
Numerator:		
Net loss attributable to common stockholders, basic	$ (12.0)	$ (15.2)
Effect of dilutive securities	—	—
Net loss, diluted	$ (12.0)	$ (15.2)
Denominator:		
Weighted average common shares outstanding - basic	7,035,510	4,216,568
Potential common share issuances:		
Incremental dilutive shares from equity instruments (treasury stock method)	—	—
Weighted-average common shares outstanding	7,035,510	4,216,568
Diluted net loss per share	$ (1.71)	$ (3.59)

The following outstanding securities have been excluded from the computation of diluted weighted shares outstanding for the years noted below, as they would have been anti-dilutive due to the Company's losses at December 31, 2021 and 2020 and also because the exercise price of certain of these outstanding securities was greater than the average closing price of the Company's common stock.

	Years Ended December 31,	
	2021	2020
Warrants outstanding	45,577	70,361
Stock options outstanding	538,713	515,847
RSAs outstanding	188,588	—
RSUs outstanding	—	243,800
Series A convertible preferred stock to common shares	—	79,304
Series B convertible preferred stock to common shares	—	272,084
Total	772,878	1,181,396

Note 3. Accounts Payable and Accrued Liabilities

Accounts payable and accrued liabilities consisted of the following (rounded in millions):

	December 31, 2021	December 31, 2020
Trade payables	$ 0.1	$ 0.2
Accrued legal and consulting expenses	0.1	0.2
Total	$ 0.2	$ 0.4

Note 4. Commitments and Contingencies

Commitments

Operating Leases

The Company leased office space for a 12-month term from January 1, 2022 through December 31, 2022 with a monthly payment of approximately $8,000. The future minimum lease payments required under the Company's non-cancellable operating leases for 2022 total approximately $96,000. Total rent expense for the year ended December 31, 2021 and 2020 was approximately $0.1 million for both years.

Contingency Settlements

Settlement of Arbitration and Dissolution of Enfission LLC

On February 11, 2021, the Company entered into a settlement agreement (the "Settlement Agreement") with Framatome SAS and Framatome Inc. (together, "Framatome"), resolving the pending claims and counterclaims between the parties in arbitration and judicial proceedings related to the parties' inactive joint venture, Enfission, LLC. Under the terms of the Settlement Agreement, all joint venture agreements were terminated, and the joint venture was dissolved on March 23, 2021. The Company accrued $4.2 million related to the Settlement Agreement at December 31, 2020. The Company paid Framatome approximately $4.2 million for outstanding invoices for work performed by Framatome and other expenses incurred by Framatome on March 15, 2021. Additionally, the Company recorded an approximate $34,000 foreign currency transaction gain related to the settlement payment for the year ended December 31, 2021. The Company received approximately $120,000 as the final cash distribution relating to the dissolution and wind-down of Enfission in December 2021.

Mediation Settlement

A former Chief Financial Officer of the Company filed a complaint against the Company with the U.S. Occupational Safety and Health Administration (OSHA) on March 9, 2015. This complaint was dismissed by OSHA in January 2018 without any findings against the Company. On March 14, 2018, an appeal was filed with the U.S Department of Labor Office of Administrative Law Judges (OALJ). On September 6, 2019, the Company filed a motion for summary decision seeking a decision in its favor as a matter of law. The motion for summary judgement was denied on September 30, 2020. The complaint was mediated on May 13, 2021 and the parties subsequently reached an agreement to resolve all claims for the total monetary sum of approximately $675,000 in exchange for a dismissal of the pending litigation, full release of all claims against the Company, and other conditions. On July 13, 2021, the settlement agreement was finalized by both parties and the Company applied for court approval by the OALJ assigned to this matter. The settlement was approved by the OALJ on July 22, 2021. The Company made the settlement payment and related costs of $695,000 and the insurers reimbursed the Company for the settlement payment of $663,000. The Company bore the costs of $32,000. The case was final and conclusive.

As of December 31, 2021, legal fees owed in connection with the mediation were paid in full by the Company's insurance carriers. As of December 31, 2020, legal fees of approximately $13,000 were owed in connection with the mediation and paid by the insurance carriers.

Note 5. Research and Development Costs

On December 19, 2019, the Company was awarded a voucher from the U.S. Department of Energy's (DOE) Gateway for Accelerated Innovation in Nuclear (GAIN) program to support development of Lightbridge Fuel™ in collaboration with Idaho National Laboratory (INL). The scope of the project included experiment design for irradiation of Lightbridge metallic fuel material samples in the Advanced Test Reactor at INL. On April 22, 2020, the Company entered into a Cooperative Research and Development Agreement (CRADA) with Battelle Energy Alliance, LLC, the operating contractor of INL, in collaboration with DOE. Signing the CRADA was the last step in the contracting process to formalize a voucher award from the GAIN program. The voucher award can only be used to conduct the experiment defined in the CRADA. The initial total project value was estimated at approximately $0.8 million, with three-quarters of this amount expected to be provided by DOE for the scope performed and the remaining amount funded by Lightbridge, by providing in-kind services with no cash obligations to the project. Because of project staffing issues at INL related to the laboratory's COVID-19 restrictions and U.S. export control matters, the Company completed a contract extension for this INL GAIN voucher in January 2021. The period of performance was extended to September 30, 2021. All work was completed on this GAIN voucher in the third quarter of 2021. This experiment design formed the basis of the current and future efforts with the Idaho National Laboratory. The total final project amount recorded as contributed services – research and development was approximately $0.5 million, less than the projected project value amount of $0.8 million. The primary reasons for this reduction were due to the repurposing of some of its previously completed safety analysis work for other company's projects that were similar to the conditions of our Company's project, and was able to use some of their current drop-in capsule design work as the basis for the Company's sample capsule design work. For the year ended December 31, 2021, the Company recorded approximately $0.4 million of contributed services – research and development for work that was completed that caused the DOE to incur payment obligations related to the GAIN voucher. The Company has no payment obligations related to the GAIN voucher. This amount was recorded as contributed services – research and development in the Other Operating Income section of the consolidated statement of operations and the corresponding amount was recorded as research and development expenses.

On March 25, 2021, the Company was awarded a second voucher from the DOE's GAIN program to support development of Lightbridge Fuel™ in collaboration with the Pacific Northwest National Laboratory (PNNL). The scope of the project is to demonstrate Lightbridge's nuclear fuel casting process using depleted uranium, a key step in the manufacture of Lightbridge Fuel™. On July 14, 2021, the Company executed a CRADA with the Battelle Memorial Institute, Pacific Northwest Division, the operating contractor of the PNNL, in collaboration with the DOE. The total project value is approximately $0.7 million, with three-quarters of this amount expected to be provided by DOE for the scope performed and the remaining amount funded by Lightbridge, by providing in-kind services to the project. The project commenced in the third quarter of 2021 and is expected to be completed by the third quarter of 2022. For the year ended December 31, 2021, the Company recorded approximately $0.1 million of contributed services – research and development, for work that was completed that caused the DOE to incur payment obligations related to the GAIN voucher. This amount was recorded as contributed services – research and development in the Other Operating Income section of the consolidated statement of operations and the corresponding amount was recorded as research and development expenses.

The research and development services provided under the GAIN vouchers are utilized by the Company in its ongoing development of our next generation nuclear fuel technology. The Company believes that the dollars paid by the DOE to Battelle for the service provided does not differ materially from what the Company would have paid had it directly contracted for these services for its research and development activity.

Note 6. Income Taxes

The 2021 and 2020 annual effective tax rate is estimated to be a combined 25% for the combined U.S. federal and state statutory tax rates. The Company reviews tax uncertainties in light of changing facts and circumstances and adjust them accordingly. As of December 31, 2021 and 2020, there were no tax contingencies or unrecognized tax positions recorded.

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities recognized for financial reporting, and the amounts recognized for income tax purposes. The significant components of deferred tax assets (at an approximate 25% effective tax rate) as of December 31, 2021 and 2020, respectively, are as follows.

Deferred tax assets consisted of the following (rounded in millions):

	2021	2020
Capitalized start-up costs	$ —	$ 0.1
Stock-based compensation	3.1	3.3
Patent impairment provision	0.3	0.3
Accrued legal settlement	—	1.1
Net operating loss carry-forward	27.6	24.3
Research and development tax credits	0.3	0.3
Less: valuation allowance	(31.3)	(29.4)
Total	$ —	$ —

The Company has a net operating loss carry-forward for federal and state tax purposes of approximately $109.2 million at December 31, 2021, that is potentially available to offset future taxable income. The Tax Cuts and Jobs Act (the “Tax Act”) changes the rules on net operating loss (NOL) carry-forwards. The 20-year limitation was eliminated for losses incurred after January 1, 2018, giving the taxpayer the ability to carry forward losses indefinitely. However, NOL carry forward arising after January 1, 2018, will now be limited to 80% of taxable income. The $109.2 million available at December 31, 2021 includes $46.9 million of post 2017 NOLs without expiration dates and $62.3 million of pre-2018 NOLs expiring from 2024 to 2037. Given the Company’s projections of taxable income for the years between 2024 and 2037, it’s likely these NOLs will expire unused.

For financial reporting purposes, no deferred tax asset was recognized because as of December 31, 2021 and 2020, management currently estimates that it is more likely than not that substantially all of the deferred tax assets, the majority of which are net operating losses that we project currently will be unused. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the years in which those temporary differences are deductible. The timing and manner in which the Company can utilize our net operating loss carry-forward and future income tax deductions in any year may be limited by provisions of the Internal Revenue Code regarding the change in ownership of corporations. Such limitation may have an impact on the ultimate realization of our carry-forwards and future tax deductions. Section 382 of the Internal Revenue Code (Section 382) imposes limitations on a corporation’s ability to utilize net operating losses if it experiences an “ownership change.” In general terms, an ownership change may result from transactions increasing the ownership of certain stockholders in the stock of a corporation by more than 50 percentage points over a three-year period. Any unused annual limitation may be carried over to later years, and the amount of the limitation may under certain circumstances be increased by the built-in gains in assets held by us at the time of the change that are recognized in the five-year period after the change. Prior period ownership changes, coupled with the Company’s projections of the lack of taxable income for the foreseeable future, would substantially limit any future benefit to be derived from our NOLs, especially those generated in pre-2018 tax years.

The reconciliation between income taxes (benefit) at the U.S. and State statutory combined tax rates of approximately 25% and the amount recorded in the accompanying consolidated financial statements is as follows (rounded in millions):

	December 31, 2021	December 31, 2020
Tax benefit at U.S. federal statutory rates	$ (1.7)	$ (3.0)
Tax benefit at state statutory rates	(0.2)	(0.6)
Tax benefit from federal and state R&D tax credits	—	(0.1)
Increase in valuation allowance	1.9	3.7
Total provision for income tax benefit	$ —	$ —

Note 7. Stockholders' Equity and Stock-Based Compensation

On June 28, 2021, at the Company's annual shareholder meeting, the shareholders' approved an amendment to the Articles of Incorporation of the Company to increase the number of authorized shares of common stock from 8,333,333 shares to 13,500,000 shares and an amendment to the Lightbridge Corporation 2020 Omnibus Incentive Plan to increase the number of shares of common stock available for issuance under this Incentive Plan from 350,000 shares to 650,000 shares.

At December 31, 2021, the Company had 9,759,223 common shares outstanding (including outstanding restricted stock awards totaling 188,588 shares). Also outstanding were warrants relating to 45,577 shares of common stock, stock options relating to 538,713 shares of common stock and performance-based RSA awards of 188,588 shares, all totaling 10,532,101 shares of common stock and all common stock equivalents, outstanding at December 31, 2021.

At December 31, 2020, the Company had 6,567,110 common shares outstanding. Also outstanding were warrants relating to 70,361 shares of common stock, stock options relating to 515,847 shares of common stock, 243,800 restricted shares units of common stock, 699,878 shares of Series A convertible preferred stock convertible into 58,323 shares of common stock (plus accrued dividends of $691,120 relating to an additional 20,980 common shares), and 2,666,667 shares of Series B convertible preferred stock convertible into 222,222 shares of common stock (plus accrued dividends of $897,518, relating to an additional 49,862 common shares), all totaling 7,748,505 shares of common stock and all common stock equivalents, including accrued preferred stock dividends, outstanding at December 31, 2020.

Common Stock Equity Offerings

ATM Offerings

On May 28, 2019, the Company entered into an at-the-market (ATM) equity offering sales agreement with Stifel, Nicolaus & Company, Incorporated (Stifel), which was amended on April 9, 2021, pursuant to which the Company may issue and sell shares of its common stock from time to time through Stifel as the Company's sales agent. Sales of the Company's common stock through Stifel, if any, will be made by any method that is deemed to be an "at-the-market" equity offering as defined in Rule 415 promulgated under the Securities Act of 1933. On March 25, 2021, the Company filed a new shelf registration statement on Form S-3, registering the sale of up to $75 million of the Company's securities, which registration statement was declared effective on April 5, 2021. The Company filed a prospectus supplement, dated April 9, 2021, with the Securities and Exchange Commission pursuant to which the Company offered and sold shares of common stock having an aggregate offering price of up to $9.0 million through its ATM. The Company, after this offering was completed, filed a second prospectus supplement, dated November 19, 2021, with the Securities and Exchange Commission pursuant to which the Company may offer and sell shares of common stock having an aggregate offering price of up to up to $20.0 million from time to time under this prospectus supplement, through its ATM.

The Company records its ATM sales on a settlement date basis. The Company sold approximately 2.0 million shares under the ATM for the year ended December 31, 2021 resulting in net proceeds of approximately $14.8 million under the two above-mentioned prospectus supplements filed. For the year ended December 31, 2020, the Company sold approximately 3.3 million shares under the ATM, respectively, resulting in net proceeds of approximately $12.3 million.

Preferred Stock Equity Offerings

Series A Preferred Stock - Securities Purchase Agreement

On August 2, 2016, the Company issued 1,020,000 shares of newly created Non-Voting Series A Convertible Preferred Stock (the "Series A Preferred Stock") to General International Holdings, Inc. for $2.8 million or approximately $2.75 per share. Dividends accrued on the Series A Preferred Stock at the rate of 7% per year and was paid in-kind through an increase in the liquidation preference per share. The liquidation preference, initially $2.7451 per share of Series A Preferred Stock, was the base that was also used to determine the number of common shares into which the Series A Preferred Stock would have converted as well as the calculation of the 7% dividend. Each share of Series A Preferred Stock was convertible at the option of the holder into such number of shares of the Company's common stock equal to the liquidation preference divided by the conversion price of $32.94 per share subject to adjustments in the case of stock splits and stock dividends.

The holder of the Series A Preferred Stock was also entitled to participating dividends whenever dividends in cash, securities (other than shares of the Company's common stock) or property were paid on common shares. The amount of the dividends was the amount to which the holder would have been entitled if all shares of Series A Preferred Stock had been converted to common stock immediately prior to the record date.

The Series A Preferred Stock was initially convertible into 1,020,000 shares of common stock (convertible into 85,000 common shares when adjusted for the one-for-twelve reverse stock split on October 21, 2019). The average of the high and low market prices of the common stock on August 6, 2016, the date of the closing of the sale of the Series A Preferred Stock, was approximately $39.78 per share. At $39.78 per share the common stock into which the Series A Preferred Stock was initially convertible was valued at approximately $3.4 million. This amount was compared to the $2.8 million of proceeds of the Series A Preferred Stock to indicate that a beneficial conversion feature (BCF) of approximately $0.6 million existed at the date of issuance in 2016, which was immediately accreted as a deemed dividend because the conversion rights were immediately effective.

Additionally, comparison of the $2.7451 original conversion price of the payment-in-kind (PIK) dividends prior to the one-for-twelve reverse stock split on October 21, 2019, to the $3.315 commitment date fair value per share indicated that each PIK dividend would accrete $0.5699 of BCF as an additional deemed dividend for every $2.7451 of PIK dividend accrued.

On April 8, 2021 and August 31, 2021, the holder of the Series A Preferred Shares converted 36,111 preferred shares into 4,228 common shares in total for the payment of PIK dividends.

Exchange of Outstanding Series A Convertible Preferred Stock for Common Shares

On October 29, 2021, the Company entered into an exchange agreement with General International Holdings, Inc., the holder of all of the outstanding Series A Preferred Stock, pursuant to which General International Holdings, Inc. delivered to the Company all of the outstanding Series A Preferred Stock in exchange for 262,910 shares of the Company's common stock ($10 per share induced conversion price), without any cash payments by either party. The exchange was effected without registration under the Securities Act of 1933, as amended, pursuant to the exemption from registration set forth in Section 3(a)(9) of the Securities Act.

The liquidation value of this preferred stock on the date of exchange to common shares was $2.6 million (including the accrued dividend of $0.8 million). To induce this exchange, the Company offered to exchange shares of common stock at a rate of $10 per share, compared to a conversion rate of $32.94 per share of common stock pursuant to the terms of the Series A Preferred Stock. This resulted in the total issuance of 262,910 shares of common stock upon the exchange, which included an additional 183,098 shares of common stock compared to the number of shares that would have been issuable upon conversion of all of the outstanding Series A Preferred Stock.

In accordance with ASC 470-20, the Company accounted for the exchange as an induced conversion based on the short period of time the exchange offer was open and that all equity securities pursuant to the original terms were exchanged. Pursuant to this accounting guidance, the Company evaluated the fair value of the incremental 183,098 common shares issued to the Series A Preferred Stockholders. Based on the $9.57 closing stock price on October 29, 2021, the Company recorded to additional paid-in capital a deemed dividend of $1.8 million at the date of the exchange. This amount was presented in the accompanying consolidated statement of operations under the caption deemed dividend upon exchange of Series A and Series B Preferred Stock to common stock and shown as an adjustment to net loss, to arrive at net loss attributable to common stockholders.

Series B Preferred Stock - Securities Purchase Agreement

On January 30, 2018, the Company issued 2,666,667 shares of newly created Non-Voting Series B Convertible Preferred Stock (the "Series B Preferred Stock") and associated warrants to purchase up to 55,555 shares of the Company's common stock to the several purchasers for approximately $4.0 million or approximately $1.50 per share of Series B Preferred Stock and associated warrant. Dividends accrued on the Series B Preferred Stock at the rate of 7% per year and would be paid in-kind through an increase in the liquidation preference per share. The liquidation preference, initially $1.50 per share of Series B Preferred Stock, was the base that was also used to determine the number of common shares into which the Series B Preferred Stock would convert as well as the calculation of the 7% dividend. Each share of Series B Preferred Stock was convertible at the option of the holder into such number of shares of the Company's common stock equal to the liquidation preference divided by the conversion price of $18 per share subject to adjustments in the case of stock splits and stock dividends.

Of the $4.0 million proceeds, approximately 0.3 million was allocated to the warrants with the remaining $3.7 million allocated to the Series B Preferred Stock. The Series B Preferred Stock was initially convertible into 2,666,667 shares of common stock (convertible into 222,222 shares of common stock when adjusted for the one-for-twelve reverse stock split on October 21, 2019). The average of the high and low market prices of the common stock on January 30, 2018, the date of the closing of the sale of the preferred stock, was approximately $28.08 per share. At $28.08 per share the common stock into which the Series B Preferred Stock was initially convertible was valued at approximately $6.2 million. This amount was compared to the $3.7 million (rounded) of proceeds allocated to the Series B Preferred Stock to indicate that a BCF of approximately $2.6 million existed at the date of issuance, which was immediately accreted as a deemed dividend because the conversion rights were immediately effective.

Additionally, comparison of the original $1.50 conversion price prior to the one-for-twelve reverse stock split on October 21, 2019 of the PIK dividends to the $2.34 commitment date fair value per share on January 30, 2018 indicated that each PIK dividend would accrete 0.84 of BCF as an additional deemed dividend for every $1.50 of PIK dividend accrued.

Exchange of Outstanding Series B Convertible Preferred Stock for Common Shares

On December 3, 2021, the Company entered into a series of Exchange Agreements with all of the holders of the Company's Series B convertible preferred stock.

Pursuant to the Exchange Agreements, the holders exchanged all outstanding Series B Preferred Stock for shares of the Company's common stock at an exchange rate equal to the sum of the liquidation preference of the Series B Preferred Stock and the accrued and unpaid dividends thereon, divided by $10.00 per share (the "Exchange"). Upon the closing of the Exchange, the Company issued an aggregate of 522,244 shares of common stock to the holders in exchange for all 2,666,667 issued and outstanding Series B Preferred Stock. This Exchange was effected without registration under the Securities Act of 1933, as amended, pursuant to the exemption from registration set forth in Section 3(a)(9) of the Securities Act.

The liquidation value of this Series B Preferred Stock on the date of exchange to common shares was $5.2 million (including the accrued dividend of $1.2 million). To induce this exchange, the Company offered to exchange shares of common stock at a rate of the greater of $10 per share or 85% of the most recent closing price for the common stock on the Nasdaq Capital Market, compared to a conversion rate of $18 per share of common stock pursuant to the terms of the Series B Preferred Stock. This resulted in the total issuance of 522,244 shares of common stock upon conversion, which included an additional 232,111 shares of common stock compared to the number of shares that would have been issuable upon conversion of all of the outstanding Series B Preferred Stock.

In accordance with ASC 470-20, the Company accounted for the exchange as an induced conversion based on the short period of time the exchange offer was open and that all equity securities pursuant to the original terms were exchange. Pursuant to this accounting guidance, the Company evaluated the fair value of the incremental 232,111 common shares issued to the Series B Preferred Stockholders. Based on the $7.57 closing stock price on December 3, 2021, the Company recorded to additional paid-in capital a deemed dividend of $1.8 million at the date of the exchange. The deemed dividend was presented in the accompanying consolidated statement of operations under the caption deemed dividend upon exchange of Series A and Series B Preferred Stock to common stock and shown as an adjustment to net loss, to arrive at net loss attributable to common stockholders.

Warrants

The Company's outstanding warrants at December 31, 2021 and 2020 are below. These warrants are classified within equity on the consolidated balance sheets.

	December 31, 2021	December 31, 2020
Outstanding Warrants		
Issued to Investors on October 25, 2013, entitling the holders to purchase 20,833 common shares in the Company at an exercise price of $138.00 per common share up to and including April 24, 2021. In 2016, 4,954 of these warrants were exchanged for common stock, and all remaining warrant holders agreed to new warrant terms, which excluded any potential net cash settlement provisions in exchange for a reduced exercise price of $75.00 per share (warrants expired).	—	13,665
Issued to Investors on November 17, 2014, entitling the holders to purchase 45,577 common shares in the Company at an exercise price of $138.60 per common share up to and including May 16, 2022. On June 30, 2016, the warrant holders agreed to new warrant terms, which excluded any potential net cash settlement provisions in order to classify them as equity in exchange for a reduced exercise price of $75.00 per share.	45,577	45,577
Issued to an investment bank and subsequently transferred to a principal of the investment bank regarding the Series B Preferred Stock investment on January 30, 2018, entitling the holder to purchase 11,119 common shares in the Company at an exercise price of $18.00 per share, up to and including January 30, 2021 (warrants expired).	—	11,119
Total	45,577	70,361

Stock-based Compensation

2020 Equity Incentive Plan

On March 9, 2020, the Board of Directors adopted the Company's 2020 Omnibus Incentive Plan (the "2020 Plan"). On September 3, 2020, the shareholders approved the 2020 Plan to authorize grants of the following types of awards (a) Options, (b) Stock Appreciation Rights, (c) Restricted Stock and Restricted Stock Units, and (d) Other Stock-Based and Cash-Based Awards.

Stock Options

During the year ended December 31, 2021, the Company issued 58,164 stock options to consultants. The 2021 options issued to the consultants of the Company were assigned fair values ranging from $2.08 per share to $4.75 per share (total fair value of $150,000). The value was determined using Black-Scholes pricing model. The following assumptions were used in the Black-Scholes pricing model:

Expected volatility	95.15% to 131.85%
Risk free interest rate	0.06% to 0.93%
Dividend yield rate	0
Weighted average years	1-6 years
Closing price per share - common stock	$4.55 to $6.51

Stock option transactions to the employees, directors and consultants are summarized as follows for the year ended December 31, 2021:

	Options Outstanding	Weighted Average Exercise Price	Weighted Average Grant Date Fair Value
Beginning of the year - January 1, 2021	515,847	$ 20.23	$ 14.51
Granted	58,164	6.72	2.58
Exercised	(30,282)	8.94	6.77
Forfeited	(3,997)	62.52	43.63
Expired	(1,019)	329.81	291.73
End of the year - December 31, 2021	538,713	$ 18.51	$ 12.92
Options exercisable	526,947	$ 18.79	$ 13.11

During the year ended December 31, 2021, the Company received approximately $0.3 million of net proceeds from the exercise of 30,282 stock options.

Stock option transactions to the employees, directors and consultants are summarized as follows for the year ended December 31, 2020:

	Options Outstanding	Weighted Average Exercise Price	Weighted Average Grant Date Fair Value
Beginning of the year - January 1, 2020	518,551	$ 21.99	$ 15.89
Granted	7,634	4.45	3.28
Exercised	(6,548)	3.82	2.59
Forfeited	(1,844)	10.80	8.33
Expired	(1,946)	491.10	384.02
End of the year - December 31, 2020	515,847	$ 20.23	$ 14.51
Options exercisable	466,121	$ 21.35	$ 15.27

A summary of the status of the Company's non-vested options as of December 31, 2021 and December 31, 2020, and changes during the year ended December 31, 2020 and the year ended December 31, 2021, is presented below:

	Shares	Weighted Average Exercise Price	Weighted Average Fair Value Grant Date
Non-vested – December 31, 2019	84,873	$ 10.73	$ 5.15
Granted	7,634	4.45	3.28
Vested	(41,552)	10.80	8.29
Forfeited	(1,229)	10.80	8.33
Non-vested – December 31, 2020	49,726	$ 9.71	$ 7.44
Granted	58,164	6.72	2.58
Vested	(96,124)	8.40	4.89
Forfeited	—	—	—
Non-vested – December 31, 2021	11,766	$ 5.71	$ 4.25

The above tables include stock options issued and outstanding as of December 31, 2021 as follows:

i. A total of 339,855 incentive stock options and non-qualified 10-year options have been issued, and are outstanding, to the directors, officers, and employees at exercise prices of $3.82 to $75.60 per share. From this total, 127,299 options are held by the Chief Executive Officer, who is also a director, with remaining contractual lives of 3.3 years to 7.9 years. All other options issued to directors, officers, and employees have a remaining contractual life ranging from 3.3 years to 7.9 years.

ii. A total of 198,858 non-qualified 1 to 10-year options have been issued, and are outstanding, to consultants at exercise prices of $3.82 to $75.60 per share and have a remaining contractual life ranging from 0.2 years to 9.7 years.

As of December 31, 2021, there was approximately $42,000 of total unrecognized compensation cost related to non-vested stock options granted under the plans. That cost is expected to be recognized over a weighted-average period of approximately 2.06 years. For stock options outstanding at December 31, 2021 and 2020, the intrinsic value was approximately $238,000 and $33,000, respectively. For those vested stock options at December 31, 2021 and 2020, the intrinsic value was approximately $225,000 and $33,000, respectively.

The following table provides certain information with respect to the above-referenced stock options that were outstanding and exercisable at December 31, 2021:

	Stock Options Outstanding			Stock Options Vested		
Exercise Prices	Weighted Average Remaining Contractual Life -Years	Number of Awards	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life -Years	Number of Awards	Weighted Average Exercise Price
$ 3.82-$9.00	5.32	141,217	$ 5.18	4.99	129,451	$ 5.14
$ 9.01-$12.48	6.60	116,544	$ 10.80	6.60	116,544	$ 10.80
$ 12.49-$24.00	5.12	195,090	$ 14.23	5.12	195,090	$ 14.23
$ 24.01-$72.00	3.72	62,771	$ 55.07	3.72	62,771	$ 55.07
$ 72.01-$75.60	3.15	23,091	$ 75.59	3.15	23,091	$ 75.59
Total	5.24	538,713	$ 18.51	5.16	526,947	$ 18.79

Common Share Issuances

2021

For the year ended December 31, 2021, the Company issued 10,462 common shares to its investor relations firm for services provided during the year ended December 31, 2021.

On November 18, 2021, the Board of Directors approved an equity grant of $35,000 to each director, which equaled to a total of 19,644 shares of common stock issued to the six directors, valued on the grant date at $10.69 per share. There were 13,096 common shares issued to four directors that vested immediately upon issuance and the remaining 6,548 shares of common shares were issued to the two remaining directors that vested on January 1, 2022.

2020

During the year ended December 31, 2020, the Company issued 4,000 common shares to its investor relations firm.

On October 28, 2020, the Board of Directors approved a grant of a total of 21,200 shares of common stock to the Company's four directors. The Company filed a Form S-8 with the SEC, to register the underlying shares of the 2020 Plan on March 25, 2021. All of these common shares were issued on March 31, 2021 and vested immediately upon issuance.

RSUs Issued and Net Share Settlements for Payments of Withholding Taxes

On October 28, 2020, the Compensation Committee of the Board granted from the 2020 Plan time-based RSUs to certain of the Company's executive officers, employees, and consultants. Each RSU represents a contingent right to receive, upon vesting, one share of the Company's common stock. The number of RSUs granted to executive officers, employees and consultants totaled 243,800 shares. These RSUs awards vest in three equal instalments on each of the first three annual anniversaries of the grant date, on October 28, 2021, October 28, 2022 and October 28, 2023.

On October 28, 2021, the first tranche of 78,617 of total outstanding RSUs vested. Regarding these 78,617 RSUs that vested, the Company withheld 35,304 common shares of the employees at the stock price on the vesting date of $9.93 per share, in order to make payments of withholding taxes of $0.3 million on these vested shares. The Company issued a total of 43,313 shares of common stock, net of the share settlement for the taxes paid upon the vesting of these RSUs, to its employees and one consultant.

On November 4, 2021, the Compensation Committee of the Board of Directors approved the accelerated vesting of the remaining 157,233 RSUs outstanding, and all these remaining 157,233 RSUs vested on December 15, 2021. Regarding these 157,233 RSUs vested on December 15, 2021, the Company withheld 70,265 common shares to be issued to the employees, at the stock price on the vesting date 6.74 per share in order to make the payments for withholding taxes of $0.5 million on these vested shares. The Company issued a total of 86,968 shares of common stock, net of share settlement for the taxes paid upon vesting of RSUs, to its employees and one consultant. Total payments for withholding taxes on the net share settlements of vested RSU equity awards for the year ended December 31, 2021 was $0.8 million.

For the remaining 157,233 RSUs where the vesting was accelerated on December 15, 2021, the remaining unamortized compensation expense amount of $0.4 million was expensed on this date.

Restricted Stock Units Outstanding

The following summarizes the Company's RSUs activity:

	Number of Shares	Weighted Average Grant Date Fair Value
Total RSUs outstanding at January 1, 2021	243,800	$ 2.69
Total RSUs granted	—	$ —
Total RSUs vested (including accelerated vesting)	(235,850)	$ 2.69
Total RSUs forfeited	(7,950)	$ 2.69
Total unvested RSUs outstanding at December 31, 2021	—	$ —

Restricted Stock Awards

On November 18, 2021, the Board of Directors approved an equity grant of approximately $2 million, which equaled to a total of 188,588 RSAs, to all of its employees and two consultants, valued at the stock price on the grant date of $10.69 per share. These RSAs awards contained a performance-based accelerated vesting provision and a service-based vesting provision, with the service-based vesting provision being one-third vesting on each of the first three anniversaries of the date of grant. As of December 31, 2021, the Company had deemed it not probable that the performance-based vesting provision would be met. Therefore these 188,588 shares were included in the total outstanding common shares at December 31, 2021 and compensation expense recognized straight line over the three-year vesting period. A total of $0.1 million of compensation expense was recorded for the year ended December 31, 2021.

There was an additional performance-based RSA grant of approximately $2 million, which equaled a total 188,588 shares, with immediate vesting upon the Company completing a business acquisition in 2022, with the target's historical financials meeting certain financial performance metrics. This RSA grant, based on managements' probability assessment of meeting this milestone at December 31, 2021, was not probable of being met and no expense was recorded as stock-based compensation for the year ended December 31, 2021. These 188,588 common shares were not included in the total outstanding common shares at December 31, 2021, on the accompanying balance sheet and statement of stockholders' equity. The Company will reassess the probability of achieving this performance condition at each reporting period in 2022 and record the approximately $2 million as an expense as well as include these performance-based RSA shares in the total outstanding common shares, if there is a change to its assessment that it is probable that this performance-condition will be met.

The following summarizes the Company's RSAs activity:

	Number of Shares	Weighted Average Grant Date Fair Value
Total RSAs outstanding at January 1, 2021	—	$ —
Total RSAs granted	377,176	$ 10.69
Total RSAs vested	—	$ —
Total RSAs forfeited	—	$ —
Total unvested RSAs outstanding at December 31, 2021	377,176	$ 10.69

Scheduled vesting for outstanding RSAs with service conditions at December 31, 2021 is as follows:

	Year Ending December 31,			
	2022	2023	2024	Total
Scheduled vesting	62,862	62,864	62,862	188,588

As of December 31, 2021, there was approximately $1.9 million of total unrecognized compensation cost related to these unvested RSAs compensation arrangements. The compensation expense will be recognized on a straight-line basis over the three-year vesting period.

The components of total stock-based compensation expense included in the Company's consolidated statements of operations for the years ended December 31, 2021 and 2020 are as follows (rounded in millions):

	Years Ended December 31,	
	2021	2020
Research and development expenses	$ —	$ —
General and administrative expenses	0.8	0.1
Total stock-based compensation expense	$ 0.8	$ 0.1

Note 8. Subsequent Events

ATM Sales

Sales under the ATM that were made from January 1, 2022 to February 4, 2022 were approximately 0.8 million common shares that totaled net proceeds of approximately $5.4 million. There were no ATM transactions after February 4, 2022 to the date of the filing of these financial statements.

SIGNATURES

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

LIGHTBRIDGE CORPORATION

Date: March 31, 2022

By: */s/ Seth Grae*
Seth Grae
Chief Executive Officer,
President and Director

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Seth Grae and Larry Goldman, jointly and severally, his or her attorney-in-fact, with the power of substitution, for him or her in any and all capacities, to sign any amendments to this Annual Report on Form 10-K and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact, or his or her substitute or substitutes, may do or cause to be done by virtue hereof.

In accordance with the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities on March 31, 2022.

Signature	**Title**
/s/ Seth Grae Seth Grae	Chief Executive Officer, President and Director (Principal Executive Officer)
/s/ Larry Goldman Larry Goldman	Chief Financial Officer, and Treasurer (Principal Financial and Accounting Officer)
/s/ Thomas Graham, Jr. Thomas Graham, Jr.	Director
/s/ Victor Alessi Victor Alessi	Director
/s/ Sweta Chakraborty Sweta Chakraborty	Director
/s/ Jesse Funches Jesse Funches	Director
/s/ Daniel Magraw Daniel B. Magraw	Director
/s/ Mark Tobin Mark Tobin	Director