Lightbridge

2023

Annual Report to Stockholders

Directors and Officers

Board of Directors

AMBASSADOR THOMAS GRAHAM JR.
Chairman of the Board

SWETA CHAKRABORTY, PH.D.
Chief Executive Officer
We Don't Have Time U.S.

JESSE FUNCHES
Former Chief Financial Officer U.S.
Nuclear Regulatory Commission

SHERRI GOODMAN
Vice-Chair U.S. State Department
International Security Advisory Board

SETH GRAE
President and Chief Executive Officer

DANIEL B. MAGRAW
Senior Fellow and Professorial Lecturer,
Foreign Policy Institute at the Johns
Hopkins School of Advanced
International Studies

MARK TOBIN
Chief Financial Officer
Camp Construction Services

Executive Officers

SETH GRAE
President and Chief Executive Officer

LARRY GOLDMAN, C.P.A.
Chief Financial Officer & Corporate Secretary

ANDREY MUSHAKOV, PH.D.
Executive Vice President -Nuclear Operations

Corporate Information

CORPORATE HEADQUARTERS

Lightbridge Corporation
11710 Plaza America Drive
Suite 2000
Reston, Virginia 20190 USA

INVESTOR RELATIONS

Copies of Lightbridge's 2023 Annual Report on Form 10-K are available at no charge. Please direct requests and other investor relations questions to:

Lightbridge Corporation
Attn: Investor Relations
11710 Plaza America Drive
Suite 2000
Reston, Virginia 20190 US
+1 347-947-2093
IR@ltbridge.com

TRANSFER AGENT AND REGISTRAR

Computershare Trust Company
350 Indiana Street
Golden, Colorado 80401 USA
+1 800-962-4284

AUDITORS

BDO USA, LLP
Philadelphia, Pennsylvania

OUTSIDE LEGAL COUNSEL

Hogan Lovells U.S. LLP
Washington. D.C.

STOCK EXCHANGE LISTING

Nasdaq Capital Market
Symbol: LTBR

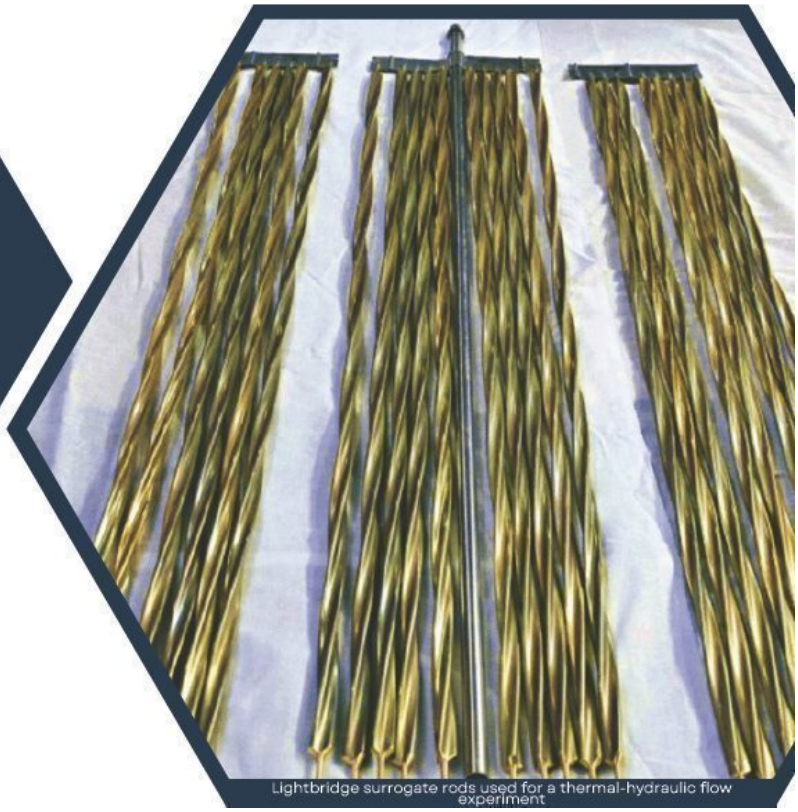
2024 ANNUAL MEETING

Friday, April 19, 2024
11:00 a.m. ET
Online Access:
www.virtualshareholdermeeting.com/LTBR2024

About Lightbridge

Lightbridge Corporation (NASDAQ: LTBR) is focused on developing advanced nuclear fuel technology essential for delivering abundant, zero-emission, clean energy and providing energy security to the world. The Company is developing Lightbridge Fuel™, a proprietary next-generation nuclear fuel technology for existing light water reactors and pressurized heavy water reactors, significantly enhancing reactor safety, economics, and proliferation resistance. The Company is also developing Lightbridge Fuel for new small modular reactors (SMRs) to bring the same benefits plus load-following with renewables on a zero-carbon electric grid.

Lightbridge has entered into two long-term framework agreements with Battelle Energy Alliance, LLC, the United States Department of Energy's (DOE) operating contractor for Idaho National Laboratory (INL), the United States' lead nuclear energy research and development laboratory. DOE's Gateway for Accelerated Innovation in Nuclear (GAIN) program has twice awarded Lightbridge to support the development of Lightbridge Fuel over the past several years. Lightbridge is participating in two university-led studies through the DOE Nuclear Energy University Program at Massachusetts Institute of Technology and Texas A&M University. An extensive worldwide patent portfolio backs Lightbridge's innovative fuel technology. Lightbridge is included in the Russell Microcap® Index. For more information, please visit www.ltbridge.com.



Lightbridge surrogate rods used for a thermal-hydraulic flow experiment

Lightbridge Corporation

CEO Letter to Stockholders

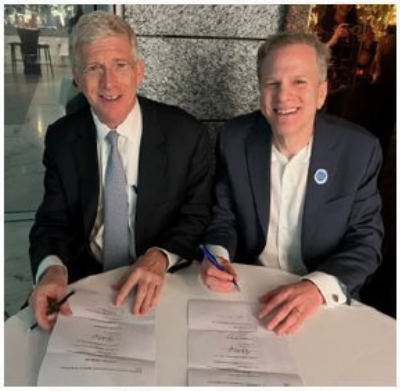
To our Valued Shareholders,

I am pleased to present an overview of Lightbridge's progress in 2023, a brief description of a standard framework for keeping track of progress on nuclear fuel development efforts that we are adopting going forward, and key upcoming fuel development milestones that we expect to accomplish over the next 2-3 years. I will also summarize key highlights from COP28, which I attended.

Key Milestones and Achievements in 2023

Strengthening our Leadership Team: We welcomed Sherri Goodman and Dr. Scott Holcombe to our team. Ms. Goodman, a recognized national security expert, joined Lightbridge as an independent director, bringing invaluable insights into the intersection of energy and national security. As our new Vice President of Engineering, Dr. Holcombe brings extensive expertise in nuclear fuel and materials development and management of interdisciplinary teams of engineers and subject matter experts, further bolstering our nuclear fuel technology leadership.

Agreement with Centrus Energy: We announced an agreement with Centrus Energy to conduct a front-end engineering and design (FEED) study for a Lightbridge Pilot Fuel Fabrication Facility (LPFFF) in Piketon, Ohio. Centrus hosts the only U.S.-based production facility for high assay low enriched uranium (HALEU),



From left to right: Daniel B. Poneman, Centrus CEO, Seth Grae, President & CEO of Lightbridge

(HALEU) partnering with the U.S. Department of Energy (DOE) on the site. The key objective of the FEED study is to determine the scope of work, cost and schedule estimates, and identify key risk factors for establishing an LPFFF. The results from this study will form the basis for a decision on the way forward for establishing an LPFFF for manufacture of commercial-size fuel rods for demonstrating and licensing Lightbridge Fuel in commercial reactors. The LPFFF could potentially be expanded to a full commercial-scale facility.

From left to right: Dr.Constantin Paunoiu, Director of Institutul de Cercetări Nucleare Pitești, and Dr. Andrey Mushakov, Lightbridge's Executive Vice President, Nuclear Operations

Engineering Study for CANDU Reactors: We announced an agreement with Institutul de Cercetări Nucleare Pitești, a subsidiary of Regia Autonoma Tehnologii pentru Energia Nucleara (RATEN ICN), to perform an engineering study to assess the compatibility and suitability of Lightbridge Fuel for use in CANDU reactors. Key areas for assessment include mechanical design, neutronics analysis, and thermal-hydraulic evaluations. The study will identify any critical parameters for further evaluation and design. The findings will guide future economic evaluations and support navigating potential regulatory-licensing-related issues. Due to the unique design and operating conditions of CANDU reactors, we believe this type of reactor may offer an opportunity for faster time to market.

Collaborative Research and Development Initiatives: We announced a research study with Texas A&M University, NuScale Power, and Structural Integrity Associates as part of the DOE Nuclear Energy University Program (NEUP) R&D Awards. This project focuses on thermal-hydraulic modeling and testing and aims to increase the understanding of the overall performance of Lightbridge Fuel under simulated normal and off-normal conditions in NuScale's SMR. This follows a similarly structured NEUP study with the Massachusetts Institute of Technology announced in 2022 that focuses on neutronics modeling and safety evaluation of Lightbridge Fuel in a NuScale SMR.

Lightbridge's James Fornof, Vice President of Program Management (first from the left) and Dr. Scott Holcombe, Vice President of Engineering (fourth from the left) are joined by Prof. Yassin A. Hassan, Director of the Center for Advanced Small Modular and Micro Nuclear Reactors (CASMR) at Texas A&M University (third from the left)

Enhanced Plutonium Disposition: We announced that a recently published peer-reviewed technical paper[1] on the disposition of weapons-grade plutonium revealed that, based on computer simulations, a Lightbridge-designed fuel rod significantly outperforms traditional mixed-oxide (MOX) fuel in consuming plutonium, consuming approximately 5.5 times more plutonium per fuel rod than MOX fuel, making the Lightbridge-designed rods well-suited for consuming excess weapons-grade plutonium.

1. https://www.tandfonline.com/doi/full/10.1080/00295450.2022.2145836

Technology Readiness Level Framework

Lightbridge is adopting the Technology Readiness Level (TRL) system to illustrate the progress of its fuel development efforts. The TRL system, originally developed by NASA[2] and widely recognized across various industries, including the OECD Nuclear Energy Agency provides a standardized framework for assessing and communicating the maturity of a particular technology. This framework encompasses a scale from 1 to 9, with TRL 1 representing the initial concept or theoretical stage, and TRL 9 denoting a technology that has been proven in its operational environment. Utilizing the TRL system allows Lightbridge to map the development of its nuclear fuel technology against a clear, standardized metric, enabling stakeholders to gauge progress in a structured and transparent manner.

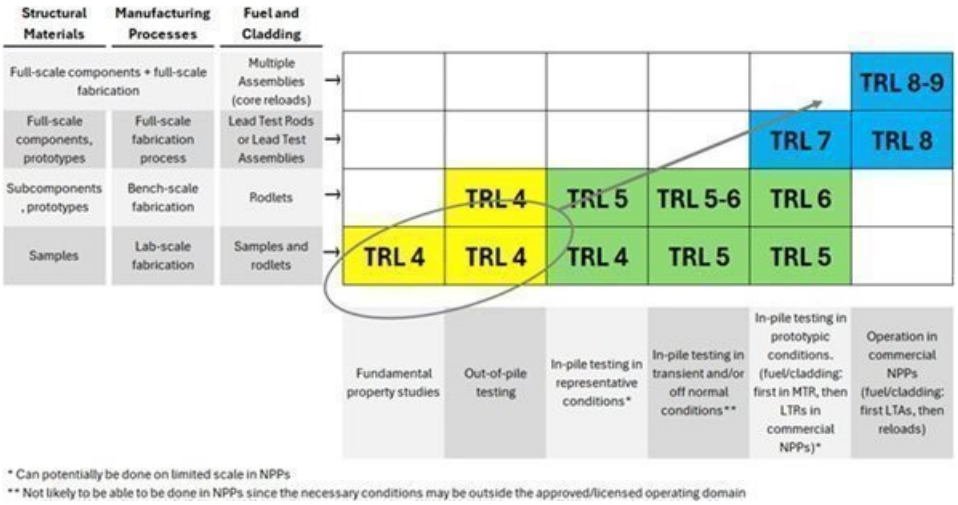


Figure 1: Adapted from the OECD-NEA FIDES-II Strategic Plan 2023, page 7[3].
Illustration of the general progression of Technical Readiness Level for innovative fuel and cladding, structural materials, and manufacturing processes, starting with investigations of fundamental properties and ending with use of full-scale fuel assemblies and components in NPPs.

Currently, Lightbridge Fuel is positioned at TRL 4-5, indicating a significant phase in our development process. At this stage, Lightbridge Fuel has moved beyond theoretical research (TRL 1-3) and entered into the realm of validation in a laboratory environment (TRL 4) and initiation of validation in representative operating conditions (TRL 5). This signifies that the core principles underlying Lightbridge Fuel have been successfully demonstrated through calculations, in a number of laboratory experiments, and in test reactor proof-of-concept experiments, where our efforts are now focused on verifying the technology's performance under conditions that closely simulate operational scenarios. This is a pivotal transition from conceptual designs and laboratory tests to in-reactor testing in representative and actual conditions the fuel will experience in commercial reactors. This phase is critical for demonstrating our fuel's design, materials, performance, and for identifying any potential challenges, allowing for adjustments and enhancements before advancing to system prototype demonstration in operational environments (TRL 6-7).

2. *https://www.tandfonline.com/doi/full/10.1080/00295450.2022.2145836*
3. *https://www.oecd-nea.org/jcms/390976_Media/strategic-plan-final-2023*

Achieving TRL 4-5 is an important milestone which validates the Lightbridge Fuel design thus far and sets the stage for subsequent development steps, moving us closer to commercialization and widespread adoption of our advanced nuclear fuel (TRL 8-9).

Key Upcoming Fuel Development Milestones Anticipated over the Next 2-3 Years

Applying the TRL framework to the upcoming fuel development milestones illustrates how each goal aligns with different TRL levels:

- Expand our fuel development team to build in-house modeling and simulation capabilities in neutronics, thermal-hydraulics, fuel performance, and transient analyses (supports TRL levels 4-9);
- Continue to execute our ongoing work at Idaho National Laboratory leading to casting and extrusion of unclad fuel material samples using enriched uranium and their subsequent insertion for irradiation testing in the Advanced Test Reactor (supports late stages of TRL level 4; the experimental data would feed into model development and validation described above);
- Complete the Engineering Study for the use of Lightbridge Fuel in CANDU reactors in collaboration with RATEN ICN (this corresponds to activities pre-TRL level 4 to confirm feasibility of using Lightbridge Fuel in another type of reactor, i.e., CANDU pressurized heavy water reactor);
- Complete the FEED study for an LPFFF in collaboration with Centrus Energy (supports TRL levels 5-8); and
- Commence manufacturing efforts relating to co-extrusion of cladded rodlets for loop irradiation testing (supports late stages of TRL level 4 and TRL levels 5-7).

COP28 Takeaways and Tripling Nuclear Capacity by 2050

Significantly, for the first time, at COP28 nuclear energy was recognized alongside other clean energy sectors in the negotiations' final statement, marking the broader acceptance of nuclear as a key component of the global decarbonization strategy. The conference was a confluence of government officials, industry leaders, and environmental activists, each bringing their perspectives to the table.

COP28 served as a platform for announcing a significant commitment by the United States and over 20 other nations to triple nuclear energy globally by 2050. To meet this highly ambitious commitment of tripling nuclear power by 2050 assumes maintaining the operation of the current roughly 400 large nuclear reactors worldwide—93 of which are in the United States. Additionally, it necessitates the construction of approximately 800 more large reactors, which would signify an unprecedented expansion in nuclear power infrastructure. If the focus shifts towards small modular reactors, the numbers required could soar into the thousands, potentially exceeding 10,000 units, depending on their capacity.

As the nuclear sector gears up for an unprecedented expansion, we believe the demand for more efficient, safer, and economically viable nuclear fuel technology will surge, positioning Lightbridge Fuel as an important player in this growing nuclear capacity and its massive addressable market. Lightbridge Fuel's anticipated benefits, such as enhanced safety, improved performance, economic benefits due to power uprate and fuel cycle extension features, and load following opportunities can offer an attractive fuel technology option to existing and future water-cooled reactors.

Conclusion

We are focused on further advancing our technologies, expanding our market presence, and continuing our collaborations with industry and academic partners. Our ongoing research and development efforts and strong intellectual property portfolio position us favorably in an industry set to expand dramatically throughout the world.

I want to thank our shareholders, employees, partners, and vendors for your continued support. We will keep you apprised of our progress and key developments.

Sincerely,

Seth Grae
President and Chief Executive Officer
Lightbridge Corporation

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)
☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended **December 31, 2023**

OR

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

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. ☐

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

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

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

At June 30, 2023, 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, 2023) was $69,561,740.

At February 21, 2024 there were 13,941,480 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 2024 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, 2023
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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," "may," 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 toward the 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;
- any adverse changes to our agreements or relationship with the U.S. government and its national laboratories;
- our ability to fund our future operations, including general corporate overhead and outside research and development expenses, and continue as a going concern;
- the future market and demand for our fuel for nuclear reactors 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;
- 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 domestically and abroad;
- the trading price of our securities is likely to be volatile, and purchasers of our securities could incur substantial losses; 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 next generation nuclear fuel for water-cooled reactors that could significantly improve the economics and safety of existing and new nuclear power plants, large and small, and enhance proliferation resistance of spent nuclear fuel while supplying clean energy to the electric grid. 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 believe Lightbridge can benefit from a growing nuclear power industry, and that our nuclear fuel can help enable that growth to happen.

We believe our metallic fuel will offer significant economic and safety benefits over traditional nuclear fuel, primarily because of the superior heat transfer properties and the resulting lower operating temperature of all-metal 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 include small modular reactors (SMRs), which are now in the development and licensing phases. We expect that Lightbridge Fuel™ can provide water-cooled SMRs with the same benefits our technology brings to large reactors, with such benefits being even more meaningful to the economic case for deployment of SMRs, including potential load following capability when included on a virtually zero-carbon electric grid with renewable energy sources. We expect Lightbridge Fuel™ to generate more power in SMRs than traditional nuclear fuels.

We have built a significant portfolio of patents, and we anticipate testing our nuclear fuel through third-party vendors and others, including the United States Department of Energy's (DOE) national laboratories. Currently, we are performing the majority of our research and development (R&D) activities within and in collaboration with the DOE's national laboratories.

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 was inspired by the anticipated needs of prospective customers, as nuclear utilities have expressed interest in the improved economics and enhanced safety that we believe metallic fuel will provide.

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 mass 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 is needed to (i) increase power output from the same core size to improve reactor economics, and (ii) enhance the fuel performance of nuclear power generation. 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 power industry prepares to meet the increasing global demand for electricity production, nuclear utilities are seeking longer operating cycles and higher reactor power outputs for current and future reactor fleets. 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 future 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 new-build reactors implementing a power uprate. In addition to projected electricity production cost savings, we believe our technology may allow utilities or countries 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 demands have become increasingly variable with large additions of intermittent renewable energy generation.

Nuclear Industry and Addressable Market

Overview of the Nuclear Power Industry

Nuclear power provides a non-fossil fuel, low-carbon energy solution that can meet baseload electricity needs. According to the U.S. Energy Information Administration, nuclear power provided approximately 4.3% of the world's total energy from all sources in 2022, including approximately 9% of global electricity generation. According to the World Nuclear Association (WNA), as of January 2024, there were 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).

Of the world's 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 net operating capacity. According to the WNA, as of January 2024, there are approximately 60 nuclear reactors under construction. Most reactors currently under construction or planned for future construction are located in Asia.

We expect Lightbridge Fuel™ to be able to operate in various types of water-cooled reactors, including existing or future light water reactors, which include water-cooled SMRs, as well as for Canada Deuterium Uranium (CANDU)-type pressurized heavy water reactors. The existing U.S. fleet of nuclear reactors represents 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 anticipated operating cycle extension from 18 to 24 months, or a power uprate of 17%, as described below, without extending the cycle length.

Target Market for Lightbridge Fuel™

Our target market segments include water-cooled commercial power reactors, such as PWRs, BWRs, VVERs, CANDU heavy water reactors, water-cooled SMRs, as well as water-cooled research reactors.

We believe that most significant economic benefit of Lightbridge Fuel™ may be its potential to provide a 30% power uprate in new-build water-cooled reactors, as existing large reactors cannot realize that benefit because their systems are not designed to handle that much of an increase in power. Accordingly, the highest power uprate existing large PWRs could take from Lightbridge Fuel™ is estimated to be approximately 17%.

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, produce about the same amount of CO2 equivalent emissions per unit of electricity generated as wind power. 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 such sectors, and other current global electricity needs, with non-emitting or low-emitting energy sources 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 could play an important role toward reaching this goal.

Growing Importance of Energy Security

We believe that Russia's invasion of Ukraine has made clear the need for countries to diversify their energy production and wean off dependency on fossil fuels provided by countries that may threaten their national security. As a result of this military conflict, oil and natural gas prices surged in early 2022, and many countries have imposed sanctions upon Russia in response. European countries have responded by reconsidering their plans for domestically produced nuclear energy by either keeping existing nuclear power plants running or moving ahead with plans for new plants or both. For example, the United Kingdom and France are deploying new nuclear power plants, Belgium has decided to reverse its decision to close all its nuclear plants in the wake of Russia's invasion of Ukraine and Canada, Sweden, Romania, Ghana, and several other countries have announced plans to deploy new nuclear power plants. It has become clear that a stable domestic energy supply ensures energy security and provides the strongest protection against energy price volatility. Increasingly, policymakers view nuclear energy as critical to a secure energy future.

Anticipated Safety Benefits of Lightbridge Fuel™

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

- Lightbridge Fuel™ operates at lower operating temperatures than current conventional nuclear fuel, contributing to lower stored thermal energy in the fuel rods; it is therefore 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; and
- has lighter and stiffer fuel assembly, which may contribute to improved seismic performance.

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 Nuclear Regulatory Commission (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 in a VVER-1000 reactor, unlike conventional uranium dioxide fuel, the cladding of the Lightbridge-designed metallic fuel rods would stay approximately 200 degrees cooler than 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 expected to mitigate hydrogen gas generation in design-basis LOCA situations.

Lightbridge Spent Fuel - Proliferation Resistance

The April 2018 issue of Nuclear Engineering and Design, a technical journal affiliated with the European Nuclear Society, included a peer-reviewed 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.

A modified variant of Lightbridge Fuel™ incorporating plutonium instead of, or in addition to, uranium in the metallic fuel rods could potentially be used to dispose of plutonium from reprocessed used reactor fuel, utilizing the plutonium to generate electricity. Our fuel also has the potential to be used to dispose of excess plutonium from nuclear weapons.

Development of Lightbridge Fuel™

We believe our metallic fuel could be able to operate in different types of water-cooled commercial power reactors, such as pressurized water reactors (including VVERs), boiling-water reactors, heavy water pressurized reactors, such as CANDUs, water-cooled SMRs, and water-cooled research reactors.

We have obtained patent protection in a number of 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.

Recent Developments

FEED Study with Centrus Energy for a Lightbridge Pilot Fuel Fabrication Facility

On December 5, 2023, we entered into an agreement with Centrus Energy Corp. (Centrus Energy) to conduct a front-end engineering and design (FEED) study to construct a Lightbridge Pilot Fuel Fabrication Facility (LPFFF) to manufacture Lightbridge Fuel™ using high-assay low-enriched uranium (HALEU) at the American Centrifuge Plant in Piketon, Ohio, the only HALEU production plant in the world outside of Russia. The FEED study will identify infrastructure and licensing requirements as well as the estimated cost and construction schedule for the LPFFF. Centrus Energy's wholly-owned subsidiary, American Centrifuge Operating, LLC, will lead the study. The work is expected to be completed in 2024 at a fixed price of approximately $0.5 million.

Engineering Study of Lightbridge Fuel™ for use in CANDU reactors

On October 16, 2023, we engaged Institutul de Cercetări Nucleare Pitești, a subsidiary of Regia Autonoma Tehnologii pentru Energia Nucleara in Romania to perform an engineering study to assess the compatibility and suitability of Lightbridge Fuel™ for use in CANDU reactors. This assessment will cover key areas including mechanical design, neutronics analysis, and thermal and thermal-hydraulic evaluations. The findings from this engineering study will play an important role in guiding future economic evaluations and navigating potential regulatory licensing-related issues for potential use of Lightbridge Fuel™ in CANDU reactors. The work is expected to be completed in 2024 at a fixed price of approximately $0.2 million.

HALEU Consortium Membership

To support establishment of domestic HALEU infrastructure, the DOE announced on December 7, 2022 the creation of a HALEU Consortium. According to the DOE, the purposes of the HALEU Consortium include: (i) providing the Secretary of Energy HALEU demand estimates for domestic commercial use, (ii) purchasing HALEU made available to members for commercial use under the program, (iii) carrying out demonstration projects using HALEU under the program, and (iv) identifying actionable opportunities to improve the reliability of the HALEU supply chain. On December 15, 2022, the Company submitted a formal request to the DOE to join the HALEU Consortium to mitigate HALEU supply risk. On January 12, 2023, the Company received written confirmation from the DOE of Lightbridge's membership in the HALEU Consortium. HALEU is a key component necessary for the fabrication and operation of Lightbridge Fuel™ in light water reactors.

Idaho National Laboratory Agreements

In December 2022, Lightbridge entered into agreements with Battelle Energy Alliance, LLC (BEA), the DOE's operating contractor for Idaho National Laboratory (INL), to support the development of Lightbridge Fuel™. The framework agreements use an innovative structure that consists of an "umbrella" Strategic Partnership Project Agreement (SPP) and an "umbrella" Cooperative Research and Development Agreement (CRADA), each with BEA, with an initial duration of seven years.

We anticipate that the initial phase of work under the two agreements that has been released will culminate in casting and extrusion of unclad fuel material samples using enriched uranium supplied by the DOE that will subsequently be inserted for irradiation testing in the Advanced Test Reactor (ATR) at INL. The initial phase of work aims to generate irradiation performance data for Lightbridge's delta-phase uranium-zirconium alloy relating to various thermophysical properties. The data will support fuel performance modeling and regulatory licensing efforts for commercial deployment of Lightbridge Fuel™.

We anticipate that subsequent phases of work under the two umbrella agreements that have not yet been released may include post-irradiation examination of the irradiated fuel material coupons, loop irradiation testing in the ATR, and post-irradiation examination of one or more uranium-zirconium fuel rodlets, as well as transient experiments in the Transient Reactor Test Facility at INL.

In 2023, we worked with INL to complete and issue a Quality Implementation Plan (QIP) for our collaborative project at INL which was an essential first step to ensure all future work performed at INL on the project would meet the U.S. nuclear industry quality assurance requirements. Additionally, we worked with INL to demonstrate casting of delta-phase uranium-zirconium ingots with depleted uranium using existing INL equipment. As part of that effort, we cast several laboratory-scale ingots using depleted uranium and zirconium alloy materials. Our next step is to cast additional ingots using depleted uranium and zirconium alloy materials and conduct initial extrusions from those ingots in the next several months.

Nuclear Energy University Program Awards

Texas A&M University (TAMU), NuScale Power, and Structural Integrity Associates are working on a 3-year study of our nuclear fuel, led by TAMU. In mid-2023, TAMU was awarded $1 million by the DOE's Nuclear Energy University Program (NEUP) R&D Awards to conduct this study. The project entails a characterization of the performance of the Lightbridge Fuel™ Helical Cruciform advanced fuel design, which will generate sets of experimental data on friction factor, flow, and heat transfer behavior under NuScale's SMR simulated normal and off-normal conditions.

We previously announced the ongoing NEUP project with the Massachusetts Institute of Technology (MIT). The study led by MIT and funded by DOE relates to evaluation of accident tolerant fuels in various SMRs. The project aims to simulate the fuel and safety performance of Lightbridge Fuel™ for the NuScale SMR and provide scoping analysis to improve the safety and economics of water-cooled SMRs.

We do not have any contractual obligations with the collaboration teams working on the above-mentioned projects and will not receive any revenue or record any benefits from these awards.

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

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

- continue to execute SPP/CRADA work at INL leading to casting and extrusion of unclad fuel material samples using enriched uranium and their subsequent insertion for irradiation testing in the ATR.
- complete a feasibility study for the use of our nuclear fuel in CANDU heavy water reactors.
- complete a FEED study for a LPFFF in collaboration with Centrus Energy.
- commence manufacturing efforts relating to co-extrusion of cladded rodlets for loop irradiation testing.

The long-term milestones towards development and commercialization of nuclear fuel assemblies include, among other things, irradiating nuclear material samples and prototype fuel rods with enriched uranium 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 accurately predict the timing of the commercialization of our nuclear fuel technology. However, based on our best estimate and assuming adequate R&D funding levels, we expect to begin demonstration of lead test rods (LTRs) and/or possibly LTAs with our metallic fuel in commercial reactors in the 2030s and begin receiving purchase orders for initial fuel reload batches from utilities 15-20 years from now, with 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.

Certain Challenges and Uncertainties

1. Funding and/or in-kind support from government and/or strategic partners and/or other third-party sources

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 funding constraints. This is in addition to our corporate overhead and other fixed costs, such as in-house project management and project control personnel. As a result, we believe seeking and securing significant funding and/or in-kind contributions from government and/or strategic partners and/or other third-party sources to support our fuel development program is essential for us to adhere to our expected timelines for our fuel development and commercialization efforts.

2. Availability of suitable test loops in the ATR

After the Halden research reactor located in Halden, Norway, 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 chose the ATR at INL and applied to the DOE for and in December 2019, won a Gateway for Accelerated Innovation in Nuclear (GAIN) Voucher for an ATR experiment design and this project was completed during the third quarter of 2021.

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

If sufficient loop capacity within the ATR is not available, we may not be able to obtain sufficient data to justify regulatory approval for LTA demonstration in a large commercial PWR in a commercially feasible timeframe. This would likely necessitate additional loop irradiation testing in another test reactor or LTR demonstration in a large commercial PWR in addition to the ATR loop testing before LTA demonstration 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. Consequently, the projected fuel development costs and timelines make it unfeasible for Lightbridge to fund this fuel development effort on its own.

3. Partnerships with fuel vendors and nuclear utilities

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 nuclear fuel fabricator and the nuclear utility will be primarily responsible for securing the necessary regulatory licensing approvals for the LTA operation. We plan to also build relationships with large reactor and/or SMR reactor fuel vendors, as well as existing nuclear utilities and/or potential SMR customers.

4. Supply chain infrastructure for HALEU

Establishment of required supply chain infrastructure to support HALEU 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 for light water reactors 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 to develop and demonstrate a qualified fabrication process for our metallic fuel rods

Demonstration of a qualified fabrication process both for semi-scale irradiation fuel rod samples and subsequently for full-length (approximately 12 to 14 feet) metallic fuel rods for large PWR LTAs and shorter length for SMRs (approximately 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 PWR metallic fuel rods for large PWRs has yet to be fully demonstrated. In 2021, we demonstrated the co-extrusion of full-length rods using surrogate materials (i.e., rods which replaced the uranium component with a suitable physical analogue). Coextrusion is the primary forming operation in the manufacturing of our fuel and this demonstration was an important milestone on the path to developing and qualifying the full manufacturing process for actual fuel rods with enriched uranium.

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.

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 agreed to load four lead test assemblies with a chromia and alumina doped ATF design. Similar ATF concepts are being tested by GE Nuclear, 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, we believe 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 in existing light water reactors (LWRs) and/or power uprates in BWRs 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 and or achieving power uprates 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 and/or offer power rate uprates opportunities. While it is not certain that the ATF vendors will be successful in this approach, if ATF could provide for longer cycles and/or power uprates, it could severely weaken or undermine our economic value proposition in existing large LWRs. 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.

Nuclear power faces competition from other sources of electricity as well, including natural gas, which at times 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. 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 in light water reactors 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, and 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 funding and/or in-kind contributions from government and/or strategic partners and/or other third-party sources as well as political support for our project will be essential to the success of our nuclear fuel development program. Without significant funding and cost sharing contributions from government and/or strategic partners and/or other third-party sources toward our fuel development activities, it will be unfeasible for the Company to fund all its future fuel development efforts on its own within the expected timelines or at all.

In addition to external funding and/or in-kind support, 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. 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.

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 1 new patent (worldwide) in 2023 and currently have 12 pending patent applications (worldwide). As of December 31, 2023, we held 11 U.S. patents and more than 146 foreign patents.

The expiration dates of these patents, unless it is 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 Resources

As of December 31, 2023, 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 needs. We have a competitive compensation plan and benefits plan that is designed to attract, retain, and reward individuals and includes an employee stock purchase plan and a 401k plan with a 100% matching employer contribution with immediate vesting.

Our Culture

Our mission is to help the world combat climate change and meet 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 empowers 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

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, or at all. Any capital raises may cause significant dilution to our shareholders.

As of December 31, 2023, we had $28.6 million in cash and cash equivalents. We have experienced substantial and recurring losses from operations, which has created an accumulated deficit of $152.4 million as of December 31, 2023. We will continue to incur losses because we are in the early development stage of commercializing our nuclear fuel.

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 potentially 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. If we are unable to meet our future 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. 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/or in-kind contributions 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 receiving significant funding and/or in-kind contributions from the U.S. government to not only support our ongoing R&D efforts, but to also 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.

Changes to, or termination of, any agreements with the U.S. government national laboratories, or deterioration in our relationship with the U.S. government, could adversely affect our research and development activities.

We are a party to agreements and arrangements with U.S. national laboratories that are subject to review and approval by the DOE and which are important to our R&D activities. Termination, expiration, or modification of one or more of these or other agreements could adversely affect our future prospects to develop our fuel and/or commercially deploy it. In addition, deterioration in our relationship with the U.S. national laboratories that are parties to these agreements and/or the DOE could impair or impede our ability to successfully implement these agreements, which could adversely affect our R&D activities.

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 reactor loops and/or other test facilities; 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 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.

Additionally, we believe our metallic fuel can be used in CANDU heavy water reactors. However, we have yet to complete our feasibility study to confirm our fuel's suitability for those types of reactors. As a result, we do not yet have an economic model for CANDU-type reactors and are uncertain at this time as to potential economic benefits, if any, our metallic fuel could provide in those types of reactors.

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.

We may not achieve the expected benefits from our collaboration agreement with Centrus Energy Corp.

On December 7, 2023, we announced the Company's entry into a collaboration agreement with Centrus Energy Corp. to engage in a front-end engineering and design (FEED) study to add a dedicated Lightbridge Pilot Fuel Fabrication Facility (LPFFF) at the American Centrifuge site in Piketon, Ohio. The FEED study is intended to identify infrastructure and licensing requirements as well as the estimated cost and deployment schedule for the LPFFF. Centrus Energy's wholly-owned subsidiary, American Centrifuge Operating, LLC, will lead the study, which is expected to be completed in 2024. The American Centrifuge Plant is currently the only place in the world to produce HALEU in UF6 form outside of Russia. There can be no guarantee that the FEED study will return results that confirm the feasibility of a LPFFF and may indicate that the infrastructure and licensing requirements or the estimated cost or timelines to deploy the LPFFF would be overly onerous, too lengthy or prohibitively expensive to proceed with the deployment of the LPFFF. If the FEED study indicates that the LPFFF cannot be completed at the American Centrifuge Plant on terms acceptable to us, it may delay our anticipated timeline for the commercialization of our fuel, which would adversely affect our business, financial condition, and results of operations.

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, such as the ATR at INL, 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 may have enough space for additional flow 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 sufficient capacity within the ATR is not available, we may not be able to obtain sufficient data to justify regulatory approval for LTA demonstration in a large commercial PWR in a commercially feasible timeframe. This would likely necessitate additional loop irradiation testing in another test reactor or LTR demonstration in a large commercial PWR in addition to the ATR loop testing before LTA demonstration 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 multi-lobe 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 and/or cost overruns.

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 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 or CANDUs 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 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 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. 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 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. Upon commercialization, a reduction or elimination of customer contracts or future customer contracts resulting from lower public support, less raw materials, lower demand, increased regulation, and increased costs could adversely affect our business model and future prospects.

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.

We rely on a limited number of suppliers for HALEU or other key source materials and/or key components and/or key equipment necessary for the development and fabrication of our nuclear fuel, which could, under certain circumstances, adversely delay our research and development activities.

If the supply of a single-sourced or limited-sourced material and/or key component and/or key equipment is delayed or ceases, we may not be able to produce the related test fuel rod, which could adversely delay our research and development activities. In addition, a single-source or limited-source supplier of a key component or a key piece of equipment could potentially exert significant bargaining power over price, quality, or other terms relating to these materials or equipment, which could have a material adverse effect on our financial condition, results of operations and cash flows.

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. Additionally, certain material and equipment prices are expected to remain at high levels 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 are dependent on management and key personnel for our success, and the loss of which could have a material adverse effect on our business.

Our business depends upon the recruitment and continued service of our highly skilled, educated, and trained employees, and the loss of, or the inability to attract and retain, qualified personnel could have a material adverse effect on our business. Our ability to attract, motivate, compensate, and retain highly qualified and diverse employees is necessary to support and achieve business objectives. Competition for skilled and diverse employees in our industry can be intense, and any uncertainty surrounding future employment opportunities, organizational and reporting structures and related concerns may impair our ability to attract and retain qualified employees.

The loss of the services of qualified employees and any inability to recruit effective replacements or to otherwise attract, motivate, train, or retain highly qualified and diverse employees could have a material adverse effect on our business, financial condition, and results of operations.

Also, any significant leadership change and accompanying senior management transition involves inherent risk, and any failure to ensure a smooth transition could hinder our strategic planning, execution, and future performance. While we strive to mitigate the negative impact associated with changes to our senior management team, such changes may cause uncertainty among investors, employees, and others concerning our future direction and performance. If we fail to effectively manage any leadership changes, including organizational and strategic changes, such failure could have a material adverse effect on our ability to successfully attract, motivate and retain highly qualified employees, as well as our business, financial condition, and results of operations.

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, some 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 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 our 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.

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. The third-parties with which we outsource certain of our IT functions utilize a variety of systems and cybersecurity capabilities, and such third-parties may not be successful in preventing a breach that exploits a weakness in their cybersecurity systems. In some cases, we may not be aware of cyber incidents immediately as we rely on such third-parties to inform us of a cyber incident that could affect our information contained in their systems.

Disruptions from cybersecurity events may jeopardize the security of information, trade secrets, or confidential data 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, or the third-parties with whom we contract, 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 and, in some cases, our insurance coverage may not cover the cyber incident at all.

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, government contracts 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.

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. Furthermore, our patents, trade secrets, information and intellectual property may be the subject of infringement by third-parties. We do not know how successful we would be should we choose to assert our patents or other intellectual property rights 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.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets, and other intellectual property protection, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our intellectual property and proprietary rights generally. Proceedings to enforce our intellectual property and proprietary rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly, could put our patent applications at risk of not issuing, and could provoke third-parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property and proprietary rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Additionally, sanctions or other restrictions on payments made to Russia imposed by the United States government in response to Russia's invasion of Ukraine may make it more difficult for us to maintain patent protection in certain foreign jurisdictions. Certain of our patents are maintained by the Eurasian Patent Office and the Russian patent office, Rospatent. Each of the Eurasian Patent Office and Rospatent use the Russian Central Bank to process patent annuity payments. The U.S. Office of Foreign Assets Control (OFAC) has identified the Russian Central Bank as a sanctioned entity. Paying a Russian firm or agent to make payments that will be processed by the Russian Central Bank could be deemed an act of evading or avoiding sanctions. On May 5, 2022, OFAC published General License 31, which created an exemption to such sanctions for payments made to maintain intellectual property rights. However, there can be no assurance that this exemption will be made permanent, and if it is rescinded, we may be unable to make the required annuity or other maintenance payments with respect to our Russian and Eurasian patents. If we are unable to make the required annuity or other maintenance payments, there can be no assurance that our Russian and Eurasian patents will continue to receive adequate protection in the applicable jurisdictions, which could have a material adverse effect on our patent portfolio.

Further, in response to the sanctions imposed by OFAC, the Russian government issued a decree in March 2022 stating that patent holders associated with foreign states that commit "unfriendly actions against Russian legal entities and individuals" will be entitled to no renumeration from the unsanctioned use of such patent holders' intellectual property. While the impact of this decree has yet to be determined, it may significantly undermine intellectual property protection in Russia. Because of this significant uncertainty with respect to the treatment of foreign owned patents maintained in Russia, there can be no assurance that we will be able to maintain adequate protection of our Russian patents.

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. Also, our portfolio of patents evolves as new patents are issued and older patents expire and the expiration of patents could have a negative effect on our ability to prevent competitors from duplicating certain or all of our products. 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, courts outside the U.S. 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.

Applicable Russian intellectual property law may not protect some of our intellectual property, which could have a material adverse effect on our business.

Intellectual property rights have been 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, including laws adopted in response to international sanctions against Russia or otherwise. In particular, in response to the sanctions imposed by OFAC as a result of Russia's invasion of Ukraine, the Russian government issued a decree in March 2022 stating that patent holders associated with foreign states that commit "unfriendly actions against Russian legal entities and individuals" will be entitled to no renumeration from the unsanctioned use of such patent holders' intellectual property. 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, 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 have identified a material weakness in our internal control over financial reporting.

Management, including our Chief Executive Officer and our Chief Financial Officer (CFO), assessed the effectiveness of our internal control over financial reporting as of December 31, 2023 and concluded that we did not maintain effective internal control over financial reporting. Specifically, management identified a material weakness related to the design of our controls over logical access and segregation of duties, at the application control level, in certain information technology environments.

We previously identified a material weakness in our internal control over financial reporting and may identify additional material weaknesses in the future or otherwise fail to maintain an effective system of internal controls, which may result in material misstatements of our financial statements or cause us to fail to meet our periodic reporting obligations.

See Part II. Item 9A., Controls and Procedures, below for additional information about the material weakness. While certain actions have been taken to implement a remediation plan to address this material weakness and to enhance our internal control over financial reporting, if this material weakness is not remediated, it could adversely affect our ability to report our financial condition and results of operations in a timely and accurate manner, which could negatively affect investor confidence in our Company, and, as a result, the value of our common stock could be adversely affected.

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 the 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.

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 25,000,000 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.

Our ability to utilize our net operating loss carryforwards to offset future taxable income will be limited and may also expire.

Our ability to fully utilize our existing net operating losses (NOLs) generated after the tax year 2017 will be limited and the use of our NOLs generated prior to the 2018 tax year are severely limited, due to ownership changes in prior years as defined under Section 382 of the Internal Revenue Code. An "ownership change" is generally defined as a greater than 50% change in equity ownership by value over a rolling three-year period. Future NOLs generated will be limited if (i) we undergo an "ownership change" as described under Section 382, (ii) we do not reach profitability or are only marginally profitable, or (iii) there are changes in U.S. government laws and regulations. We did not perform a complete Section 382 study to determine the limitation on prior year NOLs, due to the long timeline for developing our nuclear fuel to commercialization to generate taxable income. Further, based on the results of our phase I Section 382 study in 2022, it's likely our NOLs generated prior to the 2018 tax year will expire unused given the 20-year carry forward period for these NOLs. Future ownership changes, some of which may be beyond our control, as well as differences and fluctuations in the value of our equity securities may adversely affect our ability to utilize our current and future NOLs and could reduce our flexibility to raise capital in future equity financings or other transactions, or we may decide to pursue transactions even if they would result in an ownership change and impair our ability to use our NOLs. We also may decide to pursue transactions even if they would result in an ownership change and impair our ability to use our NOLs. In addition, any changes to tax rules and regulations or the interpretation of tax rules and regulations could negatively impact our ability to recognize any potential benefits from our NOLs or net unrealized built-in losses.

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 1C. CYBERSECURITY

Risk management and strategy

Lightbridge utilizes third-party vendors to manage its Information Technology (IT) systems and has a Managed Service Provider (MSP) for general administration of the IT process including providing a Chief Information Security Officer (CISO), who is responsible for leading our enterprise-wide cybersecurity strategy, policy, standards, architecture, and processes. The MSP utilizes a Security Information and Event Management (SIEM) system to monitor the IT Infrastructure. This and other third-party security applications provide reports that include but are not limited to Endpoint protection, Employee Security scores, Phishing reports, Dark Web scanning and Vulnerability scanning. The CISO reports to our CFO. This CISO is informed about and monitors prevention, detection, mitigation, and remediation efforts through regular communication and reporting from professionals in the industry, many of whom hold cybersecurity certifications, and through the use of technological tools and software and results from third-party audits. The CISO issues quarterly reports and reports to the CFO, as appropriate, providing updates on the Company's cyber risks and threats, the status of projects to strengthen our information security systems, assessments of the information security program, and the emerging threat landscape. The Company requires its employees to take a yearly cyber training course and its employees are also required to sign confidentiality agreements for purposes including ensuring cybersecurity.

Risks from Cybersecurity Threats

As of the date of this report, we are not aware of any material risks from cybersecurity threats, that have materially affected or are reasonably likely to materially affect the Company, including our business strategy, results of operations, or financial condition.

Governance

The Board of Directors is acutely aware of the critical nature of managing risks associated with cybersecurity threats. The Board has established robust oversight mechanisms to ensure effective governance in managing risks associated with cybersecurity threats because Lightbridge recognizes the significance of these threats to our operational integrity and stakeholder confidence. Furthermore, significant cybersecurity matters, and strategic risk management decisions are escalated to the Board of Directors, ensuring that they have comprehensive oversight and can provide guidance on critical cybersecurity issues.

Board of Directors Oversight

The Audit Committee is central to the Board's oversight of cybersecurity risks and bears the primary responsibility for this domain. The Audit Committee is composed of board members with diverse expertise including risk management, technology, and finance that equips them to oversee cybersecurity risks effectively. The Audit Committee conducts an annual review of the company's cybersecurity posture and the effectiveness of its risk management strategies. This review helps in identifying areas for improvement and ensuring the alignment of cybersecurity efforts with the overall risk management framework. The CFO reports to the Audit Committee regarding cybersecurity risks and provides a comprehensive briefing to the Audit Committee on a regular basis as needed, with a minimum frequency of once per year. The CFO also maintains an ongoing dialogue regarding emerging or potential cybersecurity risks and cybersecurity incidents.

ITEM 2. PROPERTIES

Our office space is located at 11710 Plaza America Drive, Suite 2000 Reston, VA 20190 USA. In January 2024, the lease was renewed for the term of January 1, 2024 through December 31, 2024 with a monthly payment of 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 our knowledge, the Company does not have any current pending legal issues or proceedings.

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 February 15, 2024, our common stock was held by 52 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 board of 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

None.

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 MD&A consists of the following sections:

- Overview of Our Business and Development of Lightbridge Fuel™ - a general overview of our business and updates;
- Critical Accounting Estimates - a discussion of critical judgments and estimates;
- Operations Review - an analysis of our consolidated results of operations for the periods presented in our consolidated financial statements; and
- Liquidity, Capital Resources, and Financial Position - an analysis of our cash flows and an overview of our financial position.

As discussed in more detail under "Forward-Looking Statements" preceding this MD&A, the following discussion contains forward-looking statements that are based on our management's current expectations, estimates, and projections, which are subject to a number of risks and uncertainties. Our actual results may differ materially from those discussed in these forward-looking statements because of the risks and uncertainties inherent in future events, including those set forth under "Forward-Looking Statements" and Part I. Item 1A. *Risk Factors.*

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 longer fuel cycles, and we also expect the fuel will provide 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.

Recent Developments

FEED Study with Centrus Energy for a Lightbridge Pilot Fuel Fabrication Facility

On December 5, 2023 we entered into an agreement with Centrus Energy Corp. (Centrus Energy) to conduct a front-end engineering and design (FEED) study to construct a Lightbridge Pilot Fuel Fabrication Facility (LPFFF) to manufacture Lightbridge Fuel™ using high-assay low-enriched uranium (HALEU) at the American Centrifuge Plant in Piketon, Ohio, the only HALEU production plant in the world outside of Russia. The FEED study will identify infrastructure and licensing requirements as well as the estimated cost and construction schedule for the LPFFF. Centrus Energy's wholly-owned subsidiary, American Centrifuge Operating, LLC, will lead the study. The work is expected to be completed in 2024 at a fixed price of approximately $0.5 million.

Engineering Study of Lightbridge Fuel™ for use in Canada Deuterium Uranium (CANDU) reactors

On October 16, 2023, we engaged Institutul de Cercetări Nucleare Piteşti, a subsidiary of Regia Autonoma Tehnologii pentru Energia Nucleara in Romania to perform an engineering study to assess the compatibility and suitability of Lightbridge Fuel™ for use in CANDU reactors. This assessment will cover key areas including mechanical design, neutronics analysis, and thermal and thermal-hydraulic evaluations. The findings from this engineering study will play an important role in guiding future economic evaluations and navigating potential regulatory licensing-related issues for potential use of Lightbridge Fuel™ in CANDU reactors. The work is expected to be completed in 2024 at a fixed price of approximately $0.2 million.

HALEU Consortium Membership

To support establishment of domestic HALEU infrastructure, the DOE announced on December 7, 2022 the creation of a HALEU Consortium. According to the DOE, the purposes of the HALEU Consortium include: (i) providing the Secretary of Energy HALEU demand estimates for domestic commercial use, (ii) purchasing HALEU made available to members for commercial use under the program, (iii) carrying out demonstration projects using HALEU under the program, and (iv) identifying actionable opportunities to improve the reliability of the HALEU supply chain. On December 15, 2022, the Company submitted a formal request to the DOE to join the HALEU Consortium to mitigate HALEU supply risk. On January 12, 2023, the Company received written confirmation from the DOE of Lightbridge's membership in the HALEU Consortium. HALEU is a key component necessary for the fabrication and operation of Lightbridge Fuel™ in light water reactors.

Idaho National Laboratory Agreements

In December 2022, Lightbridge entered into agreements with Battelle Energy Alliance, LLC (BEA), the DOE's operating contractor for Idaho National Laboratory (INL), to support the development of Lightbridge Fuel™. The framework agreements use an innovative structure that consists of an "umbrella" Strategic Partnership Project Agreement (SPP) and an "umbrella" Cooperative Research and Development Agreement (CRADA), each with BEA, with an initial duration of seven years.

We anticipate that the initial phase of work under the two agreements that has been released will culminate in casting and extrusion of unclad fuel material samples using enriched uranium supplied by the DOE that will subsequently be inserted for irradiation testing in the Advanced Test Reactor (ATR) at INL. The initial phase of work aims to generate irradiation performance data for Lightbridge's delta-phase uranium-zirconium alloy relating to various thermophysical properties. The data, which will be obtained during post-irradiation examination work to be released under a future Project Task Statement, will support fuel performance modeling and regulatory licensing efforts for commercial deployment of Lightbridge Fuel™.

We plan to negotiate subsequent phases of work under the two umbrella agreements that have not yet been released that may include post-irradiation examination of the irradiated fuel material coupons, loop irradiation testing in the ATR, and post-irradiation examination of one or more uranium-zirconium fuel rodlets, as well as transient experiments in the Transient Reactor Test Facility at INL.

In 2023, we worked with INL to complete and issue a Quality Implementation Plan (QIP) for our collaborative project at INL which was an essential first step to ensure all future work performed at INL on the project would meet the U.S. nuclear industry quality assurance requirements. Additionally, we worked with INL to demonstrate casting of delta-phase uranium-zirconium ingots with depleted uranium using existing INL equipment. As part of that effort, we cast several laboratory-scale ingots using depleted uranium and zirconium alloy materials. Our next step is to cast additional ingots using depleted uranium and zirconium alloy materials and conduct initial extrusions from those ingots in the next several months at INL.

Nuclear Energy University Program Awards

We are working with Texas A&M University (TAMU), NuScale Power, and Structural Integrity Associates on a 3-year study led by TAMU. In mid-2023, TAMU was awarded $1 million by the DOE's Nuclear Energy University Program (NEUP) R&D Awards to conduct this study. The project entails a characterization of the performance of the Lightbridge Fuel™ Helical Cruciform advanced fuel design, which will generate sets of experimental data on friction factor, flow, and heat transfer behavior under NuScale's small modular reactors (SMRs) simulated normal and off-normal conditions.

We previously announced our ongoing NEUP project with the Massachusetts Institute of Technology (MIT). The study led by MIT and funded by DOE relates to evaluation of accident tolerant fuels in various SMRs. The project aims to simulate the fuel and safety performance of Lightbridge Fuel™ for the NuScale SMR and provide scoping analysis to improve the safety and economics of water-cooled SMRs.

We do not have any performance obligations with the collaboration teams working on the above-mentioned projects and will not receive any revenue or record any benefits from these awards.

Fuel Development Strategy

We believe 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 (in our judgement) 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.

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

a. Fuel Fabrication

In the short to medium term, 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 to perform process development activities and establish the capability to manufacture development quantities of fuel rods for irradiation testing.

Fabrication of LTAs 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. In December 2023, to help us identify infrastructure and regulatory licensing requirements as well as better define cost and schedule estimates for a LPFFF, we entered into a contract with Centrus Energy to conduct a FEED Study for the LPFFF. Expanding that pilot-scale fuel fabrication facility from LTA capability to batch reload quantities would require a substantial additional capital investment in the manufacturing facility and equipment. These estimates assume sufficient funding availability and that the project receives prioritization by the DOE and US Nuclear Regulatory Commission (NRC) to facilitate access to the required quantities of the HALEU material and timely regulatory licensing of such a facility.

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. This project is currently underway, and we expect insertion of fuel material coupons in the ATR in 2025 and completion of irradiation testing to full burnup and post-irradiation examination of the fuel material coupons in approximately four years thereafter. 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 rods is to demonstrate the performance and behavior of the fuel rods 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 rods 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 NRC-regulated nuclear power plant would be sufficiently well understood to request a license amendment from the NRC for operation of a LTA.

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; however, installation of the new so-called "I-loops" will increase the loop irradiation capacity of ATR for performing tests on Lightbridge Fuel™ in the desired test conditions.

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, wherein analysis of the fuel rod performance and behavior is performed, from the time when the additional test loop becomes available.

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 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.

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 could be significantly reduced in terms of cost and time. Lightbridge intends to leverage the AFQ methodologies to qualify its advanced fuels.

Along with leveraging the AFQ approach, uranium-zirconium 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 approximately 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 eight years. The NRC's 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 2030s.

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

- A large portion of our project funding requirements is met with direct or indirect cash and/or in-kind contributions from government and/or strategic partner and/or other third-party sources;
- our expected time estimates for loop availability in the 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;
- potential accelerated fuel qualification methodology (AFQ) that we currently plan to develop for Lightbridge Fuel™ is accepted by the 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-scale fuel fabrication facility will be capable of manufacturing LTA quantities of metallic fuel rods to the desired rod length and specification.

Operations Review

Consolidated Results of Operations

The following table presents our operating results for the years indicated (rounded to millions):

	Year Ended December 31,		Increase (Decrease) Change $	Increase (Decrease) Change %
	2023	2022		
Operating Expenses				
General and administrative	$ 7.1	$ 7.5	$ (0.4)	(5)%
Research and development	1.9	0.7	1.2	171%
Total Operating Expenses	9.0	8.2	0.8	10%
Other Operating Income				
Contributed services - research and development	—	0.4	(0.4)	(100)%
Total Other Operating Income	—	0.4	(0.4)	(100)%
Total Operating Loss	(9.0)	(7.8)	1.2	15%
Other Income	1.1	0.3	0.8	267%
Net loss before Income Taxes	(7.9)	(7.5)	0.4	5%
Income tax expense	—	—	—	—
Net Loss	$ (7.9)	$ (7.5)	$ 0.4	5%

Operating Expenses

General and Administrative

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 $0.4 million for the year ended December 31, 2023, as compared to the year ended December 31, 2022. The decrease of $0.4 million was primarily due to a decrease in employee compensation and employee benefits of $0.4 million, due to the increase in the time allocation percentage of G&A labor costs to research and development expenses, a decrease in consulting expenses of $0.1 million, a decrease in insurance expense of $0.1 million, a decrease in dues and subscriptions of $0.1 million, and a decrease in promotion expenses of $0.1 million, offset by an increase in stock-based compensation of $0.4 million, which was due to the partial vesting of restricted stock awards granted in 2022.

Total stock-based compensation included in general and administrative expenses was $1.1 million for the years ended December 31, 2023 and 2022.

Research and Development (R&D)

R&D expenses consist primarily of costs associated with our CRADA and SPP agreements with INL for the research and development of our fuel, employee compensation and related fringe benefits including stock-based compensation and related allocable overhead costs for the research and development of our fuel and contributed services - research and development for the work performed under the Gateway for Accelerated Innovation in Nuclear (GAIN) vouchers.

Total R&D expenses increased by $1.2 million for the year ended December 31, 2023, as compared to the year ended December 31, 2022 due to the increase in R&D activities related to the development of our fuel. This increase primarily consisted an increase in INL project labor costs of $0.8 million, an increase in allocated employee compensation and employee benefits of $0.4 million, an increase in consulting expenses of $0.1 million, an increase in travel expenses of $0.1 million and an increase in stock-based compensation expenses of $0.1 million. This increase was offset by a decrease of $0.3 million primarily related to the GAIN voucher work recorded as research and development expenses in 2022 that was completed in the first quarter of 2023.

We currently anticipate investing approximately $6 million to $8 million in the R&D of our nuclear fuel over the next 12 to 15 months.

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.

Other Operating Income

There was a decrease in other operating income of $0.4 million related to a decrease in contributed services - research and development for the year ended December 31, 2023 due to the GAIN voucher project that was completed in the first quarter of 2023. There are no outstanding GAIN vouchers. Contributed services - research and development are recorded with a charge to R&D expenses and a corresponding amount recorded to contributed services - research and development.

Other Income

There was an increase in other income of $0.8 million due to rising treasury bill interest rates over the past year which resulted in an increase in interest income earned from the purchase of treasury bills and from our bank savings account for the year ended December 31, 2023, as compared to the year ended December 31, 2022.

Provision for Income Taxes

We incurred a pre-tax net loss for both 2023 and 2022. We reviewed all sources of income for the purpose of recognizing the deferred tax assets and concluded a full valuation allowance for 2023 and 2022 was necessary. Therefore, we did not have a provision for taxes for both years ended December 31, 2023 and 2022. Prior period ownership changes, coupled with the Company's projections of no taxable income for the foreseeable future, will substantially limit any future benefit to be derived from our NOLs.

See Note 7. 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

We measure liquidity in terms of our ability to fund the cash requirements of our R&D activities and our general and administrative expenses, including our contractual obligations and other commitments. We believe that based on our current level of operating expenses and currently available cash resources, we will have sufficient funds available to cover our business activities and operating cash needs for the next 12 months. Our long-term cash requirements are currently estimated to be an average of $10.0 million of outside or third-party R&D expenditures per year over the next 10-15 years. In order to meet these long-term cash requirements for future planned operations to develop and commercialize our nuclear fuel, including any additional expenditures that may result from unexpected developments, it will be necessary for our project to receive direct or indirect funding and/or in-kind support from government and/or strategic partners and/or other third-party sources.

At December 31, 2023, we had cash and cash equivalents of $28.6 million, as compared to $28.9 million at December 31, 2022, a decrease of $0.3 million. We raised net proceeds of $6.4 million from the sale of approximately 1.5 million shares of common stock during the year ended December 31, 2023. Our net cash used in operating activities for the year ended December 31, 2023 was $6.5 million and our cash flow projections indicate that we will have continued negative cash flows for the foreseeable future. We currently do not anticipate any incoming cash flows, other than the sale of common stock through our ATM offering. Therefore, 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 $28.2 million of working capital as of the date of this filing. We currently project a negative cash flow from our operations for both our general and administrative and R&D expenses, resulting in total expected expenditures of approximately $13.8 million for the next 12 months. Our R&D expenses are expected to increase over the next 12-15 months. Our cash balance at December 31, 2023 and as of the date of this filing exceeds our anticipated cash requirements for the next 12 months. There are inherent uncertainties in forecasting the future required R&D or other expenditures in the future. Once other anticipated agreements are finalized or other future R&D agreements are entered into and the future R&D expenses are known, we expect to incur 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. 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 the 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 need to receive substantial funding and in-kind support from government and/or strategic partners and/or other third-party sources throughout our nuclear fuel R&D development period in order to fund our ongoing R&D efforts in the future. If we are unable to obtain such funding and/or in-kind support 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.

Our current source of cash available to us for the next 12 months, in addition to cash and cash equivalents on hand, is the potential funding from equity issuances pursuant to the 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 Securities and Exchange Commission, or SEC, on March 25, 2021, registering the sale of up to $75 million of the Company's securities which was declared effective on April 5, 2021. We filed a prospectus supplement, dated April 4, 2023, with the SEC pursuant to which we may offer and sell shares of common stock having an aggregate offering price of up to $17.9 million from time to time, through the ATM. We will file another prospectus supplement with the SEC after we have either sold $17.9 million of our common stock under this prospectus supplement or are required to file a new prospectus supplement when our current S-3 shelf registration expires in April 2024. Under current SEC regulations set forth under General Instruction I.B.6. of Form S-3, if at any time our public float is less than $75.0 million, and for so long as our public float remains less than $75.0 million, the amount we can raise through primary public offerings of securities in any twelve-month period using shelf registration statements is limited to an aggregate of one-third of our public float, which is referred to as the baby shelf rules. As of the date of this filing, we are subject to the baby shelf rules for any offerings conducted on our current shelf registration statement, and therefore may be limited on the amount of funding available under this Form S-3 shelf registration statement in the future. Although we expect this ATM facility to continue to be a source of working capital for the Company in 2024, there is no assurance that an ATM financing arrangement will be available to us in the future. See Note 8. 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 financing.

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 could substantially impair our ability to raise capital in the future and continue developing our nuclear fuel.

Short-Term and Long-Term Liquidity Sources

Our current source of liquidity is cash raised from our ATM facility.

As discussed above, we will seek new financing in order to bring 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 on terms acceptable to us, or at all. 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/or 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 to support the remaining R&D activities that are 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.

The following table provides detailed information about our net cash flows for the years ended December 31, 2023 and 2022 (rounded in millions):

Cash Flow

	Year Ended December 31,	
	2023	**2022**
Net Cash Used in Operating Activities	$ (6.5)	$ (6.7)
Net Cash Used in Investing Activities	—	—
Net Cash Provided by Financing Activities	6.2	10.9
Net Cash (Outflow) Inflow	$ (0.3)	$ 4.2

Operating Activities

Cash used in operating activities decreased by $0.2 million in 2023 as compared to 2022. The decrease was primarily due to changes in net operating assets and liabilities, which were driven by an increase in prepaid assets of $0.2 million, offset by an increase in accounts payable and accrued liabilities of $0.4 million.

Investing Activities

Net cash used in our investing activities was insignificant for the years ended December 31, 2023 and 2022.

Financing Activities

Cash provided by financing activities decreased by $4.7 million. This decrease was due to a decrease in the net proceeds received from the issuance of common stock under our at-the-market (ATM) facility in fiscal year 2023 of $4.6 million and an increase in net share settlement of equity awards for the payment of withholding taxes of $0.1 million.

Cash provided by our ATM facility was $6.4 million (sale of approximately 1.5 million common shares) and $11.0 million (sale of approximately 1.9 million common shares) for the years 2023 and 2022, respectively. Cash used during the years 2023 and 2022 related to the payment of withholding taxes on the net share settlement of equity awards was $0.2 million and $0.1 million, respectively.

Contractual Obligations and Commitments

On December 9, 2022, we entered into an initial project task statements with BEA, the operating contractor of INL, in collaboration with the DOE, which statements set forth the initial scopes of work and funding commitments under the umbrella agreements, each dated September 27, 2022, between the Company and BEA. At December 31, 2023, we had approximately $2.9 million in outstanding project task statement obligations to BEA relating to the research and development being conducted under the SPP and CRADA at INL. Performance of work under these agreements may be terminated at any time by either party, without any liability, after the effective date of termination, upon giving a thirty-day written notice under the SPP and a sixty-day written notice under the CRADA, to the other party. In the event of termination, the Company shall be responsible for BEA's costs (including the closeout costs), through the effective date of termination, but in no event shall the Company's cost responsibility exceed the total estimated cost stated in each PTS and any subsequent modification to the PTS.

Engineering Study of Lightbridge Fuel™ for use in CANDU reactors

On October 16, 2023, the Company engaged RATEN ICN in Romania to perform an engineering study to assess the compatibility and suitability of Lightbridge Fuel™ for use in CANDU reactors. As of December 31, 2023, the Company had approximately $0.2 million in outstanding project commitments to RATEN ICN.

FEED Study with Centrus Energy for a Lightbridge Pilot Fuel Fabrication Facility

On December 5, 2023, we entered into an agreement with Centrus Energy to conduct a FEED study to add a dedicated LPFF at the American Centrifuge Plant in Piketon, Ohio. The work is expected to be completed in 2024 at a cost and with a remaining contractual obligation of approximately $0.5 million at December 31, 2023.

Operating Leases

The Company leased office space for a 12-month term from January 1, 2024 through December 31, 2024 with a monthly payment of approximately $8,000. The future minimum lease payments required under the non-cancellable operating leases for 2024 total approximately $0.1 million.

Critical Accounting Estimates

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 consolidated financial statements, and the reported amounts of expenses during the reporting period. Actual results could differ from those estimates. Estimates and assumptions are periodically reviewed and the effects of revisions are reflected in the consolidated financial statements in the period they are determined to be necessary. Our significant accounting policies are more fully described in Note 1. Basis of Presentation, Summary of Significant Accounting Policies, and Nature of Operations, in 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. There were no critical accounting estimates at December 31, 2023 and 2022.

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 DISCLOSURES 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, 2023 and 2022 begins on page 41 of this Report.

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

None

ITEM 9A. CONTROLS AND PROCEDURES

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and CFO, has evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of December 31, 2023 (as such term is defined in Rule 13a-15(e) under the Exchange Act). Our disclosure controls and procedures are designed to provide reasonable assurance that the information required to be disclosed in our reports filed or submitted under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to management, including our Chief Executive Officer and CFO, as appropriate to allow timely decisions regarding required disclosure. Any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives.

Based upon this evaluation as of December 31, 2023, our disclosure controls and procedures were not effective due to the material weakness described below.

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 defined in Rules 13a-15(f) under the Exchange Act. Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP and includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, 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.

A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of annual or interim financial statements will not be prevented or detected on a timely basis.

Management has assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2023, utilizing the criteria in the Committee of Sponsoring Organizations of the Treadway Commission's *Internal Control-Integrated Framework* (2013). Based on its assessment as of December 31, 2023, our management determined that the Company's internal control over financial reporting was not effective due to the material weakness described below.

Management determined that there was a material weakness related to the design of our information technology general controls (ITGC) over logical access to key information systems used in the financial reporting process, resulting in certain segregation of duties conflicts. Additionally, certain business process controls that are dependent on information from these systems were also not effective.

Remediation Plan

The Company's management, under the oversight of the Audit Committee, has undertaken measures to remediate these deficiencies. This includes enhancing the design of logical access controls to ensure appropriate segregation of duties through improved internal documentation and monitoring activities. Management began to implement these remedial steps during the fourth quarter of fiscal 2023 by removing privileged access. The material weakness will not be considered remediated until the applicable remedial controls operate for a sufficient period of time and management has concluded, through testing, that these controls are designed and operating effectively.

Notwithstanding the material weakness described above, there have been no restatements of prior period financial statements, and no changes in previously released financial results were required as a result of the material weakness.

Remediation of Previously Reported Material Weakness

As previously reported, we did not maintain effective controls over the review of accounts payable. During 2023, we implemented remediation plans to address this material weakness by designing and implementing processes and controls over the timely identification, recording, and review of accounts payable. Management has concluded, through testing, that these controls are designed and operating effectively as of December 31, 2023, and the material weakness has been effectively remediated.

Changes in Internal Control Over Financial Reporting

Except as noted above, there was no change in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) of the Exchange Act that occurred during the quarter ended December 31, 2023 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

During the three months ended December 31, 2023, no director or officer of the Company adopted or terminated a Rule 10b5-1 trading arrangement or non-Rule 10b5-1 trading arrangement, as each term is defined in Item 408(a) of Regulation S-K.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

The information required by Item 10 of Part III will be included in our Proxy Statement relating to the 2024 Annual Meeting of Stockholders and is incorporated herein by reference.

ITEM 11. EXECUTIVE COMPENSATION

Information required by Item 11 of Part III will be included in our Proxy Statement relating to the 2024 Annual Meeting of Stockholders and is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Information required by Item 12 of Part III will be included in our Proxy Statement relating to the 2024 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 2024 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 2024 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, 2023 and 2022
- Consolidated Statements of Operations for the Years Ended December 31, 2023 and 2022
- Consolidated Statements of Cash Flows for the Years Ended December 31, 2023 and 2022
- Consolidated Statements of Changes in Stockholders' Equity for the Years Ended December 31, 2023 and 2022
- Notes to Consolidated Financial Statements
- Report of BDO USA, P.C. dated March 4, 2024 on the Company's financial statements filed as a part hereof for the fiscal years ended December 31, 2023 and 2022. 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 October 27, 2022 (incorporated by reference to Exhibit 3.1 to the Form 10-K filed by the Company on March 30, 2023).
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).
4.2	Description of Securities (incorporated by reference to Exhibit 4.2 to the Form 10-K filed by the Company on March 31, 2022).
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 3, 2023).
10.7**	Form of Non-Statutory Stock Option Agreement for Employees under the 2020 Omnibus Incentive Plan. (incorporated by reference 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 reference 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 reference to Exhibit 10.14 to the Form 10-K filed by the Company on March 25, 2021).
10.10**	Form of Restricted Stock Award Agreement under the 2020 Omnibus Incentive Plan (incorporated by reference to Exhibit 10.14 to the Form 10-K filed by the Company on March 31, 2022).
10.10**	Employment Agreement, dated August 8, 2018, between the Company and Seth Grae (incorporated by reference to Exhibit 10.2 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 Andrey Mushakov (incorporated by reference to Exhibit 10.3 to the Form 10-Q filed by the Company on August 9, 2018).
10.13**	Employment Agreement, dated August 8, 2018, between the Company and Larry Goldman (incorporated by reference to Exhibit 10.4 to the Form 10-Q filed by the Company on August 9, 2018).
10.14**	Form of Indemnification Agreement (August 2018) (incorporated by reference to Exhibit 10.5 to the Form 10-Q filed by the Company on August 9, 2018).
10.15▲	Strategic Partnership Project Agreement, dated September 27, 2022, between the Company and Battelle Energy Alliance, LLC(incorporated by reference to Exhibit 10.15 to the Form 10-K filed by the Company on March 30, 2023).
10.16▲	Project Task Statement under the Strategic Partnership Project Agreement, dated December 9, 2022, between the Company and Battelle Energy Alliance, LLC(incorporated by reference to Exhibit 10.16 to the Form 10-K filed by the Company on March 30, 2023).
10.17▲	Cooperative Research and Development Agreement, dated September 27, 2022, between the Company and Battelle Energy Alliance, LLC(incorporated by reference to Exhibit 10.17 to the Form 10-K filed by the Company on March 30, 2023).
10.18▲	Project Task Statement under the Cooperative Research and Development Agreement, dated December 9, 2022, between the Company and Battelle Energy Alliance, LLC(incorporated by reference to Exhibit 10.18 to the Form 10-K filed by the Company on March 30, 2023).
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, P.C.

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.
97.1*	Incentive Compensation Recovery Policy.
101	The following materials from Lightbridge Corporation's Annual Report on Form 10-K for the year ended December 31, 2023, 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).

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* Filed or furnished herewith

** Indicates management contract or compensatory plan or arrangement.

▲ Certain portions of this Exhibit have been redacted pursuant to Item 601(b)(10)(iv) of Regulation S-K. The Company agrees to furnish supplementally an unredacted copy of this Exhibit to the SEC upon request.

ITEM 16. FORM 10-K SUMMARY

None.

LIGHTBRIDGE CORPORATION
DECEMBER 31, 2023 and 2022

TABLE OF CONTENTS

Report of Independent Registered Public Accounting Firm

Stockholders 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, 2023 and 2022, 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, 2023 and 2022, and the results of its operations and its cash flows for each of the years then ended**,** in conformity with accounting principles generally accepted in the United States of America.

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 matter 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 opinions on the critical audit matter or on the accounts or disclosures to which it relates.

Research and Development Expenses

As described in Note 1 to the consolidated financial statements, the Company records research and development expenses as incurred, which consist primarily of wages and related payroll benefits, non-cash stock-based compensation, materials, testing, consulting and other outside research and development services, related to the development of the Company's nuclear fuel technology. During the year ended December 31, 2023, the Company recorded approximately $1.9 million of research and development expenses.

We identified the evaluation of research and development expenses as a critical audit matter due to the management judgment involved in: (i) determining whether expenses incurred are related to the research and development activities, and (ii) the methodology used to allocate certain expenses incurred related to wages, payroll benefits, and non-cash stock-based compensation to research and development expenses. Auditing these elements was especially challenging due to the nature and extent of audit effort and evidence required to address the matter.

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

- Testing a sample of research and development expenses by: (i) obtaining and inspecting underlying supporting documents, and (ii) inquiring of project manager to determine whether expenses incurred are related to the research and development activities.

- Testing management's allocation of wages, payroll benefits, and non-cash stock-based compensation by: (i) recalculating the percentage of wages, payroll benefits and non-cash stock-based compensation allocated to research and development expenses, and (ii) testing the completeness and accuracy of data used in determining the allocation.

/s/ BDO USA, P.C.

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

Philadelphia, Pennsylvania
March 4, 2024

LIGHTBRIDGE CORPORATION
CONSOLIDATED BALANCE SHEETS

	December 31, 2023	December 31, 2022
ASSETS		
Current Assets		
Cash and cash equivalents	$ 28,598,445	$ 28,899,997
Prepaid expenses and other current assets	207,063	115,264
Total Current Assets	28,805,508	29,015,261
Other Assets		
Prepaid project costs and other long-term assets	483,000	345,000
Trademarks	108,865	108,225
Total Assets	$ 29,397,373	$ 29,468,486
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current Liabilities		
Accounts payable and accrued liabilities	$ 486,326	$ 350,331
Total Current Liabilities	486,326	350,331
Commitments and contingencies - Note 5		
Stockholders' Equity		
Preferred stock, $0.001 par value, 10,000,000 authorized shares, 0 shares issued and outstanding at December 31, 2023 and 2022	—	—
Common stock, $0.001 par value, 25,000,000 authorized, 13,698,274 shares and 11,900,217 shares issued and outstanding at December 31, 2023 and 2022, respectively	13,698	11,900
Additional paid-in capital	181,295,125	173,595,385
Accumulated deficit	(152,397,776)	(144,489,130)
Total Stockholders' Equity	28,911,047	29,118,155
Total Liabilities and Stockholders' Equity	$ 29,397,373	$ 29,468,486

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

LIGHTBRIDGE CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended December 31,	
	2023	**2022**
Revenue	$ —	$ —
Operating Expenses		
General and administrative	7,149,773	7,490,086
Research and development	1,922,865	669,818
Total Operating Expenses	9,072,638	8,159,904
Other Operating Income		
Contributed services - research and development	31,028	372,612
Total Other Operating Income	31,028	372,612
Total Operating Loss	(9,041,610)	(7,787,292)
Other Income		
Interest income	1,132,964	289,435
Total Other Income	1,132,964	289,435
Net Loss Before Income Taxes	(7,908,646)	(7,497,857)
Income taxes	—	—
Net Loss	$ (7,908,646)	$ (7,497,857)
Net Loss Per Common Share		
Basic and diluted	$ (0.65)	$ (0.69)
Weighted Average Number of Common Shares Outstanding	12,099,574	10,834,574

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, 2023 AND 2022

	Common Stock		Additional Paid-in	Accumulated	Total
	Shares	Amount	Capital	Deficit	Equity
Balance - January 1, 2022	9,759,223	$ 9,759	$ 161,772,641	$ (136,991,273)	$ 24,791,127
Shares issued, net of share settlement for withholding taxes paid upon vesting of restricted stock awards	268,796	269	(104,873)	—	(104,604)
Shares issued - registered offerings - net of offering costs	1,855,085	1,855	11,024,930	—	11,026,785
Shares issued to consultant & directors for services	17,113	17	59,983	—	60,000
Stock-based compensation	—	—	842,704	—	842,704
Net loss	—	—	—	(7,497,857)	(7,497,857)
Balance - December 31, 2022	11,900,217	$ 11,900	$ 173,595,385	$ (144,489,130)	$ 29,118,155
Shares issued, net of share settlement for withholding taxes paid upon vesting of restricted stock awards	240,499	240	(221,850)	—	(221,610)
Shares issued - registered offerings - net of offering costs	1,492,148	1,493	6,403,938	—	6,405,431
Shares issued to consultant & directors for services	65,410	65	259,935	—	260,000
Stock-based compensation	—	—	1,257,717	—	1,257,717
Net loss	—	—	—	(7,908,646)	(7,908,646)
Balance - December 31, 2023	13,698,274	$ 13,698	$ 181,295,125	$ (152,397,776)	$ 28,911,047

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

LIGHTBRIDGE CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31,	
	2023	**2022**
Operating Activities		
Net Loss	$ (7,908,646)	$ (7,497,857)
Adjustments to reconcile net loss to net cash used in operating activities:		
Common stock issued for services	45,000	45,000
Stock-based compensation	1,257,717	842,704
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	(91,799)	(1,812)
Prepaid project costs and other long-term assets	(138,000)	(345,000)
Accounts payable and accrued liabilities	350,995	193,810
Net Cash Used in Operating Activities	(6,484,733)	(6,763,155)
Investing Activities		
Trademarks	(640)	(6,642)
Net Cash Used in Investing Activities	(640)	(6,642)
Financing Activities		
Net proceeds from the issuances of common stock	6,405,431	11,026,785
Payments for taxes related to net share settlement of equity awards	(221,610)	(104,604)
Net Cash Provided by Financing Activities	6,183,821	10,922,181
Net (Decrease) Increase in Cash and Cash Equivalents	(301,552)	4,152,384
Cash and Cash Equivalents, Beginning of Year	28,899,997	24,747,613
Cash and Cash Equivalents, End of Year	$ 28,598,445	$ 28,899,997
Supplemental Disclosure of Cash Flow Information		
Cash paid during the year:		
Interest paid	$ —	$ —
Income taxes paid	$ —	$ —
Non-Cash Financing Activities:		
Payment of accrued liabilities with common stock	$ 215,000	$ 15,000

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. 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 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 intercompany transactions and balances have been eliminated in consolidation.

Segment Reporting

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 our operating expenses.

Basis of Presentation and Use of Estimates and Assumptions

The preparation of consolidated financial statements, in conformity with accounting principles generally accepted in the United States of America (GAAP), requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of expenses during the reporting period. Actual results could differ from those estimates. Estimates and assumptions are periodically reviewed and the effects of revisions are reflected in the consolidated financial statements in the period they are determined to be necessary. There were no significant estimates at December 31, 2023 and 2022.

Fair Value of Financial Instruments

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 unaffiliated market participants at the measurement date.

ASC 820 establishes a fair value hierarchy that prioritizes the inputs used to measure fair value. 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 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 categorization of financial instruments within the valuation hierarchy is based on the lowest level of input that is significant to the fair value measurement. 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; and

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.

The Company's financial instruments consist principally of cash and cash equivalents, accounts payable and accrued liabilities. The carrying amounts of cash and cash equivalents (which includes U.S. treasury bills at December 31, 2022), accounts payable and accrued liabilities are considered to be a Level 1 measurement, representative of their respective fair values because of the short-term nature of those instruments. U.S. treasury bills are classified as Level 1 on the fair value hierarchy as there are quoted prices in active markets for identical assets.

The following tables summarize the valuation of the Company's cash equivalents that fall within the fair value hierarchy (in millions) at December 31, 2022. There were no cash equivalents at December 31, 2023.

Assets	Level I	Level II	Level III
Treasury Bills	$ 19.90	$ —	$ —

Certain Risks and Uncertainties

The Company will need additional funding and /or in-kind support via a combination of strategic alliances, government grants, further offerings of equity securities, or an offering of debt securities in order to support its future research and development (R&D) activities required to further enhance and complete the development and commercialization of its fuel products.

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, risks related to the research and development of our nuclear fuel, regulatory approval of the Company's fuel, 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 the Company's assets, and global or regional catastrophic events. The Company may also be subject to various additional political, economic, and other uncertainties.

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 2023 and 2022. The Company buys and holds short-term U.S. treasury bills to maturity. U.S. treasury bills totaled zero and $19.9 million as of December 31, 2023 and 2022, respectively. The remaining $9.0 million at December 31, 2022, were on deposit with two prominent financial institutions.

Contributed services - Research and Development

The Company was awarded a grant in 2021 from the United States Department of Energy (DOE), which represented contributed services to further the Company's R&D activities. The Company concluded that its government grants were not within the scope of ASC Topic 606, *Revenue Recognition*, 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 (Subtopic 958-605), 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 (not-for-profits and business entities).

Subtopic 958-605 requires nonfinancial assets, which includes services, such as the R&D services provided under the Gateway for Accelerated Innovation in Nuclear (GAIN) vouchers described in Note 6. Research and Development Expenses, be shown on a gross method at the fair value of the services contributed, with contributed services - research and development shown as other operating income and the related costs as a charge to R&D expense, rather than depicting contributed services - research and development as a reduction of R&D 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.

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 performs an impairment test in the fourth quarter or more frequently if events or circumstances indicate that an impairment loss may have been incurred. For the fourth quarter 2023 test, the Company applied the FASB's accounting guidance which allows the company to first assess qualitative factors to determine the extent of additional quantitative analysis, if any, that may be required to test trademarks for impairment. Based on the qualitative assessments performed, the company concluded that it was more likely than not that the fair value of the Trademarks substantially exceeded its carrying value and therefore, further quantitative analysis was not required. As a result, no impairment was recorded. As of December 31, 2023 and December 31, 2022, the carrying value of trademarks was approximately $0.1 million.

Leases

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.

Income Taxes

Income taxes are accounted for using the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to temporary differences between the financial statements carrying amounts of assets and liabilities and their respective tax bases, operating loss carryforwards, and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. In accordance with Financial Accounting Standards Board (FASB) ASC 740, *Accounting for Income Taxes*, the Company reflects in the financial statements the benefit of positions taken in a previously filed tax return or expected to be taken in a future tax return only when it is considered 'more-likely-than-not' that the position taken will be sustained on its technical merits by a taxing authority upon examination. As of December 31, 2023 and 2022, the Company had no unrecognized income tax benefits and correspondingly there is no impact on the Company's effective income tax rate associated with these items. The Company's policy for recording interest and penalties relating to uncertain income tax positions is to record them as a component of income tax expense in the accompanying consolidated statements of operations. As of December 31, 2023 and 2022, the Company had no such accruals.

Research and Development Expenses

Research and development expenses are expensed when incurred. Research and development expenses consist primarily of wages and related payroll benefits, non-cash stock-based compensation, materials, testing, consulting, and other third-party research and development services, related to the development of the Company's nuclear fuel. Advance payments for goods or services for future research and development activities are deferred and expensed as the goods are delivered or the related services are performed.

Stock-Based Compensation

The stock-based compensation expense incurred by the Company 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 any stock options granted is measured at the grant date. Options or common stock granted to consultants for services performed are accounted for in the same manner as options and stock issued to employees for services.

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

The Company uses a Black-Scholes pricing model to determine the fair value of stock options on the measurement date of the grant for service-based vesting conditions. 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 upon exercise of the stock options or vesting of Restricted Stock Units (RSUs) or Restricted Stock Awards (RSAs) grants may be issued net of the number of shares with a fair value equal to the amount required to satisfy applicable tax withholding requirements. As a result, the actual number of shares issued with tax withholding obligations are fewer than the actual number of shares exercised under the stock option or on the dates of vesting of RSU or RSA grants.

The Company grants RSAs, which is an award of common shares that have full voting rights and dividend rights (with dividends paid upon vesting of the RSA) but are restricted regarding the sale or transfer before vesting. These restrictions lapse as the award vests. The shares are forfeited and returned to the Company if they do not vest. The RSAs are included in common stock issued and outstanding and 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. The number of RSAs to be granted are determined by the closing stock price on the date of the RSAs grant.

Comprehensive Loss

Comprehensive loss is defined as a change in equity of a business enterprise during a period resulting from transactions from nonowner sources. There have been no items qualifying as other comprehensive loss and, therefore, for all periods presented, the Company's comprehensive loss was the same as its reported net loss.

Recently Adopted Accounting Pronouncement

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 the 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 does not expect to have revenue or receivables for the foreseeable future. The Company adopted this guidance on January 1, 2023, and it did not have a material impact on its results of operations, financial position, and disclosures because the Company had no outstanding accounts receivable on which to apply this new standard.

Recent Accounting Pronouncements Not Yet Adopted

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 Subtopic 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, 2023, 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 Company will adopt this guidance January 1, 2024 and does not expect the adoption to have a material impact on its results of operations, financial position, and disclosures because the Company does not have any transactions or instruments to which this standard applies. If in the future, the Company issues new convertible debt, warrants or other instruments, the standard may have a material effect, but it cannot be determined at this time.

In November 2023, the FASB issued ASU 2023-07, Segment Reporting (Topic 280): *Improvements to Reportable Segment Disclosures* (ASU 2023-07). The ASU expands public entities' segment disclosures by requiring disclosure of significant segment expenses that are regularly provided to the chief operating decision maker and included within each reported measure of segment profit or loss, an amount and description of its composition for other segment items, and interim disclosures of a reportable segment's profit or loss and assets. The ASU is effective for us January 1, 2024 and will be applied retrospectively. Early adoption is permitted. This ASU will likely result in additional required disclosure when adopted. The Company is currently evaluating the provisions of this ASU and the impact on its consolidated financial statements and related disclosures.

Note 2. Net Loss Per Share

Basic net loss per share is computed using the weighted-average number of common shares outstanding during the reporting period, except that it does not include unvested common shares subject to repurchase or cancellation. Diluted net loss 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. For the years ended December 31, 2023 and 2022, there is no difference in the number of shares used to calculate basic and diluted shares outstanding as the inclusion of the potentially dilutive securities would be antidilutive.

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, 2023 and 2022 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,	
	2023	2022
Stock options outstanding	510,787	525,903
Restricted stock awards outstanding	557,688	416,316
Total	1,068,475	942,219

Note 3. Prepaid Project Costs

Prepaid Project Costs – Short-Term

On October 16, 2023, the Company engaged RATEN ICN in Romania to perform an engineering study to assess the compatibility and suitability of Lightbridge Fuel™ for use in Canada Deuterium Uranium (CANDU) reactors. The total price of approximately $0.2 million shall be payable in three installments, including an advance payment of $0.1 million, and total of a milestone payment and a final payment of approximately $0.1 million. The Company advanced payment for future project work totaling approximately $56,000 and approximately 50% of this amount was expensed at December 31, 2023 and the remaining amount was recorded under Prepaid expenses and other current assets.

On December 5, 2023, the Company entered into an agreement with Centrus Energy to conduct a front-end engineering and design (FEED) study to add a dedicated Lightbridge Pilot Fuel Fabrication Facility (LPFFF) at the American Centrifuge Plant in Piketon, Ohio. The work is expected to be completed in 2024. The Company advanced payment for future project work totaling approximately $0.1 million and approximately 23% of this amount was expensed at December 31, 2023 and the remaining amount was recorded under Prepaid expenses and other current assets.

Prepaid Project Costs – Long-Term

In 2022, the Company entered into agreements with Idaho National Laboratory (INL), in collaboration with the DOE, to support the development of Lightbridge Fuel™. At the time of signing, the Company made advanced payments for future project work totaling $0.4 million to Battelle Energy Alliance, LLC (BEA), DOE's operating contractor for INL. In May 2023, the Company and INL modified the agreements to extend the contract term to May 2029, aligning it with the duration of the irradiation testing and increasing the advanced payments by $0.1 million. The prepaid project costs were $0.5 million as of December 31, 2023 and $0.3 million as of December 31, 2022 under Other Assets - Prepaid project costs and other long-term assets.

Note 4. Accounts Payable and Accrued Liabilities

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

	December 31, 2023	December 31, 2022
Trade payables	$ 0.1	$ 0.2
Accrued director fees, legal and consulting expenses	0.4	0.2
Total	$ 0.5	$ 0.4

Note 5. Commitments and Contingencies

Commitments

The Company had total contractual commitments of approximately $3.6 million for research and development work as of December 31, 2023 for the following three R&D projects.

Project Task Statements - INL

The Company had approximately $2.9 million in outstanding project task statement (PTS) commitments to BEA relating to the R&D work being conducted under the Strategic Partnership Project Agreement (SPP) and Cooperative Research and Development Agreement (CRADA) at INL. Performance of work under these agreements may be terminated at any time by either party, without any liability, after the effective date of termination, upon giving a thirty-day written notice under the SPP and a sixty-day written notice under the CRADA, to the other party. In the event of termination, the Company shall be responsible for BEA's costs (including the closeout costs), through the effective date of termination, but in no event shall the Company's cost responsibility exceed the total estimated cost stated in each PTS and any subsequent modification to the PTS.

Engineering Study of Lightbridge Fuel™ for use in CANDU reactors

On October 16, 2023, the Company engaged RATEN ICN in Romania to perform an engineering study to assess the compatibility and suitability of Lightbridge Fuel™ for use in CANDU reactors. As of December 31, 2023, the Company has approximately $0.2 million in remaining outstanding project commitments to RATEN ICN.

FEED Study with Centrus Energy for a Lightbridge Pilot Fuel Fabrication Facility

On December 5, 2023, the Company entered into an agreement with Centrus Energy to conduct a FEED study to add a dedicated LPFFF at the American Centrifuge Plant in Piketon, Ohio. The work is expected to be completed in 2024. The Company had approximately $0.5 million in remaining outstanding project commitments to Centrus Energy for the FEED study at December 31, 2023.

Operating Leases

The Company leased office space for a 12-month term from January 1, 2024 through December 31, 2024 with a monthly payment of approximately $8,000. The future minimum lease payments required under the non-cancellable operating leases for 2024 total approximately $0.1 million. Total rent expense for the year ended December 31, 2023 and 2022 was approximately $0.1 million.

Note 6. Research and Development Expenses

INL Project

In 2022, Lightbridge entered into agreements with BEA, to support the development of Lightbridge Fuel™. These framework agreements use an innovative structure that consists of an "umbrella" Strategic Partnership Project Agreement and an "umbrella" Cooperative Research and Development Agreement, with an initial duration of seven years. Throughout the duration of these umbrella agreements, all R&D work contracted with BEA is through the issuance of PTSs. The initial phase of work under the two agreements will culminate in irradiation testing in the Advanced Test Reactor (ATR) of fuel samples using enriched uranium supplied by the DOE. The initial phase of work aims to generate irradiation performance data for Lightbridge's delta-phase uranium-zirconium alloy relating to various thermophysical properties. The data, which will be obtained during post-irradiation examination work, will support fuel performance modeling and regulatory licensing efforts for the commercial deployment of Lightbridge Fuel™. For the year ended December 31, 2023, the Company recorded $0.8 million in research and development expenses associated with INL.

Romania Feasibility Study

On October 16, 2023, the Company engaged RATEN ICN in Romania to perform an engineering study to assess the compatibility and suitability of Lightbridge Fuel™ for use in CANDU reactors. The total price of approximately $0.2 million is payable in three installments, including an advance payment of $0.1 million and an interim milestone payment and final payment totaling approximately $0.1 million. For the year ended December 31, 2023, the Company recorded $27,000 in research and development expenses associated with RATEN ICN.

Centrus Feed Study

On December 5, 2023, the Company entered into an agreement with Centrus Energy to conduct a FEED study to add a dedicated Lightbridge pilot fuel fabrication facility (LPFFF) at the American Centrifuge Plant in Piketon, Ohio. The work began in 2023 and is expected to be completed in 2024 at a cost of approximately $0.5 million. For the year ended December 31, 2023, the Company recorded $23,400 in research and development expenses associated with this FEED study.

DOE GAIN Voucher

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 this project was to demonstrate Lightbridge's nuclear fuel casting process using depleted uranium, a key step in the manufacture of Lightbridge Fuel™. The total project value was $0.7 million, with three-quarters of this amount expected to be paid by the DOE for the scope of work performed by PNNL and the remaining amount provided by Lightbridge, by providing in-kind services to the project. The PNNL GAIN voucher project was completed on January 31, 2023. For the years ended December 31, 2023 and 2022, the Company recorded $31,000 and $0.4 million of contributed services - research and development, respectively, for work that was completed that caused the DOE to incur payment obligations to its contractor related to the GAIN voucher. The Company recorded the corresponding amount as R&D expenses for the work that was completed by the DOE contractor.

The R&D services provided under the GAIN vouchers were utilized by the Company in its ongoing development of its next generation nuclear fuel technology. The Company believes that the amounts paid by the DOE to its contractor for the services provided do not differ materially from what the Company would have paid had it directly contracted for these services for its R&D activity.

Total R&D expenses, including internal costs and other outside R&D costs, for the years ended December 31, 2023 and 2022 were $1.9 million and $0.7 million, respectively.

Note 7. Income Taxes

The Company's ability to utilize its net operating loss (NOL) carryforwards may be substantially limited due to ownership changes that have occurred or that could occur in the future, as required by Section 382 of the Internal Revenue Code of 1986, as amended (the Code), as well as similar state provisions. These ownership changes may limit the amount of NOL carryforwards that can be utilized annually to offset future taxable income and tax, respectively. In general, an "ownership change," as defined by Section 382 of the Code, results from a transaction or series of transactions over a three-year period resulting in an ownership change of more than 50 percent of the outstanding stock of a company by certain stockholders or public groups.

During the course of preparing the Company's consolidated financial statements, as of and for the year ended December 31, 2022, the Company completed a preliminary assessment of the available NOL carryforwards under Section 382 of the Code. The Company determined that it likely had undergone multiple ownership changes from 2009 to 2022 as defined under Section 382. As a result of these identified ownership changes, the portion of NOL carryforwards attributable to the pre-ownership change periods are subject to a substantial annual limitation under Section 382 of the Code. A conclusive Section 382 study had not been performed for December 31, 2023 due to the Company's current projections of the lack of taxable income for the foreseeable future. NOLs created in years beginning after 2017 now only offset 80% of taxable income but no longer have a 20-year expiration.

The 2023 and 2022 annual effective tax rate is estimated to be 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 adjusts them accordingly. As of December 31, 2023 and 2022, 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% total effective tax rate, consisting of a 21% effective tax rate for Federal and a 4% effective tax rate for the state) as of December 31, 2023 and 2022, respectively, are as follows.

The reconciliation of federal statutory income tax rate to the effective income tax rate was as follows:

	December 31, 2023	December 31, 2022
Book income at federal statutory rate, 21%	21.00%	21.00%
State taxes, net of federal benefit	4.25%	4.82%
Change in valuation allowance	(25.40)%	(31.97)%
Permanent difference	(0.15)%	(0.16)%
True-Ups, Stock-based compensation and Other	0.30%	6.31%
	—%	—%

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

	December 31, 2023	December 31, 2022
Stock-based compensation	$ 3.7	$ 3.5
Patent impairment provision	0.3	0.4
Net operating loss carry-forwards	15.0	13.6
Research and development expenses – capitalized for tax purposes	0.5	0.1
Research and development tax credits	0.3	0.3
Total deferred tax asset	19.8	17.9
Less: valuation allowance	(19.8)	(17.9)
Net deferred tax asset	$ —	$ —

The Company has NOL carryforwards for federal and state tax purposes of approximately $60 million at December 31, 2023 and $54.4 million at December 31, 2022, that is potentially available to offset future taxable income. There were no deferred tax liabilities at December 31, 2023 and 2022. As of December 31, 2023 and 2022, the Company had federal research and development credit carry-forwards of approximately $0.3 million. The federal research and development credit carry-forwards have a 20-year carry-forward period and expire from 2036 to 2040. The Company's NOL carryforwards included the NOL from 2018 (post-2017) to current reporting year and all have an unlimited carryforward period. For financial reporting purposes, no deferred tax asset was recognized because as of December 31, 2023 and 2022, management currently estimates that it is more likely than not that substantially all the deferred tax assets, the majority of which are NOLs, will be unused. The increase in the total valuation allowance for the years ended December 31, 2023 and 2022 was approximately $1.9 million and $2.5 million, respectively. 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. 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.

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, 2023	December 31, 2022
Tax benefit at U.S. federal statutory rates	$ (1.7)	$ (1.6)
Tax benefit at state statutory rates	(0.3)	(0.4)
Other	—	(0.4)
Increase in valuation allowance	2.0	2.4
Total provision for income tax benefit	$ —	$ —

Uncertain Tax Positions

We file income tax returns in the U.S. federal jurisdiction and Virginia. The tax years 2018 through 2022 remain subject to examination by the appropriate governmental agencies. At December 31, 2023 and 2022, the Company had no unrecognized tax benefits. As of December 31, 2022 and 2023, we did not accrue interest and penalties.

Recent Change in U.S. Tax Law

Prior to 2022, Internal Revenue Code Section 174 allowed taxpayers to deduct R&D expenditures in the year in which they were incurred. The 2017 Tax Act amended Section 174, effective for amounts paid or incurred in tax years beginning after December 31, 2021, to require taxpayers to charge their R&D expenditures to a capital account. Capitalized R&D expenses are required to be amortized over five years (15 years for expenditures attributable to foreign research).

Due to the Company's future significant R&D expenses, the impact of this tax law change will mean that a significant portion of the total operating expenses will be taken as a deduction over a 5-year period rather than being currently deductible. The Company does not expect to pay taxes as a result of this tax law change as the remaining operating expenses, after excluding research and development expenses are significant and the Company expects to continue to generate losses for tax purposes.

Note 8. Stockholders' Equity and Stock-Based Compensation

At December 31, 2023, the Company had 13,698,274 common shares outstanding (including outstanding RSAs totaling 557,688 shares). Also outstanding were stock options relating to 510,787 shares of common stock, all totaling 14,209,061 shares of common stock and all common stock equivalents, potentially outstanding at December 31, 2023.

At December 31, 2022, the Company had 11,900,217 common shares outstanding (including outstanding RSAs totaling 416,316 shares). Also outstanding were stock options relating to 525,903 shares of common stock, all totaling 12,426,120 shares of common stock and all common stock equivalents, outstanding at December 31, 2022.

Common Stock Equity Offerings

At-the-Market (ATM) Offerings

On May 28, 2019, the Company entered into an at-the-market 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. Under this agreement, the Company pays Stifel a commission equal to 4.0% of the aggregate gross proceeds of any sales of common stock under the agreement. The offering of common stock pursuant to this agreement can be terminated with 10 days written notice by either party. 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 shelf registration statement on Form S-3, registering the sale of up to $75.0 million of the Company's securities, which registration statement was declared effective on April 5, 2021 and expires on April 5, 2024. On April 4, 2023, the Company filed a prospectus supplement with the amount of the Company securities available for issuance totaling $17.9 million with $11.9 million available for future share issuances as of December 31, 2023.

The Company records its ATM sales on a settlement date basis. The Company sold 1,492,148 shares under the ATM for the year ended December 31, 2023 resulting in net proceeds of $6.4 million (stock issuance costs were $0.4 million). The Company sold 1,855,085 shares under the ATM for the year ended December 31, 2022 resulting in net proceeds of $11.0 million (stock issuance costs were $0.5 million).

Stock Option Plan

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. The total number of shares of common stock available for issuance under the 2020 Plan is 1,800,000 shares with 803,467 shares available for future issuance at December 31, 2023.

Stock Options

Stock options issued to the Company's employees, directors and consultants are summarized as follows for the year ended December 31, 2023:

	Number of Options	Weighted Average Exercise Price	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding, December 31, 2022	525,903	$ 18.74	4.52	$ 4,982
Granted	35,482	4.58		
Exercised	—	—		
Forfeited	—	—		
Expired	(50,598)	17.47		
Outstanding, December 31, 2023	510,787	$ 17.88	3.84	$ —
Vested and expected to vest, December 31, 2023	510,787	$ 17.88	3.84	$ —
Options exercisable, December 31, 2023	498,177	$ 18.21	3.71	$ —

During the year ended December 31, 2023, the Company issued 35,482 stock options to two consultants. These options were assigned a fair value of $1.77 per share. For the year ended December 31, 2022, the Company issued 18,852 stock options to two consultants. These options were assigned a weighted average fair value of $3.98 per share. The value was determined using the Black-Scholes pricing model. For expected volatility, we have concluded that our historical volatility over the option's expected holding term provides the most reasonable basis for this estimate. For the risk-free interest rate, we use U.S. Treasury Note rates which mature at approximately the same time as the option's expected holding term or option life determined by using the simplified method. We recognize forfeitures of equity-based awards as a reduction to compensation costs in the period in which they occur. The estimated future forfeiture rates, based on the historical forfeiture rates, which were not significant, were zero.

The intrinsic value is calculated as the difference between the fair value of the Company's common stock and the exercise price of the stock options. The fair value of the Company's common stock is $3.21 and $3.89 per share at December 31, 2023 and 2022, respectively. As of December 31, 2023, total unrecognized compensation cost related to option awards was $41,600, which is expected to be recognized over a remaining weighted-average vesting period of 2.0 years.

Common Stock

Consultants' Stock Issuances

For the years ended December 31, 2023 and 2022, the Company issued 13,325 shares (with stock prices ranging from $4.00 to $5.82 per share) and 10,565 shares of common stock (with stock prices ranging from $4.56 to $8.35 per share), respectively, to its investor relations firm for services provided during the years, recorded to general and administrative expenses. The total stock-based compensation expense recorded for these share issuances was $60,000 for each year with a weighted average grant date fair value of $4.50 per share.

Directors' Stock Issuances

On November 20, 2023, the Board of Directors approved an equity grant valued at $240,000 (included in accrued liabilities and general and administrative expenses) in total to its six directors, which resulted in granting a total of 60,456 shares of common stock, valued on the grant date at $3.97 per share, which vested on January 2, 2024.

On December 15, 2022, the Board of Directors approved an equity grant valued at $200,000 in total to its five independent directors, recorded in general and administrative expenses, which resulted in granting a total of 52,085 shares of common stock to the five independent directors, valued on the grant date at $3.84 per share, which vested on January 3, 2023.

Restricted Stock Awards

The following summarizes the Company's restricted stock award activity and the RSA outstanding:

	Number of Shares	Weighted-Average Grant Date Fair Value	Aggregate Intrinsic Value
Outstanding, December 31, 2022	416,316	$ 6.52	$ 1,619,469
Awards granted	301,099	$ 3.91	
Awards vested	(159,727)	$ 7.06	
Awards forfeited	—	$ —	
Outstanding, December 31, 2023	557,688	$ 4.95	$ 1,790,178

The intrinsic value is calculated as the fair value of the Company's common stock. The fair value of the Company's common stock is $3.21 and $3.89 per share at December 31, 2023 and 2022, respectively. The fair value of the RSAs vested in 2023 was $0.6 million.

As of December 31, 2023, all the outstanding restricted stock units are unvested. As of December 31, 2023, total unrecognized compensation cost related to restricted stock units was $2.6 million, which is expected to be recognized over a remaining weighted-average vesting period of 2.1 years.

2023 Transactions

On May 3, 2023, the Board of Directors approved a RSA equity grant valued at $120,000 to one new officer of the Company, which resulted in the issuance of a total of 35,088 shares of common stock to the new officer, valued on the grant date at $3.42 per share and issued on May 3, 2023. These RSAs vest annually in equal installments over three years. These 35,088 shares were included in the total outstanding common shares at December 31, 2023 and compensation expense will be recognized straight line over the three-year vesting period.

On November 20, 2023, the Board of Directors approved a RSA equity grant of approximately $1.1 million, which equated to 266,011 RSAs granted to all of its employees and two consultants, valued at the stock price on the grant date of $3.97 per share. These RSAs awards vest annually in three equal installments on the grant date anniversary.

On November 18, 2023, 62,864 of the total 188,588 RSAs that were granted on November 18, 2021 vested. These RSAs vest annually with a three-year straight line vesting period. The Company withheld 21,854 common shares to make payments for withholding taxes of $0.1 million on these vested shares. The Company issued a total of 41,010 shares of common stock, net of this share settlement for the taxes due and paid upon the vesting of these RSAs to its employees. The common shares withheld became available for reissuance under the 2020 Plan.

On December 15, 2023, 96,863 of the total 290,590 RSAs that were granted on December 15, 2022 vested. These RSAs vest annually with a three-year straight line vesting period. The Company withheld 38,746 common shares to make payments for withholding taxes of $0.1 million on these vested shares. The Company issued a total of 58,117 shares of common stock, net of this share settlement for the taxes due and paid upon the vesting of these RSAs, to its employees. The common shares withheld became available for reissuance under the 2020 Plan.

2022 RSA Transactions

On December 15, 2022, the Board of Directors approved an equity grant of approximately $1.4 million, which equaled a total of 290,590 RSAs to all its employees and two consultants, valued at the stock price on the grant date of $4.71 per share. These RSAs awards vest annually in three equal installments on the grant date anniversary.

RSA Summary – 2023 and 2022

As of December 31, 2023 and 2022, there were 557,688 and 416,316 RSAs included in the total issued and outstanding common stock, respectively. Compensation expense is recognized in a straight line over the three-year vesting period. A total of $1.2 million and $0.7 million of compensation expense was recorded for the year ended December 31, 2023 and 2022, respectively, for the RSAs.

Stock-Based Compensation Expense

Stock Options

The following assumptions were used in the Black-Scholes pricing model to determine the fair value of stock options granted:

	2023	2022
Expected volatility	68.13% to 95.7%	97.58% to 115.37%
Risk free interest rate	4.21% to 5.12%	1.02% to 3.28%
Dividend yield rate	—	—
Expected term	1 – 6 years	2 – 6 years
Closing price per share – common stock	$4.31 to $4.35	$5.93 to $6.27

Total non-cash stock-based compensation expense recorded related to options granted and restricted stock awards included in the Company's consolidated statements of operations for the years ended December 31, 2023 and 2022 are as follows (rounded in millions):

	Year Ended December 31,	
	2023	2022
Research and development expenses	$ 0.2	$ —
General and administrative expenses	1.1	0.8
Total stock-based compensation expense	$ 1.3	$ 0.8

Note 9. Defined Contribution 401K Retirement Plan

The Company has an established 401k retirement plan for its employees. The Company matches employee contributions to the plan 100%, with immediate vesting. The Company contributed approximately $0.2 million and $0.1 million to the 401k plan for the years ended December 31, 2023 and 2022, respectively.

Note 10. Related Party Transactions

On February 9, 2022, the Company entered into an agreement with We Don't Have Time Inc. (WDHT), an organization with a social media network platform dealing with the climate crisis, pursuant to which WDHT provides a variety of climate-change related consulting services to the Company and the Company pays a monthly membership fee of $1,200 to WDHT. Dr. Chakraborty, a member of the Company's Board of Directors, is also the CEO of WDHT's US division. For the years ended December 31, 2023 and 2022, the Company incurred $14,400, respectively, in dues paid to WDHT. This agreement was terminated on January 1, 2024.

Note 11. Subsequent Events

ATM Sales

Sales of common stock under the Company's ATM from January 1, 2024 to March 4, 2024 amounted to approximately 179,000 shares, which resulted in total net proceeds of approximately $0.6 million.

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 4, 2024

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 the dates indicated.

Signature	Title	Date
/s/ Seth Grae Seth Grae	Chief Executive Officer, President, and Director (Principal Executive Officer)	March 4, 2024
/s/ Larry Goldman Larry Goldman	Chief Financial Officer, and Treasurer (Principal Financial and Accounting Officer)	March 4, 2024
/s/ Thomas Graham, Jr. Thomas Graham, Jr.	Director	March 4, 2024
/s/ Sweta Chakraborty Sweta Chakraborty	Director	March 4, 2024
/s/ Jesse Funches Jesse Funches	Director	March 4, 2024
/s/ Sherri Goodman Sherri Goodman	Director	March 4, 2024
/s/ Daniel Magraw Daniel B. Magraw	Director	March 4, 2024
/s/ Mark Tobin Mark Tobin	Director	March 4, 2024

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