Lightbridge

2024

Annual Report to Stockholders

Directors and Officers

Board of Directors

SETH GRAE
Chairman and Chief Executive Officer
Chairman of the American Nuclear Society's International Council

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

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 2024 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

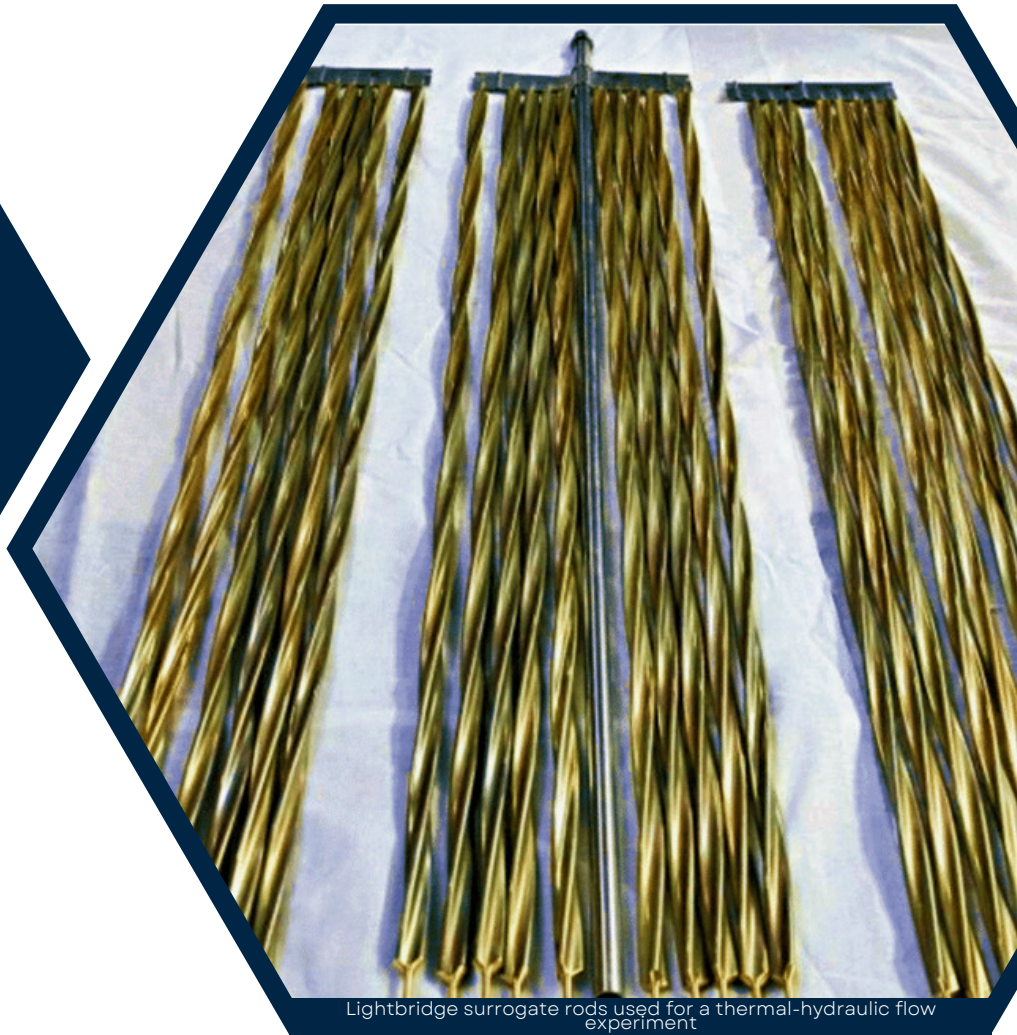
2024 ANNUAL MEETING

Thursday, May 8, 2025
11:00 a.m. ET
Online Access:
www.virtualshareholdermeeting.com/LTBR2025

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

CEO Letter to Stockholders

To our Valued Shareholders,

As we reflect on Lightbridge's achievements in 2024, I am pleased to report significant progress in our mission to revolutionize nuclear fuel technology during this unprecedented period of public and private sector support and growing recognition of nuclear power's essential role in our clean energy future, which has created an extraordinary opportunity for Lightbridge.

Strategic Developments and Technical Progress

I am particularly excited about our memorandum of understanding with Oklo, signed in January 2025. This collaboration explores co-locating our commercial-scale fuel fabrication facilities and presents promising opportunities for advanced fuel recycling. Given Oklo's focus on uranium-zirconium fuel using high assay low enriched uranium (HALEU), we anticipate potential synergies in fuel fabrication and spent fuel reprocessing.

Oklo CEO Jacob Dewitte and Lightbridge CEO Seth Grae interviewed by Liz Claman on The Claman Countdown

At Idaho National Laboratory (INL), we achieved a crucial manufacturing milestone with the successful demonstration of our proprietary co-extrusion process. Our team produced an eight-foot-long fuel sample combining a uranium-zirconium fuel mixture with an outer zirconium alloy cladding. INL is currently conducting a detailed characterization of this sample, and we plan to proceed with enriched uranium and zirconium alloy extrusions for irradiation testing in the Advanced Test Reactor.

Independent Validation and Research

The TopFuel 2024 conference in Grenoble, France featured three significant technical papers about Lightbridge Fuel. Independent simulation studies from MIT and Structural Integrity Associates (SIA), supported by U.S. Department of Energy grants, confirmed our fuel's expected enhanced safety and performance characteristics. The MIT study highlighted our fuel's increased heat transfer area, lower operating temperature, and higher critical heat flux margin in NuScale's VOYGR small modular reactor. The SIA study confirmed expected superior performance of Lightbridge Fuel under accident conditions in Pressurized Water Reactors.

An engineering study by RATEN ICN also demonstrated that our fuel, using enrichment below 5% uranium-235, can provide approximately double the discharge burnup of current CANDU reactor fuel. This finding opens exciting possibilities for future applications.

Future Steps Toward Fuel Development and Commercialization

We have established clear development milestones for Lightbridge Fuel™ over the next two to three years. At Idaho National Laboratory, we plan to produce samples, coupons, and rodlets necessary for testing under our agreements, culminating in the casting and extrusion of enriched uranium fuel material samples for irradiation testing in Idaho National Laboratory's test reactors.

We are advancing our modeling capabilities through the development and validation of Lightbridge-specific methods and modifications to existing codes. This work is essential for accurately predicting our fuel's performance across all operating conditions for which it will be licensed. Simultaneously, we are developing a comprehensive Fuel Qualification Plan to support licensing of our fuel rods, assemblies, and components in relevant operational scenarios.

Heated-up billet assembly being loaded into the extrusion press prior to co-extrusion

Lightbridge and INL teams at Idaho National Laboratory

Our regulatory strategy includes preparing and submitting to the U.S. Nuclear Regulatory Commission (NRC) an Engagement Plan outlining our approach to interfacing with the NRC regarding license applications and supporting documentation. On the manufacturing front, we continue to refine our co-extrusion process for cladded rodlets and are progressing with site selection for our Lightbridge Pilot Fuel Fabrication Facility. This facility will be crucial for producing fuel samples, coupons, rodlets, and full-length fuel rods for lead test assemblies.

The recently signed MOU with Oklo will explore co-location opportunities for a Lightbridge Commercial Scale Fuel Fabrication Facility on Oklo's proposed site which could support manufacturing full-length fuel rods at batch reload quantities.

Critical to our development pathway is a series of planned thermal-hydraulic experiments. These tests will confirm pressure drop, critical heat flux performance, and other essential parameters of Lightbridge Fuel under various operating conditions across different reactor types.

Our long-term commercialization roadmap encompasses several key milestones: irradiation of enriched uranium samples and prototype fuel rods in test reactors, post-irradiation examination, comprehensive out-of-reactor testing including seismic experiments, advanced computer modeling and simulation work, and the design and deployment of lead test assemblies in commercial reactors. These steps will culminate in demonstrating our production process at a pilot-scale facility and validating our fuel's performance in commercial reactor operations.

Market Evolution and Industry Transformation

The nuclear industry is experiencing unprecedented momentum. At COP28, over 20 countries committed to tripling nuclear capacity by 2050. Major technology companies, including Microsoft, Amazon, Meta, and Google, are actively pursuing nuclear power solutions for their data centers, creating an entirely new market segment. The recently announced $500 billion Stargate Project exemplifies the scale of AI opportunity that would need significant amounts of reliable electric power that nuclear energy could help to supply.

We're also witnessing a revival in existing nuclear assets, with capacity upgrades, life extensions, and the recommissioning of shutdown reactors. The International Energy Agency projects that nuclear capacity will more than double by 2050, reaching 916 gigawatts. This growth is driven by increasing recognition of nuclear power's crucial role in providing reliable, carbon-free baseload power, particularly as countries prioritize energy security and reduce fossil fuel dependence.

Photo of President Trump meeting with leaders of US nuclear companies, including Lightbridge CEO Seth Grae in 2019

Funding Outlook

In support of our long-term business and future financing requirements with respect to our fuel development, we expect to continue to seek government funding in the future, along with new strategic alliances that may contain cost-sharing contributions and additional funding from others in order to help fund our future R&D milestones, leading to the commercialization of Lightbridge Fuel. We anticipate investing approximately $17 million for both capital expenditures and operating expenditures in the R&D of our nuclear fuel in 2025.

Conclusion

Lightbridge's metallic fuel technology is positioned to play a crucial role in this industry transformation. Our technology can potentially enable a 30% power uprate in new-build water-cooled reactors and achieve uprates of 17% or higher in existing large reactors. These capabilities, combined with our robust intellectual property portfolio and ongoing collaboration with U.S. Department of Energy facilities, position us to contribute significantly to the industry's growth.

The convergence of energy security concerns, technological innovation, and environmental stewardship creates unprecedented opportunities for nuclear power and Lightbridge. We remain focused on executing this detailed development and commercialization strategy to deliver our innovative fuel technology safely, efficiently, and economically.

I am more optimistic than ever about our industry's future and Lightbridge's role in shaping it. Thank you for your continued support as we work to advance nuclear technology and contribute to a cleaner, more secure energy future.

Sincerely,

Seth Grae
Chairman 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, 2024**

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 LLC**

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, 2024, 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, 2024) was $46,721,670.

At March 2, 2025 there were 20,357,551 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 2025 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, 2024
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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 (R&D) 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 (ATFs);
- access to and availability of nuclear test reactors and the risks associated with unexpected changes in our nuclear fuel development timeline;
- access to and availability of adequate resources and manufacturing capabilities at national laboratories that affect our nuclear fuel development timeline and project costs;
- 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 believe that increasing the supply of reliable electric power is necessary for people and economies to flourish. 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 or to "behind the meter" customers for electric power, including data centers. 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.

Technology industry companies believe that nuclear energy can offer a strategic, sustainable, and reliable solution for powering data centers. Advances in reactor technology, combined with growing corporate and governmental support for clean energy, can position nuclear power to be the cornerstone of future energy strategies for data-intensive industries. We believe that, by integrating nuclear power, the data center sector can achieve operational efficiency, energy security, and sustainability. We believe uses of our fuel could include providing additional power via power uprates of existing reactors, which may be willing to pay a premium for reliable, clean, and sustainable baseload electricity. Oil and gas producing companies are investing in low-emission energy technologies to reduce fossil fuel emissions from oil and gas production. Advances in nuclear reactor and fuel technology can position nuclear power as a key energy source for this purpose.

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 enable power uprates in SMRs.

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 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 can provide via power uprates.

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 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. We believe Lightbridge Fuel™ can meet these goals.

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) 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 17% or more in existing PWRs.

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% of the world's total energy consumption from all sources in 2023, including approximately 9% of global electricity generation. According to the World Nuclear Association (WNA), as of January 2024, there were 417 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 74% of the net operating capacity, with Pressurized Heavy – Water Reactors (PHWRs) and BWRs being the second and third most prevalent and accounting for approximately 11% and 10% of net operating capacity, respectively.

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 power uprates.

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 expected power uprate for existing large PWRs could take from Lightbridge Fuel™ is estimated to be 17% or potentially higher.

For SMRs and other reactors integrated with renewable grids, we believe Lightbridge Fuel™ may be able to enhance load-following capabilities, making it particularly valuable in markets with increasing renewable energy penetration.

The annual cost of nuclear fuel for a single reactor depends on several factors, including the type of reactor, its power output, fuel design, and market prices for uranium, enrichment, and fabrication. According to the September 2023 WNA report, the estimated total cost per reactor per year was approximately $40.0 million based on the September 2021 prices of natural uranium and other inputs. The prices of natural uranium and other inputs have increased since 2021, so we expect the annual nuclear fuel costs to be higher now.

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 CO_2 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. Some 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 U.S. 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. A recent analytical modeling study of Lightbridge Fuel™ by Structural Integrity Associates that was funded by the U.S. Department of Energy shows that under a design-basis LOCA scenario in a PWR reactor, unlike conventional uranium dioxide fuel, the cladding of the Lightbridge-designed metallic fuel rods would stay below the 850-900 degrees Celsius temperature at which steam begins to react with the zirconium cladding to generate hydrogen gas. Build-up of hydrogen gas in a nuclear power plant can lead to a hydrogen explosion, which contributed to the damage at the Fukushima Daiichi nuclear power plant. Lightbridge Fuel™ is 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. We believe a modified variant of 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

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 (SPPA) 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 use a rolling wave planning approach for project management purposes on the released scopes of work. It is an iterative planning technique in which the work to be accomplished in the near term is planned in detail, while work further in the future is planned at a higher level. As such, periodic revisions to the scope and/or cost estimates are anticipated.

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.

On March 18, 2024, we announced a successful extrusion demonstration at INL of a billet into an unclad cylindrical rod, made of depleted uranium and zirconium alloy using the same composition of uranium and zirconium elements in the alloy as what is planned to be ultimately used in Lightbridge Fuel™. Subsequent to that, INL has successfully completed the extrusion of another unclad cylindrical rod, made of depleted uranium and zirconium alloy.

On February 12, 2025, we announced a successful co-extrusion demonstration of a coupon sample consisting of an alloy of depleted uranium and zirconium with an outer cladding made of nuclear-grade zirconium alloy material at INL. The co-extrusion process demonstration conducted at INL entailed pressing the metallic alloy billet encased in zirconium alloy cladding through a die to produce a cylindrical rod with a length of approximately eight feet. INL is currently performing characterization of the co-extruded sample to confirm the as-fabricated specifications and other parameters.

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 evaluate feasibility of constructing 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 FEED study was to identify infrastructure and licensing requirements as well as the estimated cost and construction schedule for the LPFFF.

In the second quarter of 2024, the Company and Centrus Energy completed Phase 1 of the FEED Study. On June 27, 2024, Lightbridge and Centrus Energy agreed to a Change Order modifying the remaining scope, schedule, and cost for the FEED study. The total fee was $0.3 million with $0.1 million due upon acceptance of the final report by the Company. In the third quarter of 2024, Centrus completed the remaining scope of work as modified under the Change Order and submitted its final report that was accepted by the Company. The Company determined the labor effort and schedule estimates show that the Piketon site may be better suited for deployment of an industrial-scale facility rather than a much smaller pilot-scale fuel fabrication facility the Company is looking to establish over the next few years. As such, we will not proceed with deployment of a LPFFF at the Piketon site at this time. We are currently exploring other options/sites for deployment of the LPFFF.

The Company expensed approximately $0.3 million for the year ended December 31, 2024 in connection with the work that has been completed by Centrus Energy and has no further obligations to Centrus under the agreement or Change Order.

Romania Feasibility 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 (RATEN ICN) in Romania to perform an engineering study to assess the compatibility and suitability of Lightbridge Fuel™ for use in CANDU reactors. This assessment covers 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 results of this Feasibility Study indicate that Lightbridge Fuel™ can double the discharged burnup in a CANDU reactor at U-235 enrichment levels of less than 3% compared to conventional uranium dioxide fuel. Based on these favorable initial results, we plan to continue further evaluation of Lightbridge Fuel™ in CANDU reactors.

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. In October 2024, MIT presented a technical paper with preliminary safety evaluation results at the TopFuel 2024 Conference in Grenoble, France. According to MIT, the results show promising safety and performance benefits for Lightbridge Fuel™. Compared to conventional fuel, Lightbridge Fuel™ demonstrated improved thermal-hydraulic margins, lower operating temperatures, and greater potential for power uprates, which contributes to enhancing reactor economics.

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.

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:

- **INL:** To produce samples, coupons, and rodlets necessary for testing to be performed under our INL agreements. We will continue to execute the SPPA/CRADA work at INL leading to casting and extrusion of fuel material samples using enriched uranium and their subsequent insertion for irradiation testing in the ATR.

- **Modeling:** Continue development and/or validation (benchmarking) of Lightbridge-specific methods and modifications to existing modeling codes to accurately predict Lightbridge Fuel™ performance over the full domain of operating conditions for which Lightbridge Fuel™ will be licensed.

- **Fuel Qualification Plan:** Develop a Fuel Qualification Plan that describes our approach to characterizing and validating the performance our fuel rods, assemblies, and assembly components in relevant operation scenarios, and validation of the modeling tools that accurately describe the performance of Lightbridge Fuel™ in the relevant conditions.

- **NRC Engagement Plan:** Prepare and submit the NRC Engagement Plan that outlines how and when Lightbridge will engage the NRC regarding submission of relevant information and supporting documentation for license applications.

- **Fabrication:** Continue manufacturing efforts relating to establishing a manufacturing process for the co-extrusion of cladded rodlets for loop irradiation testing and other fuel testing. In addition, we plan to complete site selection and begin deployment of a LPFFF with capacity to produce fuel samples, fuel coupons, fuel rodlets, and full-length fuel rods for lead test rods and lead test assemblies for demonstration of our fuel in commercial reactors.

- **Thermal-Hydraulic Analysis and Experiments:** Perform thermal-hydraulic modeling of Lightbridge Fuel™ to prepare for a series of thermal-hydraulic experiments to confirm pressure drop, critical heat flux performance, and other thermal-hydraulic parameters of Lightbridge Fuel™ under various operating conditions in different types of reactors.

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 process 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.

The above future steps describe our current proposed approach to deploying Lightbridge Fuel™ in CANDU and/or U.S. PWR 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 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. Lightbridge aims to engage early with relevant nuclear regulators to inform them of our future R&D activities.

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 limited due to funding constraints. In addition to our fuel development costs, we have ongoing 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 anticipated 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 challenging 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 a LTR and/or LTAs and engagement with a nuclear utility that is willing to accept our LTR/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 LTR/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 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.

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.

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. Additionally, we need to conduct thermal-hydraulic experiments to collect experimental data relating to pressure drop, critical heat flux performance, and other thermal-hydraulic parameters for Lightbridge Fuel™. There are a limited number of experimental facilities with suitable capabilities for performing these experiments.

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 and thermal-hydraulic tests 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 partial-length 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 (a nuclear-powered icebreaker ship), 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 with uranium and zirconium alloy 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). On February 12, 2025, we announced a successful co-extrusion demonstration of a clad cylindrical rod comprising depleted uranium and zirconium alloy with the length of approximately eight feet. Co-extrusion is the primary forming operation in the manufacturing of our fuel and these demonstrations were important milestones on the path to developing and qualifying the full manufacturing process for actual fuel rods with enriched uranium and zirconium alloy.

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 enable power uprates. 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. This is the direction the commercial U.S. nuclear power industry is currently pursuing.

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 incremental 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 decade, the ATF program has received significant DOE funding support and initial interest from utility customers conducting 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 Framatome and GE Nuclear.

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 few years, 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 efficiency relative to conventional uranium dioxide fuels. As a result, ATF vendors have begun exploring opportunities for extending the operating cycle length in existing PWRs 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 enable 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.

Raw Materials

We plan to utilize small quantities of raw materials for our testing and demonstration efforts over the next several years. During the commercial phase of our operations, we will ultimately need to procure significant quantities of enriched uranium and zirconium materials necessary for fabrication of our metallic fuel rods. 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%.

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

Due to the 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 challenging 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 may 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 one new patent (worldwide) in 2024 and currently have 22 pending patent applications (worldwide). As of December 31, 2024, we held 11 U.S. patents and more than 146 foreign patents.

The expiration dates of these patents, unless they are 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, 2024, we had ten 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, 2024, we had approximately $40.0 million in cash and cash equivalents. We have experienced substantial and recurring losses from operations, which has created an accumulated deficit of $164.2 million as of December 31, 2024. 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 total over the next 10-15 years) in order to continue our R&D activities and fund our operations through the commercialization of our nuclear fuel. R&D costs may exceed our budget estimates, leading to financial strain and suspending our R&D activities. 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, including using our at-the-market (ATM) facility, 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 current or 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 agreements or their agreements with others 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 economic benefits to utilities by enabling power uprates, 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 and/or enabling significant power uprates in existing PWRs, this 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 up to 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. While the initial feasibility study indicates the potential for Lightbridge Fuel™ to double the burnup in CANDU reactors, 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.

Development of our nuclear fuel technology is dependent upon the availability of a test reactor and access to adequate resources and manufacturing capabilities at national laboratories.

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 on a timely basis, 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.

Furthermore, we currently rely on existing manufacturing equipment and capabilities at INL to demonstrate our co-extrusion fabrication process using depleted uranium and zirconium alloy and to eventually manufacture samples using enriched uranium and zirconium alloy for irradiation testing in a test reactor environment. INL has indicated to the Company that due to resource and manufacturing equipment constraints, it may not be able to meet the Company's preferred project timeline. Based on the actual costs and project performance to date, we believe that the total project cost will likely exceed the previously anticipated budgets.

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. Utility companies and reactor operators may hesitate to adopt unproven fuel types due to operational or safety concerns. 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. Safety concerns or incidents during testing, transportation, or use could damage the company's reputation and lead to liability claims. 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. Unforeseen engineering difficulties may arise during manufacturing or scaling production. 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, de-conversion 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. Disposal or recycling of our spent fuel may face scrutiny, requiring additional safeguards. 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. In October 2024, DOE launched a HALEU program whereby DOE is funding production of 250 metric tons of HALEU in both oxide and metallic forms in the United States over the next 10 years to facilitate establishment of a U.S. supply chain for HALEU. 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. Evolving regulations may impose additional compliance costs or require design modifications. 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. Extensive testing and performance demonstration may delay approvals or reveal deficiencies.

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 us and/or a future fuel fabricator partner in obtaining these materials could be detrimental to our ability to eventually market our nuclear fuel either directly or through a future fuel fabricator partner.

Production of Lightbridge Fuel™ rods and/or fuel assemblies is dependent on the ability of the Company and/or our future fuel fabricator partners 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.

The Company and/or our future fabricator partners 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 could have a material adverse effect on the 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 for use in the same types of reactors 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). Such competitor ATF designs could undermine our nuclear fuel's economic value proposition if they extend the operating cycle length beyond 18 months. Recently, the Nuclear Regulatory Commission (NRC) approved an increase in the burnup limit for a different manufacturer's ATFs design, which could eventually allow that design to achieve a cycle length beyond 18 months.

Some 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 might be more 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.

Industry groups have proposed initiatives that seek to relax existing licensing constraints, which could potentially result in conventional uranium dioxide and/or ATFs designs achieving additional cycle length extensions and/or extended power uprates in operating light water reactors. Such initiatives, if approved by the NRC, could limit the competitive advantages and market opportunities for Lightbridge Fuel™. Competitors may also challenge our patents, leading to costly litigation or loss of exclusivity.

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.

The occurrence of cybersecurity incidents, or a deficiency in our cybersecurity or the cybersecurity of our service providers, could negatively impact our business by causing disruptions to our operations, a compromise or corruption of our confidential information, regulatory enforcement and other legal proceedings, and/or damage to our business, all of which could negatively impact our financial results.

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 cybersecurity incidents,, such measures cannot provide absolute security and our operations may be susceptible to incidents affecting our third-party networks, including from circumvention of security systems, denial of service attacks or ransomware, hacking, computer viruses or malware, technical malfunction, employee error or noncompliance, malfeasance, physical breaches, or system disruptions. Evolving technologies, such as the use of artificial intelligence, also pose new threats to cybersecurity. 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 cybersecurity incident that exploits a weakness in their cybersecurity systems. In some cases, we may not be aware of cybersecurity incidents immediately as we rely on such third-parties to inform us of a cybersecurity incident that could affect our information contained in their systems.

Cybersecurity incidents may jeopardize the security, trade secrets, confidential data, or other information stored in and transmitted through our systems or the systems of third parties. In addition, cybersecurity incidents may cause extended disruptions to operations and thus could impact our ability to develop products and conduct research and development. 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 after data has been taken or significant systems are compromised. Certain efforts may be nation-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 further expend significant additional capital and other resources to protect against or respond to cybersecurity incidents. 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 cybersecurity 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, investors, 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:

- the effect of any potential acquisition on our financial and strategic positions and our reputation;
- the inability to successfully integrate or benefit from acquired technologies or services;
- risk that we are unable to obtain the anticipated benefits of any potential acquisition, including synergies or economies of scale;
- any unanticipated costs or liabilities associated with the acquisition;
- any difficulty integrating the accounting systems, operations, and personnel of the acquired business;
- the 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 and challenges in assimilating and training new employees;
- the potential failure of the due diligence processes to identify significant problems, liabilities or other shortcomings or challenges of an acquired company or assets, which could result in unexpected litigation, regulatory exposure, financial contingencies, and known and unknown liabilities;
- the use of resources that are needed in other parts of our business; and
- the 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. Large or costly acquisitions or investments may also diminish our capital resources and liquidity or limit our ability to engage in additional transactions for a period of time.

We may require significant financing to complete an acquisition or investment through bank loans, raising of debt, issuance of equity securities or the incurrence of debt. Acquisitions could also result in dilutive issuances of equity securities or the incurrence of debt, which could adversely affect our operating results. We cannot be assured that such financing options will be available to us on reasonable terms, or at all. In addition, if an acquired business or assets fail to meet our expectations, our operating results, business, and financial position may suffer. The foregoing risks may be magnified as the cost, size or complexity of a potential acquisition or acquired company increases, or where the acquired company's market or business are materially different from ours, or where more than one integration is occurring simultaneously or within a concentrated period of time.

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.

Material weaknesses in our internal control over financial reporting may be identified, which could adversely affect our ability to provide accurate and timely financial statements and harm investor confidence.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal controls are designed to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements in accordance with generally accepted accounting principles (GAAP). However, internal controls have inherent limitations and may not prevent or detect misstatements, errors, or fraud.

Failure to address identified weaknesses effectively and in a timely manner could result in:

- non-compliance with Section 404 of the Sarbanes-Oxley Act of 2002;
- delays in filing our periodic reports with the SEC; and/or
- potential enforcement actions or penalties.

As reported on the Annual Report on Form 10-K for the year ended December 31, 2023, 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. 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. The Company's management, under the oversight of the Audit Committee, took measures and remediated these deficiencies.

Management, including our Chief Executive Officer (CEO) and our Chief Financial Officer (CFO), assessed the effectiveness of our internal control over financial reporting as of December 31, 2024 and concluded that we remediated the material weakness in our internal control over financial reporting from the prior year.

See Item 9A. *Controls and Procedures* in this Annual Report on Form 10-K for additional information about the material weakness.

Risks Related to the Ownership of Our Common Stock

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.

The Company currently has a limited number of authorized common shares available for future issuance.

As of February 27, 2025, we had 3.1 million authorized but unissued common stock shares, excluding an additional 1.1 million shares reserved under the 2020 omnibus incentive equity plan. The board of directors has approved an increase in the Company's authorized common stock from 25,000,000 shares to 100,000,000 shares and this issue will be voted on by the Company's stockholders at the next stockholders annual meeting, which is expected to occur in June 2025. If the increase in the authorized number of shares is not approved by the Company's stockholders, the Company may not have the ability to raise capital funds that may be necessary to further develop its core business, to finance working capital requirements, to have shares available for use in connection with its stock option plans, and to pursue other corporate purposes that may be identified by the board of directors.

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.

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 via a Managed Service Provider (MSP) for general administration of the IT process including providing a Virtual Chief Information Officer (vCIO).

vCIO services include: (a) operational review, strategic planning, technology road-mapping; (b) development of a custom IT policy/handbook; and (c) reporting in accordance with the service level agreement and support commitment adherence data to Lightbridge via MSP's Service Delivery Team.

vCIO services also include the following:

- Providing operational oversight of IT functions
- Identify and help plan for improvements to Lightbridge's overall infrastructure
- Assist with the management of technology vendors
- Act as a point of contact in emergency/systems down situations and liaison between Lightbridge and Dataprise resources
- Perform trend analysis and document recommendations to Lightbridge as needed.

Lightbridge also utilizes third-party vendors to manage its cybersecurity needs via a Managed Services Security Provider (MSSP). MSSP services include:

- Managed Security Services
- Email Phishing Simulations
- End User Security Awareness Training
- Dark Web Credential Monitoring
- Vulnerability Scanning
- Next-Generation Anti-Virus ("NGAV")

We and our MSP/MSSP also utilize processes designed to reduce cybersecurity risk from a third-party vendor and technology. For example, we may conduct upfront diligence of the third-party's cybersecurity, employ contracts that address cybersecurity risk, and monitor vendors compliance with their representations regarding cybersecurity. The MSSP utilizes a Security Information and Event Management (SIEM) system to monitor the IT Infrastructure. The SIEM and other third-party security tools/applications provide reports that include but are not limited to endpoint protection, employee security scores, phishing reports, Dark Web scanning and vulnerability scanning.

The vCIO reports to our CFO. This vCIO is informed about and monitors prevention, detection, mitigation, and remediation efforts through regular communication and reporting from other 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 vCIO issues quarterly reports and reports to the CFO, as appropriate, to provide 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 and applicable contractors to take a yearly cyber training courses and its employees and applicable contractors are also required to sign confidentiality agreements for purposes including ensuring cybersecurity. We and our MSP/MSSP have established an incident response plan to assist with responding to cybersecurity incidents. The incident response plan includes our approach to identification, escalation, and restoration from incidents, such as engaging or informing third-party experts, law enforcement, and members of the Board of Directors, as appropriate.

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 promote 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 such as significant cybersecurity incidents, and strategic risk management decisions are designed to be escalated to the Board of Directors, so that they have appropriate oversight and can provide guidance.

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 helps equip 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 aligning 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 with the Audit Committee regarding emerging or potential cybersecurity risks and cybersecurity incidents. The Audit Committee evaluates the materiality of cybersecurity incidents to determine if they require disclosure, such as an 8-K filing. This includes assessing the potential impact of cybersecurity risks or incidents on the company's financial position, operations, and reputation.

Risks from Cybersecurity Threats

As of the date of this report, while we are not aware of any material risks from cybersecurity threats, including cybersecurity incident, that have materially affected or are reasonably likely to materially affect the Company, including our business strategy, results of operations, or financial condition, there can be no guarantee that there will not be a future cybersecurity incident that will have a material impact. In the event of a cybersecurity incident, 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 cybersecurity incident at all. Additional information on cybersecurity risks we face can be found in Part I, Item 1A. Risk Factors – "We are exposed to risks related to cybersecurity and protection of confidential information" of this Annual Report on Form 10-K.

ITEM 2. PROPERTIES

Our office space is located at 11710 Plaza America Drive, Suite 2000 Reston, VA 20190 USA. In January 2025, the lease was renewed for the term of January 1, 2025 through December 31, 2025 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 14, 2025, our common stock was held by 60 stockholders of record, excluding 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, 150 Royall Street, Canton, MA 02021. Its telephone number is 800-962-4284.

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 Recent Developments of Lightbridge Fuel™ - a general overview of our business and updates;
- 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.
- Critical Accounting Estimates - a discussion of critical judgments and estimates;

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 of Lightbridge Fuel™

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.

Our Business

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 or to "behind the meter" customers for electric power, including data centers. We believe 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.

Technology industry companies believe that nuclear energy can offer a strategic, sustainable, and reliable solution for powering data centers. Advances in reactor technology, combined with growing corporate and governmental support for clean energy, can position nuclear power as a cornerstone of future energy strategies for data-intensive industries. We believe that by integrating nuclear power, the data center sector can achieve operational efficiency, energy security, and sustainability. We believe uses of our fuel could include providing additional power via power uprates of existing reactors, which may be willing to pay a premium for reliable, clean, and sustainable baseload electricity. Oil and gas producing companies are investing in low-emission energy technologies to reduce fossil fuel emissions from oil and gas production. Advances in nuclear reactor and fuel technology can position nuclear power as a key energy source for this purpose.

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 enable power uprates in SMRs.

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 R&D activities within and in collaboration with the DOE's national laboratories.

Recent Developments of Lightbridge Fuel™

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 (SPPA) 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 use a rolling wave planning approach for project management purposes on the released scopes of work. It is an iterative planning technique in which the work to be accomplished in the near term is planned in detail, while work further in the future is planned at a higher level. As such, periodic revisions to the scope and/or cost estimates are anticipated.

The Company anticipates entering into additional modifications to the Project Task Statements (PTS) under the SPPA and/or CRADA with INL to expand the scope of work, including performing additional extrusions, updating the experiment design for irradiation testing of coupon samples in the ATR, as well as other potential activities. We are discussing these additional scopes and timing of work with INL to be performed under the two "umbrella" agreements with BEA; which we anticipate will increase our R&D expenses for the SPPA and/or CRADA. In late 2024, we worked with INL to re-baseline the project scope, schedule, and cost estimate at completion. As a result, the expected cost estimate at completion was increased by approximately $2.0 million. The successful execution of this project is subject to risks, including potential delays, cost overruns, regulatory challenges, and changes in funding availability, and if the project scope does increase, then the project will be successfully executed or completed. Regardless of whether further project modifications occur, INL has indicated to the Company that due to resource and manufacturing equipment constraints, INL may not be able to meet the Company's preferred project timeline, and that the total project cost will exceed the current budget.

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.

On March 26, 2024, the Company and BEA entered into Modification No. 2 PTS under the SPPA, dated December 9, 2022, as amended on May 23, 2023, by and between the Company and BEA. Pursuant to the terms of Modification No. 2, the potential amounts payable by the Company to reimburse BEA for its expenses and employee time were increased by approximately $0.6 million, bringing the total estimated cost for the work to be performed under the "umbrella" SPPA to $1.7 million.

On October 24, 2024, the Company and BEA entered into Modification No. 3 PTS under the SPPA, dated December 9, 2022, as amended on May 23, 2023 and March 26, 2024, by and between the Company and BEA. Pursuant to the terms of Modification No. 3, the potential amounts payable by the Company to reimburse BEA for its expenses and employee time were increased by approximately $0.3 million, bringing the total estimated cost for the work to be performed under the "umbrella" SPPA to approximately $2.0 million.

On January 16, 2025 the Company and BEA entered into Modification No. 3 PTS under the CRADA, dated September 27, 2022, as amended on May 22, 2023, May30, 2023, by and between the Company and BEA. Pursuant to the terms of Modification No. 3, the potential amounts payable by the Company to reimburse BEA for its expenses and employee time were increased from $2.6 million by approximately $1.6 million, bringing the total estimated cost for the work to be performed under the "umbrella" CRADA to $4.2 million. This modification also required that a $0.6 million advance payment be made, which was paid on January 16, 2025.

After Modification No. 3, to the PTS under the CRADA and the anticipated Modification No. 4 to the PTS under the SPPA, total cash payments from the Company to BEA under both Agreements are estimated at approximately $6.5 million (excluding project contingencies) on a cost reimbursable basis over the performance periods under the initial releases.

Romania Feasibility 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 (RATEN ICN) in Romania to perform an engineering study to assess the compatibility and suitability of Lightbridge Fuel™ for use in CANDU reactors. This assessment covers 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. On July 2, 2024, we issued a change order adding a new task to the remaining scope of this engineering study. Following the change order, the Company paid a total fee of approximately $0.2 million for this engineering study, which was completed in 2024. We anticipate performing additional studies with RATEN ICN.

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. The TAMU study is expected to be completed in 2026. In mid-2023, TAMU was awarded $1.0 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 (ATFs) 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. In October 2024, MIT presented a technical paper with preliminary safety evaluation results at the TopFuel 2024 Conference in Grenoble, France. According to MIT, the results have shown promising safety and performance benefits for Lightbridge Fuel™. Compared to conventional fuel, Lightbridge Fuel™ demonstrated improved thermal-hydraulic margins, lower operating temperatures, and greater potential for power uprates, which contributes to enhancing reactor economics.

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 economic 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:

- **INL:** To produce samples, coupons, and rodlets necessary for testing to be performed under our INL agreements. We will continue to execute the SPPA/CRADA work at INL leading to casting and extrusion of fuel material samples using enriched uranium and their subsequent insertion for irradiation testing in the ATR.

- **Modeling:** Continue development and/or validation (benchmarking) of Lightbridge-specific methods and modifications to existing modeling codes to accurately predict Lightbridge Fuel™ performance over the full domain of operating conditions for which Lightbridge Fuel™ will be licensed.

- **Fuel Qualification Plan:** Develop a Fuel Qualification Plan that describes our approach to characterizing and validating the performance our fuel rods, assemblies, and assembly components in relevant operation scenarios, and validation of the modeling tools that accurately describe the performance of Lightbridge Fuel™ in the relevant conditions.

- **NRC Engagement Plan**: Prepare and submit the NRC Engagement Plan that outlines how and when Lightbridge will engage the NRC regarding submission of relevant information and supporting documentation for license applications.

- **Fabrication:** Continue manufacturing efforts relating to establishing a manufacturing process for the co-extrusion of cladded rodlets for loop irradiation testing and other fuel testing. In addition, we plan to complete site selection and begin deployment of a LPFFF with capacity to produce fuel samples, fuel coupons, fuel rodlets, and full-length fuel rods for lead test rods and lead test assemblies for demonstration of our fuel in commercial reactors.

- **Thermal-Hydraulic Analysis and Experiments:** Perform thermal-hydraulic modeling of Lightbridge Fuel™ to prepare for a series of thermal-hydraulic experiments to confirm pressure drop, critical heat flux performance, and other thermal-hydraulic parameters of Lightbridge Fuel™ under various operating conditions in different types of reactors.

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 process 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.

The above future steps describe our current proposed approach to deploying Lightbridge Fuel™ in CANDU and/or U.S. PWR 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 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. Lightbridge aims to engage early with relevant nuclear regulators to inform our future R&D activities.

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 that we believe would have a commercial market for our fuel 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.

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 LTR/LTA could take several years to complete and require tens of millions of dollars in capital expenditures. Expanding that pilot-scale fuel fabrication facility to batch reload quantities would require a substantial additional capital investment in the manufacturing facility and equipment (in the order of hundreds of millions of dollars). These estimates assume sufficient funding availability and that the project receives prioritization by the DOE and U.S. Nuclear Regulatory Commission (NRC) to facilitate access to the required quantities of the HALEU material and timely regulatory licensing of such a facility.

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 with INL, and we expect insertion of fuel material coupons in the ATR in 2026 and completion of irradiation testing to full burnup and post-irradiation examination of the fuel material coupons in approximately several 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.

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 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 plan on such a loop irradiation test to be performed in the ATR at INL. The ATR currently has limited irradiation loop test facilities; however, the planned installation of the new so-called "I-loops" in the coming years 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.

Preparation for Lead Test Assembly Operation

Insertion of a 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 a 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 may take four years.

We expect that the LTA design effort, development of computer modeling and simulation capabilities, and performance of the LTA safety justification may 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 and the change in amounts for the years indicated (rounded to millions):

	Year Ended December 31,		Increase (Decrease)	Increase (Decrease)
	2024	2023	Change $	Change %
Operating Expenses				
General and administrative	$ 8.5	$ 7.1	$ 1.4	20%
Research and development	4.6	1.9	2.7	142%
Total Operating Expenses	13.1	9.0	4.1	46%
Total Operating Loss	(13.1)	(9.0)	4.1	46%
Other Income	1.3	1.1	0.2	18%
Net loss before Income Taxes	(11.8)	(7.9)	3.9	49%
Income tax expense	—	—	—	—
Net Loss	$ (11.8)	$ (7.9)	$ 3.9	49%

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.

General and administrative expenses increased by $1.4 million for the year ended December 31, 2024, as compared to the year ended December 31, 2023. The increase of $1.4 million was primarily due to an increase in employee compensation and employee benefits of $0.3 million, an increase in consulting fees and professional fees of $0.3 million, an increase in stock-based compensation of $0.6 million, an increase in IT expenses of $0.1 million, an increase in travel and recruitment expenses of $0.1 million, and an increase in patent expense of $0.1 million, partially offset by a decrease in insurance expense of $0.1 million.

Total stock-based compensation included in general and administrative expenses was $1.7 million and $1.1 million for the years ended December 31, 2024 and 2023, respectively.

Research and Development (R&D)

R&D expenses consist primarily of costs associated with our CRADA and SPPA agreements with INL, employee compensation and related fringe benefits including stock-based compensation and other research and development costs for the development of our Lightbridge Fuel™.

The following table presents the total R&D expenses for the year ended December 31, 2024 and 2023 (rounded to millions):

	Year Ended December 31,	
	2024	2023
INL Project	$ 1.7	$ 0.8
Romania Feasibility Study	0.2	—
Centrus Energy FEED Study	0.3	—
Allocated employee compensation and stock-based compensation	1.8	0.7
Other outside R&D expenses	0.6	0.4
Total	$ 4.6	$ 1.9

R&D expenses increased by $2.7 million for the year ended December 31, 2024, as compared to the year ended December 31, 2023 due to the increase in R&D activities related to the development of Lightbridge Fuel™. This increase primarily consisted of an increase in INL project labor costs of $0.9 million, an increase of outside R&D costs of $0.4 million, an increase in R&D employees and allocated employee compensation and employee benefits of $1.0 million, an increase in quality assurance expenses of $0.1 million, an increase in R&D modeling computer hardware and software and travel expenses of $0.2 million and an increase in stock-based compensation expenses of $0.1 million.

Total stock-based compensation included in research and development expenses was $0.3 million and $0.2 million for the years ended December 31, 2024 and 2023, respectively.

We currently anticipate investing approximately $17.0 million in the R&D of our nuclear fuel for 2025. Meeting this future budgeted R&D spending for the next 12 months is uncertain and actual spending may differ.

Due to the nature of our R&D expenditures, future costs 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 Income

There was an increase in other income of $0.2 million due to higher cash balances 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, 2024, as compared to the year ended December 31, 2023.

Provision for Income Taxes

We incurred a pre-tax net loss for both 2024 and 2023. We reviewed all sources of income for the purpose of recognizing the deferred tax assets and concluded a full valuation allowance for 2024 and 2023 was necessary. Therefore, we did not have a provision for taxes for both years ended December 31, 2024 and 2023. 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. 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, 2024, we had cash and cash equivalents of $40.0 million, as compared to $28.6 million at December 31, 2023, an increase of $11.4 million. We raised net proceeds of $21.4 million from the sale of approximately 4.5 million shares of common stock during the year ended December 31, 2024. Our net cash used in operating activities for the year ended December 31, 2024, was $9.5 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 at-the-market (ATM) offering. 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 R&D development stage of our nuclear fuel.

To complete the development and commercial deployment of Lightbridge Fuel™ we currently estimate a total R&D, including Capital Expenditures (CAPEX) investment in the range of $200 million to $300 million or approximately $20.0 million per year over the next 10-15 years. We plan to raise this capital through a combination of strategic and financial investors, as well as potentially receiving grants from the DOE and/or other government sources.

Sufficient funding is needed to continue our nuclear fuel development project and to achieve our future R&D milestones leading to the commercialization of our nuclear fuel. The actual amount of cash we will need to reach the commercialization of our nuclear fuel 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 other costs to commercialize our nuclear fuel. Accordingly, there is high potential for budget variances in the current above cost projections and fuel development timelines of our current planned operations over the above cited fuel development period. Currently, we plan to continue to utilize our ATM to finance our future R&D and general and administrative activities.

We will also need to receive substantial funding and in-kind support from government, 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.

We have approximately $48.4 million of working capital as of the date of this filing. We currently project a negative cash flow from our operations from both our general and administrative and R&D expenses, resulting in total expected expenditures of approximately $25.0 million for 2025. Our R&D expenses are expected to increase over the next 12 months based on our fuel development activities. Our cash balance at December 31, 2024, 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 R&D and other expenditures that will be required in the future. We may also be unsuccessful in raising the capital necessary in the future to continue the R&D development of our fuel. 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 to further develop our fuel, resulting in higher negative monthly cash flows from operations in future periods.

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 at-the-market equity offering sales agreement, as amended, , with Stifel, Nicolaus & Company, Incorporated. We filed a shelf registration statement on Form S-3 with the Securities and Exchange Commission (SEC) on March 29, 2024, registering the sale of up to $75.0 million of the Company's securities that was declared effective on April 19, 2024. On May 10, 2024, we filed a prospectus supplement, which was further supplemented on July 19, 2024 and August 9, 2024 pursuant to which we may offer and sell shares of common stock having an aggregate offering price of up to $12.6 million from time to time, through the ATM. On November 22, 2024, we filed a prospectus supplement pursuant to which we may offer and sell shares of common stock having an aggregate offering price of up to $45.0 million from time to time through the ATM.

Although we expect this ATM facility to continue to be our primary source of working capital for the Company in 2025, 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 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 prior equity financings.

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

Currently, our primary 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.

See Note 8. Stockholders' Equity and Stock-Based Compensation 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 prior equity financings.

Cash Flow

The following table provides detailed information about our net cash flows for the years ended December 31, 2024 and 2023 (amounts reflected in millions):

	Year Ended December 31,	
	2024	**2023**
Net Cash Used in Operating Activities	$ (9.5)	$ (6.5)
Net Cash Used in Investing Activities	—	—
Net Cash Provided by Financing Activities	20.9	6.2
Net Cash Inflow (Outflow)	$ 11.4	$ (0.3)

Operating Activities

Cash used in operating activities increased by $3.0 million in 2024 as compared to 2023. This increase was primarily due to increased spending on R&D, general and administrative expenses and changes in working capital, which included an increase in prepaid assets of $0.1 million, and was partially offset by an increase in accounts payable and accrued liabilities of $0.2 million.

Investing Activities

Net cash used in our investing activities was insignificant for the years ended December 31, 2024 and 2023.

Financing Activities

Cash provided by financing activities increased by $14.7 million. This increase was due to an increase in the net proceeds received from the issuance of common stock under our at-the-market (ATM) facility in the year ended December 31, 2024 of $15.0 million, partially offset by an increase in net share settlement of equity awards for the payment of withholding taxes of $0.3 million.

Cash provided by our ATM facility was $21.4 million (sale of approximately 4.5 million common shares) and $6.4 million (sale of approximately 1.5 million common shares) for the years 2024 and 2023, respectively. Cash used during the years 2024 and 2023 related to the payment of withholding taxes on the net share settlement of equity awards was $0.5 million and $0.2 million, respectively.

See Note 12. Subsequent Events 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 cash provided by our ATM facility after December 31, 2024.

Project Task Statements - INL

On December 9, 2022, we entered into 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, 2024, we had approximately $1.7 million in project task statements to BEA relating to the research and development being conducted under the SPPA 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 SPPA 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.

Operating Leases

The Company leased office space for a 12-month term from January 1, 2025 through December 31, 2025 with a monthly payment of approximately $8,000. The future minimum lease payments required under the non-cancellable operating leases for 2025 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, 2024 and 2023.

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, 2024 and 2023 begins on page 44 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 CEO and CFO, has evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of December 31, 2024 (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 CEO 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, 2024, our disclosure controls and procedures were effective.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as 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, 2024, utilizing the criteria in the Committee of Sponsoring Organizations of the Treadway Commission's *Internal Control-Integrated Framework* (2013). Based on this assessment, management has concluded that the Company's internal control over financial reporting was effective as of December 31, 2024.

Remediation of Previously Reported Material Weakness

As disclosed in our Annual Report on Form 10-K for the year ended December 31, 2023, 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. Management, under the oversight of the Audit Committee, remediated this material weakness by December 31, 2024. This includes enhancing the design of logical access controls to ensure appropriate segregation of duties through improved internal documentation and monitoring activities. Management also removed privileged access to accounting software and implemented a semi-annual internal review of logical access to the accounting software used in the financial reporting process. Management has concluded through testing that these new implemented controls are designed and operating effectively as of December 31, 2024 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, 2024 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, 2024, 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 2025 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 2025 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 2025 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 2025 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 2025 Annual Meeting of Stockholders and is incorporated herein by reference.

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).
1.3	Amendment No. 2 to the At-the-Market Equity Offering Sales Agreement, dated May 8, 2024, by and between Lightbridge Corporation and Stifel, Nicolaus & Company, Incorporated (incorporated by reference to Exhibit 1.1 to the Form 10-Q filed by the Company on May 10, 2024).
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).
3.3	Certificate of Designation of Series X Preferred Stock (incorporated by reference to Exhibit 3.2 to the Form 8-K filed by the Company on March 3, 2025).
4.2*	Description of Securities.
4.3	Specimen Certificate for Company's Common Stock (incorporated by reference to Exhibit 4.1 to the Company's registration statement on Form S-3 filed on April 1, 2013, File No. 333-187659).
10.1**	Lightbridge Corporation 2006 Stock Plan (incorporated by reference to Exhibit 10.1 to the Form 8-K filed by the Company on February 21, 2006).
10.2**	Lightbridge Corporation 2015 Equity Incentive Plan, as amended (incorporated by reference to Appendix A to the definitive proxy statement filed on March 29, 2018, File No. 001-34487).
10.3**	Form of Incentive Stock Option Agreement for Employees under the 2015 Equity Incentive Plan (incorporated by reference to Exhibit 99.2 to the Company's Registration Statement on Form S-8, File No. 333-218796, filed on June 16, 2017).
10.4**	Form of Non-Qualified Stock Option Agreement for Employees under the 2015 Equity Incentive Plan (incorporated by reference to Exhibit 99.3 to the Company's Registration Statement on Form S-8, File No. 333-218796, filed on June 16, 2017).
10.5**	Form of Non-Qualified Stock Option Agreement for Non-Employee Directors under the 2015 Equity Incentive Plan (incorporated by reference to Exhibit 99.4 to the Company's Registration Statement on Form S-8, File No. 333-218796, filed on June 16, 2017)
10.6**	Amended Lightbridge Corporation 2020 Omnibus Incentive Plan (incorporated by reference to Appendix A to the definitive proxy statement filed on April 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).
10.19▲	Modification No. 2 to the Project Task Statement, dated March 25, 2024, under the Strategic Partnership Project Agreement, dated December 9, 2022, as amended on May 23, 2023, by and between Lightbridge Corporation and Battelle Energy Alliance, LLC (incorporated by reference to Exhibit 10.1 to the Form 10-Q filed by the Company on May 10, 2024).
10.20▲	Modification No. 3 to the Project Task Statement, dated October 24, 2024, under the Strategic Partnership Project Agreement, dated December 9, 2022, as amended on May 23, 2023 and March 26, 2024, by and between Lightbridge Corporation and Battelle Energy Alliance, LLC (incorporated by reference to Exhibit 1.01 to the Form 8-K filed by the Company on October 25, 2024).
10.21 ▲	Modification No. 3 to the Project Task Statement, dated January 16, 2025, under the Cooperative Research and Development Agreement, dated December 9, 2022, by and between Lightbridge Corporation and Battelle Energy Alliance, LLC. (incorporated by reference to Exhibit 10.1 to the Form 8-K filed by the Company on January 17, 2025).
10.22	Subscription and Investment Representation Agreement, dated February 27, 2025, by and between the Company and the Purchaser (incorporated by reference to Exhibit 10.1 to the Form 8-K filed by the Company on March 3, 2025).
19.1*	Insider Trading Policy.
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 Independent Registered Public Accounting Firm
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 (incorporated by reference to Exhibit 97.1 to the Form 10-K filed by the Company on March 4, 2024).

101	The following materials from Lightbridge Corporation's Annual Report on Form 10-K for the year ended December 31, 2024, formatted in Inline eXtensible Business Reporting Language (XBRL): (i) the Consolidated Balance Sheets; (ii) Consolidated Statement of Operations; (iii) Consolidated Statement of Cash Flows; (iv) Consolidated Statement of Changes in Stockholders' Equity; and (v) Notes to Consolidated Financial Statements
101.INS	Inline XBRL Instance Document (the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document).
101.SCH	Inline XBRL Taxonomy Extension Schema Document.
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document.
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	Inline XBRL Taxonomy Extension Labels Linkbase Document.
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document.
104*	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101).

* Filed or furnished herewith

** Indicates management contract or compensatory plan or arrangement.

▲ 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, 2024 and 2023

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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, 2024 and 2023, 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, 2024 and 2023, 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, 2024, the Company recorded approximately $4.6 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 3, 2025

LIGHTBRIDGE CORPORATION
CONSOLIDATED BALANCE SHEETS

	December 31, 2024	December 31, 2023
ASSETS		
Current Assets		
Cash and cash equivalents	$ 39,990,827	$ 28,598,445
Prepaid expenses and other current assets	324,378	207,063
Total Current Assets	40,315,205	28,805,508
Other Assets		
Prepaid project costs and other long-term assets	528,805	483,000
Trademarks	108,865	108,865
Total Assets	$ 40,952,875	$ 29,397,373
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current Liabilities		
Accounts payable and accrued liabilities	$ 424,585	$ 486,326
Total Current Liabilities	424,585	486,326
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, 2024 and 2023	—	—
Common stock, $0.001 par value, 25,000,000 authorized, 18,783,912 shares and 13,698,274 shares issued and outstanding at December 31, 2024 and 2023, respectively	18,784	13,698
Additional paid-in capital	204,694,348	181,295,125
Accumulated deficit	(164,184,842)	(152,397,776)
Total Stockholders' Equity	40,528,290	28,911,047
Total Liabilities and Stockholders' Equity	$ 40,952,875	$ 29,397,373

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

LIGHTBRIDGE CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended December 31,	
	2024	**2023**
Revenue	$ —	$ —
Operating Expenses		
General and administrative	8,460,519	7,149,773
Research and development	4,598,978	1,922,865
Total Operating Expenses	13,059,497	9,072,638
Other Operating Income		
Contributed services - research and development	—	31,028
Total Other Operating Income	—	31,028
Operating Loss	(13,059,497)	(9,041,610)
Other Income		
Interest income	1,272,431	1,132,964
Total Other Income	1,272,431	1,132,964
Net Loss Before Income Taxes	(11,787,066)	(7,908,646)
Income taxes	—	—
Net Loss	$ (11,787,066)	$ (7,908,646)
Net Loss Per Common Share		
Basic and diluted	$ (0.81)	$ (0.65)
Weighted Average Number of Common Shares Outstanding	14,487,834	12,099,574

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, 2024 and 2023

	Common Stock		Additional Paid-in	Accumulated	Total
	Shares	Amount	Capital	Deficit	Equity
Balance – January 1, 2023	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 of $350,430	1,492,148	1,493	6,403,938	—	6,405,431
Shares issued to consultant and 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
Shares issued, net of share settlement for withholding taxes paid upon vesting of restricted stock awards	383,755	384	(568,732)	—	(568,348)
Shares issued - registered offerings - net of offering costs of $1,128,284	4,547,207	4,548	21,407,957	—	21,412,505
Shares issued through the exercise of options	10,974	11	41,910	—	41,921
Shares issued to consultants and directors for services	143,702	143	479,857	—	480,000
Stock-based compensation	—	—	2,038,231	—	2,038,231
Net loss	—	—	—	(11,787,066)	(11,787,066)
Balance - December 31, 2024	18,783,912	$ 18,784	$ 204,694,348	$ (164,184,842)	$ 40,528,290

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

LIGHTBRIDGE CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31,	
	2024	**2023**
Operating Activities		
Net loss	$ (11,787,066)	$ (7,908,646)
Adjustments to reconcile net loss to net cash used in operating activities		
Common stock issued for services	110,806	45,000
Stock-based compensation	2,038,231	1,257,717
Changes in operating assets and liabilities		
Prepaid expenses and other current assets	(3,121)	(91,799)
Prepaid project costs and other long-term assets	(45,805)	(138,000)
Accounts payable and accrued liabilities	193,259	350,995
Net Cash Used in Operating Activities	(9,493,696)	(6,484,733)
Investing Activities		
Trademarks	-	(640)
Net Cash Used in Investing Activities	-	(640)
Financing Activities		
Net proceeds from the issuances of common stock	21,412,505	6,405,431
Net proceeds from the exercise of stock options	41,921	-
Payments for taxes related to net share settlement of equity awards	(568,348)	(221,610)
Net Cash Provided by Financing Activities	20,886,078	6,183,821
Net Increase (Decrease) in Cash and Cash Equivalents	11,392,382	(301,552)
Cash and Cash Equivalents, Beginning of Year	28,598,445	28,899,997
Cash and Cash Equivalents, End of Year	$ 39,990,827	$ 28,598,445
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	$ 15,000	$ 215,000
Common stock issued for consulting services	$ 180,000	$ -

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 nuclear fuel. The Company views its operations and manages its business as one business segment, which is the development and commercialization of its nuclear fuel.

Basis of Consolidation

These consolidated financial statements included 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 were inactive. All intercompany transactions and balances have been eliminated in consolidation.

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 affected 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 were periodically reviewed and the effects of revisions were reflected in the consolidated financial statements in the period they are determined to be necessary. There were no significant estimates at December 31, 2024 and 2023.

Fair Value of Financial Instruments

The Company determined 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.

Accounting Standards Codification (ASC), *Fair Value Measurement* (ASC 820), established a fair value hierarchy that prioritizes the inputs used to measure fair value. Assets and liabilities measured at fair value were 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 was based on the lowest level of input that is significant to the fair value measurement. The three levels of the fair value hierarchy were 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 were 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 were not active and inputs other than quoted prices that were observable for the asset or liability; and

Level 3 - Unobservable inputs that reflect management's assumptions.

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

The Company's financial instruments consisted principally of cash and cash equivalents, accounts payable and accrued liabilities. The carrying amounts of our financial instruments are considered to be a Level 1 measurement, because of the short-term nature of those instruments.

The following table summarize the valuation of the Company's financial instruments that fall within the fair value hierarchy (in millions) at December 31, 2024:

	Level I	Level II	Level III
Cash and cash equivalents	$ 40.0	$ —	$ —
Accounts payable and accrued liabilities	$ 0.4	$ —	$ —

The following table summarize the valuation of the Company's financial instruments that fall within the fair value hierarchy (in millions) at December 31, 2023:

	Level I	Level II	Level III
Cash and cash equivalents	$ 28.6	$ —	$ —
Accounts payable and accrued liabilities	$ 0.5	$ —	$ —

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 (ATFs), changes in government regulations, risks related to the R&D 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 R&D 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.

The Company is engaged in significant research and development (R&D) activities to advance its nuclear fuel technology at Idaho National Laboratory (INL). For the year ended December 31, 2024, R&D expenses associated with activities conducted at the INL accounted for approximately 37% of the Company's total R&D expenditure. The Company currently relies on INL for developing, testing and evaluating its nuclear fuel. Any disruption in access to INL's resources, including changes in government policies, facility downtime, regulatory constraints, or unforeseen operational challenges could have a material adverse effect on the Company's current ability to advance its R&D activities.

Cash and Cash Equivalents

The Company may at times invest its excess cash in interest bearing accounts and U.S. treasury bills. It classified 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 held cash balances in excess of the federally insured limits of $250,000. The Company deemed this credit risk not to be significant as cash was held by two prominent financial institutions in 2024 and 2023.

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), applied 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 required nonfinancial assets, which includes services, such as the R&D services provided under the Gateway for Accelerated Innovation in Nuclear (GAIN) vouchers, (totaled $0 and $31,000 for 2024 and 2023, respectively) 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 were capitalized. Trademarks were considered intangible assets with an indefinite useful life and therefore were not amortized. The Company performed 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 2024 test, the Company applied the accounting guidance which allowed the company to first assess qualitative factors to determine the extent of additional quantitative analysis, if any, that may have 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, 2024 and 2023, 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 were not recorded on the consolidated balance sheet in accordance with the short-term lease recognition exemption. The Company applied the practical expedient to not separate non-lease components for all leases that qualified. Lease expense was recognized on a straight-line basis over the lease term. The Company had only one lease for office rent and the lease was for a term of 12 months without renewal options.

Income Taxes

Income taxes were accounted for using the asset and liability method. Deferred tax assets and liabilities were 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 were measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences were expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates was recognized in income in the period that included the enactment date. In accordance ASC 740, *Accounting for Income Taxes*, the Company reflected 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 was 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, 2024 and 2023, the Company had no unrecognized income tax benefits and correspondingly there was 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 was to record them as a component of income tax expense in the accompanying consolidated statements of operations. As of December 31, 2024 and 2023, the Company had no such accruals.

Research and Development Expenses

Research and development expenses were expensed when incurred. Research and development expenses consisted primarily of wages and related payroll benefits, non-cash stock-based compensation, materials, R&D modeling computer hardware and software, testing, consulting, and other third-party research and development services, related to the development of the Company's nuclear fuel. Advanced payments for goods or services for future research and development activities were deferred and expensed as the goods were delivered or the related services were performed.

Stock-Based Compensation

The stock-based compensation expense incurred by the Company for employees and directors in connection with its equity incentive plan was based on the employee model of ASC 718, *Compensation—Stock Compensation*, and the fair value of any stock options granted was measured at the grant date. Options or common stock granted to consultants for services performed were accounted for in the same manner as options and stock issued to employees for services.

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

The Company used 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. Shares that were issued to employees upon exercise of the stock options or vesting of Restricted Stock Units (RSUs) or Restricted Stock Awards (RSAs) grants were 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 were fewer than the actual number of shares exercised under the stock option or on the vesting dates of RSU or RSA grants.

The Company granted RSAs, which was 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 were forfeited and returned to the Company if they did not vest. The RSAs were included in common stock issued and outstanding and were 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 showed 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 cash flow impact is reflected within financing activities in the consolidated statements of cash flows. The number of RSAs to be granted are determined by the closing stock price on the date of the RSAs grant.

Under ASC 718, the Company elected to account for forfeitures as they occur and recorded compensation cost assuming all option holders have completed the requisite service period. If an employee forfeited an award because they failed to complete the requisite service period, the Company reversed compensation cost previously recognized in the period the award was forfeited. Thus, the total cumulative amount of compensation cost recognized for an award was the same regardless of whether the Company elected to estimate forfeitures or accounted for forfeitures as they occurred.

Comprehensive Loss

Comprehensive loss was defined as a change in equity of a business enterprise during a period resulting from transactions from non-owner 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.

Recent Adopted Pronouncements

In November 2023, the FASB issued ASU No. 2023-07, *Segment Reporting* (Topic 280): *Improvements to Reportable Segment Disclosures* (ASU 2023-07), which expanded on the required disclosure of incremental segment information. The new guidance was effective for fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024, with early adoption permitted. The Company adopted this ASU on January 1, 2024. This ASU resulted in additional disclosures upon adoption.

In August 2020, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 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 simplified the complexity associated with applying GAAP for certain financial instruments with characteristics of liabilities and equity. This ASU (1) simplified 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 required entities to account for beneficial conversion features and cash conversion features in equity, separately from the host convertible debt or preferred stock; (2) revised the scope exception from derivative accounting in Subtopic 815-40 for freestanding financial instruments and embedded features that were both indexed to the issuer's own stock and classified in stockholders' equity, by removing certain criteria required for equity classification; and (3) revised 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 was effective for fiscal years beginning after December 15, 2023, including interim periods within those fiscal years. Early adoption was permitted, but no earlier than fiscal years beginning after December 15, 2020, including interim periods within those fiscal years. Adoption was either through a modified retrospective method or a full retrospective method of transition. The Company adopted this guidance on January 1, 2024 and the adoption did not have a material impact on its results of operations, financial position, and disclosures because the Company did not have any transactions or instruments to which this standard applied. If in the future the Company issued new convertible debt, warrants or other instruments, the standard may have a material effect, but it cannot be determined at this time.

Recent Accounting Pronouncements

In December 2023, the FASB issued ASU No. 2023-09, *Income Taxes* (Topic 740): *Improvements to Income Tax Disclosures* (ASU 2023-09), which modified the rules on income tax disclosures to require entities to disclose (1) specific categories in the rate reconciliation, (2) the income or loss from continuing operations before income tax expense or benefit (separated between domestic and foreign) and (3) income tax expense or benefit from continuing operations (separated by federal, state and foreign). ASU 2023-09 also required entities to disclose their income tax payments to international, federal, state and local jurisdictions, among other changes. The guidance was effective for annual periods beginning after December 15, 2024. Early adoption was permitted for annual financial statements that have not yet been issued or made available for issuance. ASU 2023-09 should be applied on a prospective basis, but retrospective application was permitted. The Company does not expect this guidance to have a material impact on its consolidated financial statements and related disclosures upon adoption.

In November 2024, the FASB issued ASU No. 2024-03, *Income Statement - Reporting Comprehensive Income - Expense Disaggregation Disclosures* (Subtopic 220-40): *Disaggregation of Income Statement Expenses* ("ASU 2024-03"), which required disclosure of certain costs and expenses on an interim and annual basis in the notes to the consolidated financial statements. The guidance is effective for annual reporting periods beginning after December 15, 2026 and interim periods within annual reporting periods beginning after December 15, 2027. Early adoption is permitted. The guidance is to be applied either (1) prospectively to financial statements issued for reporting periods after the effective date or (2) retrospectively to any or all prior periods presented in the financial statements. The Company is currently evaluating the potential impact of adopting this new guidance on the consolidated financial statements and related disclosures.

The Company has evaluated other recently issued, but not yet effective, accounting standards that have been issued or proposed by the FASB or other standards-setting bodies through the filing date of these consolidated financial statements and does not believe the future adoption of any such standards will have a material impact on the consolidated financial statements and related disclosures.

Note 2. Net Loss Per Share

Basic net loss per share was computed using the weighted-average number of common shares outstanding during the reporting period, except that it did not include unvested common shares subject to repurchase or cancellation. Diluted net loss per share was computed using the weighted-average number of common shares and, if dilutive, potential common shares outstanding during the period. Potential common shares consisted of the incremental common shares issuable upon the exercise of stock options. For the years ended December 31, 2024 and 2023, there was 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 outstanding securities in the table below 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, 2024 and 2023 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,	
	2024	**2023**
Stock options outstanding	464,940	510,787
Restricted stock awards outstanding	781,864	557,688
Total	1,246,804	1,068,475

Note 3. Prepaid Project Costs and Other Long-term Assets

In 2022, the Company entered into two 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 to $0.5 million. The prepaid project costs were $0.5 million as of both December 31, 2024 and 2023, recorded under Other Assets - Prepaid project costs and other long-term assets on the accompanying consolidated balance sheets.

Note 4. Accounts Payable and Accrued Liabilities

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

	December 31, 2024	**December 31, 2023**
Trade payables	$ 0.2	$ 0.1
Accrued research and development expenses	0.1	—
Accrued accounting and consulting expenses	0.1	0.4
Total	$ 0.4	$ 0.5

Note 5. Commitments and Contingencies

Operating Leases

The Company leased office space for a 12-month term from January 1, 2025 through December 31, 2025 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, 2024 and 2023 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" SPPA and an "umbrella" CRADA, 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 Project Task Statements (PTS). The initial phase of work under the two agreements is expected to culminate in future irradiation testing in the INL Advanced Test Reactor 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. Data gathered during future post-irradiation examination work are expected to support fuel performance modeling and regulatory licensing efforts for the commercial deployment of Lightbridge Fuel™. For the year ended December 31, 2024 and 2023, the Company recorded $1.7 million and $0.8 million in R&D expenses associated with INL, respectively.

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 Canada Deuterium Uranium (CANDU) reactors. The total price of approximately $0.2 million was 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, 2024 and 2023, the Company recorded $0.2 million and $27,000, respectively in R&D expenses associated with RATEN ICN feasibility study. The Company made its final payment in December 2024 and has no further obligations under the agreement.

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 front-end engineering and design (FEED) study to evaluate deployment of a Lightbridge Pilot Fuel Fabrication Facility (LPFFF) at the American Centrifuge Plant in Piketon, Ohio. For the year ended December 31, 2024 and 2023, the Company recorded $0.3 million and $23,400, respectively in R&D expenses associated with this FEED study and has no further payment obligations.

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, 2024, 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 2024 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, 2024 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 2024 and 2023 annual effective tax rate was 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.

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, 2024 and 2023, respectively, are as follows.

	December 31, 2024	December 31, 2023
Book income at federal statutory rate, 21%	21.00%	21.00%
State taxes, net of federal benefit	0.81%	4.25%
Change in valuation allowance	(6.58)%	(25.40)%
Permanent difference	(0.07)%	(0.15)%
True-Ups, Stock-based compensation and Other	(15.16)%	0.30%
	—%	—%

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

	December 31, 2024	December 31, 2023
Stock-based compensation	$ 1.5	$ 3.7
Patent impairment provision	0.3	0.3
Net operating loss carry-forwards	17.0	15.0
Research and development expenses – capitalized for tax purposes	1.4	0.5
Research and development tax credits	0.3	0.3
Total deferred tax asset	20.5	19.8
Less: valuation allowance	(20.5)	(19.8)
Net deferred tax asset	$ —	$ —

The Company has NOL carryforwards for federal and state tax purposes of approximately $71.8 million at December 31, 2024 and $60 million at December 31, 2023, that is potentially available to offset future taxable income. There were no deferred tax liabilities at December 31, 2024 and 2023. As of December 31, 2024 and 2023, 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, 2024 and 2023, 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, 2024 and 2023 was approximately $0.7 million and $2.0 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, 2024	December 31, 2023
Tax benefit at U.S. federal statutory rates	$ (0.6)	$ (1.7)
Tax benefit at state statutory rates	(0.1)	(0.3)
Other	—	—
Increase in valuation allowance	0.7	2.0
Total provision for income tax benefit	$ —	$ —

Uncertain Tax Positions

We file income tax returns in the U.S. federal jurisdiction and State of Idaho, New York and Virginia. The tax years 2021 through 2023 remain subject to examination by the appropriate governmental agencies. At December 31, 2024 and 2023, the Company had no unrecognized tax benefits. As of December 31, 2024 and 2023, there were no tax contingencies or unrecognized tax positions recorded. As of December 31, 2024 and 2023, we did not accrue interest and penalties.

Note 8. Stockholders' Equity and Stock-Based Compensation

At December 31, 2024, the Company had 18,783,912 common shares outstanding (including outstanding RSAs totaling 781,864 shares). Also outstanding were stock options relating to 464,940 shares of common stock (of which 445,275 stock options were vested), all totaling 19,248,852 shares of common stock and all common stock equivalents, outstanding as of December 31, 2024.

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 (of which 498,177 stock options were vested), all totaling 14,209,061 shares of common stock and all common stock equivalents, outstanding at December 31, 2023.

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 and May 8, 2024 (the ATM Agreement), 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 amended agreement, the Company pays Stifel a commission equal to 3.0% 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.

The Company filed a shelf registration statement on Form S-3 with the Securities and Exchange Commission (SEC) on March 29, 2024, registering the sale of up to $75.0 million of the Company's securities that was declared effective on April 19, 2024. On May 10, 2024, the Company filed a prospectus supplement, which was further supplemented on July 19, 2024 and August 9, 2024 (collectively, the "First Prospectus Supplement"), pursuant to which the Company may offer and sell shares of common stock having an aggregate offering price of up to $12.6 million from time to time through the ATM. The Company exhausted all sales under the First Prospectus Supplement. On November 22, 2024, the Company filed a prospectus supplement (the "Second Prospectus Supplement") to which the Company may offer and sell shares of common stock having an aggregate offering price of up to $45.0 million from time to time through the ATM.

The Company records its ATM sales on a settlement date basis. The Company sold 4,547,207 shares under the ATM for the year ended December 31, 2024 resulting in net proceeds of $21.4 million (stock issuance costs were $1.1 million). 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).

Stock-Based Compensation

Amendment to 2020 Omnibus Incentive Plan

On March 9, 2020, the Board of Directors adopted the Company's 2020 Omnibus Incentive Plan (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.

On February 27, 2024, the Board of Directors approved an increase of 700,000 shares to the authorized number of shares under the 2020 Plan, increasing the total authorized number of shares from 1,800,000 shares to 2,500,000 shares. This increase was approved by the stockholders at the shareholders' annual meeting on April 19, 2024. The total number of shares of common stock available for issuance under the 2020 Plan was 2,500,000 shares with 1,073,914 shares available for future issuance at December 31, 2024.

Stock Options

Stock options issued to the Company's employees, directors and consultants are summarized as follows for the year ended December 31, 2024:

	Number of Options	Weighted Average Exercise Price	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding, December 31, 2023	510,787	$ 17.88	3.84	$ —
Granted	71,330	2.91		—
Exercised	(10,974)	3.82		60,102
Forfeited	(71,448)	21.89		—
Expired	(34,755)	5.33		—
Outstanding, December 31, 2024	464,940	$ 16.24	3.07	$ 184,818
Vested and expected to vest, December 31, 2024	464,940	$ 16.24	3.07	$ 184,818
Options exercisable, December 31, 2024	445,275	$ 16.81	2.80	$ 153,803

During the year ended December 31, 2024, the Company received approximately $42,000 of net proceeds from the exercise of 10,974 stock options.

During the year ended December 31, 2024, the Company issued 71,330 stock options to two consultants. These options were assigned a fair value of $1.19 per share (total fair value of $85,000). 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 (total fair value of $42,800). The weighted-average grant-date fair value per share of the stock options granted for the years ended December 31, 2024 and 2023, was $2.91 and $4.58, respectively.

The fair value was determined using the Black-Scholes pricing model. For expected volatility, the Company concluded that the historical volatility over the option's expected holding term provided the most reasonable basis for this estimate. For the risk-free interest rate, the Company used 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. The Company recognized forfeitures of equity-based awards as a reduction to compensation costs in the period in which they occur.

The following assumptions were used in the Black-Scholes pricing model to determine the fair value of stock options granted during the years ended December 31, 2024 and 2023:

	Year Ended December 31,	
	2024	2023
Expected volatility	75.36%-92.89%	68.13%-95.70%
Risk free interest rate	3.76%-4.54%	4.21%-5.12%
Dividend yield rate	—	—
Expected life	2 - 6 years	1 - 6 years
Closing price per share - common stock	$2.49 - $2.62	$4.31 - $4.35

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 was $4.73 and $3.21 per share at December 31, 2024 and 2023, respectively. As of December 31, 2024 and 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 2.06 years.

Common Stock

Consultants' Stock Issuances

For the year ended December 31, 2024 and 2023, the Company issued 18,201 shares (with stock prices ranging from $3.00 to $4.00 per share with a weighted average stock price of $3.30 per share) and 13,325 shares (with stock prices ranging from $4.00 to $5.82 per share) of common stock, respectively, to its investor relations firm for services provided during the period, recorded to general and administrative expenses. These shares vested immediately upon issuance. The expense recorded for these share issuances was $15,000 for each quarter with a weighted average grant date fair value of $3.30 per share in 2024 and $4.50 per share in 2023, respectively. The shares were valued based on the closing market price of the Company's common stock on the date of grant.

On August 19, 2024, the Board of Directors approved an equity grant valued at $180,000 to a consulting and investment research firm, for corporate advisory services to be provided over a twelve-month period, and preparation and dissemination of a report regarding the Company, which resulted in issuing the consultant 71,713 shares of common stock on the grant date, valued at $2.51 per share. These shares vested immediately upon issuance and are not forfeitable. The compensation cost of $180,000 is recognized on a straight-line basis over the requisite service period. Approximately $66,000 was recorded as consulting expense for the year ended December 31, 2024.

As of December 31, 2024, the unrecognized compensation cost of approximately $114,000 was recorded under Prepaid expenses and other current assets on the accompanying consolidated balance sheet, which is expected to be recognized over a remaining service period of 0.6 years.

Director Compensation – Equity-Settled Awards

On December 4, 2024, the Board of Directors approved an equity grant valued at $500,000 in total to its five directors for the service period and year ended December 31, 2024, which resulted in granting a total of 85,915 shares of common stock, valued on the grant date at $5.82 per share, with a scheduled share release date on January 2, 2025. On November 20, 2023, the Board of Directors approved an equity grant valued at $240,000 in total to its six directors for the service period and year ended December 31, 2023, which resulted in granting a total of 60,456 shares of common stock, valued on the grant date at $3.97 per share, with the shares issued in January 2024.

As a result, the fair value of the stock awards was measured on the grant date and recorded as an increase to stock-based compensation expense and additional paid-in capital in 2024. The fair value of the shares granted was determined based on the closing market price of the Company's common stock on the grant date.

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, 2023	557,688	$ 4.95	$ 1,790,178
Awards granted	484,269	5.82	2,818,446
Awards vested	(253,425)	5.72	1,430,838
Awards forfeited	(6,668)	10.69	82,083
Outstanding, December 31, 2024	781,864	5.19	3,698,217

The intrinsic value was calculated as the fair value of the Company's common stock. The fair value of the Company's common stock was $4.73 and $3.21 per share at December 31, 2024 and 2023, respectively. The fair value of the RSAs vested in 2024 and 2023 was $1.4 million and $0.6 million, respectively.

As of December 31, 2024, all the outstanding restricted stock awards are unvested. As of December 31, 2024, total unrecognized compensation cost related to restricted stock awards was $3.9 million, which is expected to be recognized over a remaining weighted-average vesting period of 2.50 years.

2024 Transactions

In 2024, a total of 253,425 RSAs vested. These RSAs vest annually with a three-year straight line vesting period. The Company withheld 100,514 shares to make payments for withholding taxes of $0.4 million on these vested shares, resulting in the issuance of 152,911 net shares to its employees and consultants. The common shares withheld became available for reissuance under the 2020 Plan.

On December 4, 2024, the Board of Directors approved an RSA equity grant of approximately $2.8 million, which equated to 484,269 RSAs granted to all of its employees and two consultants, valued at the closing market price of the Company's stock on the grant date of $5.82 per share. These RSAs awards vest annually in three equal installments on the grant date anniversary.

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 closing market price of the Company's stock on the grant date of $3.97 per share. These RSAs awards vest annually in three equal installments on the grant date anniversary.

In 2023, a total of 159,727 RSAs vested. These RSAs vest annually with a three-year straight line vesting period. The Company withheld 60,600 shares to make payments for withholding taxes of $0.2 million on these vested shares, resulting in the issuance of 99,127 net shares to its employees and consultants. The common shares withheld became available for reissuance under the 2020 Plan.

RSA Summary – 2024 and 2023

As of December 31, 2024 and 2023, there were 781,864 shares and 557,688 shares of RSAs included in the total issued and outstanding common stock, respectively. The weighted-average grant-date fair value per share of RSAs granted for the years ended December 31, 2024 and 2023, was $5.82 and $3.91, respectively. Compensation expense is recognized in a straight line over the three-year vesting period. A total of $1.4 million and $1.2 million of compensation expense was recorded for the years ended December 31, 2024 and 2023, respectively, for the RSAs.

Stock-Based Compensation Expense

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, 2024 and 2023 are as follows (rounded in millions):

	Year Ended December 31,	
	2024	2023
Research and development expenses	$ 0.3	$ 0.2
General and administrative expenses	1.7	1.1
Total stock-based compensation expense	$ 2.0	$ 1.3

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 $0.3 million and $0.2 million to the 401k plan for the years ended December 31, 2024 and 2023, 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 provided a variety of climate-change related consulting services to the Company and the Company paid a monthly membership fee of $1,200 to WDHT. Dr. Chakraborty, a member of the Company's Board of Directors, was also the CEO of WDHT's US division. For the years ended December 31, 2024 and 2023, the Company incurred $0 and $14,400, respectively, in dues paid to WDHT. This agreement was terminated on January 1, 2024.

Note 11. Segment Reporting

Operating segments are defined as components of an enterprise about which separate discrete information is available for evaluation by the chief operating decision maker, or decision-making group, in deciding how to allocate resources in assessing performance. The Company has one reportable business segment: nuclear fuel technology. This segment consists of the research and development and commercialization of its nuclear fuel. The Company's chief operating decision maker ("CODM") is the chief executive officer.

The accounting policies of the segment are the same as those described in the summary of significant accounting policies. The CODM assesses performance for the segment based on net loss as reported on the consolidated statement of operations. The Company expects to continue to incur significant expenses and operating losses for the foreseeable future as it advances its nuclear fuel through all the stages of its development and commercialization. In addition, the measure of segment assets is reported on the consolidated balance sheet as total assets.

The CODM uses segment net loss to allocate resources predominately in the annual budget and forecasting process and uses that measure as a basis for evaluating progress toward R&D milestones. The CODM uses cash forecast models in deciding how to invest into the segment. Research and development expenses, general and administrative expenses are included in segment net loss and used to monitor budget versus actual results. Monitoring budgeted versus actual results is used in assessing performance of the segment, while research and development milestones scorecard results and scorecard general and administrative budgeted results are used in establishing management's incentive compensation.

The table below summarizes the significant expense categories regularly provided to the CODM for the years ended December 31, 2024, and 2023 (rounded in millions):

	Year Ended December 31,	
	2024	2023
Revenue	$ -	$ -
General and administrative	8.5	7.1
Research and development:		
INL Project	1.7	0.8
Romania feasibility study	0.2	-
Centrus Energy FEED study	0.3	-
Allocated employee compensation and stock-based compensation	1.8	0.7
Other outside R&D expenses	0.6	0.4
Total research and development	4.6	1.9
Other segments item (1)	(1.3)	(1.1)
Net loss	$ (11.8)	$ (7.9)

(1) Other segment items include interest income and contributed services – research and development

Note 12. Subsequent Events

ATM Sales

Sales of common stock under the Company's ATM from January 1, 2025 to February 28, 2025 amounted to 1.4 million shares, which resulted in total net proceeds of approximately $10.1 million.

INL Modification No. 3 to the CRADA PTS

On January 16, 2025, the Company and BEA entered into Modification No. 3 to the PTS under the CRADA, dated September 27, 2022, as amended on May 22, 2023 and May 30, 2023, by and between the Company and BEA. Pursuant to the terms of Modification No. 3, the potential amounts payable by the Company to reimburse BEA for its expenses and employee time associated with R&D activities were increased by approximately $1.6 million, bringing the total estimated cost for the work to be performed under the "umbrella" CRADA to $4.2 million. This modification also required that a $600,000 advance payment be made, which was due and paid on January 16, 2025.

After Modification No. 3 to the PTS under the CRADA and the anticipated Modification No. 4 to the PTS under the SPPA, total cash payments from the Company to BEA under both Agreements were estimated at approximately $6.5 million excluding project contingencies) on a cost reimbursable basis over the performance periods under the initial releases.

Increase in Authorized Common Shares

On February 26, 2025, the Company's Board of Directors approved increasing the authorized common shares from 25,000,000 shares to 100,000,000 shares. This change will take effect upon receiving majority shareholder approval at the 2025 shareholder annual meeting.

Issuance of Series X Preferred Stock

On February 27, 2025, the Company entered into a Subscription and Investment Representation Agreement (the "Subscription Agreement") with Jesse Funches, chairman of the Audit Committee and an independent member of the Board (the "Purchaser"), pursuant to which the Company agreed to issue and sell one (1) share of the Company's Series X Preferred Stock, par value $0.001 per share (the "Series X Preferred Stock"), to the Purchaser for $100 in cash. The sale closed on February 27, 2025. The Company will redeem the Series X Preferred Stock for $100 in cash after the Company's annual 2025 shareholder meeting (the "Annual Meeting").

The Series X Preferred Stock does not have any voting rights except with respect to any proposal to increase the number of authorized shares of common stock of the Company. Each share of Series X Preferred Stock will be entitled to 25,000,000 votes on such proposal, voting together with the holders of our common stock. The votes by the holder of Series X Preferred Stock will be cast at the Annual Meeting automatically in the same "mirrored" proportion as the aggregate votes cast "for" and "against" the proposal by the holders of our common stock who vote on such proposal (excluding abstentions, broker non-votes and shares of common stock that are not voted "for" or "against" such proposal). The voting power attributable to the Series X Preferred Stock will be disregarded for purposes of determining whether a quorum is present at the Annual Meeting.

An amendment to the Lightbridge Corporation 2020 Omnibus Incentive Plan

On February 26, 2025, the Company's Board of Directors approved an amendment to the Lightbridge Corporation 2020 Omnibus Incentive Plan to increase the number of shares of common stock available for issuance thereunder from 2,500,000 shares to 5,000,000 shares. This change will take effect upon receiving shareholder approval at the Company's 2025 shareholder annual meeting.

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 3, 2025

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

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 Chairman (Principal Executive Officer)	March 3, 2025
/s/ Larry Goldman Larry Goldman	Chief Financial Officer, and Treasurer (Principal Financial and Accounting Officer)	March 3, 2025
/s/ Sweta Chakraborty Sweta Chakraborty	Director	March 3, 2025
/s/ Jesse Funches Jesse Funches	Director	March 3, 2025
/s/ Sherri Goodman Sherri Goodman	Director	March 3, 2025
/s/ Daniel Magraw Daniel B. Magraw	Director	March 3, 2025
/s/ Mark Tobin Mark Tobin	Director	March 3, 2025

Lightbridge

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