

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

FORM 8-K

CURRENT REPORT

Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): **September 23, 2024**

**ASP Isotopes Inc.**

(Exact name of registrant as specified in its charter)

**Delaware**

(State or other jurisdiction of  
incorporation)

**001-41555**

(Commission  
File Number)

**87-2618235**

(IRS Employer  
Identification No.)

**601 Pennsylvania Avenue NW,  
South Building, Suite 900  
Washington, DC**

(Address of principal executive offices)

**20004**

(Zip Code)

Registrant's telephone number, including area code: **(202) 756-2245**

**Not Applicable**

(Former name or former address, if changed since last report.)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

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

Title of each class

**Common Stock, par value \$0.01**

Ticker symbol(s)

**ASPI**

Name of each exchange on which registered

**The Nasdaq Stock Market LLC**

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

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

**Item 5.02. Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain officers.**

*Amendment to Quantum Leap Energy LLC 2024 Equity Incentive Plan*

On September 23, 2024, the board of managers of Quantum Leap Energy LLC (“QLE”), a wholly owned subsidiary of ASP Isotopes Inc. (the “Company”), adopted an amendment to the Quantum Leap Energy LLC 2024 Equity Incentive Plan (the “QLE 2024 EIP”), which provides for the issuance of awards of QLE common equity to employees, officers, directors/managers and consultants of QLE (who may also be employees, officers, directors and consultants of the Company or a subsidiary of QLE). The amendment to the QLE 2024 EIP reduced the maximum aggregate number of shares or units of QLE’s common equity that may be issued under the QLE Plan from thirty percent (30%), to fifteen percent (15%), of the common equity deemed outstanding as of the effective date of the amendment to the QLE Plan (treating as outstanding the Company’s membership interest and the shares or units of common equity issuable upon conversion of the series of convertible notes issued as of such effective date).

The foregoing description of the amendment to the QLE 2024 EIP does not purport to be complete and is qualified in its entirety by reference to the copy of the First Amendment to the Quantum Leap Energy LLC 2024 Equity Incentive Plan, which is incorporated herein by reference and is filed as Exhibit 10.1 to this Current Report on Form 8-K.

**Item 7.01. Regulation FD Disclosure.**

On September 26, 2024, the Company released its current investor presentation, which is attached hereto as Exhibit 99.1 and is incorporated by reference herein. All of the information in the attached presentation is presented as of September 2024, and the Company does not assume any obligation to update such information in the future.

The information in this Item 7.01 and in the Company presentation furnished as Exhibit 99.1 to this Current Report on Form 8-K shall not be deemed to be “filed” for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liabilities of that section or Sections 11 and 12(a)(2) of the Securities Act of 1933, as amended, and shall not be incorporated by reference into any filing with the U.S. Securities and Exchange Commission made by the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

The Company’s Company presentation furnished as Exhibit 99.1 to this Current Report on Form 8-K includes “safe harbor” language pursuant to the Private Securities Litigation Reform Act of 1995, as amended, indicating that certain statements contained therein are “forward-looking” rather than historical.

**Item 9.01. Financial Statements and Exhibits.**

<b>Exhibit No.</b>	<b>Description</b>
<a href="#">10.1</a>	<a href="#">First Amendment to Quantum Leap Energy LLC 2024 Equity Incentive Plan.</a>
<a href="#">99.1</a>	<a href="#">ASP Isotopes Inc. Corporate Overview dated as of September 2024.</a>
104	Cover Page Interactive Date File (embedded within the Inline XBRL document)

**SIGNATURES**

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

**ASP ISOTOPES INC.**

Date: September 26, 2024

By: /s/ Paul Mann  
Name: Paul Mann  
Title: Chief Executive Officer

**First Amendment  
To  
Quantum Leap Energy LLC  
2024 Equity Incentive Plan**

**Background**

A. Quantum Leap Energy LLC (the “*Company*”), maintains the Quantum Leap Energy LLC 2024 Equity Incentive Plan (the “*Plan*”). Capitalized terms used herein without definition shall have the meanings assigned to them in the Plan.

B. The Plan was originally effective as of March 7, 2024, the date of the first closing with respect to the Company’s offering of convertible promissory notes with a stated interest rate of 6.0% for the first year and 8.0% thereafter.

C. The Plan currently authorizes the issuance of up to thirty percent (30%) of the Common Equity Deemed Outstanding as of the Effective Date, and the Company’s board of managers has determined that it is in the best interest of the Company and its sole member to amend the Plan to reduce the maximum aggregate number of shares or units of Common Equity that may be issued under the Plan to fifteen percent (15%) of the Common Equity Deemed Outstanding as of the date hereof.

**Amendment**

1. Section 4.1 of the Plan shall be deleted in its entirety and replaced with the following:

“**4.1 Maximum Number of Shares Issuable.** Subject to adjustment as provided in Sections 4.2 and 4.3, the maximum aggregate number of shares or units of Common Equity that may be issued under the Plan shall be fifteen percent (15%) of the Common Equity Deemed Outstanding as of the effective date of the First Amendment to the Plan.”

2. Except as set forth in this amendment, the Plan shall be unaffected hereby and shall remain in full force and effect.

The undersigned hereby certifies that the foregoing amendment to the Plan was duly approved and adopted and has executed this First Amendment to the Plan as of September , 2024.

**Quantum Leap Energy LLC**

By \_\_\_\_\_  
Name:  
Title:



# Corporate Overview

September 2024

## Forward Looking Statements

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### Forward Looking Statements

This presentation contains, and our officers and representatives may from time to time make, "forward-looking statements" within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they are based only on our current beliefs, expectations and assumptions regarding the future of our business, future plans and strategies, projections, anticipated events and trends, the economy and other future conditions. Forward-looking statements can be identified by words such as "believes," "anticipates," "expects," "estimates," "projects," "will," "may," "might" and words of a similar nature. Examples of forward-looking statements include, among others but are not limited to, statements we make regarding expected operating results, such as future revenues and prospects from the potential commercialization of isotopes, and our strategies for product development, engaging with potential customers, market position, and financial results. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict, many of which are outside our control. Our actual results, financial condition and events may differ materially from those indicated in the forward-looking statements based upon a number of factors. Forward-looking statements are not a guarantee of future performance or developments. You are strongly cautioned that reliance on any forward-looking statements involves known and unknown risks and uncertainties. Therefore, you should not rely on any of these forward-looking statements. There are many important factors that could cause our actual results and financial condition to differ materially from those indicated in the forward-looking statements, including: our reliance on the efforts of third parties; our ability to complete the construction and commissioning of our proposed enrichment plants or to commercialize the isotopes produced using the ASP technology or the Quantum Enrichment Process; our ability to obtain regulatory approvals for the production and distribution of isotopes; the financial terms of any current and future commercial arrangements; our ability to complete certain transactions and realize anticipated benefits from acquisitions; contracts, dependence on our Intellectual Property (IP) rights, certain IP rights of third parties; and the competitive nature of our industry. Any forward-looking statement made by us in this presentation is based only on information currently available to us and speaks only as of the date on which it is made. We undertake no obligation to publicly update any forward-looking statement, whether as a result of new information, future developments or otherwise.

### Market and Industry Data

This presentation includes market and industry data and forecasts that we obtained from internal research, publicly available information and industry publications and surveys. Industry publications and surveys generally state that the information contained therein has been obtained from sources believed to be reliable. Unless otherwise noted, statements as to our potential market position relative to other companies are approximated and based on third-party data and internal analysis and estimates as of the date of this overview. Although we believe the industry and market data and statements as to potential market position to be reliable as of the date of this presentation, we have not independently verified this information, and it could prove inaccurate. Industry and market data could be wrong because of the method by which sources obtained their data and because information cannot always be verified with certainty due to the limits on the availability and reliability of raw data, the voluntary nature of the data-gathering process and other limitations and uncertainties. In addition, we do not know all of the assumptions regarding general economic conditions or growth that were used in preparing the information and forecasts from sources cited herein. All forward-looking statements herein are qualified by reference to the cautionary statements set forth herein and should not be relied upon.

## ASP Isotopes: At a Glance

ASPI's advanced technology leverages 20 years of R&D history to enrich isotopes in varying levels of atomic mass. Our goal is to use innovative technology to become an indispensable supplier of enriched isotopes to three multi-billion-dollar end markets.



### Medical

Opportunity to be one of the few producers in the undersupplied global medical isotopes market, which is anticipated to grow from \$5.1bn in 2022, to \$11.4bn by 2032, growing at a CAGR of 8.8%<sup>2</sup>. This will be driven by increasing prevalence of cancers, rising demand for personalised medicine, and growing technological advancements in diagnostic imaging modalities.



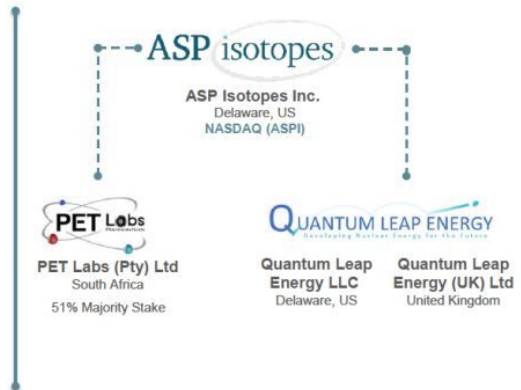
### Semiconductors

The global semiconductor market is on track to surpass \$1tn by 2030. ASPI is partnering with the global semiconductor industry to supply large quantities of Silicon-28 through 2030 and beyond to allow the industry to unlock the significant performance benefits that arise from switching to Silicon-28 Nanowires.



### Nuclear Energy

ASPI's subsidiary, "Quantum Leap Energy" ("QLE"), is looking to address the multi-billion-dollar opportunity in the nuclear sector, by applying its Quantum Enrichment technology to uranium to produce the essential fuels for next-generation nuclear power plants.



## Target Milestones – 2024

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### Market Milestones

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- Secure at least 2 additional supply agreements for isotopes critical for new technologies and healthcare.
- Generate sufficient revenues for the company to have annual positive operating cash flow.
- Enter additional supply contracts for new isotopes in the 2025-2028 timeframe.



### Operational Milestones

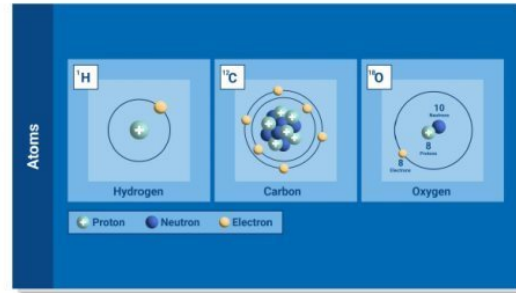
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- Start commercial production of isotopes at our enrichment facilities in South Africa. – 2H24
- Start constructing a first isotope enrichment facility outside South Africa – which will be in a location with 100% renewable electricity supply, advantageous energy costs and reliable supply. – 2H24



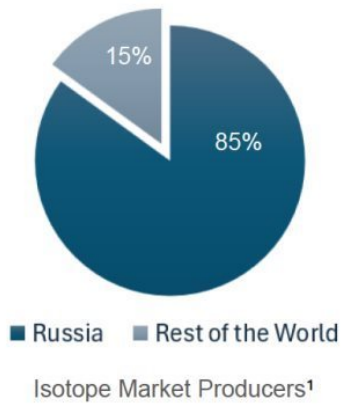
## What is an Isotope?

- **Isotopes are variations of atoms, the smallest units of matter that retain all the chemical properties of an element. Isotopes are forms of a chemical element with specific properties.**
- Atoms with the same number of protons but different numbers of neutrons are known as isotopes. Isotopes exhibit nearly identical chemical properties but differ in mass, leading to variations in their physical properties. There are stable isotopes, which do not emit radiation, and unstable isotopes, which do emit radiation.
- Isotopes can be separated based on weight, and their amounts and proportions can be measured.
- Given their unique properties, isotopes are highly valuable in various fields, including medical treatment and diagnostics. Additionally, they have broad applications in nuclear energy, semiconductors, oil and gas, basic research and national security segments.



## Isotope Supply Chain

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Isotopes have one of the most **severely compromised supply chains of any material in the world** and are critical to many end markets including nuclear medicine, energy, food and water:

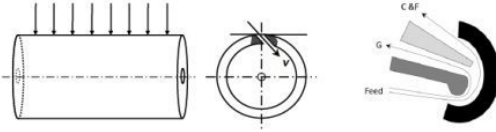
- Global isotope production is **dominated by Russia (85%)** with the remainder produced in the Netherlands (15%) by URENCO.
- The world remains susceptible to global disruption of industrial production, electricity generation, national defense, and the entire economy at large. The existence of many industries and defense capabilities faces existential risk without a secure isotope supply.

# Our Technologies

1

## Aerodynamic Separation Process (ASP)

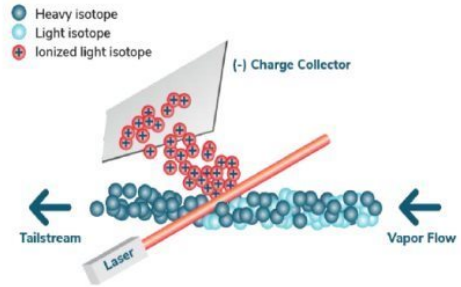
The Aerodynamic Separation Process utilizes gaseous diffusion via a stationary wall centrifuge paired with proprietary flow directors to separate isotopes of varying levels of atomic mass.



2

## Quantum Enrichment (QE)

Quantum enrichment technology employs precisely tuned lasers and quantum mechanical principles to efficiently separate isotopes based on their unique transition energies, achieving high selectivity for most elements.



## ASP Technology: Illustrative Separation Segment and Element Recovery

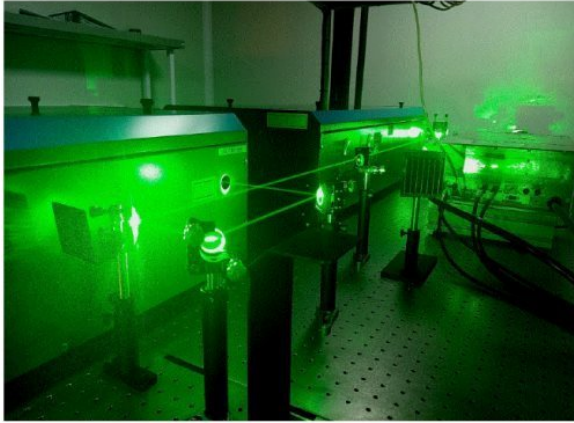


© ASP Isotopes Inc.

ASP isotopes <sup>®</sup>

## QE Technology: Illustrative Laser System

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### **Cost-Effective**

Isotope enrichment facilities using our technology can be constructed at a fraction of capital cost and time vs. traditional isotope separation facilities.



### **Modular, Scalable Design**

The plants can be small in footprint and modular in design, allowing for capacity expansion and growing demand.



### **Environmentally Friendly**

Our enrichment plants are designed to harvest and enrich a natural mix of isotopes, producing zero waste (not radioactive or any other waste in any form).

# The Opportunity in Nuclear Medicine

## The Opportunity in Nuclear Medicine

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- The global medical isotope market generated \$5.1 billion in 2022 and is anticipated to generate \$11.4 billion by 2032.<sup>2</sup>



- Benefitting from increased regulatory approvals and R&D spend in the radiopharmaceuticals sector.

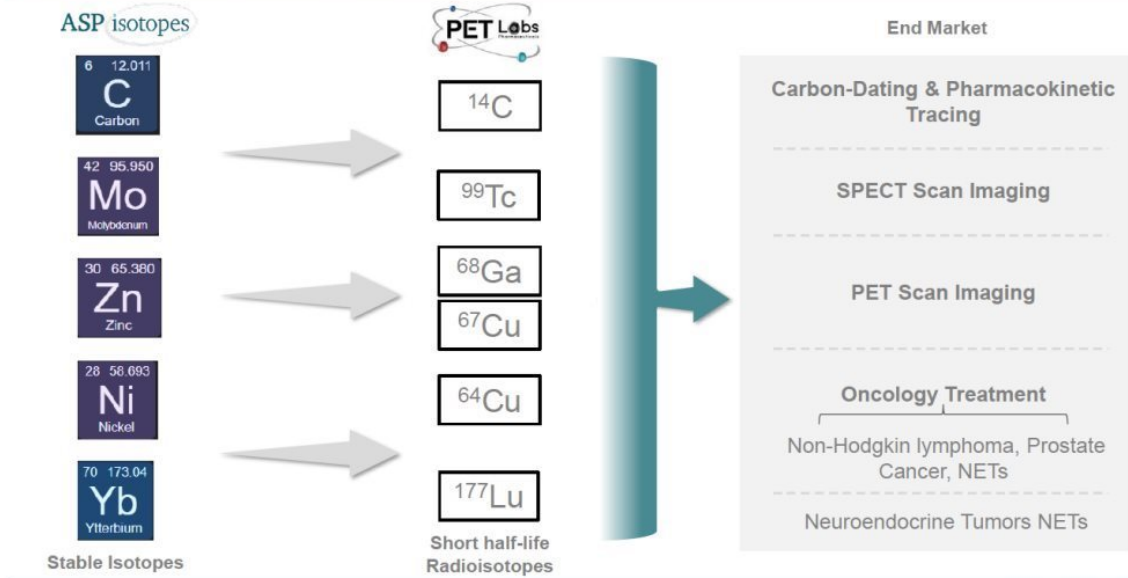


- Pipeline advancements have created multi-billion-dollar opportunities.

- Currently, there are **severe shortages of all medical isotopes**.



# Nuclear Medicine: Isotopes of Interest



# Isotope End Markets: Molybdenum-100 (<sup>100</sup>Mo)

Single-photon emission  
computed tomography (SPECT)

Global Market Size<sup>3</sup>

**\$4.61B**

**<sup>99</sup>Tc**  
Technetium-99

<sup>99</sup>Tc Global Market Size<sup>3</sup>

**\$4.17B**

## Current Isotope Conversion Process

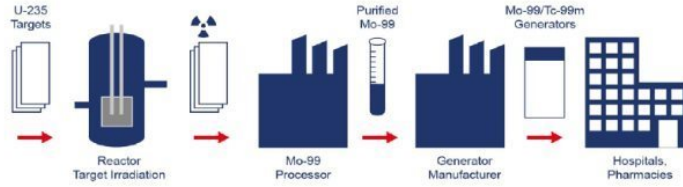


## ASP Isotope Conversion Process



- SPECT scans are used to examine the function of internal organs.
- This imaging technique helps detect certain types of cancer. It creates a 3-dimensional image that can provide information about blood flow and chemical reactions.
- <sup>100</sup>Mo would result in a more convenient supply chain with lower shipping costs. Market entry date: H2 2024

## Current <sup>99</sup>Mo Supply Chain



# Isotope End Markets: Ytterbium-176 (<sup>176</sup>Yb)

## Radiopharmaceutical Theranostics

Global Market Size

**\$1.8bn**

The radiopharmaceutical theranostics market is expected to be worth \$3.43bn by 2028, growing at a CAGR of 11.3%, with the <sup>177</sup>Lutetium segment expecting to remain the dominant product.

Our <sup>176</sup>Yb facility is expected to complete construction and commissioning in 4Q 2024 with first commercial production also in 4Q 2024. This is the Company's first Quantum Enrichment Facility.

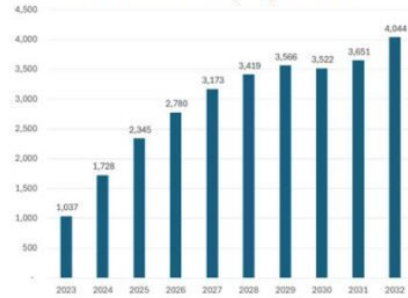
**<sup>176</sup>Yb**

Ytterbium-176

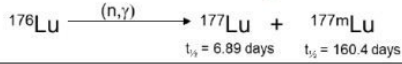
<sup>176</sup>Yb Global Market Size

**\$100m**

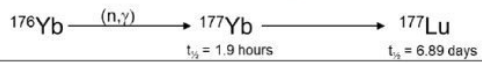
Consensus Forecasts (US\$) for Pluvicto



### Traditional route starting with <sup>177</sup>Lu



### Carrier-free route starting with <sup>176</sup>Yb



### The <sup>177</sup>Lu supply chain is fragile and experiencing bottlenecks:

- <sup>176</sup>Yb provides a superior route to obtaining <sup>177</sup>Lu. The traditional route, beginning with <sup>176</sup>Lu requires separating its products, <sup>177</sup>Lu and <sup>177m</sup>Lu, which is both difficult and carries a long half-life.
- Russia has historically been the world's primary producer of <sup>176</sup>Yb .
- Supply disruptions for the critical isotope provide an opportunity for ASPi to meet demand requirements and capture significant market share.

## Isotope End Markets: Zinc-68 (<sup>68</sup>Zn)



### <sup>68</sup>Ga is the Key Diagnostic for Most Lutetium and Actinium Based Drugs in Development

<p>~15x Increase in Demand</p>	<ul style="list-style-type: none"> <li>• There are currently two FDA approved <sup>68</sup>Ga labelled drug products.</li> <li>• Additional near-term approvals and increase in use cases upon approval of PSMA therapeutic Radiopharmaceuticals likely drives a 15x increase in demand.</li> </ul>
<p><sup>68</sup>Ga Generators Cannot Address Market Needs</p>	<ul style="list-style-type: none"> <li>• The primary commercial source for Gallium is <sup>68</sup>Ga generators, which are unlikely to produce sufficient isotopes to meet anticipated demand.</li> <li>• <sup>68</sup>Ga production using liquid targets are highly inefficient.</li> </ul>
<p><sup>68</sup>Ga Generator Install-Base Expansion is Cost Prohibitive</p>	<ul style="list-style-type: none"> <li>• Assuming enough generators can be made to meet projected <sup>68</sup>Ga demand; the cost to secure those generators will likely be prohibitive.</li> </ul>

## Isotope End Markets: Carbon-14 ( $^{14}\text{C}$ )

### Medical tracing

Global Market Size **\$10m p/a**

- Medical tracing is a scientific technique used to track the passage of a molecule. The technique incorporates a radioisotope through a reaction, cell, organism, biological system, or metabolic pathway.
- $^{14}\text{C}$  is used as a radiolabeling compound due to its relatively harmless emission of alpha particles, and long-lasting half-life, which allows researchers to track drug molecules throughout the body.



ASP's Carbon-14 enrichment facility



Historically, Russia has been the sole supplier of Carbon-14. Availability of the isotope since the start of 2022 has been intermittent and unreliable. Now customers are seeking alternative suppliers to meet their demand.



We have the capacity to meet total global demand.

ASPI has entered into multi-year supply agreement with minimum annual revenues of \$2.5M per year.

ASPI expects to start commercial supply of Carbon-14 during 2H 2024.

## Medical Isotopes – Timelines

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Isotopes	End-Market	R&D Stage	R&D Evaluation	Under Construction	Anticipated Market Entry	Technology
Carbon-14	Pharma & Agrochem	✓	✓	✓	2024	ASP
Molybdenum-100	Nuclear Medicine	✓	✓	✓	2024	ASP
Molybdenum-98		✓	✓	✓	2024	ASP
Ytterbium-176		✓	✓	✓	2025	QE
Zinc-67/68		✓	--	--	2025	ASP
Nickel-64		✓	--	--	TBD	QE
Xenon-129/136		✓	--	--	TBD	ASP

# The Opportunity in Semiconductors

## The Opportunity in Semiconductors: Materials

ASPI can establish itself as an indispensable part of the semiconductor supply chain.

- Using our proprietary technology and increasing capacity our goal is to become the world's leading supplier of enriched Silicon-28.
- We aim to enrich Silicon-28 content from 92.2% to the required >99.995% purity product, removing Silicon-29 and 30 isotopes.
- Preliminary research suggests that enriched Silicon-28 can deliver superior conductivity and transformational performance - unlocking greater computing potential.

Demand for semiconductors and their materials is growing, with the market on track to surpass **US\$1tn by 2030**.<sup>6</sup>

Data Centres

AI

Consumer Electronics

EVs

Quantum Computing

Our Silicon-28 enrichment plant in South Africa



*ASPI is the world's only commercial supplier of Silicon-28 and is partnering with the global semiconductor industry to supply large quantities of Silicon-28 through 2030 and beyond to allow the industry to unlock the significant performance gains that arise from switching to Silicon-28 Nanowires.*



## Silicon-28: Technological Breakthrough

- Electronics are relatively affordable because Silicon is cheap and abundant. But, although naturally occurring Silicon is a good conductor of electricity, it is not a good conductor of heat when it is reduced to very small sizes – and when it comes to fast computing, that presents a big problem.
- Silicon-28, an isotopically pure form of silicon, presents a solution. Its thermal conductivity is about 60% higher.
- Our technology has demonstrated the potential to produce enriched Silicon-28 at a commercial scale. We expect to supply semiconductor companies with highly enriched Silicon-28 from 2024.

*For many decades, researchers theorized that chips made of pure Silicon-28 would overcome Silicon's thermal conductivity limit, and therefore improve the processing speeds of smaller, denser microelectronics. But purifying silicon down to a single isotope requires intense levels of energy which few facilities can supply – and even fewer specialize in manufacturing market-ready isotopes.*

*- Lawrence Berkeley National Laboratory<sup>7</sup>*

Isotopes	End-Market	R&D Stage	R&D Evaluation	Under Construction	Anticipated Market Entry	Technology
Silicon-28	Semiconductors	✓	✓	✓	2024	ASP
Germanium-70/72/74		✓	✓	✓	2025	ASP

## Plan for Growth: Scaling into New Isotopes

Iceland is a desirable location for ASP's expansion for several reasons. Here we expect to produce multiple enriched Isotopes supported by long-term contracts with significant partners. Planned isotopes include Silicon-28, Germanium-72 & 74, Xenon-129, Deuterium, Zinc-68, Molybdenum-100 & 98 and Chlorine-37.

We expect customers to contribute considerable amounts of capital to the construction of additional manufacturing capacity for new isotopes. Benefits include...

### Cost of Energy

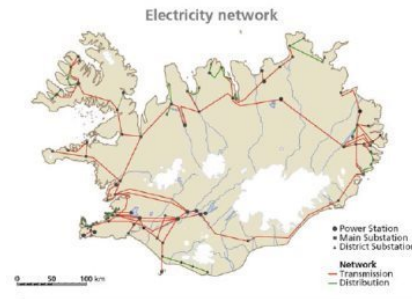
- A local green energy provider has provided a quote for 10+ year energy supply at <math><5\text{¢}/\text{Kw/h}</math> – approximately one fifth of the cost in mainland Europe, a third of the cost in the US, and only 3% of current energy costs in South Africa.

### Regulation

- Policy in Iceland aims to benefit the high-tech green industry, supporting the country's long-held ESG-based ethos. Regulatory applications are in progress and ASP is well placed to receive support from relevant government ministries and non-proliferation regulators.

### Location

- Plant location will be conveniently located near an international airport and shipping port. It is also a source of highly skilled workforce.



# The Opportunity in Nuclear Energy



## The Problem is Well-Known...Solving it is not as Straightforward

Global electricity production needs to double by 2050 and Net Zero targets have been set across the world.

- During COP28, 24 countries backed a Ministerial Declaration calling for the tripling of global nuclear energy capacity by 2050.
- UK aims to have up to 24 GW of nuclear capacity by mid-century, up from 6 GW today, which could meet around a quarter of the country's forecast electricity demand.
- China plans to build more reactors in the next 15 years than have been built globally in the last 35. It has 38 operable reactors; 19 are under construction, and the country plans to produce 70 GW of power by 2025.<sup>8</sup>
- India plans to build 10 new large reactors and Japan is targeting 20-22% of electricity generation from nuclear by 2030.<sup>9</sup>

**Yes, nuclear can help answer the climate and energy security challenge**

**Nuclear power absolutely needed to reach climate goals, IEA's Birol says**

**Are small modular reactors the solution to decarbonising the industry sector?**

**Nuclear power generation to reach record high next year, IEA forecasts**

**'Nuclear renaissance' promised as Government banks on small reactors plan**

To reach Net Zero emissions by 2050, the world must increase global electricity generation by 250% and double Nuclear energy output.<sup>10</sup>

## SMR (Small Modular Reactors): Next Wave in Nuclear Energy

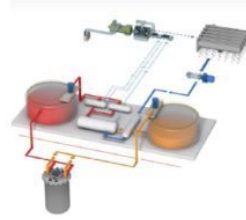
### The world is moving to a new type of nuclear reactor: SMR

The US DOE has already committed billions of dollars to Advanced Reactor Design Program (ARDP) to facilitate and accelerate development of advanced reactors.

- Modular, smaller size (50 MWe to 300 MWe) reactors allowing greater flexibility in deployment.
- Designed for production-line manufacturing rather than conventional custom-built capital projects.
- Limited on-site preparation to substantially reduce lengthy construction times.
- Simplicity of design, enhanced safety features, economics and quality afforded by factory production, and more flexibility (financing, siting, sizing, and end-use applications).
- Can provide power for applications where large plants are not needed or sites lack infrastructure to support a large unit (e.g. smaller electrical markets, isolated areas, smaller grids, sites with limited water and acreage, or unique industrial applications).



TerraPower's Natrium



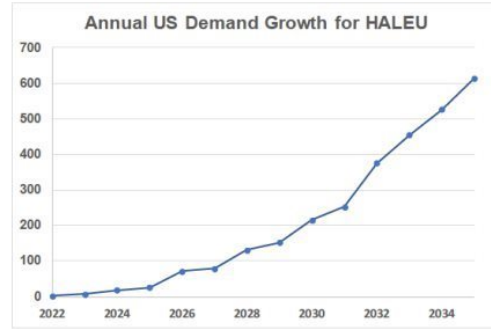
X-Energy's Xe-100



Rolls-Royce's SMR

## HALEU Supply: A Growing Concern for SMRs

- Current commercial light water reactors use low-enriched uranium (LEU) fuel which has less than 5%  $^{235}\text{U}$  content.
- Many SMRs and advanced reactors will require **High Assay Low Enriched Uranium (HALEU)** with  $^{235}\text{U}$  enrichment up to 19.75%.
- Currently, there is no commercial supplier of HALEU in the Western World. Without fuel these SMR's are unlikely to become a reality.
- Recently TerraPower delayed the start-up of its SMR from 2028 by at least 2 years due to the lack of availability of HALEU.
- The U.S. government has made a multi-billion-dollar commitment to help commercialize HALEU-fuelled advanced reactors.
- Many European and Asian countries are also in need of HALEU for SMRs.



The NEI estimates (above) that by 2035 US domestic demand for HALEU could reach >600 Metric Tons per annum.



We believe that our proprietary Single Stage Quantum Enrichment Technology provides an ideal solution...

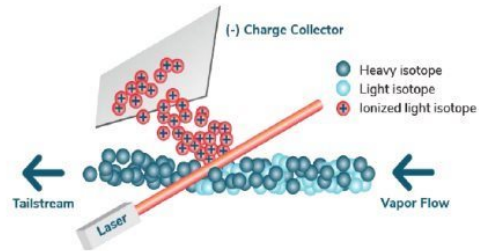
## Our Technology: What is Quantum Enrichment (QE)?

- Isotopes of every element have unique spectroscopic "signatures" defined by the electromagnetic radiation or "light" absorbed by their atoms from electron transitions.
- QE separates two isotopes by taking advantage of the slight differences in the transition energy between two isotopes. This method is described as a "quantum mechanics" method.

**In principle, Quantum Enrichment can separate isotopes of most elements, achieving desired enrichment in a single step.**

A laser is a device that can produce large numbers of photons, all having almost precisely the same frequency or energy.

By precisely tuning lasers to a specific isotope's spectrum (color) signature, those atoms can be selectively photoionized and then electrically separated based on their electric charge.



## Comparing and Contrasting Enrichment Methods

	Gaseous Diffusion	Centrifugation	Atomic Vapor Laser Isotope Separation (AVLIS)	Separation of Isotopes by Laser Excitation	Quantum Leap Energy
Cost	High Capital Cost	Capital 1/10 of Diffusion	Low Capital, Small Size	Low Capital, Small Size	Low Capital, Small Size
Speed	High Pressure	High Speed	U Metal 3000K	Adiabatic expansion nozzles (10-20K)	U Metal 3000K
Technology Notes	High Technology	Rotor Design & Material	Selective Photoionization	Laser Excitation Transmission by Skimmer	Enhanced Resonant Multiphoton Ionization
Selectivity	Selectivity $\alpha \geq 1.003$	Selectivity $\alpha \geq 1.15$	Selectivity $\alpha \geq 10-50$	Selectivity $\alpha \geq 2-20$	Selectivity $\alpha \geq 50$
SWU	2500 kWh/SWU	50 kWh/SWU	40 kWh/SWU	Estimate < 50 kWh/SWU	40 kWh/SWU
Stages Required	500 Stages to reactor grade	50 Stages	1-2 Stages	1-2 Stages	Single Stage



# Quantum Enrichment: Real World Experience

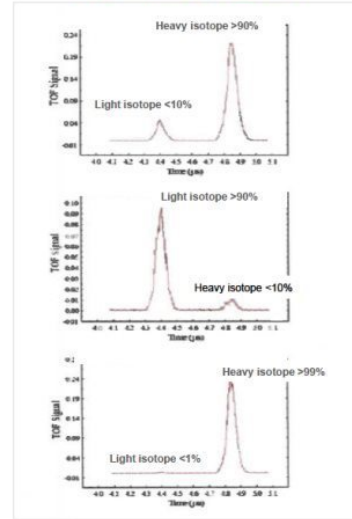
Our team have used lasers to enrich many different metals

- Uranium
- Lithium (the only isotopes where results have been published)
- Zirconium
- Zinc

The separation process shown on the right is for Lithium 6 and 7

- A metal with an atomic mass <100
- Mix of isotopes: ~5% is the light isotope (Lithium 6) and ~95% is the heavy isotope (Lithium 7)
- After a single enrichment stage –
  - In the product stream the light isotope (lithium 6) is >90% and the heavy isotope (lithium 7) is <10%
  - **Light side enrichment factor (b) of 112**

Laser Enrichment of Lithium 6



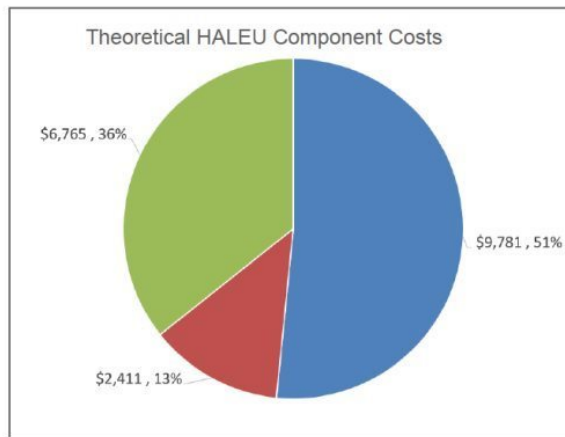
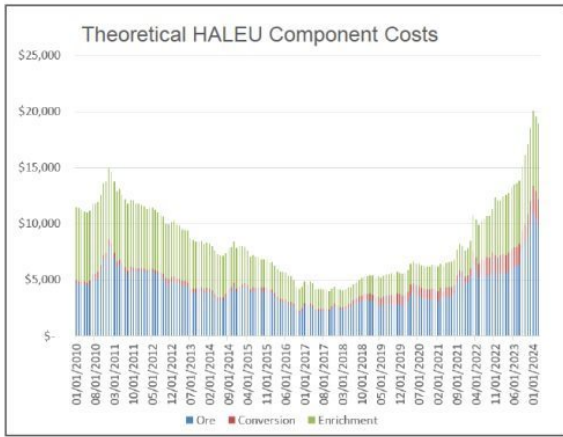
# Nuclear Fuel: Supply Chain and Prices

- Uranium supply has been in a state of sustained deficit since 2018, which is widening due to years of underinvestment in uranium assets, resulting in production issues from the world's largest suppliers.
- Meanwhile, demand for front-end nuclear fuel ( $U_3O_8$ ,  $UF_6$ , EUP) continues to grow given ambitious global nuclear roll out strategies.
- Global geopolitics is adding pressure to an already bifurcated market, particularly in conversion and enrichment where Russia is the dominant player.
- China is the demand outlier and could procure over 7x global annual supply for themselves, and their domestic conversion and enrichment production will be used solely for their own reactor fleet.
- It takes several years, often over 12 years, for new permitted uranium supply to come on stream.



## Implications for HALEU

- If available (currently there is no Western Supplier of HALEU), HALEU would likely cost >\$18,000 per Kg.
- Many SMR companies based their business plans assuming HALEU <\$10,000 per Kg. We believe Quantum Enrichment may allow for HALEU production at significantly lower prices versus current indicative prices.



## Potential to Close the Loop on Nuclear Waste



Depleted tails from other uranium enrichers produce nuclear waste. The management of this waste is becoming a problem.



We believe that our technology can process this waste into HALEU - Potentially providing a solution to this growing environmental problem.



If we can secure access to this nuclear waste at an attractive cost, we should be able to produce HALEU at highly competitive prices.



Depleted UF6 Tails stored in Ohio, USA

Isotopes	End-Market	R&D Stage	R&D Evaluation	Under Construction	Anticipated Market Entry	Technology
Chlorine-37	Nuclear Energy	✓	--	--	TBD	ASP
Lithium-6		✓	--	--	TBD	QE
Uranium-235		✓	--	--	TBD	QE and ASP

## Investment Overview

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### Leverage the following...

#### Proven Proprietary Technology

ASPI's advanced technologies leverage 20 years of R&D history to enrich isotopes in varying levels of atomic mass, allowing it to meet the growing demand in the Nuclear Medicine, Semiconductors, and Nuclear Energy industries.

#### Multiple Secular & Geopolitical Tailwinds

Favorable long-term market trends are expected to drive long-term secular industry growth. Recent geopolitical events have created high urgency for companies and countries to search for reliable sources of isotopes.

#### Consistent Operational Performance

Since incorporation, we have completed the construction of our first manufacturing facility, and we continue to expand our operating footprint in South Africa. Our South African facilities are expected to enter commercial production during 2024 and should drive free cash flow.

To capitalize on three multi-billion-dollar opportunities...

#### Nuclear Medicine



#### Semiconductors



#### Nuclear Energy

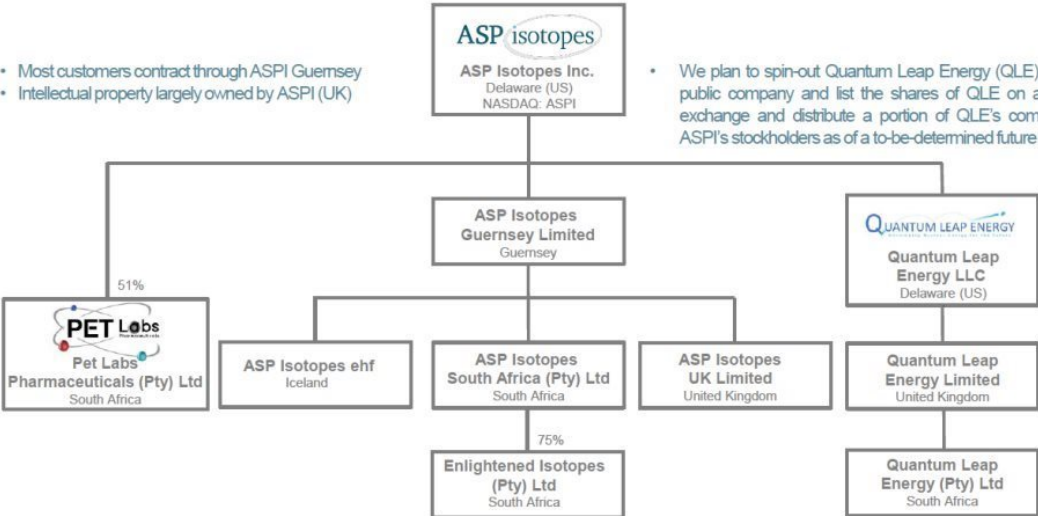


# Appendix

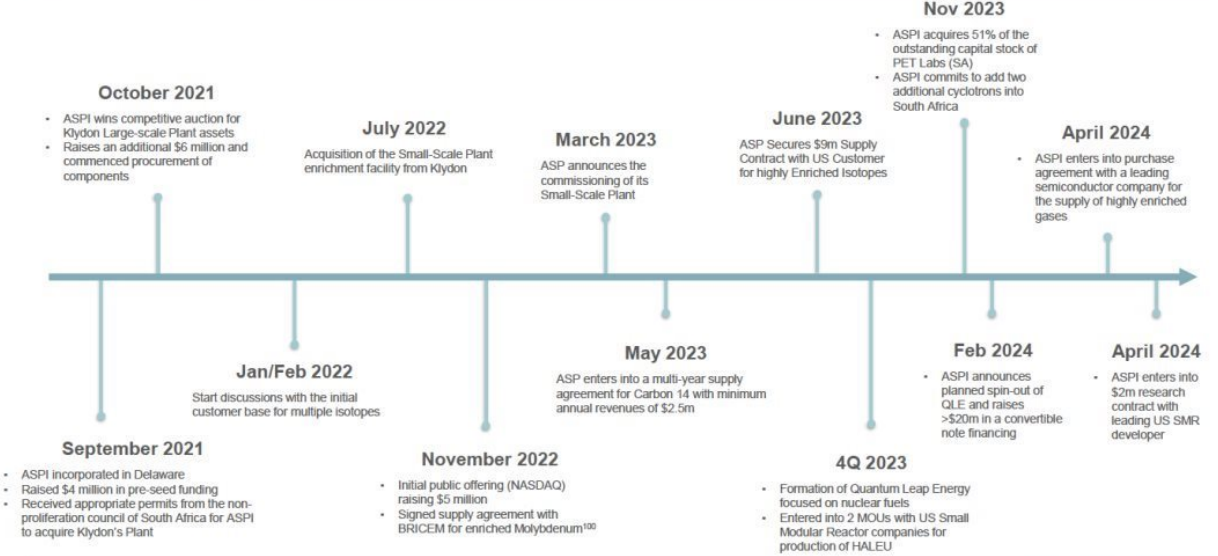
# Current Group Structure

- Most customers contract through ASPI Guernsey
- Intellectual property largely owned by ASPI (UK)

- We plan to spin-out Quantum Leap Energy (QLE) as a separate public company and list the shares of QLE on a U.S. national exchange and distribute a portion of QLE's common equity to ASPI's stockholders as of a to-be-determined future record date.



# Company History





# One of the Most Experienced Laser Groups in the World

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Our team has designed and constructed lasers for the following customers...

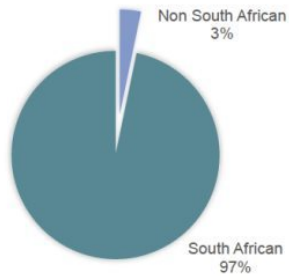


## ASPI: Employees Demographics

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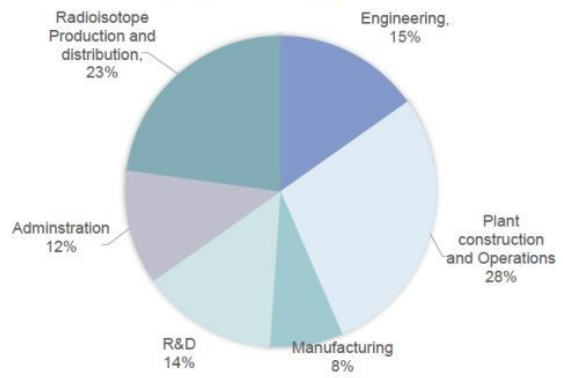
We now have over 70 employees...

### Employees By Nationality



19% of employees have PhDs  
41% of employees have advanced degrees or higher

### Employees By Role



## ASP Isotopes: Leadership Team

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### **PAUL MANN**

*Chairman, and CEO*



- Co-founded ASP Isotopes in September 2021
- 20+ years of experience on Wall Street investing in healthcare and chemicals companies at Soros Fund Management, Highbridge Capital and Morgan Stanley.
- MA and MEng (Chemical Engineering) from Cambridge University, Research Scientist at Procter and Gamble. CFA charter holder.

### **HENDRIK STRYDOM, PhD**

*Director, Chief Technology Officer*



- Co-developer of "Aerodynamic Separation Process" (ASP) and CEO of Klydon, the predecessor company since 1993.
- Extensive research on the laser separation of heavy isotopes (AVLIS, MLIS, SILEX).
- Dr. Strydom has PhD (Physics) (2000) from the University of Natal (Durban).

### **GERDUS KEMP, MD, PhD**

*Medical Director, CEO PET Labs*



- CEO Pet-Labs, a South African radiopharmaceutical operations company dedicated to nuclear medicine and the science of radiopharmaceutical production
- Medical Director Klydon, Medical Director Molybdos
- Ph.D. (Inorganic Chemistry) from the University of Johannesburg. Current Lecturer in Radiography, University of Pretoria

## ASP Isotopes: Senior Management

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**Xandra Van Heerden, PhD**   
*Head of R&D*

- Head of Research & Development at ASP. Previously R&D Manager at a large biomedical engineering company
- Senior lecturer at the University of Pretoria for five years, with a focus on chemical mass transfer processes and separation technologies (Distillation)
- PhD (Chemical Engineering) from the University of Pretoria

**Heino Van Wyk**   
*Head of Engineering*

- Process engineer with design experience in Petrochemical, Chemical, Water and Isotope Separation Plants
- Process Engineer and Engineering Manager at Klydon. Headed up design process on a MoF6 & Carbon-14 enrichment plant
- BEng (Chemical Engineering) from the University of Pretoria

**Heather Kiessling**   
*Chief Financial Officer*

- 30+ years experience with life science and high-tech companies
- Managing Director at Danforth Advisors LLC, a life science consulting firm
- Held finance leadership roles at Cytonome/ST, LLC and AutoImmune Inc.
- CPA and holds a BA from University of California, San Diego, and an MBA from University of Michigan Graduate School of Business.

**Robert Ainscow**   
*Chief Operating Officer*

- Co-Founder, ASP Isotopes
- 20+ years experience on Wall Street in Capital Markets, Asset-Backed Finance, and Control at Investec Bank, Bear Sterns, and Morgan Stanley
- B.A. (Joint Hons) in Law and Modern Languages from Bristol University

## ASP Isotopes: Scientific Advisors

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**PROF EINAR RONANDER, PhD** 

*Chief Scientific Advisor*

- Globally recognized as a leading scientist in the field of isotope separation for medical and industrial applications
- Pioneered the Molecular Laser Isotope Separation (MLIS) and the Atomic Vapour Laser Isotope Separation (AVLIS) for heavy volatile isotopes
- Has extensive knowledge base and experience in gas centrifuge separation, distillation separation, electromagnetic separation, infra-red lasers for MLIS, and visible lasers for AVLIS. Einar obtained a PhD (Physics) at the University of Stellenbosch, a PhD (Chemistry) at the University of Pretoria, he serves on the Advisory Board for Science (Univ. Stellenbosch), and the Steering Committee of the Laser Institute at University of Stellenbosch.
- Einar serves as reviewer of global scientific papers for leading journals and his own published papers rate in the top 10% globally by citations standards, and he performs as invited speaker at global conferences and is an Extra Ordinary Prof (Physics).

**SERGEY VASNETSOV** 

*Consultant and Chemical Engineer*

- Founder and Managing Director of ChemBridges, strategy consulting firm, since 2016.
- SVP of Strategy and M&A at LyondellBasell (NYSE: LYB) (2010-2016).
- Managing Director, Equity Research at Barclays Capital and Lehman Brothers (1996-2010).

## ASP Isotopes: Non-Executive Directors

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### PROF MIKE GORLEY, PhD

Director 

- Director of Fusion Technology at the U.K. Atomic Energy Authority, and a visiting Professor at the University of Bristol, U.K. Mike is a well-known expert in fusion technology and fusion materials.
- Previously served as a Chief Technologist and Strategic leader and program area manager for fusion technology at the UK Atomic Energy Authority.
- Ph.D. (DPhil) in Materials Science from Oxford University, U.K.

### TODD WIDER, MD

Director 

- Executive Chairman and Chief Medical Officer, Emendo Biotherapeutics
- Active Staff (~20 Years) in reconstructive surgery at Mount Sinai Hospital in New York
- MD Columbia College, Residency in General Surgery and Plastic and Recon at Columbia Presbyterian, Postdoctoral fellowships at Memorial Sloan Kettering as Chief Microsurgery Fellow

### DUNCAN MOORE, PhD

Director 

- Partner at East West Capital Partners, specializing in investment opportunities within the Healthcare Industry across the APAC region.
- Global Head of Healthcare Equity Research at Morgan Stanley from 1991 to 2008,
- M.Phil & PhD in Biochemistry from Cambridge University

### ROB RYAN

Director 

- 30+ years private investor with experience in investment banking, private equity and international financial law.
- Was a partner and MD of Balbec Capital LP.
- Worked at international investment banks after starting his career as a solicitor at a leading U.K. multinational law firm.
- LL.B. degree from the University of Leicester.

## Data Sources

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