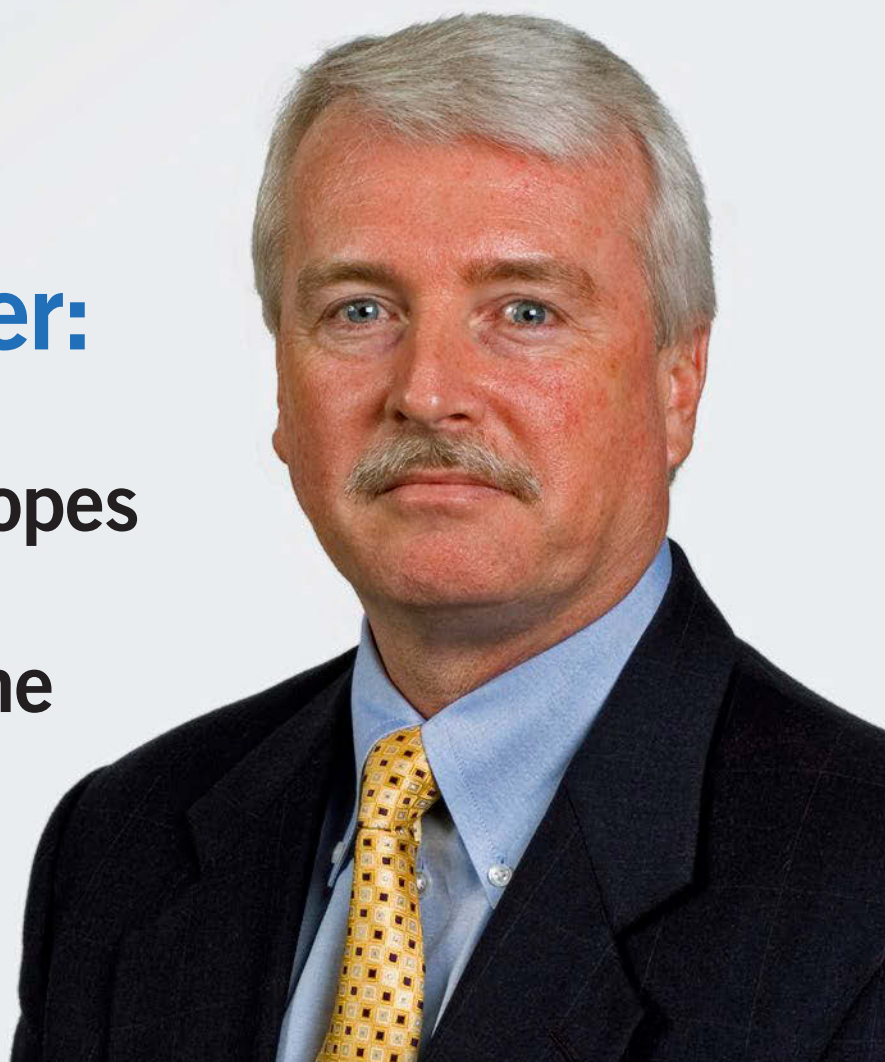


Chris Wagner:

The role of Eden Radioisotopes in the future of nuclear medicine



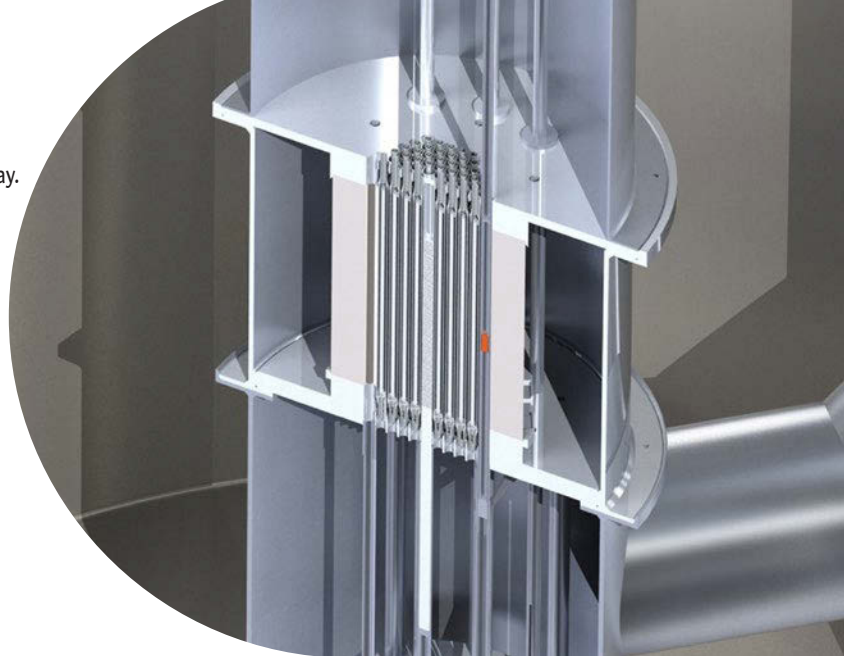
Chris Wagner, chief
executive officer.

Inset: Fission Mo-99 process.
(Images: Eden)

Chris Wagner has more than 40 years of experience in nuclear medicine, beginning as a clinical practitioner before moving into leadership roles at companies like Mallinckrodt (now Curium) and Nordion. His knowledge of both the clinical and the manufacturing sides of nuclear medicine laid the groundwork for helping to found Eden Radioisotopes, a start-up venture that intends to make diagnostic and therapeutic raw material medical isotopes like molybdenum-99 and lutetium-177.

Eden plans to build a dedicated nuclear fission reactor and co-located hot cell processing facility to serve the global medical radioisotope market. The facility will address the expected future shortfalls and supply constraints for several of these key radioisotopes. Eden's reactor is designed to produce Mo-99, Lu-177, and other activation isotopes simultaneously.

Reactor core cutaway.
(Image: Eden)



Wagner, Eden's CEO, talked with *Nuclear News* editor-in-chief Rick Michal about the company's plans to enter the fast-growing nuclear medicine industry, where radioactive substances are used in both diagnostic (molecular imaging) and radiotherapeutic (targeted tumor cell treatment) applications.

What led to the founding of Eden Radioisotopes?

Eden was founded in May 2019 by five individuals, four of whom came from Sandia National Laboratories. In the late 1990s, the U.S. government recognized an impending shortage of medical isotopes, particularly Mo-99, and invested in the development of production technology at Sandia and Los Alamos National Laboratories. Although this work was later paused due to noncompetitive policies once a Canadian company promised to meet global demand, that plan fell through. When the Canadian National Research Universal reactor at Chalk River was shut down and no replacement came on line, the original fears became reality. Eden was formed to revive and commercialize the technology with the aim of providing a stable domestic supply of critical medical isotopes.

Why is Mo-99 so important in health care?

Mo-99 decays into technetium-99m (Tc-99m), which is used in approximately 80 percent of the world's 40 million nuclear medicine procedures annually. Tc-99m is essential for diagnostic imaging of conditions like cancer, heart disease, and neurological disorders. The isotope's short half-life means it must be delivered quickly after production, making proximity to production facilities crucial for health care systems. What makes nuclear medicine imaging unique and

critical, versus other imaging modalities, is that it provides functional information, showing how organs and tissues are working, like metabolism, blood flow, and receptor binding. MRI, CT, and ultrasound primarily show high-resolution images of anatomical details but limited functional information.

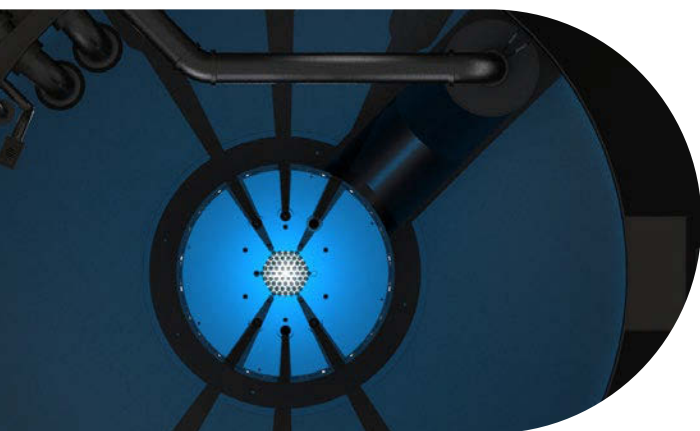
What caused the global shortage of isotope production capacity?

Two of the six primary medical isotope-producing reactors were shut down over the past decade, and no new facilities have come on line in the Western Hemisphere. The aging infrastructure and limited geographic distribution of reactors—mostly in Europe, South Africa, and Australia—contribute to supply vulnerabilities. Even brief unplanned outages may result in market shortages within days.

How does Eden plan to address these capacity challenges?

Eden plans to build a dedicated medical isotope production reactor and co-located processing facility. We have secured initial investment and have completed preliminary review by the Nuclear Regulatory Commission of our license application for construction permit approval. Eden plans to formally submit these construction permit application materials for docketing and further review later this year. The facility will be designed to produce up to one-half of the world's weekly demand for Mo-99, around 5,000 6-day Curies/wk, plus 1.8 million patient doses for Lu-177 demand, as well as other isotopes.

Continued



View from the bridge of Eden Radioisotopes' new-generation radioisotope reactor showing the core and multiple targets for the concurrent creation of Mo-99, Lu-177, and other activation radioisotopes. (Image: Eden)

What makes Eden's reactor different from existing ones?

In addition to Eden's reactor being the only one specifically built for medical isotope production, with both the reactor and processing facility co-located, the reactor will operate nearly continuously for 22 hours each day, offering unmatched uptime, compared with traditional research reactors that currently provide medical isotopes and operate on five-week cycles. The reactor core will be about the size of a 55-gallon drum, and the facility is designed for optimized logistics, likely located near Hobbs, N.M.—close to both an airport for transporting the material and Waste Control Specialists for nuclear waste handling. We plan a staff of 105–110 people, with around 70 dedicated to operations.

From Mo-99 Target to Patient in ~36 hrs.



Image: Eden

How will Eden handle the logistics of shipping these sensitive materials?

Products will be shipped in shielded containers small enough—roughly 18–24 inches in size—to be transported by air, which is the standard practice today. The proximity of the facility to an airport and its partnership with radiopharmaceutical manufacturers around the world ensures quick turnaround—materials produced in Hobbs could be in Japan or Europe within 24 to 48 hours.

Is Eden considering further expansion beyond the New Mexico plant?

Yes. Eden has announced plans to potentially build a second reactor in New Brunswick, Canada. This would create redundancy, provide for operational flexibility and efficiency, and meet growing demand, particularly as new radiotherapies emerge. In addition, the New Mexico facility will have additional positions available in the reactor core to scale up production without physical expansion.

Can you explain the industry shift toward radiotherapy and PET (positron emission tomography) diagnostics?

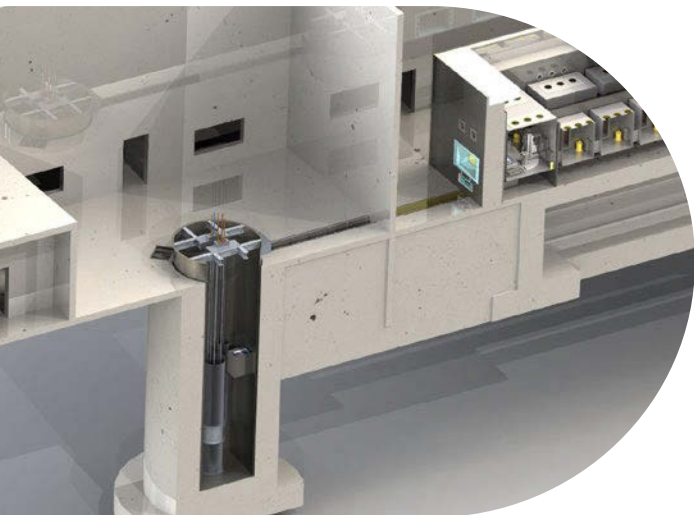
The industry is rapidly moving from conventional nuclear medicine diagnostic imaging toward targeted radiotherapies and PET imaging. Radiotherapies using isotopes like Lu-177 and actinium-225 are revolutionizing cancer treatment. For example, Novartis has introduced Lu-177 therapies for prostate and neuroendocrine cancers that have shown better patient tolerance, increased survival, and outpatient compatibility.

What is the future market outlook for radiopharmaceuticals?

The radiotherapeutic market is expected to explode—from \$2 billion today to over \$27–\$30 billion by 2032. Pharma giants are investing billions in acquisitions and clinical trials—more than \$14 billion in just the past few years. This includes companies like Novartis and Eli Lilly, which are betting heavily on radiopharmaceuticals for prostate, neuroblastoma, lung, and potentially breast cancers.

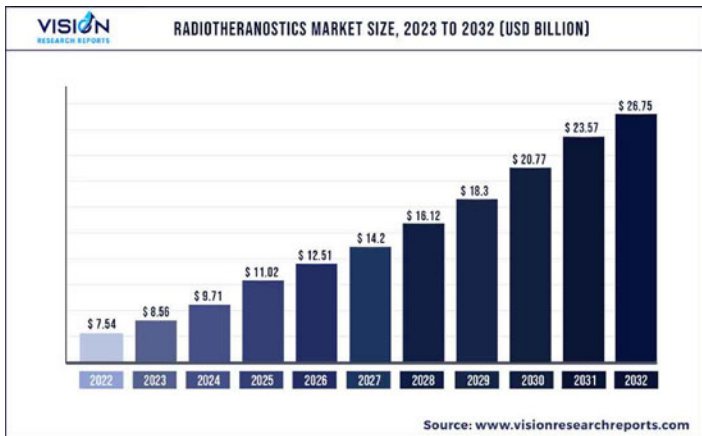
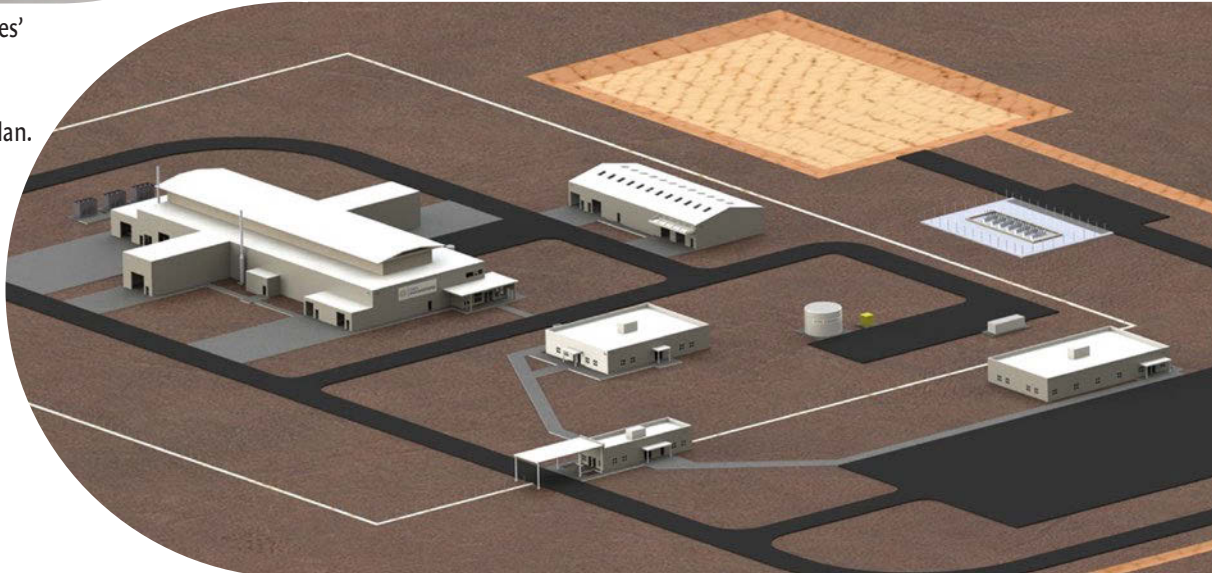
How do PET scans fit into this future?

PET scans, which now mostly use a glucose-tagged isotope (F-18 FDG), are becoming more personalized with novel targeted imaging agents. This is where most of the future diagnostic volume growth will occur. The goal is to use one molecule tagged with a diagnostic isotope for imaging and one with a therapeutic isotope for treatment. PET isotopes have short half-lives and are produced in local radiopharmacies, but the radiotherapeutic isotopes will still depend on reactors like Eden's.



Above: Eden Radioisotopes' medical isotope facility.

Right: Eden facility site plan.
(Images: Eden)



What are the broader implications for U.S. health care if Eden succeeds?

Eden would give the U.S. a domestic source of Mo-99 for diagnostic imaging and Lu-177 for radiotherapeutic treatments, which would shield the country from unplanned foreign reactor outages and international disruptions like those experienced after 9/11, which restricted commercial airline shipments of radioactive materials. A domestic supply improves reliability, shortens delivery time, reduces decay loss, and ensures treatment availability during global crises.

