H.B. 104 Hearing Testimony Transcript

Thank you Chairman Vitale and Members of the House Energy and Natural Resources Committee for allowing me the opportunity to testify before you.

My name is Edward Pheil and I am the Co-Founder and Chief Technology Officer of Elysium Industries. Elysium is an advanced reactor designer working at the cross-section of nuclear energy and High-Level Waste management. Prior to founding the Company in 2015, I spent three decades working at the United States Department of Energy's Knolls Atomic Power Laboratory. The Naval Nuclear Laboratory supports the design and construction of the US Navy's power reactors for submarine and aircraft carrier propulsion. I began in operations and quickly shifted to design, to which I've devoted the majority of my career.

Nuclear power is crucial to US energy independence and the 1000+ tons of Spent Nuclear Fuel, categorized as High-level waste, can help secure this independence for Ohio for the coming centuries. Nuclear energy represents 14.7% of Ohio's electricity mix and 88% of its emission-free electricity. Recently, it has been widely recognized by institutions such as the UN IPCC, as an important source of power for the future energy mix. Isotope production has also bettered our society with the advent of medical imaging and treatments. The cost of nuclear energy has been growing in the United States for a myriad of reasons, however the main driver is the lack of R&D incentives and funding.

The negative perception, which has abated investment and innovation in nuclear energy, is mostly built on the fear of accidents such as Chernobyl and Fukushima, the concern around the storage of long-lived spent nuclear fuel waste, and the threat of arms proliferation. Innovation can help solve these problems, similar to how fossil fuels look to carbon capture and renewables to battery storage.

Fortunately, the United States has actually developed a portfolio of "advanced" reactor solutions back in our prime in the 1960s and 70s, which can be used to address these perception issues. Elysium is one of the many vendors commercializing such demonstrated designs, having even developed our waste to fuel conversion process with DOE national laboratory experts.

My decision to found Elysium stems from several events. I was born and raised near Three Mile Island, inspiring me to dedicate my life to improving the safety of nuclear reactors. It is with the same intention that I entered the private sector. This also provided the opportunity to seek solutions to the waste problem by closing the fuel cycle. Improving resistance to state or terror-driven arms proliferation would also facilitate US nuclear exports, which contribute to global peace and security. Advanced

nuclear presents a lot of promise for our future generations' needs beyond electricity such as medical isotopes, industrial process heat, decarbonization of the transportation sector (synthetic fuels, hydrogen production), and space travel.

Like other US advanced nuclear vendors, we are planning to construct and operate a non-commercial power demonstration reactor in the US. We are currently looking at several sites including the DOE's Portsmouth site, which used to enrich uranium. It is now being remediated and we are among a group of advanced reactor vendors looking at it as a possible prototype site.

H.B. 104 can definitely help spur investment and innovation in Ohio's nuclear industry. This could create job opportunities and drive up the state's exports to the rest of the US and the world. The US is currently lagging behind Russia and China when it comes to commercial nuclear exports, because of a simple lack of interest in advanced nuclear.

I hope my testimony will provide you with the same sense of urgency the industry faces in leveraging the last generation of experienced nuclear reactor designers. I look forward to your questions and am happy to provide supplemental information at the Committee and its Members' request.

Thank you.

- Ohio is becoming increasingly fertile ground for advanced nuclear with its recent Bill passages

- this bill can help spur innovation and economic development of Ohio with exportable technologies

(1) A leader in the development and construction of new type advanced nuclear research reactors ;

(2) A national and global leader in the commercial production of isotopes and research ;

(3) A leader in the research and development of high level-nuclear-waste reduction and storage.
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Ohio State and Nuclear:

October 7, 2019 In Ohio, Shady Front Groups Fight Dirty To Attack Grassroots Campaign Against $1 Billion Nuke/Coal Bailout

Ohio utility interests spent almost $10 million to push through legislation to slap a surcharge on ratepayers' monthly electricity bills in a move to subsidize two nuclear plants owned by FirstEnergy Solutions and two coal plants owned by Ohio Valley Electric Corp.

The anti-bailout campaign has until Oct. 21 to collect more than 265,000 signatures to put a referendum on the November 2020 ballot.

https://www.ewg.org/energy/22892/ohio-shady-front-groups-fight-dirty-attack-grassroots-campaign-against-1-billion

July 9, 2019 Why Closing Ohio's Nuke Plants Will End Up Killing More Ohioans

"A new scientific study finds that well over 100 additional deaths will occur each year if three at-risk nuclear plants in Ohio and Pennsylvania are closed prematurely and replaced by carbon-emitting, high-polluting fossil fuels."
"The report shows that increased air pollution in the region from closing these nuclear plants could lead to an average increase of 126 excess deaths per year and cause over $800 million in economic damage."

https://www.forbes.com/sites/jamesconca/2019/07/09/message-to-ohio-more-people-die-when-nuclear-plants-close/#5d8e535c6271

March 8, 2019 Ohio bill would create nonprofit to promote advanced nuclear research
Ohio House Rep. Dick Stein, R-Norwalk, introduced the Advanced Nuclear Technology Helping Energize Mankind (ANTHEM) Act last week. The bill would set up a nonprofit Ohio nuclear development authority to promote advanced nuclear reactor technology, nuclear waste reduction, isotope extraction and related activities. It has 17 co-sponsors, all Republicans.

"The intent is to move the ball forward and make Ohio a leader in advanced reactor technology," Stein said.

https://energynews.us/2019/03/08/midwest/ohio-bill-would-create-nonprofit-to-promote-advanced-nuclear-research/

https://legiscan.com/OH/drafts/HB104/2019
Ohio House Bill 104
Enact Advanced Nuclear Technology Helping Energize Mankind Act

Sec. 4164.07 . The authority is established for both of the following purposes :
(A) To be an information resource for this state, the United States nuclear regulatory commission, all branches of the United States military, and the United States department of energy on advanced-nuclear - research reactors, isotopes, and isotope technologies ;

(B) To make this state all of the following:
(1) A leader in the development and construction of new type advanced nuclear research reactors ;
(2) A national and global leader in the commercial production of isotopes and research ;
(3) A leader in the research and development of high level-nuclear-waste reduction and storage.

Sec. 4164.09 .
(A) The authority shall consist of nine members representing the following three stakeholder groups within the nuclear engineering and manufacturing industry:
(1) Safety;
(2) Industry;
(3) Engineering research and development.
(B) The governor, the speaker of the house of representatives, and the president of the senate shall each appoint one member from each of the three stakeholder groups.
(C)(1) A member appointed from the safety group shall hold at least a bachelor's degree in nuclear, mechanical, chemical, or electrical engineering and at least one of the following shall also apply:
(a) The member is a recognized professional in nuclear reactor safety or developing ISO 9000 standards.
(b) The member has been employed by or has worked closely with the United States department of energy or the nuclear regulatory commission and the member also has a professional background in nuclear-energy-technology development or advanced nuclear- reactor concepts.
(c) The member has been employed by a contractor that has built concept reactors and the member also worked with hazardous substances, either nuclear or chemical, during that employment.
(2) A member appointed from the industry group shall have at least five years of experience in one or more of the following:
(a) Nuclear-power-plant operation;
(b) Processing and extracting isotopes ;
(c) Managing a facility that deals with hazardous

substances, either nuclear or chemical;
(d) Handling and storing nuclear waste.
(3) A member appointed from the engineering research and development group shall hold at least a bachelor's degree in nuclear, mechanical, chemical, or electrical engineering and the member shall also be a recognized professional in at least one of the following areas of study:
(a) Advanced nuclear reactors;
(b) Materials science involving the study of alloys and metallurgy, ceramics, or composites;
(c) Molten-salt chemistry;
(d) Solid-state chemistry;
(e) Chemical physics;
(f) Actinide chemistry;
(g) Instrumentation and sensors;
(h) Control systems.
(D) The members shall serve five-year terms unless the consortium approves terms of an alternative duration.
(E) Any appointment to fill a vacancy on the authority shall be made for the unexpired term of the member whose death, resignation, or removal created the vacancy.
(F) Initial appointments under this section shall be made not later than sixty days after the effective date of this section.