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INTRODUCTION

Chairman Weber, Ranking Member Ross, and distinguished Members of the Subcommittee, thank you for the opportunity to appear before you today. My name is Joel Edwards, and I am Co-Founder and Chief Technology Officer of Zanskar Geothermal & Minerals, Inc., proudly headquartered in Salt Lake City, Utah.

Zanskar is an American energy technology company focused on discovering America's hidden geothermal resources and transforming them into baseload, clean power plants. We build new artificial intelligence tools that map the Earth's subsurface with a level of precision that, just a decade ago, was considered impossible.

These tools allow us to discover previously hidden geothermal systems and convert them into affordable, clean, reliable and secure electricity. Zanskar is working toward delivering gigawatts of this power to American homes and businesses over the next decade, and will spur significant job growth as we continue our historic geothermal exploration and development campaign.

I am grateful for this Committee's leadership in convening a hearing on subsurface science and technology. I am a geologist by training, and geology is a discovery science. We piece together the properties, processes, and history of the subsurface from rocks. That lets us find things that have always been there, but that nobody has seen.

That idea, that we can use data and human ingenuity to map the unmapped and find new resources, is an American instinct, and is a core ideal at Zanskar. And it has led us to the most important insight I can offer this Committee, which is:

The subsurface of the United States holds one of the last great unexplored American frontiers: massive and untapped geothermal potential. What we discover there will anchor American prosperity today and long into the future.

Across our country's 250 years, we have mapped America's mountain ranges and river basins, surveyed coastlines and seafloors and put satellites in orbit. Just last week, Americans flew around the moon for the first time in more than 50 years.

But the thermal properties of the rocks beneath our feet, the three-dimensional volume of crust that extends for miles beneath the American West, are in most places unknown. We have barely begun to characterize it. Within that unknown terrain, there is enough thermal

energy to power the American economy many times over, around the clock, without supply chain vulnerability, and without foreign dependence.

Zanskar was built to explore and build out that geothermal frontier. We are doing it by pairing our team's extraordinary engineers and scientists with the most significant field data collection and drilling campaigns for geothermal in American history. Day after day, Zanskar crews fan out across the West, testing our model's predictions and prospecting for anomalous heat in areas no one has surveyed before. We think of ourselves as modern wildcatters, and many of our field geologists are fresh out of school, developing a craft that will define their careers as they push the American geothermal frontier forward. This iterative process has resulted in the world's best platform for geothermal discovery.

I appreciate the opportunity to testify before you and to describe that frontier – what Zanskar has found, what we believe is still there, and how the Administration, Congress and the private sector can work together to build this enduring path to limitless American energy dominance.

THE GEOTHERMAL OPPORTUNITY

Geothermal energy is heat stored in the Earth's subsurface, which can be harnessed to generate electricity or be utilized directly. Geothermal power generation operates around the clock, regardless of weather or time of day, with capacity factors that routinely exceed 90 percent, among the highest of any energy source. Modern geothermal power plants produce no emissions and have a minimal surface footprint relative to the power they generate.

Today, the United States has approximately 4 gigawatts of installed power capacity, concentrated largely in California and Nevada. But this represents only a small fraction of what is available.

In 2019, the Department of Energy's landmark GeoVision report found that with accelerated technology development and policy reform, domestic geothermal capacity could reach 60 gigawatts by 2050 — a 15-fold increase over today's installed base. Subsequent advances across advanced or other 'next-generation' geothermal generation technologies, along with our AI-driven exploration, suggest that our nation's geothermal potential is far larger still.

Unlocking this potential has never been more important. Our nation is in an energy crisis. The explosive growth of artificial intelligence and data centers, manufacturing, electrification, and other factors are driving an increase in electricity demand at a pace not seen in decades. Earlier this year, the Energy Information Administration found that average retail electricity rates have increased by over 8% since January 2025 because new supply has not kept pace. As Secretary of Energy Chris Wright has said, energy is prosperity. Right now, our nation does not have enough of it.

Geothermal is uniquely positioned to meet that demand. And American geothermal companies, armed with new technology and capital, are ready to deliver if federal policy can keep pace.

CHALLENGES AT THE FRONTIER OF SUBSURFACE HEAT

Traditional geothermal exploration has been expensive, slow, and high-risk. Our industry confronts and must overcome fundamental challenges: there is no telescope that lets you peer underground to find the heat and permeability that determine whether a geothermal resource is commercially viable.

In the past, developers relied on surface indicators such as hot springs, geysers, and fumaroles, which reveal only a small fraction of the geothermal systems that exist. In fact, if oil and gas exploration still relied only on surface indicators, our country's production would have peaked long ago. In geothermal, even with surficial indicators, most projects that have gone forward typically do not survive costly dry holes and underperforming well fields. These failed investments have deterred capital from the sector for decades.

We also face a profound geothermal information gap. While nearly all productive oil and gas basins have dense subsurface data coverage in the public domain, most of the American West is simply poorly sampled. Just last year, my team released an empirical study that found that nearly half of the operating geothermal fields in the U.S. were discovered by accident – stumbled on during water well drilling, petroleum exploration or mineral surveys. Less than 10% of the contiguous western United States has been sampled for subsurface temperatures. Millions of acres of potentially high-value land remain totally unexplored.

ZANSKAR'S APPROACH: AI-POWERED DISCOVERY FOR A DATA-DRIVEN CENTURY

Zanskar was founded to solve this problem. Our custom-built artificial intelligence, combined with advanced geoscience modeling and modern data collection methods, is enabling Zanskar to generate high-resolution models of the subsurface. Our discovery platform identifies undiscovered commercial geothermal systems by pinpointing where the right combinations of heat and permeability sit underground. This used to be an extraordinary, impossible-seeming idea. Now, we do it every day.

Most importantly: it works. In May 2024, Zanskar acquired a geothermal power plant in southwestern New Mexico called Lightning Dock. Lightning Dock had been underperforming for years and was slated to be retired. If the closure of Lightning Dock had proceeded, the facility's workforce would have lost their jobs. As we have seen too many times across America, a plant closure in a rural corner of the country can reverberate across a region, with consequences felt for decades.

We didn't let that happen. Within twelve months, using our subsurface modeling tools to identify a deeper, hotter reservoir zone, we drilled into that zone, restored the plant to full capacity, and began delivering power to the grid. Lightning Dock's workers now have stable, long-term jobs in the geothermal sector. That new production well has been

operating for almost a year now, and it is one of the most productive pumped geothermal wells in the country.

There are many more examples to come. Just last year, in Nevada, Zanskar discovered the first commercially viable 'blind' geothermal system in the U.S. to be identified in the last 30 years. The site, which we have named 'Big Blind,' is a naturally occurring geothermal system with the potential to produce more than 100 megawatts of electricity.

Through these finds and many more, we are showing that the American age of geothermal discovery is just getting started. By harnessing artificial intelligence and leveraging America's technology leadership, we are making geothermal exploration a repeatable, data-driven process.

Markets have also taken notice. In January 2026, Zanskar closed a $115 million Series C funding round – the largest venture investment to date in AI-enabled geothermal discovery. And today, we announced the closing of a $40 million pre-construction, development capital facility – among the first ever structured for early-stage geothermal power.

For a sector that has long struggled to secure non-dilutive development capital, this deal is a watershed moment for greenfield development. It strengthens Zanskar's ability to commercialize its pipeline of naturally occurring geothermal systems and sets a scalable financing precedent for greenfield geothermal as a recognized asset class across the U.S.

PUBLIC-PRIVATE PARTNERSHIP AND AMERICAN GEOTHERMAL DISCOVERY

Partnership between the public and private sectors is essential to our national efforts to unleash geothermal at scale. This is a genuine partnership, where public investment de-risks early-stage science and technology and private capital drives commercial deployment. That model has worked in oil and gas, advanced manufacturing, and in semiconductor development. It is now working in geothermal.

In particular, the Department of Energy has played a key role in enabling the geothermal technology advances that Zanskar and other companies are now commercializing. DOE-funded research at universities and national laboratories, including the Play Fairway Analysis project and its successor, INGENIOUS, both led by the University of Nevada, Reno, provided the early proof points that modern data-driven exploration and low-cost field data collection methods could lead to new geothermal prospects, such as the blind geothermal anomaly found at Gabbs Valley in Nevada. And the FORGE project in Utah showed that drilling costs could be drastically reduced in both hard and hot rock environments with modern drilling techniques ported over and modified from oil and gas.

The joint DOE and United States Geological Survey (USGS) GeoDAWN initiative, along with DOE's BRIDGE project, led by Sandia National Laboratories, together deployed complementary airborne geophysical surveys across the Walker Lane and Basin and Range. These simultaneously mapped undiscovered geothermal resources and critical mineral deposits, including on Department of Defense lands. All of this data is made

freely available through DOE's Geothermal Data Repository, providing the kind of public dataset that lowers exploration risk and unlocks private investment across the entire sector. This is exactly the role that only the federal government can play.

DOE has also recently announced competitive opportunities to further research and de-risk innovative geothermal generation and exploration technologies. We appreciate the bipartisan support from the Administration and Congress on these issues.

Zanskar supports Congress's efforts to ensure that DOE's geothermal research, development, demonstration and deployment (RD&D) efforts are fully authorized, funded and structured to facilitate technology transfer to the private sector. We also encourage Congress and DOE to keep those investments technology neutral and to support robust competition from different technological approaches across the geothermal sector.

GEOTHERMAL AS A CRITICAL MINERALS FRONTIER

The geothermal frontier is not just an energy frontier: it is a minerals frontier too. Zanskar is proud to partner with Freeport-McMoRan on the MILESHIGH project at Freeport's Morenci copper mine in Arizona, which was made possible in part by support from the U.S. Department of Energy. Zanskar is leading the geothermal exploration and development of the project, and has now completed several large field data collection campaigns and has drilled exploration wells to assess the subsurface resource.

The goal of this project is to use naturally occurring geothermal heat to raise the temperature of copper leach stockpiles, enabling recovery of residual copper from previously mined material considered unrecoverable, potentially adding 25 million or more pounds of domestic copper production annually. This is a direct demonstration of how geothermal technology can strengthen American critical mineral supply chains, reducing dependence on imported copper while cutting emissions.

Beyond enhanced copper recovery, nearly all geothermal brines contain dissolved minerals that could be extracted for additional mineral production. As geothermal fluids circulate through hot rock deep in the Earth's crust, they leach and concentrate a range of critical materials, including lithium, manganese, zinc, silica, and rare earth elements, that are essential to batteries, semiconductors, defense systems, and the broader clean energy supply chain. Today, the United States imports the majority of many of these materials, often from China.

Geothermal operations are uniquely positioned to change that: the brine that drives a power turbine or heats a leach pad can, with the right mineral recovery technology, simultaneously yield a domestic supply of battery-grade lithium or other critical minerals. The Salton Sea Known Geothermal Resource Area in California, already home to

operating geothermal power plants, is estimated to contain one of the largest lithium deposits in the world.

What was once considered a waste stream is increasingly recognized as a strategic asset. Zanskar's exploration platform is designed with this convergence in mind: when we map a geothermal resource, we are also mapping a potential domestic source of the minerals that underpin American technology leadership and national security.

UNLEASHING AMERICAN GEOTHERMAL DISCOVERY

More than 90 percent of viable geothermal resources in the United States are located on or beneath federal lands managed principally by the Bureau of Land Management and the U.S. Forest Service. This means that the federal government's leasing, permitting, and land management policies are central to American geothermal development.

Access to those resources begins with a lease administered under the Geothermal Steam Act of 1970, with a major update made in 2005 under the Energy Policy Act. The leasing process is a source of significant delay. Until very recently, BLM Field Offices were required to hold competitive geothermal lease sales once every two years. All too frequently, these sales either did not actually happen, or nominated lands were withheld from these sales.

In states like Utah, nominated parcels have languished for over a decade before appearing in a sale, and some nominations have never been made available. Because most geothermal resources cover many parcels, this means that developers are unable to complete land positions necessary for development. This strands potential geothermal projects, and capital moves elsewhere.

Even after a lease is secured, a geothermal project on federal land can be required to undergo National Environmental Policy Act reviews at up to six separate stages of the development process: land use planning, leasing, exploration permitting, drilling authorization, resource development, and plant construction. In total, a geothermal developer may spend five to ten years navigating NEPA compliance before it can demonstrate whether a resource is commercially viable — before a single megawatt-hour of electricity is generated.

Beyond regulatory hurdles, even well-designed regulations cannot be effectively implemented without adequate agency capacity. The BLM's geothermal program is typically understaffed relative to its workload. Field offices often lack geothermal-specific technical expertise, leading to inconsistent interpretation of regulatory requirements across different jurisdictions.

We commend the Administration and Congress for the steps you have already taken to start addressing these barriers. In particular:

Annual Lease Sales:

In December 2025, BLM issued an Instruction Memorandum (IM2026-004) directing State Offices to conduct annual competitive geothermal lease sales. This is a meaningful

step forward. We encourage Congress to codify the annual lease sale requirement by enacting legislation such as H.R. 1687, the CLEAN Act.

Other Geothermal Legislation:

On March 5, 2026, the House Natural Resources Committee reported eight geothermal bills favorably to the full House — many by unanimous bipartisan consent. Zanskar commends the Committee and urges the full House to act on all eight:

- **H.R. 301** (Rep. Maloy), Geothermal Energy Opportunity Act (GEO Act).
- **H.R. 5638** (Rep. Kennedy), Geothermal Royalty Reform Act.
- **H.R. 5631** (Rep. Hurd), Geothermal Ombudsman Act.
- **H.R. 5617** (Rep. Ansari), Geothermal Gold Book Development Act.
- **H.R. 5587** (Rep. Kim), HEATS Act.
- **H.R. 5576** (Rep. Fulcher), Enhancing Geothermal Production on Federal Lands Act.
- **H.R. 1077** (Rep. Lee of NV), STEAM Act.
- **H.R. 398** (Rep. Ocasio-Cortez), Geothermal Cost-Recovery Authority Act.

CONCLUSION

The geothermal frontier will require two things to unlock it: technology capable of operating in an environment that deterred or made unsuccessful prior exploration and development, and a policy framework that rewards the risk of going first.

The shale revolution only required the former – federally-fostered innovation across the technologies of directional drilling and hydraulic fracturing – because the majority of our country's oil and gas resources are on private lands like in Texas, North Dakota, and West Virginia. Our geothermal potential, however, is majority owned by the federal government, and this could provide even greater public benefit. With streamlined leasing and permitting, as well as continued R&D investment by the DOE, the result could transform American energy and reshape global geopolitics.

Zanskar and other American companies have built the AI platforms, the geoscientific tools, and the drilling capabilities to explore the subsurface in ways that were impossible a decade ago. We are proving that geothermal development can be systematic, repeatable, and scalable.

Over the coming months, Congress and the Trump Administration can provide a policy framework to open that frontier to American innovation and development. I am grateful for this Committee's attention to these issues, and I look forward to your questions.