AMERICA'S AI MOONSHOT: THE ECONOMICS OF AI, DATA CENTERS, AND POWER CONSUMPTION

HEARING

BEFORE THE

SUBCOMMITTEE ON ECONOMIC GROWTH, ENERGY POLICY, AND REGULATORY AFFAIRS

OF THE

COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

U.S.HOUSE OF REPRESENTATIVES

ONE HUNDRED NINETEENTH CONGRESS

FIRST SESSION

APRIL 1, 2025

Serial No. 119–15

Printed for the use of the Committee on Oversight and Government Reform

Available on: *govinfo.gov, oversight.house.gov* or *docs.house.gov*

U.S. GOVERNMENT PUBLISHING OFFICE
60–025 PDF WASHINGTON : 2025

COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

JAMES COMER, Kentucky, Chairman

JIM JORDAN, Ohio
MIKE TURNER, Ohio
PAUL GOSAR, Arizona
VIRGINIA FOXX, North Carolina
GLENN GROTHMAN, Wisconsin
MICHAEL CLOUD, Texas
GARY PALMER, Alabama
CLAY HIGGINS, Louisiana
PETE SESSIONS, Texas
ANDY BIGGS, Arizona
NANCY MACE, South Carolina
PAT FALLON, Texas
BYRON DONALDS, Florida
SCOTT PERRY, Pennsylvania
WILLIAM TIMMONS, South Carolina
TIM BURCHETT, Tennessee
MARJORIE TAYLOR GREENE, Georgia
LAUREN BOEBERT, Colorado
ANNA PAULINA LUNA, Florida
NICK LANGWORTHY, New York
ERIC BURLISON, Missouri
ELI CRANE, Arizona
BRIAN JACK, Georgia
JOHN MCGUIRE, Virginia
BRANDON GILL, Texas

GERALD E. CONNOLLY, Virginia, *Ranking Minority Member*
ELEANOR HOLMES NORTON, District of Columbia
STEPHEN F. LYNCH, Massachusetts
RAJA KRISHNAMOORTHI, Illinois
RO KHANNA, California
KWEISI MFUME, Maryland
SHONTEL BROWN, Ohio
MELANIE STANSBURY, New Mexico
ROBERT GARCIA, California
MAXWELL FROST, Florida
SUMMER LEE, Pennsylvania
GREG CASAR, Texas
JASMINE CROCKETT, Texas
EMILY RANDALL, Washington
SUHAS SUBRAMANYAM, Virginia
YASSAMIN ANSARI, Arizona
WESLEY BELL, Missouri
LATEEFAH SIMON, California
DAVE MIN, California
AYANNA PRESSLEY, Massachusetts
RASHIDA TLAIB, Michigan

MARK MARIN, Staff Director
JAMES RUST, Deputy Staff Director
MITCH BENZINE, General Counsel
KIM WASKOWSKY, Senior Professional Staff Member
DUNCAN WRIGHT, Senior Professional Staff Member
KYLE MARTIN, Counsel
MALLORY COGAR, Deputy Director of Operations and Chief Clerk
CONTACT NUMBER: 202-225-5074

JAMIE SMITH, Minority Staff Director
CONTACT NUMBER: 202-225-5051

SUBCOMMITTEE ON ECONOMIC GROWTH, ENERGY POLICY, AND REGULATORY AFFAIRS

ERIC BURLISON, Missouri, Chairman

GARY PALMER, Alabama
CLAY HIGGINS, Louisiana
BYRON DONALDS, Florida
SCOTT PERRY, Pennsylvania
LAUREN BOEBERT, Colorado

MAXWELL FROST, Florida, *Ranking Minority Member*
YASSAMIN ANSARI, Arizona
DAVE MIN, California
RO KHANNA, California

C O N T E N T S

WITNESSES

Written opening statements and bios are available on the U.S. House of Representatives Document Repository at: docs.house.gov.

INDEX OF DOCUMENTS

The documents listed above are available at: docs.house.gov.

AMERICA'S AI MOONSHOT: THE ECONOMICS OF AI, DATA CENTERS, AND POWER CONSUMPTION

Tuesday, April 1, 2025

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM
SUBCOMMITTEE ON ECONOMIC GROWTH, ENERGY POLICY, AND REGULATORY AFFAIRS
Washington, D.C.

The Subcommittee met, pursuant to notice, at 9:59 a.m., in room 2247, Rayburn House Office Building, Hon. Eric Burlison [Chairman of the Subcommittee] presiding.

Present: Representatives Burlison, Palmer, Higgins, Perry, Boebert, Frost, Ansari, and Min.

Also present: Representatives Fedorchak and Subramanyam.

Mr. BURLISON. This hearing of the Subcommittee on Economic Growth, Energy Policy, and Regulatory Affairs will come to order.

Without objection, the Chair may declare a recess at any time.

I recognize myself for the purpose of making an opening statement. And I am going to need my glasses for that.

We are here today to discuss America's AI "moonshot." Artificial intelligence, or AI, is likely to become one of the most consequential technology transformations of the century. America is seeking to redefine the possibilities of this emerging technology around the globe.

AI has the potential to transform countless economic sectors.

In health care, AI is already allowing providers to create cancer screening and pretreatment plans for patients diagnosed with cancer. This could transform how our healthcare providers provide the best possible care.

In manufacturing, AI is being used to predict machine failure, allowing proactive maintenance that saves money, time, and even lives.

In defense, AI is being used to improve decision-making processes to protect our men and women in uniform.

Many more examples exist, from education to finance to government services. Even industry will benefit from AI.

Our country has the skills, the expertise, and the capital necessary to bring this vision to life, but what we needed most was a President who sees the importance of this innovation for future economic prosperity.

In his first news conference following his inauguration, President Trump announced the plan of Stargate, a joint venture between OpenAI, Oracle, SoftBank, and MGX to invest in AI infrastructure to propel new developments in this field. This $500 billion investment will allow both the U.S. and our strategic partners around the globe to unlock the next generation of AI.

Later, President Trump signed Executive Order 14179 to "sustain and enhance America's global AI dominance in order to promote human flourishing, economic competitiveness, and national security."

But planning for the future of machine learning is complex, as there are numerous factors that must be considered by Congress and the Administration to ensure that America's private sector will be leading the charge on AI.

Data center power demand is reshaping how power generators and utilities plan for future demand growth and the infrastructure needed to support this demand.

According to a report by the U.S. Department of Energy, data centers consumed roughly 4.4 percent of all U.S. electricity in 2023, a percentage that is expected to rise to between 6.7 and 12 percent by 2028. This rapid growth is astounding and has concerning implications for both current and future power generation.

Additionally, companies are in search of qualified and skilled workers to fill the estimated 100,000 jobs that are needed to support this moonshot.

Northern Virginia, which is just across the river, is a crossroads for an estimated 70 percent of the world's internet traffic.

A report published in December by the Joint Legislative Audit and Review Commission found that "the data center industry is estimated to contribute 74,000 jobs, $5.5 billion in labor income, and $9.1 billion in GDP to Virginia's economy" each year.

President Trump has made his intentions very clear. America can and will become a global leader in the field of artificial intelligence.

The nation that unlocks the future generations of AI first will experience transformational economic value and unleash a new wave of human potential.

I commend the Trump Administration's bold ambition on this issue, and I look forward to hearing from our witnesses about how we, in Congress, can make this vision a reality.

And, with that, I yield to Ranking Member Frost for his opening statement.

Mr. FROST. Thank you, Mr. Chairman.

And thank you so much to our witnesses for being here this morning.

Artificial intelligence is quickly becoming part of Americans' everyday life, and a lot of us are growing to love the entertainment and efficiency it brings. AI has exciting benefits for healthcare, education, and is reshaping our economy, national security, and social life.

Continuing progress in AI will require an enormous amount of technology and infrastructure, including the hardware, software, computer networks, data, and facilities required to operate AI algorithms.

Data center capacity plays a key role in the future of innovation and the future of our people.

In January, the President announced Stargate, an AI infrastructure project with $500 billion in commitments over 4 years that would expand on progress made during the Biden Administration.

It is a positive thing that the President is continuing the focus on developing the capacity and uses for AI, but we believe parts of his approach are wrong.

We can support innovation without removing the safeguards that have prioritized personal civil rights and liberties, but instead, we have seen that we are only pushing forward with policies that benefit a lot of companies and corporations.

The tech companies that are promoting and investing in AI are some of the most powerful in the world, and we just want to ensure that there is not a large power imbalance between those companies and the communities that they are looking to do business with and do business in.

County commissioners in Oregon were confronted with an army of top-shelf lawyers when working out a data center deal with Amazon. The deal resulted in a billion-dollar tax break for the company.

A Microsoft data center in New Albany, Ohio, received a 15-year property tax exemption while expecting to create just 30 jobs with an average salary of $50,000 a year.

We need AI policy that will help put people first. The Trump Administration has reversed some of the progress that we have seen made to establish reasonable safeguards on AI, such as regular testing requirements to demonstrate that it does not violate civil rights or civil liberties, and in an apparent attempt to clear the way for any perceived barriers to America's dominance in AI.

But the health, safety, and privacy of our people are not barriers; they are our rights, and part of our job as Congress.

At the same time, we have seen benefits from AI development. We have also started to see examples of the risks of AI, from deepfakes to the use of limitations of copyrighted material.

In just the past few weeks, we have seen AI used to replicate Studio Ghibli's style through the unauthorized training of AI on Miyazaki's copyrighted material. H&M announced that they are going to start using, quote-unquote, "AI twins" in place of real models. And more than 420 actors, directors, and other creatives sent an open letter urging the government to uphold copyright laws to protect the arts, which is important to me as an artist.

The GAO found that poorly designed AI systems used in the healthcare field can harm patients through misdiagnosis or bias, leading to questions of accuracy, security, privacy, and liability.

We should also be concerned about AI's use when it comes down to national security, including the possible use of deepfakes on the battlefield, AI-controlled nuclear weapons, or autonomous weapons authorized to make decisions about lethal force.

Relevant to our work on this Subcommittee is the promotion of reasonable AI safeguards to address environmental concerns.

AI is powered by data centers that use an astonishing amount of electricity. The carbon footprint of data centers is already great-

er than the entire commercial airline industry, and their power usage will more than double over the next 5 years.

A single data center's campus can consume a gigawatt of electricity, an amount of electricity that could power two Pittsburghs.

This electricity demand can overwhelm a city's grid and raise utility bills.

Data centers have massive diesel backup generators that are regularly test-run, expelling black fumes of toxic smoke over entire neighborhoods, and increasing output from nearby fossil fuel power plants.

In the 4 years between 2019 and 2023, researchers from Caltech estimate AI data centers cost people tens of billions of dollars in healthcare costs and resulted in more than 1,000 premature deaths.

Each data center also consumes millions of gallons of water every day for their cooling systems because humidity can be harmful to data centers' hardware, and they are often sited in states where water is already scarce.

At the same time, it is a matter of national security that we maintain our global AI edge and that that edge has already led to innovations in fields like medicine, energy, and transit that are improving people's lives and the lives of Americans.

Many will put this false dichotomy up that you have to choose an either/or approach. I reject that. But as we enthusiastically pursue AI innovation, Congress must look out for working families and pass and strengthen responsible safeguards.

Thank you, and I yield back.

Mr. BURLISON. Thank you.

Without objection, Representative Fedorchak of North Dakota and Representative Subramanyam of Virginia are waived on to the Subcommittee for the purpose of questioning the witnesses at today's hearing.

I am pleased to welcome an expert panel of witnesses who each bring experience and expertise that will be valuable to today's discussion.

I would first like to welcome Neil Chilson, the head of AI policy at the Abundance Institute. Neil previously served as Acting Chief Technologist at the Federal Trade Commission and brings a breadth of expertise in the field of artificial intelligence policy.

Thank you, Neil. Welcome.

Next, we have Josh Levi, the President of the Data Center Coalition, an association representing the owners and operators of the digital infrastructure used to support the modern economy, including cloud computing and artificial intelligence.

Thank you. Welcome, Mr. Levi.

Next, we have Mark Mills, the Executive Director of the National Center for Energy Analytics, a national energy think tank. Mark has a robust background in energy policy and experience as an experimental physicist and development engineer in microprocessors and fiber optics.

Welcome, Mr. Mills.

And, last, we have Tyson Slocum, who is the Energy Program Director at Public Citizen. Tyson is also a faculty member at the Uni-

versity of Maryland Honors College where he teaches energy and climate policy.

Welcome, Mr. Slocum.

I thank each of you for being here today, and I look forward to your testimony.

Pursuant to Committee Rule 9(g), we request that you please stand and raise your right hand.

Do you solemnly swear and affirm that the testimony that you are about to give is the truth, the whole truth, and nothing but the truth, so help you God?

Let the record show that the witnesses answered in the affirmative.

Thank you. You may be seated.

I appreciate you being here today, and I look forward to your testimony.

Let me remind you that we have read your written testimony, and it will appear in full in the record.

Please limit your oral statements to 5 minutes. And, as a reminder, please press the button on the microphone in front of you so that we can actually hear you. And after 4 minutes, the light will turn yellow, and then after 5 minutes, the light turns red, at which time your time is up.

I now recognize Mr. Chilson for his 5-minute opening statement.

STATEMENT OF NEIL CHILSON
HEAD OF AI POLICY
ABUNDANCE INSTITUTE

Mr. CHILSON. Thank you, Chairman Burlison, Ranking Member Frost, and the distinguished Members of the Subcommittee.

I am Neil Chilson. I am the head of AI policy at the Abundance Institute. We are a nonprofit dedicated to fostering the cultural and policy conditions for innovative technologies, such as artificial intelligence, to thrive and drive widespread human prosperity.

Imagine a future where AI tools routinely help doctors identify existing drugs to treat patients with rare, under researched diseases, where cancer is identified earlier with a 99 percent accuracy, where administrative costs in healthcare drop by hundreds of billions of dollars annually, and where traffic accidents decline by up to 90 percent, saving nearly 40,000 American lives and $190 billion each year.

This is not a science fiction future. It is here. Research in my written statement details each of these situations.

These credible transformations are already beginning. They are powered by AI technologies that research shows are enhancing worker productivity by up to 43 percent in certain tasks, improving team performance, leveling up low-skilled workers faster, and even boosting worker morale.

AI is also transforming jobs and powering the creation of new products, services, and entire industries, creating a more dynamic, competitive economy. It is helping small businesses and entrepreneurs scale faster. And the jobs that it is creating include high-value jobs in the skilled trades.

The race for AI dominance is underway, and America's economic future depends on winning it. And the stakes are high. Analysts

project AI will drive a $19.9 trillion global economic impact through 2030. But realizing this potential requires Congress to build the right launchpad for our AI moonshot.

Today, I want to focus on two critical regulatory environments that determine America's AI future.

First, the software regulatory environment.

America's leadership in AI has flourished under our light-touch, sector-specific approach. This open system has allowed tremendous innovation in software while still ensuring accountability through existing laws on consumer protection, civil rights, and safety.

But a patchwork of state regulations threatens this environment. Over 900 state AI bills have been introduced across the country since January.

Some states, however, are offering promising models. Utah's AI Act exemplifies a thoughtful approach. It extends traditional consumer protections to AI applications while creating a regulatory sandbox that encourages innovation.

Their first agreement was with a company named ElizaChat, which is an AI mental wellness app for teenagers, demonstrating how to bring innovation to difficult challenges but with appropriate safeguards.

To strengthen our software regulatory environment, Congress should build on Utah's success by defending AI innovators from conflicting state regulations while creating Federal regulatory sandboxes for cooperative experimentation.

Second—and other panelists on here are much more expert on some of this, but I want to dig into it a little bit here—we must reform our energy regulatory environment. While our software rules allow rapid innovation, our energy regulations create crippling bottlenecks that threaten American AI dominance.

Two out of three Federal environmental impact statements take longer than the legally required 2-year timeline, stalling critical energy projects unnecessarily. And when we do manage to build new energy sources, connecting them to the grid takes far too long.

The contrast with Texas is revealing. From 2021 to 2023, Texas added 25 gigawatts of new generation, almost double what other U.S. grids added. This is possible because Texas uses a more flexible connect-and-manage approach.

To boost our energy infrastructure, Congress should streamline permitting processes and constrain counterproductive litigation, and it should direct Federal agencies to accelerate grid interconnection.

America's AI moonshot depends on getting both regulatory environments right. We must safeguard open software innovation while dramatically reforming our energy infrastructure regulations.

By addressing these dual challenges decisively, Congress can ensure that the United States maintains and enhances its AI leadership, driving economic prosperity, improving public welfare, and securing America's competitive advantage for generations.

Thank you for your attention. I look forward to your questions.

Mr. BURLISON. Thank you.

I now recognize Mr. Levi for his 5 minutes.

STATEMENT OF JOSH LEVI
PRESIDENT
DATA CENTER COALITION

Mr. LEVI. Thank you, Subcommittee Chairman Burlison, Subcommittee Ranking Member Frost, distinguished Members of the Subcommittee. We really do appreciate the opportunity to be here today with you to provide testimony on a topic that is critical to the future of America's economy and national security.

My name is Josh Levi. I am President of the Data Center Coalition, or DCC, which is the membership association for the U.S. data center industry. Our members provide the digital infrastructure that enables cutting-edge technologies that drive the 21st century economy, including AI.

Data centers also ensure the essential services our homes, businesses, schools, hospitals, manufacturing facilities, and governments rely on and are always available.

Today, everything—from the way we work and learn to how we buy groceries, bank, and even access medical care—occurs online.

The average American household now has 21 connected devices, including phones, watches, thermostats, appliances, and others, and consumers and businesses are expected to generate twice as much data over the next 5 years as they did over the past 10.

This growth is driven by the widespread adoption of cloud services and connected devices and the rapid scaling of advanced technologies like generative AI, which alone could create up to $4.4 trillion in economic value globally by 2030, according to McKinsey.

These digital cloud-based services we all rely on actually take place in physical locations: America's data centers.

To meet growing demand for these digital services, our member companies are making multibillion-dollar investments in data center infrastructure in this country. These investments support hundreds of thousands of quality jobs across the Nation and contribute billions of dollars in local, state, and Federal tax revenue.

Data centers are now under development in at least 23 states nationwide, from mature markets like Virginia, Georgia, California, Texas, and Arizona, to emerging markets like Indiana, Missouri, Louisiana. In fact, the U.S. is expected to be the fastest-growing market for data centers globally, with capacity more than tripling between 2024 and 2030.

Beyond their critical role in the modern digital landscape, data centers are vital economic engines nationally and in local communities across the country. Between 2017 and 2023, the data center industry's total contributions to U.S. GDP was $3.5 trillion, according to PwC.

In 2023, the data center industry directly employed more than 600,000 workers in the United States and, in total, supported 4.7 million jobs. The sector contributed $163 billion in Federal, state, and local taxes in 2023, which provides consistent funding for important community priorities like public safety, transportation, education.

And reports indicate the industry is planning investments in the U.S. of many hundreds of billions of dollars based on 2025 announcements alone.

The exponential growth of the data center industry has been a catalyst for broader economic development, supporting ecosystems of suppliers, manufacturers, service providers. At the national level, each direct job in the data center industry supports more than six jobs elsewhere in the U.S. economy.

From construction companies, fabricators of steel, to HVAC and equipment manufacturing, the data center industry is fueling economic growth in countless companies across a variety of industries.

However, the continued growth of this critical industry faces challenges. The first is ensuring timely access to reliable energy, which has become the pacing issue for this industry. We believe Congress should look at ways to speed up the permitting process for electric transmission and generation to ensure the Nation has sufficient energy capacity to power America's growing economy.

Additionally, major sectors of the U.S. economy are experiencing shortages and delays with the delivery of capital equipment, especially electrical equipment. The data center industry is leaning in, working with manufacturers to shore up supply chains and shorten construction timelines.

However, we do support congressional and administrative actions to expand domestic capacity of critical electric and data center equipment. This will help ensure timely availability of these materials to allow the data center industry to meet growing demand.

Finally, the industry is facing work force shortages. As data centers expand from mature markets to emerging markets across the country, the rapid pace of development and the need to meet specialized skill requirements have contributed to labor shortage, both in operations of data centers but also in constructing data centers.

We support the creation of national technology hubs, expanding and strengthening data center education programs, including community college programs, and training veterans for jobs in the data center industry.

Data centers are vital to enabling critical and emerging technologies like AI that are essential to U.S. national security, our global competitiveness, and economic prosperity. By proactively removing barriers to deployment, the Federal Government can play a pivotal role in supporting this critical sector, fostering economic growth, and maintaining our competitive edge against foreign adversaries.

We thank the subcommittee for its leadership in promoting a strong data center and AI ecosystem here in the U.S. and look forward to continued collaboration and dialog.

Mr. BURLISON. Thank you.

I now recognize Mr. Mills for his opening statement.

STATEMENT OF MARK P. MILLS
EXECUTIVE DIRECTOR
NATIONAL CENTER FOR ENERGY ANALYTICS

Mr. MILLS. Thank you, Mr. Chairman and Ranking Member Frost and Members of the Committee, for the opportunity to testify.

Of course, the words "revolution" and "pivot in history" are frequently overused and misused. But by now, as we see from opening remarks from you, Mr. Chairman and Ranking Member Frost, it is

very clear these words are appropriate to describing the emergence of AI as a practical tool deployed in the infrastructure of the cloud.

Certainly, debates about risks and benefits over what is hype and what is real, that will continue, but the fact of an unfolding revolution is evident across nearly every domain.

Invoking the moonshot is appropriate in terms of echoing the great power competition of the 20th century and because of AI's strategic implications.

But the central promise of usable AI at scale, of course, is an economic one, and specifically at how AI will boost U.S. productivity overall. And while we are currently preoccupied with the politics of cutting government waste and the deficit, the Holy Grail remains in finding a productivity boom.

Consider if the current Congressional Budget Office forecast for anemic annual productivity growth, if AI raises that growth merely back to the long-run 20th century average, that would, by 2030, add a cumulative extra $10 trillion to the U.S. economy, and it could be more.

It is that promise that underlies the private sector's drive to spend hundreds of billions of dollars—likely a collective trillion dollars in total by 2030—to build out more data centers at the epicenter of the cloud where AI is democratized. The next 1 year's spending on data centers will exceed alone the entire decade of government spending on the moonshot.

This unprecedented digital construction that is underway has led to the rediscovery of a basic truth: all software exists inside hardware that, in turn, uses energy, and a lot of it. Each digital byte uses an infinitesimal amount of energy, but this is where we find salience for the euphemism that quantity has a quality all of its own.

Again, in moonshot terms, the amount of energy used to launch a rocket is consumed every day by just one AI-infused data center. Or, in monetary terms, $10 billion worth of data centers will consume some $10 to $20 billion of electricity over a decade of operation. And, for context, the $10 billion worth of EVs will consume one-tenth as much electricity.

Such realities invariably invoke a response that we should focus on, even mandate more energy efficiency. This is a rabbit hole subject but suffice to say that efficiency is precisely why data center demands have risen.

Consider if a smartphone today operated at the 1984 computer efficiency, that one phone would use more electricity than this entire Rayburn House Building. Instead, efficiency gains have led to billions of phones and thousands of data centers.

This is, of course, the oft-noted so-called Jevons Paradox, which I note for the record Jevons knew in the 19th century it was not a paradox but a reality.

Credible forecasts see within a half-decade or so new data centers needing somewhere between 70 gigawatts and 130 gigawatts more power capacity built than planners originally thought only a couple years ago. This is the equivalent of adding the generating capacity equal to the entire state of California in a half-dozen years.

Thus, the key question is, will there be enough power to fuel the velocity of the cloud's expansion to stay at the forefront of this revolution?

Reality and arithmetic show that the needed power will not come from squeezing more out of existing assets or even stopping coal plant retirements or utility-scale wind and solar, nor from building nuclear plants. All that will help, but it will not be enough and soon enough.

Most of the new power will come from natural gas combustion turbines and engines. Those can be and, in fact, are being built rapidly. That implies the need, of course, for a lot more natural gas.

One might be tempted here to invoke the politically charged "drill, baby, drill." But politics aside, history does show that the wells and the pipelines can be deployed fast enough at the scales needed.

This is where the moonshot metaphor fails. The Apollo program had the government spending taxpayers' money to put a dozen men on the moon, but ensuring we achieve lift-off for AI productivity will come from private capital rapidly deployed to build the needed power systems for those digital infrastructures.

The government's role here—you will not be surprised to hear me say—to ensure that U.S. industries can win this great powers race should start with asking the private sector players to identify their regulatory and policy-centric impediments to rapid deployment at the scales needed and then, of course, removing or resolving the impediments. Not eliminating rules and regulations, but accelerating and rationalizing.

This will be a great motivation to restore that longstanding effort, and this could, in fact, be the real moonshot challenge in all this.

Thank you.

Mr. BURLISON. Thank you.

I now recognize Mr. Slocum for his opening statement.

STATEMENT OF TYSON SLOCUM
ENERGY PROGRAM DIRECTOR
PUBLIC CITIZEN

Mr. SLOCUM. Thank you, Mr. Chairman, Mr. Ranking Member, Members of the Committee. I am Tyson Slocum. I direct the Energy Program with Public Citizen here in Washington, DC.

America today has more data center capacity than any other nation. While some are issuing panicked projections about massive new infrastructure needs to power future data centers, I urge the Committee to exercise restraint.

While America's power needs are indeed growing, driven by building and transportation electrification and data center development, allowing hype and hysteria to drive long-term capital-intensive infrastructure investments will lead to stranded assets that may threaten taxpayers and ratepayers with unnecessary costs.

Forecasters consistently overestimate electricity demand in part because they emphasize static load growth over efficiency gains.

We all remember in the early 2000s, in the wake of the Telecommunications Act of 1996 and other initiatives, analysts pro-

jected surging electricity demand with the internet and everyone having computers.

It never materialized. Instead, for the next two decades, America experienced flat energy demand.

Although data center energy use is increasing, energy use per computation has decreased by 20 percent every year since 2010.

There are ample opportunities to require or encourage data centers developing gen AI to pursue demand management programs to limit the need for expensive new energy-generation infrastructure.

I am concerned that President Trump's impending use of emergency powers to usurp state and local laws, forcing taxpayers and ratepayers to cover the costs of hastily implemented energy infrastructure, use of Federal Power Act Section 202(c) authority to force ratepayers to subsidize inefficient power plants, or taxpayers footing the bill for Defense Production Act giveaways to do the same is unwarranted and requires congressional oversight.

Federal energy regulators also appear to currently lack adequate authorities to ensure data center loads do not disrupt power markets.

In my recent challenge to data center giant Blackstone's efforts to buy a billion-dollar gas plant right near Dulles Airport here in Virginia, I noted that Blackstone failed to disclose to FERC that it also controls most of the data center load in that region.

Blackstone's lawyers then argued to FERC that FERC has no current authority to assess an applicant's control over data centers. And then last summer, FERC was caught off guard when 30 percent of Virginia's data centers suddenly went offline with a resulting surge in electricity nearly causing a blackout.

It is clear that regulators need additional authorities, and this is where congressional oversight could help.

I am concerned that President Trump's prioritization of exporting American natural gas to Berlin and Beijing disadvantages domestic needs for the fuel.

America is already the world's largest LNG exporter, but Trump seeks to authorize additional exports that will result in America exporting up to 40 percent of our domestically produced gas.

LNG exports are already exposing American families to higher energy burdens as gas prices at Henry Hub have doubled since November 2024. The Department of Energy warned of a triple cost increase to consumers from increasing LNG exports, including a 30 percent increase in domestic gas prices.

We have heard from some of the witnesses that natural gas needs to play a role to power data centers. We cannot be increasing LNG exports at the same time that we need additional domestic natural gas.

In addition, President Trump's chaotic use of tariffs is not only inviting an economic recession, his haphazard trade policies are hindering access to supply chains needed to build out AI infrastructure.

The Federal Reserve Bank of Dallas did a very important quarterly survey on March 26 where most of the 200 oil and gas executives surveyed expressed deep concern about the negative impacts to supply chains from the President's expanded use of tariffs.

We need smarter trade policy that targets tariffs coupled with domestic investment. We have already heard from members of the panel that there are some bottlenecks in supply chains, that tariffs are complicating those supply chain bottlenecks.

I appreciate your time and look forward to your questions. Thank you.

Mr. BURLISON. Thank you, Mr. Slocum.

I now recognize myself for 5 minutes.

Mr. Chilson, America has what some have described as a golden opportunity to lead in the next generation of AI, but many barriers still exist, as has been mentioned.

What is really holding us back from reaching our full potential, such as securing investment in private capital?

Mr. CHILSON. So, there are many challenges for this moonshot. And I want to endorse Mr. Mills' idea that it is private industry that is going to drive this ahead, and it is Congress' job to build the right launchpad for this moonshot.

And so, clearing the launchpad is the first thing. And I think especially in the energy space, permitting processes that slow down the ability to deploy and build new energy, not in a way that actually achieves, in many cases, the economic or the environmental benefits that we are seeking, but in a way that just drags things out unnecessarily slow and gives veto points to people who are not—who do not necessarily have environmental concerns in hand.

But the other big challenge I think in this space is a transformation that we are seeing—largely at the state level—about how we consider software and how we regulate software.

Software traditionally has been regulated not directly but indirectly in the uses in which it is put. So, for example, we have regulation on medical devices which often incorporate software. We have regulation on transportation. Cars are rolling computers at this point.

And so, when we regulate at the use rather than at the general computation level or the general software development level, we get closer to the harm, we get closer to the goals of regulation, and we avoid really unintended consequences.

And so, states are rolling out these big picture regulatory schemes for software. I think that is a real challenge, and I think it is something that Congress needs to step in on.

Mr. BURLISON. Thank you.

My other question has to do with the fact that there has been a lot of fear, a lot of concern or worry about what the potential outcomes might be. But to me, I see the potential for how our economy is going to pivot and grow and the tremendous opportunities that we will receive.

Why do you think Americans should be more excited about the prospects and the job opportunities that AI might bring than be fearful?

Mr. CHILSON. Well, I think the—why is artificial intelligence important? It is because intelligence is important and the ability to deploy new, powerful computation to some of the most challenging problems that we have as humans.

The healthcare space is an amazing example of this. I just saw this morning there is a new paper in Nature that is giving a

woman who has not been able to speak for years—she is fully paralyzed—it can scan her brain, and she can speak by thinking the words in her head. And she can speak at 90 words per minute, which is slightly slower than I am speaking but not that much. And that is really impressive. That is the type of medical benefit that is direct.

Outside of that, the economic benefits from efficiency—my written testimony goes into them much more—trillions of dollars of potential benefit in this space.

Mr. BURLISON. Thank you.

Mr. Levi, how do we begin to implement—actually, let me ask this question.

You described that we have different—that once we unlock this technology, that we have some real-life examples of services that are stopping us from doing so.

How do data centers support—or what kind of real-world examples of regulations and things that are hindering you from—your data centers from moving forward?

Mr. LEVI. Thank you, Mr. Chair. I appreciate the question.

And I would tell you that we are seeing a lot of barriers that are holding us back from moving forward as quickly as we can to meet these demand signals.

Clearly, energy permitting is one, and the asynchronous timelines around which data centers can be constructed and potentially operated but then be energized is very much a challenge.

We could put a data center facility from groundbreaking to commissioning 18 months to 2 years. In order to get energy projects online, we are looking at 5 years of permitting on average, up to 7 years for permitting alone for transmission infrastructure.

We are also seeing some challenges, regulatory barriers when it comes to equipment, particularly electrical equipment.

Mr. BURLISON. Thank you.

My time has expired.

And, with that, I recognize Mr. Frost for his 5 minutes of questions.

Mr. FROST. Thank you, Mr. Chairman.

Artificial intelligence requires massive data centers. Meta's planned Louisiana data center will cover over 4 million square feet.

When you realize how large these centers are, it is a little less surprising that a single center can consume as much electricity as an entire city's population.

Mr. Slocum, can you talk to us about why data centers consume so much energy?

Mr. SLOCUM. Yes. Data centers consume so much energy because they are filled with, sometimes, millions of microprocessors that are doing computations, and that takes enormous amounts of energy.

Increasingly, those microprocessors are computing those calculations more efficiently. But as you add more and more capacity, you are increasing energy demand.

And so, there are, I believe, requirements that data centers should have to improve the efficiency of these facilities, and a lot of that can be through things like demand response.

Very often, very large data center operators, whether it is Meta, or Blackstone, or Google, or Microsoft, they have data centers in multiple locations.

And you can coordinate operations of these facilities and reduce consumption in one, increase consumption in another, based upon peak loads of available generation depending upon the hour of the day. There are all sorts of smart ways to use large energy loads.

The concept of demand response has been around for more than a generation. We are not seeing it as widely adopted in the data center field as it should be.

And so, before we start committing to building a lot of new power-generation assets and associated infrastructure, we should instead be asking one of the most profitable industries on Earth: are you doing all you can to manage that energy load responsibly in concert with local communities that are asked to host these facilities?

Mr. FROST. And, just briefly, what are the impacts on working families in these communities?

Mr. SLOCUM. They could be significant. First, as you mentioned in your opening statement, sometimes these facilities are not significant job creators. They often negotiate deals with disadvantaged local governments that are out-lawyered and outgunned to give away lots of tax breaks that compromise local districts' ability to fund basic government operations like infrastructure and schools and so forth.

But you also have discrete environmental issues. As you noted in your opening statement, these facilities come with massive arrays of onsite diesel generators. And so those generators kick on sometimes during regular testing, sometimes because of issues with the regional power market.

Those diesel generators are not clean-burning facilities. It is like parking rows of 18-wheeler trucks in front of your house and turning them on all at once.

There is also noise pollution associated with these facilities. They are not always the best neighbor.

Mr. FROST. Yes, yes. Thank you. I appreciate it.

But at the same time, obviously it is here. And I think part of our job in Congress is to ask all the questions. We want to know how we can spur innovation. We also want to know how we can protect working families.

And I think in terms of technology, this institution traditionally has not been the best at asking all the questions and then legislating having all the answers in mind.

Look no further than social media and where we currently are where we drag our feet on passing good, commonsense legislation, and then we freak out when it completely gets out of hand and try to pass lazy legislation, like we have tried to do over the past few years on this.

And so, I think it is really important. And I know the chair brought up this pivot, which I think AI is going to be very helpful in a lot of different places, even in terms of figuring out how we are going to deal with the climate crisis. I think there is a lot here.

However, when we use that—when we talk about the pivot, there are a lot of people worried about it, including people like my aunt who spent a long time as a customer service representative.

When we talk about manufacturing line workers, when we talk about the American worker, our job is not to ask the questions of just one set of people but of all people, especially the working American. And I would love to see us think a little bit more about this holistically as well.

Just really quick. I have, like, no time left. But I am just curious. There are ways—and you talked about it—that we can work at curtailing a lot of these environmental impacts. Do you have any other ones top of mind?

Mr. SLOCUM. Yes. I think trying to make sure that you have zero-emission, clean energy resources. Wind, solar, coupled with on-site battery storage would be a very sustainable way that is not going to be disrupting the local community, not adding to climate destruction, and providing reliable, affordable energy for these centers.

Mr. FROST. Yes. And I think this is a place where we can talk more about it. We have had meetings on this, too, talking about permitting reform, especially as it relates to moving forward with clean energy.

So, thank you. I yield back.

Mr. BURLISON. Thank you.

I now recognize the gentleman from Alabama, Mr. Palmer, for 5 minutes.

Mr. PALMER. Thank you, Mr. Chairman.

I thank the witnesses for being here.

Mr. Mills, good to see you this morning.

What are your estimates for power-generation demands over the next decade? Any idea of what those demands will be?

Mr. MILLS. The total generation demand increases from growth?

Mr. PALMER. Right.

Mr. MILLS. Well, there probably——

Mr. PALMER. Well, let me restate it.

Mr. MILLS. Yes, sir.

Mr. PALMER. We are in an arms race with China for artificial intelligence and quantum computing. What amount of power generation, in addition to what we have now, will we need?

Mr. MILLS. Well, the FERC is reporting an increase between 60 and 130 gigawatts more demand by 2030 than they thought was——

Mr. PALMER. That is in 5 years.

Mr. MILLS. Yes. That they thought 2 years ago. And that is not just from data centers. It is also from bringing manufacturing back and electrification of other parts of the industry.

Mr. PALMER. What do you consider a greater threat to our future national security, losing the AI arms race to China or climate change?

Mr. MILLS. Well, I, as you probably know, I am on the record of putting the economy and strategic concerns as No. 1, not only from my perspective, but as we see from public opinion polls, that most people would put the economy and national security first.

Mr. PALMER. If we lose the arms race in artificial intelligence and quantum computing to China, they will be the superpower, not a superpower.

One of the things that I think we need to be taking a look at in addition to the power generation is our dependence on China for critical minerals and rare earth elements. I pointed out multiple times in these hearings that there is not a single major refinery for rare earth elements in the Western Hemisphere. There are only nine in the world. Eight are in China and the other one is in Malaysia.

I think that has got to be a top priority. I mean, we are talking about AI here. We are not going to do anything in that specter if China cuts us off from rare earth elements and critical minerals.

But we have also got to meet these demands for increased power. And one of the things that I suggested this morning in another meeting is there are over 100 coal-fired power plants and natural gas plants that have been shuttered in the United States.

If we started today trying to build new power-generation facilities, we do not have the manufacturing capacity to produce the turbines that we need to generate—to meet that new demand, but we have got existing turbines in many of these facilities and transmission lines already in place.

So, I would like your thoughts on us utilizing small modular reactors at these facilities. They are not as site-sensitive as others. For instance, you could get 600 megawatts from two small modular reactors in an existing facility where it would take 77,000 acres to get it from a turbine farm, and that turbine farm—basically, turbines would have to be replaced in 25 to 30 years. You would get 40 to 60 years generation from an SMR.

What do you think about that?

Mr. MILLS. Well, Congressman, I am delighted that the tech community in the United States and Congress are enthusiastic about nuclear power again. But the reality is that you cannot buy a small modular reactor. They do not exist yet. We have to build them at scale, and that will take years. Similarly——

Mr. PALMER. Actually, that GE Hitachi model we think can be built in 2 to 3 years.

Mr. MILLS. Oh, you can construct that scale of a reactor. This is the 300-megawatt-class reactor. It is a little bit of a euphemism to think of 300 megawatts as, quote, "small."

These are very big power plants. We can certainly build them quickly. They are possible. The regulatory barriers here are still significant. But you are talking a decade before we have the infrastructure to build them.

Similarly, we could build the infrastructure to make the critical minerals and rare earth mineral refineries here, but that will also take a decade. And, meanwhile, as you know, 90 percent of the refined critical minerals to build windmills and solar panels are in China on coal-fired grids.

So, it is a problematic trade to buy technology made in China.

Mr. PALMER. My point is that I think, having worked for two international engineering companies and having a little bit of understanding about what it takes—and I have told people this—you can open a mine here, but it will be 3 to 5 years before you start

getting aggregate out. It would take 3 years minimum to be able to build a processor or refining facility. Notwithstanding how long it takes to get the permitting, if you permit it on day one, it would still take that long.

But if we can build small modular reactors at scale, you are going to have some lower costs because you can basically build standardized designs. You can build advanced reactors that can use spent fuel. We could fuel a fleet of nuclear reactors for over a hundred years.

If you use them at these shuttered hydrocarbon plants, natural gas and coal, would it not be interesting that China is building coal-fired plants to power their AI expansion that we could then use nuclear on shuttered hydrocarbon plants with no emissions to power out?

And I honestly believe that this is something that ought to be a top priority for this Administration, a top priority for this Congress to get these SMRs in place and get them in these places where we already have the turbines and already have the transmission lines.

Mr. MILLS. Count my vote enthusiastically on that strategy, Congressman.

Mr. PALMER. Thank you, Mr. Mills.

I thank the Chairman. I yield back.

Mr. BURLISON. Thank you.

I now recognize Mr. Subramanyam from Virginia for 5 minutes of questions.

Mr. SUBRAMANYAM. Thank you, Mr. Chair.

I appreciate some of the discussion today, and I think I understand that data storage is more important than ever as we have AI and the blockchain becoming more prevalent and accessible. But I want to tell you a cautionary tale about my community.

My district is home to more data centers than any other district in the country. In fact, if my district were a country, it would have more data centers than almost every other country in the world. And, if you look at this, 10 data centers usually use more power than all of D.C., and we have more than 200 and with another 100 planned.

Many years ago, when these data centers were approved, they seemed like a great idea at the time. Talk about lower property taxes and revenue for the counties. But our community is paying the price now. And we are a cautionary tale for the rest of the country.

The power needed for these data centers is creating a huge problem for our community. We have power lines right now in Ashburn and Leesburg and all over Loudoun County. Leesburg, Lovettsville, Fauquier, Rappahannock Counties are facing similar proposals of building transmission lines for data centers that are, quite frankly, invasive and not great for the communities.

We are paying the price now for many of these data centers. In the next 5 years alone, data centers could increase customers' bills by up to $276 a year, and people's utility bills may double in the next 7 to 10 years just to power data centers.

And the environmental impact is real as well. These green spaces are disappearing, pollution is rising, and water supplies are being stretched thin. It is making reaching our clean energy goals in Vir-

ginia nearly impossible. We set those in place. And even historic places like Manassas Battlefield are under threat as well.

And it is also a security risk. Putting all the Nation's data centers in one place is a huge problem. Just look at the Ukraine war. When Russia failed to hack Ukraine's telecom networks, what did they target? They targeted the data centers. And so northern Virginia is becoming more of a target than Washington, DC. itself.

And that is why we have a lot of people in our community standing up and fighting back. The Digital Gateway in Prince William County, for instance, was blocked from moving forward by passionate citizens standing up for the health of their communities, and equally passionate citizens are fighting proposals in Fauquier County, Rappahannock County, and other parts of Loudoun.

And there is one local high school student who started a petition about a power line going through Ashburn. She said our county is meant to be a place where families can thrive, where kids can be happy and healthy, and where our communities can grow, not an industrial zone filled with data centers and high-voltage power lines.

So, what I am asking today is let us be smart about how we are deploying data storage as AI and blockchain becomes the norm. And I am calling for a national strategic plan on how we deploy more data storage that takes into account the impact on communities.

It needs to be thoughtful. We need to be thoughtful about how we handle the unintended consequences on communities, like how it will affect costs and people's utility bills, how it will impact our environment, and how do we ensure that the security of these data centers is sufficient. We need to be thoughtful about data centers and data storage and their long-term impacts. And one can support an innovation, but it does not have to come at the cost of our communities.

So, I yield back. Thank you, Mr. Chair.

Mr. FROST. Would you yield to me, Mr. Subramanyam?

Mr. SUBRAMANYAM. Yes.

Mr. FROST. I am just curious, Mr. Slocum, on what he was just talking about in terms of the rising costs for families at home. Are there any solutions that folks have been talking about in terms of those?

Mr. SLOCUM. Absolutely. In my written testimony I cite to some excellent research by the Harvard Law Electricity Policy Institute which documents all of these problematic deals between electric utilities and the data centers where the utilities and the data centers sort of have a shared objective here in terms of the utilities want to build more rate base that they can charge to consumers, and the data centers want to get access to the utilities' infrastructure that is paid for by ratepayers and not the shareholders of the big tech companies.

And so, when you are asking working families to pay higher electric rates so that more infrastructure can be built to serve billionaire-controlled tech companies, that is a problem, and that is an equity issue.

In my written testimony, I acknowledge that AI plays a central role in our economy for a number of different important deploy-

ments, but the reality is that the infrastructure has to be done in concert with ratepayers and with local residents.

And, right now, we are seeing big tech companies with their expensive lawyers strong-arming communities. And it is not just in liberal Democratic areas. It is in red states. It is in conservative areas.

And so, what we need to see is a balance. And I am always concerned when, in Washington, DC, everyone says we need permitting reform. What permitting reform means is trampling over the rights—the constitutional rights—of our communities.

We have to have a balance that respects the Constitution and respects communities' ability to live the way that they want to and not have big tech data centers dominate the discussion.

Mr. BURLISON. Thank you.

I now recognize the gentlelady from Arizona, Ms. Ansari, for 5 minutes.

Ms. ANSARI. Thank you so much, Mr. Chair.

And thank you to our witnesses for being here today.

My district in Arizona and the surrounding Phoenix metro area is one of the fastest-growing data center hubs in the country. By 2028, it is expected to be the Nation's second-largest concentration of data centers behind only northern Virginia in Mr. Subramanyam's district.

For our national security and economic prosperity, we absolutely need to be global leaders on the artificial intelligence front.

To do that, we will need to keep building more data centers and the infrastructure to support them, but we also need to do that in a way that is smart, ensuring lasting resiliency in these systems and our energy and water future.

Arizona Public Service, which is the largest power provider in my state, has projected that data centers will account for 55 percent of its power needs by 2031.

So, my first question, Mr. Levi, what are companies doing to lower their power usage going forward?

Mr. LEVI. Thank you, Representative Ansari. I very much appreciate the question. And we are certainly seeing a great deal of growth in Arizona, and it has been a great destination for data center employment.

This is an industry that continues to innovate both on energy and water utilization. I think one of the main things to recognize is that data centers centralize what would otherwise be disparate competing resources, bring them together under a facility.

In doing so, you see already—according to Lawrence Berkeley National Lab—about a 600 percent gain in energy efficiency over a disaggregated compute. That was based on research they did between 2010 and 2018.

That continues. You are seeing a tremendous lean-in on energy efficiency for a variety of reasons but one of which is energy is a cost-driver, and our members can pay anywhere from 40 to 60 percent for energy. Every electron is precious and is managed as such.

At the same time, one of the primary functions of a data center is to remove heat from servers that generate heat and ensure that those servers can continue to perform.

When I went into my first data center facility in 2001, I had to wear a windbreaker because it was a cool environment and notably so.

Going into a data center now, you will find some ambient temperatures in the 80's, maybe even higher, because the hardware has been able to withstand, based on innovations and design, increasingly high temperatures.

I do want to just indicate there is a fundamental tradeoff right now in cooling technology between energy efficiency and water efficiency, and the data center industry does take a lot of thought as they are deploying infrastructure in locations to make sure that they are aware of the water availability, the energy availability, the tradeoffs in terms of how they are going to cool those servers.

Ms. ANSARI. Thank you so much.

Actually, in our last Subcommittee hearing here we discussed how to strengthen America's energy reliability. I do strongly believe that the greatest energy source is the energy that we do not use, and the best way to ensure energy reliability is to innovate. So, that is good to hear that you feel it is moving in that direction.

Mr. Slocum, question for you. Would you agree that the AI industry and data centers would be more cost-effective if they used less electricity and therefore spent less on their power bills?

Mr. SLOCUM. Of course. The question is: do they have the necessary incentives? When they are cutting sweetheart deals with a local utility, their focus is not on efficiency. It is on obtaining access to that transmission or generation infrastructure.

And so, I think it would be helpful to have guide rules from Congress about energy efficiency and demand response initiatives for the data center industry to ensure that we prioritize more efficient operations going forward.

Ms. ANSARI. So, in Arizona and much of the West, as I know that you know, the most critical resource that we have is water, and a recent study showed that a single data center can consume up to 5 million gallons of drinking water per day. That means they are not only straining already limited resources in our state, but the result also means that water rates are going up for families.

This question is also for you. What can the AI and data center industries do to use less water while also reducing their strain on the power grid?

Mr. SLOCUM. Right. Well, as we just heard Mr. Levi say, that one of the big considerations for data center location is the availability of water. And out West water resources are incredibly scarce and becoming more scarce, and it is a huge challenge.

So, what we need to do is to ensure that they are recycling or reusing water resources, that they are treating those water resources, that we are not dipping into aquifers or other drinking water resources just to keep large computer networks from overheating.

Ms. ANSARI. Thank you.

And I just want to—I will wrap by saying I am not anti-AI or anti-data center, but if we really do want to dominate this industry as a country, we need it to be future-proofed.

We need to be innovating. And the goal is to make less energy- and water-intensive if we really want it to be sustainable. And I

do not just mean sustainable in the climate sense but sustainable as profitable and a continuously advancing industry.

So, thank you so much.

I did want to ask for unanimous consent to enter the following articles into the record if that is OK, Mr. Chair.

Mr. BURLISON. What are the names of the articles?

Ms. ANSARI. First, a 2024 article from *Business Insider* titled "Google's water use is soaring. AI is only going to make it worse."

A 2023 article——

Mr. BURLISON. Without objection.

Mr. BURLISON. Go ahead.

Ms. ANSARI. Thank you.

A 2023 article from *The Washington Post* titled "A new front in the water wars: Your internet use."

Mr. BURLISON. Without objection.

Ms. ANSARI. And the third piece and a 2024 piece from the University of Tulsa titled "Data centers draining resources in water-stressed communities."

Mr. BURLISON. Without objection.

Ms. ANSARI. Thank you.

Mr. BURLISON. I now recognize the gentleman from Pennsylvania, Mr. Perry, for 5 minutes.

Mr. PERRY. Thank you, Mr. Chairman.

Mr. Chilson, in your testimony you mentioned Microsoft's recent announcement to reopen Three Mile Island to power one of its data centers in Pennsylvania. It is at the heart of the district that I am honored to represent.

Constellation Energy, by reopening it, will create approximately 3,400 new jobs, create over $3 billion in state and Federal taxes, adding $16 billion to Pennsylvania's GDP.

Can you—I mean, well, Constellation obviously owns Three Mile Island, but Microsoft could have said, "Well, we want the most efficient." I know we were just talking about efficiency for data centers and that data center operators do not want—or maybe do not care, that is the inference, they do not care about the efficiency of the power they get.

So why did Microsoft not come to Pennsylvania, to PJM, and say, "Well, we need this much power, we want you to build this much solar; or we want you to add this much wind or this much renewable"? Why did they pick Three Mile Island?

Mr. CHILSON. I think they are looking at the tradeoffs and the cost of energy there and getting more energy from a facility that has a proven ability to generate it, and I think the ability to mobilize it quickly.

This is a race, not just a highly competitive race among companies in the U.S., but obviously internationally. And so, getting this done quickly I think is really important, and I think they saw the opportunity to jump on this particular supply.

Mr. PERRY. Do you know the efficiency rating of nuclear power, particularly Three Mile Island? Is it 95 percent efficient, 97, when it was operating previously? Do you——

Mr. CHILSON. I do not know offhand. I suspect there are some other people on this panel who might be able to tell you that.

Mr. PERRY. It is in the high 90's, right? And it is baseload power, right? And it is not dependent on the sun shining or the wind blowing.

Do data centers—should they be concerned about baseload power that is reliable and consistent 24 hours a day, 365 days a year?

Mr. CHILSON. Absolutely. They run some of the most important services. They support some of the most important services that we all use all the time. And so, they need to be up and running all the time.

Mr. PERRY. Mr. Mills, you seem interested in answering, and you can go where you want to with this. We have got a little bit of time left.

But we are looking at, as Mr. Chilson said, at a race, at a race often with our adversary, and, as they describe us, the enemy, which is China.

What can we learn, as the United States, from an energy perspective from China in winning this race?

Mr. MILLS. Well, speed matters, I guess would be the short answer, that the Chinese are very good at building nuclear plants in 4 years, new ones.

Mr. PERRY. Hold on a second. China also provides 85, somewhere in that percentage, of solar panels and solar panel-related batteries.

Mr. MILLS. Correct. Yes, sir.

Mr. PERRY. Why are they not, if they provide that and they are so good at that, why are they not using those things to meet their Paris climate accord requirements and to show the world that this works for winning this race? Why are they not doing that?

Mr. MILLS. Well, I think, not to be a cynic, they are doing that, of course. They are building everything. But they are also building coal plants at a furious pace as well.

Mr. PERRY. Right.

Mr. MILLS. And they produce over 95 percent of the silicon needed for photovoltaic cells in the world on coal-fired grids. Well, two-thirds of their grid is coal-fired, as you know. And the location of the energy-intensive manufacturing of polysilicon to make photovoltaic cells is the coal-intense part of the grid.

So, China recognizes that power is fundamental, that getting it quickly and inexpensively matters.

I am not endorsing China's environmental policies, however, because——

Mr. PERRY. And neither am I.

Mr. MILLS [continuing]. I think we can thread the needle in between the two.

I was pleased to hear that you are from the district that I visited on March 28, 1979, not to date myself.

Mr. PERRY. I lived there at that time.

Mr. MILLS. We may have bumped into each other.

Mr. PERRY. Still do.

Mr. MILLS. I spent the week of the accident at the site and spent the next half dozen years of my life defending the virtues of nuclear energy—unsuccessfully, obviously, since we abandoned it largely, but——

Mr. PERRY. I think it is coming back——

Mr. MILLS. It is.

Mr. PERRY [continuing]. Which is awesome news.

Mr. MILLS. I think the refurbishment of TMI is a very good sign, because it is possible to bring that back online. There are only maybe a half dozen reactors like that.

If I may answer the question: why did Microsoft choose that? It chose that because you can quickly get an enormous amount of highly reliable power. And, of course, Microsoft likes the fact that it is non-combustion power.

Mr. PERRY. Highly reliable, highly efficient, highly affordable, right?

Mr. MILLS. Yes, sir, all of the above.

Mr. PERRY. But they did not ask for—you can put up a lot of solar panels quickly too, right?

Mr. MILLS. Yes. I think you are going to, to be fair, I think you are going to see both.

So, if you look at what is going on in Louisiana with the large new Meta facility, it is 3 gigawatts, like three or four Three Mile Islands' worth of power requirements. And they are going to build windmills, solar arrays, and almost 3 gigawatts of that.

Mr. PERRY. Would they be doing that without Federal and state subsidies for the non-traditional power sources?

Mr. MILLS. I am skeptical that they would, but I think——

Mr. PERRY. Me too.

Mr. MILLS [continuing]. I think, given the amount of money these companies have—I share Mr. Slocum's view that these are very deep-pocketed organizations—I think they would still—this is my suspicion.

I am all for getting rid of all the subsidies. I am on record frequently before Congress on this. I think that they would still build a lot of solar and wind but a lot less of it than they are now doing.

Mr. PERRY. I yield.

Mr. BURLISON. Thank you.

I now recognize the gentleman from Louisiana, Mr. Higgins.

Mr. HIGGINS. Thank you, Mr. Chairman.

Mr. Mills, can you clarify for America what is the consumption of energy that we are talking about here as Americans try to grasp? What is the difference between a data center requirement? And what kind of energy does AI draw? Why is that different from a business or a home?

Will you explain what we are talking about regarding the needs for the consumption of energy from our—clearly, it has to come from our existing grid or the grid that we envision modernizing in the near future if we were to participate in this global competition to lead the emergence of AI and data technology.

So, could you clarify for America about how much energy is required for this?

Mr. MILLS. Well, it has surprised a lot of people, Mr. Congressman, as you know. The computer age began—I was part of the beginning of the computer age as a young man designing and manufacturing microprocessors. And very few people thought about computers in city-size power consumption terms at that time. There were a handful of forecasters who expected that to happen.

I will say again it happened because we made computing so efficient. The goal of making computers faster is you have to make them more efficient. This is sort of the central requirement.

But what it means in simple terms is—well, everything we do, if you—we are broadcasting this hearing live to the internet and, of course, that consumes energy. It is just hidden energy. And it consumes roughly as much as the people that are watching it, each person. Their energy share of watching this hearing online is roughly equal to if they took a bus ride 10 or 20 miles.

Mr. HIGGINS. But may I ask, if I could interject while the gentleman is explaining, Americans are watching something else if they are not watching this.

Mr. MILLS. That is true.

Mr. HIGGINS. And the lights are on in this place——

Mr. MILLS. Correct.

Mr. HIGGINS [continuing]. Whether anyone is in this room or not.

Mr. MILLS. All using energy.

Mr. HIGGINS. And the cameras are plugged in.

Mr. MILLS. Yes.

Mr. HIGGINS. So, regarding data centers, there is a failure to grasp. It took me a while to grasp. And I am asking you to clarify for America, why do the envisioned data centers and the AI technology, why is the consumption of energy so massive?

Mr. MILLS. Because the quantity of information processed is even more massive. So, a single data center now typically uses more power than a steel mill. We are building them by the hundreds. We are not building hundreds of steel mills, although it would be nice if we built a few dozen.

So, the magnitude of information processing that goes on—and we measure this in bytes, which has no meaning. It is a term that is exotic. But we used to be amazed at a gigabyte and megabytes.

These are measured in numbers that are literally astronomical. The quantity of data being processed and will be processed to do everything that we have heard from our witnesses, my colleagues, it will keep expanding, whether it is medical care or entertainment.

Mr. HIGGINS. OK. So, our existing grid cannot—if we were to win the race, we do not have the grid to carry to victory, do we?

Mr. MILLS. That is correct. That is correct, sir.

Mr. HIGGINS. That is right. So, modernization of the grid across the country, would you say that is of paramount consideration?

Mr. MILLS. Modernization of the grid and the opportunity for private players to produce power. It does not have to be on grid. Yes, sir, both.

Mr. HIGGINS. Roger that. OK.

It was brought up earlier regarding the need for fresh water for cooling. Can you comment on that from an energy perspective?

Mr. MILLS. Cooling is a challenge. These are very hot processes. The surface of each chip is hotter than the surface of the sun. It is a crazy number. It is hard to cool them. It takes a lot of water.

I think what you will see increasingly is data centers sited where there are not water challenges and there are not transmission challenges.

Mr. HIGGINS. Because commonly some of the least expensive energy sources are where you also have some of the least water.

Mr. MILLS. That is a challenge, that is correct.

Mr. HIGGINS. Is that correct?

Mr. MILLS. That is correct.

Mr. HIGGINS. So, these are serious challenges.

In my remaining half a minute, Mr. Levi, would you please address the supply chains? We have concerns regarding materials and components necessary for us to engage in this competition that we intend to win.

Mr. LEVI. Thank you, Representative Higgins. I very much appreciate the question.

And, yes, we have some very significant supply chain constraints, much of which is really electrical components. And it is a matter of finding transformers, switch gears.

Mr. HIGGINS. Should we be building those components in America, sir?

Mr. LEVI. We should. And as an industry, we are leaning into supply chain to try and source as much here as we can. Yes, sir.

Mr. HIGGINS. Roger that. Thank you, sir.

Mr. Chairman, my time has expired. I yield.

Mr. BURLISON. Thank you.

I now recognize the gentlelady from North Dakota, Mrs. Fedorchak.

Mrs. FEDORCHAK. Thank you, Mr. Chairman. And thank you for the opportunity to sit in on your Committee today.

I am a Member from North Dakota, a new Member, and I am on the Energy and Commerce Committee, but am very interested in this issue, particularly the powering of America's AI industry.

I spent 12 years as a utility regulator; most recently was president of the National Association of Utility Regulators. So, I am very familiar with a lot of the issues regarding our energy markets, the signals we are sending to our energy markets, the massive increase in demand that we are talking about here.

When I look back on the 12 years as a regulator in my state—and we served during a time of energy boom, so we saw demand increase—it was still like 3 percent.

So, when you look—I was in a meeting this morning with PJM, and they said that their peak demand today is 150 gigawatts and they are looking in 5 years to be at 185 gigawatts. That is mind-blowing. That is astounding.

And to meet that demand I appreciate requires a level of development that we have never before done. There is no time in history that we have grown that much power and connected it to the grid that quickly.

So, with that, I have just a couple questions for you experts, and I invite you to participate. We have got a working group my office has led on AI and energy. We want to try to get some solutions and a policy framework for solutions to bring to the table on this very issue.

But what types of efficiency upgrades can we count on—I hope—to mitigate that power demand increase? Because AI is getting more and more efficient, and hopefully some of these projections will come down because of efficiency increases and improvements.

So, for any of you, I invite you all to comment on that. Maybe with you, Mr. Mills, do you want to start?

Mr. MILLS. The efficiency—the rate of improvement in energy efficiency of compute and GPUs is faster than the vaunted Moore's Law efficiency gains. And the rate of efficiency gains in the cloud are even faster yet, because efficiency gains and the transmission of information and the memory systems, all the associated, are going extremely fast.

What is happening is that the demand for the product, software, is growing even faster, because what efficiency gains do in computing is it makes the computing cheaper, easier, faster, which for quite a long time is going to overtake all of the ostensible efficiency gains.

I think the principal solution will come from—and I will say I endorse a blend of what Mr. Slocum has said and what a lot of other people are saying, to your point, that we cannot build that much capacity that quickly. It looks like we cannot for a whole set of supply chain reasons.

So, we are going to have to figure out how to meet the demand for the services while moderating the incredible demand for power.

I think one of the solutions will be increased use of where the utility industry was a hundred years ago, which is loads this big, which are industrial-class loads, they are purely in the sort of refinery, steel mill, we will increasingly see onsite generation, independent generation, and even co-generation, "co" in the sense of not heat and power but peak shaving for the grid without costing consumers money.

Every utility I talk to, every utility CEO does not want to raise the cost of their electricity for their consumers to serve industrial load. This has been a difficult challenge.

Mrs. FEDORCHAK. For sure. Thank you.

Mr. LEVI. Thank you, Representative.

Mr. BURLISON. Were you finished?

Mrs. FEDORCHAK. Do I have another minute?

Mr. BURLISON. Yes. I am sorry.

Mrs. FEDORCHAK. Thank you.

Mr. Levi.

Mr. LEVI. I appreciate the question, Representative Fedorchak.

Mrs. FEDORCHAK. Yes, if you can.

Mr. LEVI. I would just add that data centers are highly efficient facilities, but they also enable energy savings and efficiencies economy-wide.

I talked earlier about just the changes in the last 15 years walking into a data center, the ambient temperature inside. Servers generate heat. You know, early days you had to wear a windbreaker going into a data center because it was that cool.

Mrs. FEDORCHAK. Right.

Mr. LEVI. Now ambient temperatures have increased substantially. You can go into data centers that are 80 degrees or higher. And that is part of the energy efficiency gains that we have got within the data centers if we are looking at cooling.

But I also think it is important to recognize the role of data centers in enabling energy efficiency for others. Whether you think about smart thermostats, whether you think about GETs in dynamic line monitoring, or any number of technologies that are utilized by consumers, that are utilized by businesses, utilized by gov-

ernment, all of those rely on the digital infrastructure the data centers are providing.

Mrs. FEDORCHAK. Good point.

Mr. LEVI. And there is not only substantial recognition within the data centers but certainly economy-wide of the efficiencies gained.

Mrs. FEDORCHAK. Thank you.

I am out of time, but I will say North Dakota has cool air and we are flaring gas. So, come there and use that gas and generate power.

Thank you. Appreciate it. I yield back.

Mr. BURLISON. Thank you.

I now recognize the gentlelady from Colorado, Ms. Boebert, for 5 minutes.

Ms. BOEBERT. Thank you, Mr. Chairman.

Mr. Chilson, AI's rise, it really offers a dual lifeline: coal as a power bridge and AI as a transition engine.

Do you believe that they are both crucial to keeping rural communities from collapsing?

Mr. CHILSON. I do. I am more of an expert on the AI side, so I will address that.

I do think that we are seeing that intelligence in the form of connected from here but to big data centers is a benefit across the economic spectrum and that everybody can benefit from this.

We have seen some good research that shows that, in fact, AI tools help benefit actually people who are newer or less capable in certain types of jobs to really level up their skills quickly, and there are sort of diminishing returns at the top end. And so there has been some good research on this.

So, I do think that across the economy we will see huge benefits to this technology, including in rural areas that maybe have not historically received the benefits of high technology.

Ms. BOEBERT. Awesome. Thank you.

And, Mr. Mills, you stated that AI data centers will require the equivalent of adding an entire state's worth of power generation just in the next few years alone.

I believe that that is true. And, if so, how can anyone seriously argue that wind and solar are going to be enough for all of this?

Mr. MILLS. Well, people do seriously argue that, Congresswoman, of course. And it is not that it is technically impossible to build enough wind and solar batteries. It is these things—the engineers can do a lot of things if you give them enough money. The issues are really how much——

Ms. BOEBERT. We have given them a lot already. I have not seen it——

Mr. MILLS. That is true.

Ms. BOEBERT. Yes. I have not seen it produce anything.

Mr. MILLS. It is really a velocity question and location question. I think what you will find—and we are already seeing this. You are seeing some plans for blended. I mentioned Louisiana, where you are blending solar and gas turbines.

And what you will find is you can reduce the number of gas turbines you have and the amount of gas you are consuming by using enough of them plus wind and solar.

That is going to keep happening, because the absolute quantity demand is so great that I think the industry is going to chase everything they possibly can.

It is not that they are totally price-insensitive but they are—and this is my opinion, is they do not—but they are close to price-insensitive in the sense the product is so important and the velocity is so important that they will pay a premium, including, I suspect, that the utilities have much more negotiating power than they realize. And some of the utilities they can recognize that they can negotiate construction arrangements and business arrangements that do not impact consumers, increase rates.

Ms. BOEBERT. Right. And I would think that we see such a blended form of energy right now because there are so many subsidies. And without the subsidies, it may not be as much of a blend.

We are all fine with all-of-the-above energy, but when we are shutting down coal plants in rural communities, like in Colorado, and putting that energy aside, and then saying we are going to replace it with 6,000 square acres of solar panels, but we do not have the transmission lines and we do not have the funding for that yet.

And when this is so crucial with AI's rise, I think it is imperative that we have that reliable source and stop demonizing fossil fuels. We have some coal plants that are being converted into LNG facilities. And then I would love to see SMRs come to the surface too, have these small modular reactors in places.

And so, do you believe that the energy policies that we have seen have actually kind of slowed down the progress potentially in AI's development?

Mr. MILLS. To a significant extent, yes, because when you do asymmetric subsidies—the solar and wind industry are no longer nascent small industries that need a boost with subsidies. They are massive industries globally, huge supply chains. They no longer need massive subsidies. So, it has distorted how the market would respond.

And you probably know that both in Georgia and Illinois there have been delays or cancellations of coal plant shutdowns precisely because of the need for adequate and dispatchable power.

I hope that that spreads to other states and we slow down as well. And, in fact, I will make a prediction. It will make some of my green friends' heads explode, to use that expression, but I do think you are going to see a coal plant built to fund data centers. That is happening in Asia——

Ms. BOEBERT. Yes.

Mr. MILLS [continuing]. And in Vietnam and in——

Ms. BOEBERT. China is building some 200 coal-fired energy plants and selling us solar panels. Yes.

Mr. MILLS. Exactly.

Ms. BOEBERT. But to your point, we have coal plants in Colorado that are reduced down from three stacks to one.

And in 5 seconds, could you just explain simply how much energy we need to supply this? What does that look like to the average person?

And I yield.

Mr. MILLS. There is a single refrigerator-size computer rack in a data center, and there are thousands of racks. A single one uses more electricity than 50 Teslas or any other electric car.

So, it gives you a sense, when you build millions of those, you are adding the equivalent of hundreds of million new EVs to the road in a couple years.

Ms. BOEBERT. Yes. And just for the record, EVs do not have gas pedals. They have coal pedals.

Thank you.

Mr. BURLISON. Thank you.

And, with that, I now yield to Ranking Member Frost for closing remarks.

Mr. FROST. Thank you, Mr. Chairman.

Thank you so much to the witnesses for being here today.

There is no doubt we can credit AI for exciting advancements, including in the field of healthcare, education, and much more. Congress' job must be to support those advancements but also couple them with responsible safeguard policies.

Being on the Science and Technology Committee, I know the importance of maintaining a competitive technological edge against our adversaries in AI and other technologies, like quantum computing, chip manufacturing, and space exploration.

At the same time, we cannot let our fear of our foreign adversaries turn into a scorched earth AI policy that can do real harm to the health and pocketbook and autonomy of people here at home, and we heard a little bit about that from a few of the members here today.

I am not anti-AI, anti-innovation, but the balance is so important, especially as we look decades into the future. And I agree it is exciting, you know, to work on legislation that helps create the innovation sandbox that was brought up, but we have to ensure that the communities do not get buried in the sand. And that is part of our job as legislators.

So, I appreciate everyone being here today.

And I yield to the Ranking Member.

Mr. BURLISON. Thank you, everyone, for coming today.

As we have heard, AI has a promising future for transforming the ways that various sectors of our economy operate. But for this future to be realized there are very real challenges that Congress and the Administration should consider.

Workforce challenges highlight the need for improved training and education in the fields that are necessary to support this transition. I can think not too far—I was graduating college during the dot-com boom. And when people thought of programmers, they thought of people that use punch cards, the machine learning language. It completely changed the industry and ushered in an entire new generation of software engineers like myself.

The processes for increasing energy infrastructure required for the operation of power-intensive AI uses are greatly in need of reform, particularly as it relates to permitting and regulatory barriers. A recent report by the Competitive Enterprise Institute titled "Powering Intelligence: Meeting AI's Energy Needs in a Changing Electricity Landscape" highlighted many of these reforms.

And I am asking unanimous consent to enter this into the record.

Without objection, so ordered.

Mr. BURLISON. Finally, any consideration of regulation of the development and use of AI must account for the needs of innovation and competitive markets. One can only imagine the many unlimited number of potential business ideas and ventures that might spring forward from very nuanced or niche or sometimes very impactful large-scale companies from this transformation.

AI is creating more efficiency by greatly reducing the time needed to complete tasks that would take far longer to complete without this important tool. And while we are in a global race for leadership in this rapidly evolving field, American innovation has a very proven track record of leading the way when it comes to being innovative. And the Trump Administration recognizes this incredible potential and the prosperity that it will create both within our borders and in the economies around the world.

Achieving this moonshot will require action by both Congress and the Administration to create an environment in which the tech innovators and the sectors supporting this industry can grow.

I hope this conversation today has highlighted some of the many ways that Congress and the Administration can take action to ensure that America can and will lead the world in AI for many generations to come.

And, without objection, all Members have 5 legislative days within which to submit materials and to submit additional written questions for the witnesses, which will be forwarded to the witnesses for their responses.

If there is no further business, without objection, the Subcommittee stands adjourned.

[Whereupon, at 11:27 a.m., the Subcommittee was adjourned.]