

Testimony of Richard J. Powell
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A Smarter Investment: Pathways to a Clean Energy Future
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Good morning Chairman Rush, Republican Leader Upton, and other members of the Committee. My name is Rich Powell. I am the Executive Director of ClearPath, a 501(c)3 organization that develops and advances policies that accelerate breakthrough innovations to reduce emissions in the energy and industrial sectors. To further that mission, we develop cutting-edge policy solutions on clean energy and industrial innovation. ClearPath provides education and analysis to policymakers and collaborates with relevant partners to inform our independent research and policy development. An important note: we receive zero funding from industry.

Thank you for the opportunity to appear before you today and for holding this important hearing. Climate change is an urgent challenge that merits significant policy action at every level of government and the private sector. We need to look no further than the events in Texas and across the Midwest this week to see the havoc extreme weather can have on the energy system. Preparing our grid to be reliable in the face of unique challenges is an important issue we will face moving forward. In the case of Texas, we have seen multiple forms of generation units go offline due to weather. At the height of the outages, The Electric Reliability Council of Texas (ERCOT) was experiencing over 34 GW of generation shutdowns including 27 GW of which were thermal gas or coal plants.¹ Wind and solar generation units also experienced weather-induced capacity loss of around 4-5 GW. More than 4.5 million people in Texas have gone without power as a result of the blackouts, and about half a million more across the Midwest similarly experienced a lack of power.² As America creates the grids of the future, we must recognize the challenges each form of energy faces and utilize all forms of clean energy to ensure reliable energy at the system level. We must also consider ways to strengthen our physical grid, as many areas in Texas faced prolonged outages due to downed power lines.

As this committee considers its part in a serious set of U.S. climate and clean energy policies, those solutions should be ambitious but also technology-inclusive, politically realistic, and substantively pragmatic. Policies must also support U.S. jobs. Too often, solutions are oversimplified to a set of false choices: renewable versus fossil, economy versus the environment, immediate action versus inaction. The reality is that solutions – as evidenced by Texas – must follow a comprehensive agenda to make the global clean energy transition cheaper, faster and more flexible. This will be essential for deep, global emissions reductions by mid-century, while also ensuring American competitiveness.

Serious federal policy proposals must also reflect the global nature of the challenge: a molecule of carbon dioxide emitted in Shanghai has the same impact as one released in Chicago. Policies that simply accelerate American fuel switching, shut down traditional energy production and

¹ [ERCOT, Hourly Resource Outage Capacity](#)

² [U.S. DOE, Extreme Cold & Winter Weather Situation Report](#)

industry, or merely subsidize already commercialized technologies will do little to impact global emissions, and may well lead to loss of American jobs. A more effective strategy is rooted in American clean energy abundance, innovation and exports.

We believe that this committee can continue to play a major role in America's response to the global climate challenge. With this in mind, I will discuss a few topics today:

- First, let's level-set with **where we are today**. U.S. emissions are down, energy prices are stable, and reshoring of manufacturing is underway, leading to more jobs. There is a big voluntary push among utilities to reach net-zero by 2050 – with a big caveat that we don't have all the technologies we need to get there.
- Second, we need an aggressive and politically realistic policy agenda to work with industry to get to a clean power future. First we need to **innovate** – the clean energy innovation wins in the recently passed Energy Act of 2020 now must be implemented.
- Third, in 2020, for the first time, U.S. **industrial emissions** may have exceeded power emissions, and will likely be the top source in the future. ClearPath is expanding our work into clean steel, cement and hydrogen. We see an even MORE important need to have an innovation-based, affordable approach to decarbonizing industry.

Where We Are Today

Saying that we need to transition to a clean energy economy is a bit misleading – that transition is well underway, in large part thanks to legislation this committee enacted as early as the Energy Policy Act of 2005. U.S. greenhouse gas emissions are down by more than 20 percent since 2005, and over the same period, power sector emissions have declined by approximately 40 percent.³

³ [Rhodium Group, Preliminary US Greenhouse Gas Emissions Estimates for 2020](#)

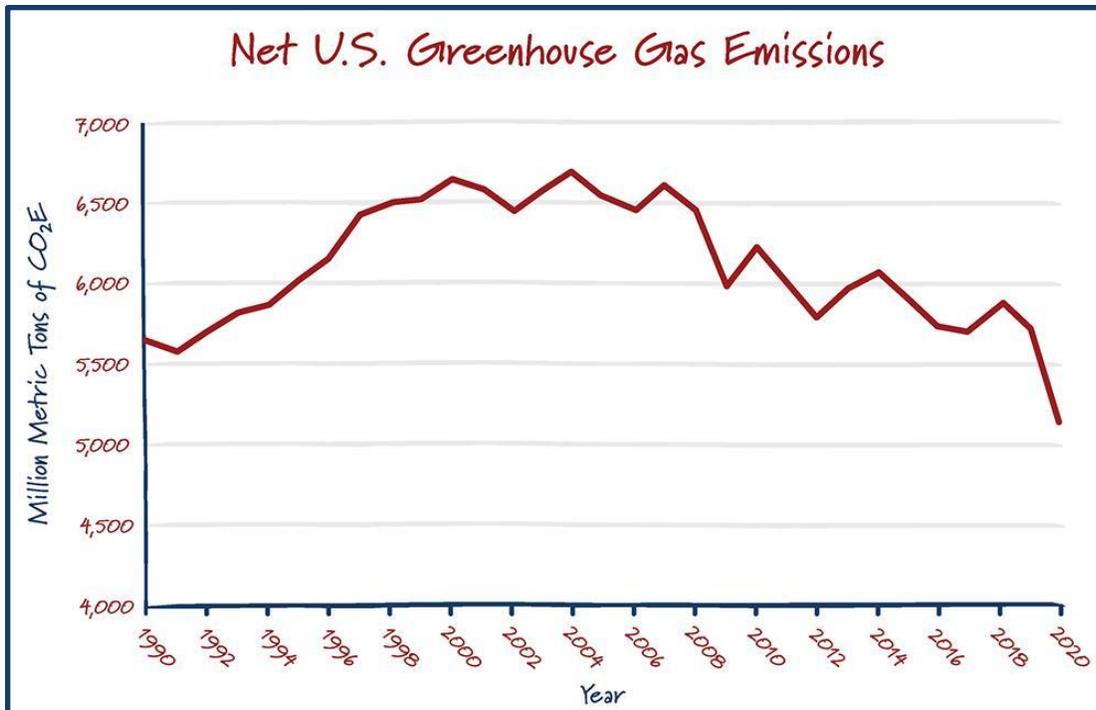


Image source: Rhodium Group ClimateDeck

At the same time, after accounting for inflation, retail electricity prices have been flat for the last decade.⁴ Over the last four years, more manufacturing jobs have come back to America, in part due to America's stable, affordable energy. Returning these manufacturing jobs to the U.S. is also leading to lower emissions because our environmental standards are tougher than in China. The latest numbers for traditional energy and energy efficiency sectors employed approximately 6.8 million Americans⁵, according to the 2020 U.S. Energy & Employment Report. Traditional oil, gas, and nuclear energy jobs are some of the highest paying jobs in the energy sector.

Additionally, more than 12.8 million Americans were employed in the highly energy-dependent and energy-cost sensitive manufacturing sectors in early 2020.⁶ This includes about 350,000 Americans employed in primary metals manufacturing, including iron and steelmaking, and close to 200,000 additional Americans who work in cement and concrete manufacturing.⁷⁸ Across all sectors of the energy economy, there have been significant job losses due to Covid-19, many of which have not been recovered.

Some of America's largest publicly owned utilities and major corporations are taking action against climate change, both to reduce emissions and to adapt to natural changes. Energy companies must plan for the long term, and the executives who lead these companies take climate threats seriously. America's largest electric utilities, including Georgia-based Southern Company, Minnesota-based Xcel Energy, North Carolina-based Duke Energy, and Michigan-

⁴ [Energy Information Administration, Electricity Data Browser](#)

⁵ [NASEO and EFI, 2020 U.S. Energy & Employment Report](#)

⁶ [BLS, Current Employment Statistics Highlights](#)

⁷ [BLS, Workforce Statistics](#)

⁸ [BLS, Current Employment Statistics - CES \(National\)](#)

based DTE have committed to reaching net-zero emissions by 2050. According to the Smart Electric Power Alliance⁹, 68 percent of all electricity customer accounts in the country are now served by a utility with a significant carbon emissions reduction goal, and 19 of the 48 companies setting goals are for net-zero or carbon-free power by 2050.

Private sector actions lead the change and let markets, not mandates, blaze the path. While encouraging, policymakers too have a role. Enabling and partnering with the private sector on breakthroughs that can address the global nature of the challenge will be at the core of any long-term solution. The utilities making big bold commitments have stated publicly that many of the 24/7 clean technologies required to get them to net-zero emissions -- while maintaining affordability and reliability -- are not yet commercially available.

Xcel Energy, whose territory extends across some of the windiest and sunniest regions of the country, has one of the most ambitious climate goals in the industry of 80 percent clean by 2030 and 100 percent clean by 2050. They have said that, even with their first rate access to wind and sun, existing technology is sufficient to reach only 80 percent clean, but not 100 percent clean:

“renewable generation and storage alone face significant technical and economic challenges if relied on exclusively to achieve carbon-free electricity. For example, the relatively short duration energy storage available today and anticipated in the future does not address seasonal challenges that arise when a system dependent on renewable resources experiences several days or weeks with low wind or solar generation. Even with continually declining prices, variable wind and solar resources are expected to provide diminishing value at high saturations. Fully relying on renewable sources could result in a costly overbuilding of the system where each incremental megawatt provides less capacity value, renewable curtailments reach high levels and massive investments in transmission and storage are required.

We need a suite of new, carbon-free resources that can be dispatched to complement our continued adoption of renewable energy, energy efficiency and demand response. Our research shows that these new resources will be the key to achieving a carbon-free generation fleet without a costly overbuilding of the energy grid...These technologies may include carbon capture and storage, power to gas, seasonal energy storage, advanced nuclear or small modular reactors, deep rock geothermal and others not yet imagined.”¹⁰

Every clean technology tool in the toolbox will be needed to meet economic development and environmental objectives. If utilities believe they have the technologies and tools to eliminate 50 to 80 percent of emissions, dependent on their region of the country, we need to ensure that we have policies to enable technologies that can eliminate the final 20-50 percent of power sector emissions – which represents more than 400 million metric tons per year. Yet only two of 14 critical power sector technologies are on track to deploy at the proper rate to reduce emissions on

⁹ [Smart Electric Power Alliance, Utilities' path to a carbon-free energy system by 2050](#)

¹⁰ [Xcel Energy, Building a Carbon-Free Future](#)

time, according to the International Energy Agency (IEA).¹¹ Requiring further emissions reductions before those technologies are ready poses significant risks to the reliability and affordability of our energy system, and to the millions of workers whose jobs rely on that energy supply.

But, thanks to your leadership, we are on the right path. In the last three Congresses, you increased Energy R&D investments more than 50 percent, significantly expanded the 45Q tax credit for carbon capture in 2018, and passed the monumental Energy Act of 2020 with moonshot R&D programs and longer-term extensions of deployment incentives.

Policy Agenda to Enable an Even Cleaner Power Sector

As noted above, we have observed a strong trend of corporate voluntary commitments to decarbonize and an accompanying call for innovation, permitting reform, and early deployment incentives to enable those commitments while maintaining affordability and reliability. We recommend that policymakers answer these calls, and work with industry, not against them.

Effective policies to make clean energy cheaper include both pushes and pulls – they invest in basic and applied R&D, demonstrate technologies in public private partnerships, and accelerate early deployment. This early deployment enables the all-important “learning by doing,” which has driven the huge cost declines in natural gas, wind, and solar, leading to more affordable energy for consumers. Financing policy is a critical component of that learning by doing.

A. Clean Energy Innovation

The Energy Act of 2020 is a perfect example of how to find common ground on clean energy solutions. The Energy Act was the most significant energy legislation we have seen in over a decade, and in one bill, you passed moonshot demonstrations for clean energy innovations for natural gas, nuclear energy, carbon capture, energy storage, hydropower, direct air capture, fusion and other technologies.

The Energy Act makes commonsense updates to all areas of research and development policy for the first time in 13 years – a time before the widespread affordable energy abundance that has been provided by hydraulic fracturing and low cost renewable energy. It updates America’s policies on energy efficiency, technology transfer, and grid modernization. It refocuses DOE to meet the most pressing challenges of this decade.

Most importantly, the new law lays the foundation for a comprehensive clean technology commercialization strategy, that focuses the world-class American innovation engine around key technologies the IEA has identified as essential to meeting deep, global decarbonization goals. The legislation establishes aggressive demonstration programs for technologies long in the works like advanced reactors, carbon capture and enhanced geothermal systems. In addition, it

¹¹ [IEA, Tracking Clean Energy Progress](#)

authorizes new programs for innovative technologies such as a carbon dioxide removal X-Prize, the DOE-U.S. Department Of Defense joint long-duration storage initiative, critical minerals supply chain RD&D, the clean industrial technology program, and a milestone-based fusion energy program. These programs will create more U.S. jobs and private sector investments for cutting-edge breakthroughs.

Congratulations on your accomplishments with the Energy Act of 2020 – now, we must look to implementation. The Energy Act authorized an aggressive program of demonstrations on an even more aggressive timeline, more than 20 new technology demonstrations by the mid-2020s. This will require unprecedented execution from DOE over the next several years. Your job in Congress is just beginning with the passage of the law – attention must now be turned to ensuring accountability of the DOE and appropriately investing through the appropriations process so your legislative successes go from letters in law to clean steel in the ground.

B. Build Cleaner Faster

We've all heard The Biden Administration's mission to "Build Back Better," but right now, we can only build new clean energy and reduce CO2 emissions as fast as we can permit new projects. If we are to truly build back better, the mission ought to be ***Build Cleaner Faster***. Speed will be a real priority – all of the analyses about what it will take to transition to a clean energy economy show that we'll need tens of thousands of miles of new pipelines carrying hydrogen and other clean fuels, along with captured carbon dioxide away from power plants and industrial facilities. We'll also need immense new transmission infrastructure to carry electricity around an increasingly electrified country – not to mention needing hundreds of new power plants sited everywhere – enormous wind farms and solar fields, geothermal wells, new nuclear plants and clean fossil plants, and repowered hydro dams. This will be the largest continental construction project in history.

New research¹², which involved 10 Princeton University researchers and eight external collaborators, lays out five pathways for the United States to deeply decarbonize the economy. In all scenarios, the required pace of building new infrastructure is rapid. According to the research, "the United States would need to expand its electricity transmission systems by 60 percent by 2030, and may need to triple it by 2050. The current power grid took 150 years to build. Now, to get to net-zero emissions by 2050, we have to build that amount of transmission again in the next 15 years and then build that much more again in the 15 years after that."

In order to build new clean infrastructure at that scale, we need to permit the projects. Currently, the federal permitting process can take a project as long as five to 10 years to complete and cost millions of dollars. The good news: a number of legislative proposals to modernize the permitting process are being written as we speak. Congressional support in making the permitting process more efficient is essential for two reasons: one, stewardship of taxpayer resources, and two, scaling clean energy rapidly, which also creates jobs. The need to act is

¹² [Princeton University, Big but affordable effort needed for America to reach net-zero emissions by 2050, Princeton study shows](#)

urgent, and the federal permitting process is of concern if we are to meet these ambitious climate goals and spur economic growth. Legislative proposals like the Federal Permitting Reform and Jobs Act by Rep. Kelly Armstrong or the Building U.S. Infrastructure through Limited Delays & Efficient Reviews (BUILDER) Act by Rep. Garret Graves are good places to start.

C. Drive Down Costs

Large scale energy innovation sometimes needs to bring together private and public investment in order to scale up deployment and bring down costs. We have seen this model work for solar, wind, natural gas and other clean energy technologies. For example, Texas entrepreneur George Mitchell figured out how to break up shale rocks to release the natural gas stuck inside. This process, called hydraulic fracturing, initially got off the ground and moved towards commercialization through government-funded R&D and tax credits.

At the end of 2020 and early this year, you hit a policy trifecta for carbon capture: new, aggressive R&D authorizations, a carbon capture tax credit (“45Q”) extension in the Energy Act of 2020, and final Administrative rules on how project developers can properly claim the 45Q credit.

The 45Q tax credit extension will provide some certainty to utilities and other industrial sources and further incentivize the build-out of CCUS projects from 2023 to the end of 2025. The Internal Revenue Service (IRS) also finalized their new rules¹³ implementing the credit just 10 days after Congress passed the extension. According to analyses from the Rhodium Group, a leading research firm, a permanent extension of the 45Q credit, as proposed by Reps. Schweikert and Wenstrup in Leader McCarthy’s carbon sequestration energy package in early 2020, could drive deep emissions reduction in facilities across more than 30 states, and about one-tenth of all U.S. industrial sector-emissions would be economical to capture.

While the 45Q tax incentive is a major victory, we also need a better, long-term structure for helping co-finance big investments and driving down costs. Energy sector innovation and broader efforts to address climate change should resemble the best of the tech start-ups in the U.S.: fast, innovative, exciting and good for consumers. But the complexity of the energy tax code and market can stymie American ingenuity.

Last Congress, a bill sponsored by your colleagues on Ways and Means, Reps. Tom Reed (R-NY) and Jimmy Panetta (D-CA), could be a major missing financing piece of the clean energy innovation puzzle – especially when added to the recent suite of Energy Act of 2020 wins to grow the U.S. innovation engine.

This Energy Sector Innovation Credit, or ESIC, would update the energy portion of the tax code by allowing cutting-edge technologies to gain commercial viability and upend the status quo without distorting the free market. The importance of grid diversity is playing out before our eyes in Texas, and we should ensure all the clean energy tools are available in the toolbox.

¹³ [IRS, 45Q Rules](#)

Without ESIC, these technologies lack the tax incentives needed to draw them into the market in a timely manner as net-zero-by-2050 goals are on the horizon.

To truly solve the global climate challenge, America must also be able to export the proven technologies and create new clean energy markets. Everything Americans are innovating and demonstrating must not only have a niche in our own energy sector, but also apply to countries like Nigeria or Indonesia that are growing exponentially – and consider what U.S. technology best fits their development goals.

To do this, we need to leverage the U.S. trade and development agencies, like the Export-Import Bank of the United States (ExIm) and the U.S. International Development Finance Corporation (DFC). Each of these agencies offer robust financing options for technologies important to the developing world and due to the size of energy projects, almost every major project requires financing backstops from the exporting country. Cementing the mission of clean energy exports and development in these agencies by law will go a long way to building new clean energy markets globally for American products.

ExIm has already taken a step in this direction by introducing its ‘transformational exports program.’ This program focuses on pushing back on China’s Belt and Road Initiative in key sectors including renewable energy. By expanding this program to include all clean energy sources, we can put all clean technologies on the same footing and enable more financing options for key technologies.

Next Challenge: Clean Industrial Innovation

At ClearPath, reducing power-sector emissions has been our primary focus; however, this year, we are excited to add the industrial sector to our portfolio. Combined with the power sector, this expands our scope from tackling a quarter of U.S. carbon emissions to half.

Our mantra in power-sector work has been that the U.S. will not meaningfully reduce emissions without more clean and affordable technologies. This is perhaps even truer in the industrial sector. The U.S. natural gas revolution and its dramatic impact on reducing U.S. emissions demonstrate the immense potential of clean energy abundance. Fortunately, we’re not starting from scratch in industry. A number of clean power technologies can be readily translated to the industrial sector, expanding markets for carbon capture, advanced nuclear for clean heat and more.

At the end of the year, Congress also provided a legislative head start. Tucked inside of the Energy Act of 2020 were measures to phase out industrial super pollutants¹⁴, create clean industrial technology research and demonstration programs¹⁵, and improve permitting processes.

Manufacturing and heavy industry have been America’s backbone since our industrial

¹⁴ [Scientific American, Congress Passes Major Climate Legislation in Year-End Omnibus](#)

¹⁵ [Senate ENR Committee, Murkowski, Manchin, House Colleagues Reach Agreement on Energy Package for Year-End Appropriations Bill](#)

revolution. More than ten million hardworking Americans are employed in these essential sectors, and ensuring those jobs stay in America must remain a priority. Industrial decarbonization cannot undermine U.S. competitiveness.

Even more so than in the power sector, trade-exposed industries will need highly affordable options to decarbonize their operations. Without them, calls for decarbonization are more likely to lead to so-called “leakage” of that manufacturing activity to less environmentally friendly countries abroad. Not only will we lose out on industrial jobs and economic activity, but we may do more harm than good on carbon emissions as the industry abroad has poorer controls or relies on more carbon intensive electricity. Technological breakthroughs are needed to make clean industrial technologies cost-competitive with existing processes.

In fact, to reduce emissions, we should focus on just the opposite approach, not risking that leakage but creating a welcoming business climate here in the U.S. to return manufacturing here where environmental standards are tougher than in China. China is exporting both outdated polluting technology and goods with enormous embedded emissions – neither are in America’s best interest.

Conclusion

A serious debate on climate solutions must include a dose of political and technical realism. Climate change is an urgent problem that must be addressed today, not tomorrow. It’s also imperative for all sides to agree that building cleaner energy in America will rebound our economy from the COVID-19 pandemic, create jobs and have a significant global impact. Indeed, many members of this committee know firsthand that bipartisan cooperation on clean technology policy is not only attainable but essential.

Thank you again for this opportunity, and I look forward to the discussion.