

Testimony of Richard J. Powell
Executive Director, ClearPath Inc.
U.S. House Select Committee on the Climate Crisis
Financing Climate Solutions and Job Creation
Thursday, July 29, 2021

Good morning Chair Castor, Ranking Member Graves and Members of the Select Committee. My name is Rich Powell, and I am the Executive Director of ClearPath.

ClearPath is a 501(c)(3) organization whose mission is to develop and advance policies that accelerate breakthrough innovations that reduce emissions in the energy and industrial sectors. We develop cutting-edge policy solutions on clean energy and industrial innovation, and we collaborate with public and private sector stakeholders on innovations in nuclear energy, carbon capture, hydropower, natural gas, geothermal, energy storage, and heavy industry to enable private-sector deployment of critical technologies. An important note: we are supported by philanthropy, not industry.

Climate change is real and industrial activity around the globe is the dominant contributor to it. I believe the challenge it poses to society merits significant action at every level of government and the private sector.

Lawmakers and businesses across the country are prioritizing investments in climate change mitigation and adaptation. Governor DeSantis of Florida, for example, has signed legislation requiring a master plan for the state to deal with sea level rise and flooding, and established a fund providing up to \$100 million annually for climate resiliency projects.¹ Meanwhile, Louisiana has a \$50 billion coastal master plan for coastal restoration in part due to rising sea levels².

Since 1980, the United States has spent \$1.9 trillion in Disaster Recovery from 290 “billion-dollar events.”³ From 2014 to 2018, the United States has seen an annual average of 13 billion-dollar disasters. If we don’t better prepare – both with smarter investments in adaptation and by mitigating the underlying problem with global clean energy solutions – we will massively deepen deficit spending. Federal incentives for clean energy innovation have already, and should continue to, play a major role in that effort.

As the Committee looks at the role federal incentives play in climate change solutions, I will discuss five key topics today:

- **A portfolio approach to clean energy innovation.** An innovation-first agenda is the best way to solve the global climate challenge by scaling up clean energy technology so the developing world chooses clean energy as an affordable option.

¹ <https://abcnews.go.com/Politics/wireStory/legislation-fight-sea-level-rise-florida-governor-76954829>

² <https://coastal.la.gov/our-plan/>

³ <https://www.ncdc.noaa.gov/billions/>

- **The 45Q tax incentive for carbon capture.** 45Q was expanded in 2018 through the FUTURE Act, and was extended recently as part of the bipartisan Energy Act of 2020. It will play a huge role in carbon emissions reductions in the U.S., private sector investment, job creation and deployment across the United States.
- **Enhancing 45Q.** Republican Leader Kevin McCarthy (R-CA) recently launched a clean energy innovation agenda, which among other climate solutions, included legislation to make the 45Q incentive permanent, increase the credit values, extend the payout term, and expand the credit to a larger pool of projects. The National Petroleum Council has found that a carbon capture incentive at roughly this level could deploy carbon capture technology at scale and incentivize an additional 350 to 400 million tonnes per year of capacity, bringing the total U.S. capacity to ~500 million tonnes per year.⁴
- **The Energy Sector Innovation Credit (ESIC).** Beyond carbon capture, conservatives in the House and Senate are leading with broader bipartisan efforts on clean energy incentives which 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.
- **Building on the strong bipartisan clean energy innovation record.** The last several Congresses have enacted record investments and authorizations to spur on clean energy innovation.

An American Innovation-Focused Approach to Solving the Global Climate Challenge

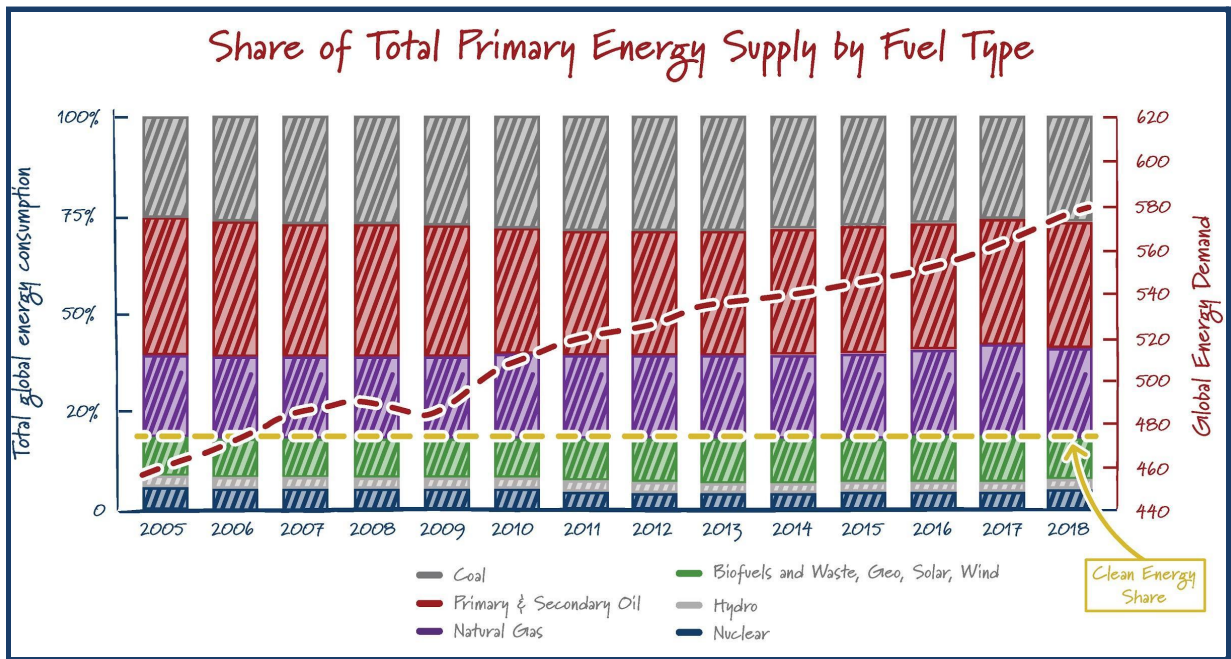
While the U.S. and a few other leaders have reversed our emissions trajectories, much of the rest of the world is growing their emissions as they grow their populations, industries, and quality of life.

The United States can truly lead on reducing global emissions. But, there is no tax or domestic regulation that will magically halt emissions around the world. We must focus on strengthening the American economy — not ceding ground to China or Russia.

That's why it is important that U.S. energy policy synchronizes with the global nature of the climate challenge. Reducing American emissions is essential, and we have seen a significant decline already. Since U.S. emissions peaked in 2005, power sector emissions have fallen by roughly 40 percent as of 2020, largely due to the abundance of cleaner natural gas and resulting coal to gas power switching, as well as an increase in renewables. But, even if the U.S. somehow eliminated all of its carbon emissions tomorrow, just the growth in carbon emissions from today through 2050 by developing Asian countries (e.g., China, India, and other Eastern Asian nations) would exceed total U.S. emissions today. Going forward, we expect power sector emissions in the United States to flatline if natural gas prices remain low, and more action is required to ensure emissions continue to decrease here at home.

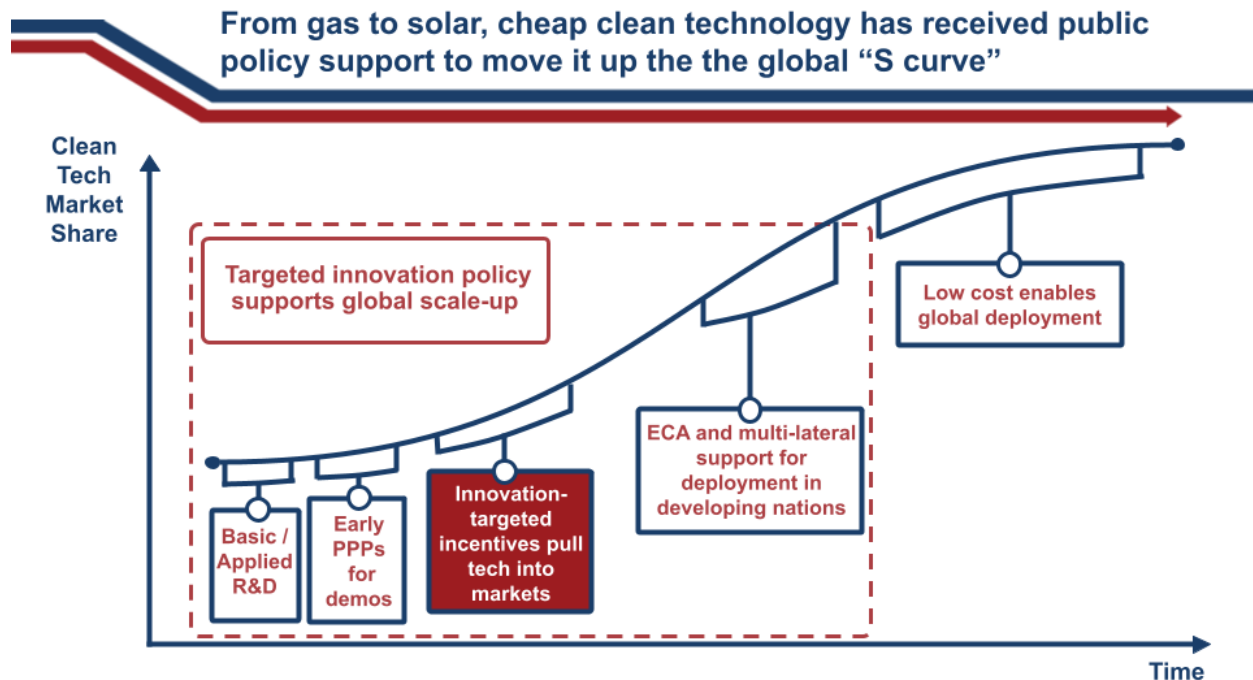
⁴ <https://dualchallenge.npc.org/>

However, clean technology available today is simply not up to the task of global economy-wide decarbonization. As the chart below indicates, the global supply of clean energy has remained stagnant since 2005. We need to focus on breakthrough technologies that offer both better performance and lower costs than the traditional emitting technologies in the market today – only then should we expect to truly change this trajectory.



China's Belt and Road Initiative, their commitment to global infrastructure finance and development to tie together a huge swath of the developing world, is currently hugely outpacing all U.S. export credit and development finance activity. Among many other things, including clean energy technologies, China continues to finance new sub-critical coal plants -- an outdated, extremely high emitting, but very cheap, coal technology -- around the developing world.

There is hope for the United States to truly change the trajectory of global emissions and remain an energy leader. If Congress leads with an innovation-focused agenda, we can guide basic and applied R&D for clean energy innovation through to commercialization. America will lead in creating jobs in new industries, reestablishing America's global energy technology leadership, and driving down global emissions by creating clean energy options that are affordable to rapidly growing nations. To do all of this, we will first need to drive down the cost of clean energy. Smart, targeted tax incentives policy has a proven record on early deployment of technologies, bringing them down the learning curve on cost and up the S curve of global adoption.



A Carbon Capture Credit with Huge Returns

Carbon capture remains one of the most promising clean energy technologies, gaining recognition for its potential to improve the environmental footprint of heavy industrial processes and eventually draw back down atmospheric CO₂. The International Energy Agency has stated that carbon capture and storage is:

- Essential to achieving net-zero emissions as it tackles emissions from existing energy infrastructure,
- A solution for some of the most hard to decarbonize sectors, and
- An opportunity to directly remove carbon from the atmosphere.⁵

The federal carbon capture tax credit (affectionately known as “45Q”) has such broad support in Congress as well as energy stakeholders because it brings robust energy security, skilled labor and environmental benefits. The 45Q tax credit is viewed as the single most useful tool in spurring the development of carbon capture, utilization, and storage projects. Most recently, a two-year extension of 45Q was passed as part of the Energy Act of 2020. Developers now have until the end of 2025 to commence construction on projects to be eligible for the credit.

Carbon capture projects are often billion-dollar investments that require long-term certainty to pencil out and attract investment. Recent modeling from the Rhodium Group, a leading research firm, determined that this extension could enable an additional 53 to 113 million tons of capture

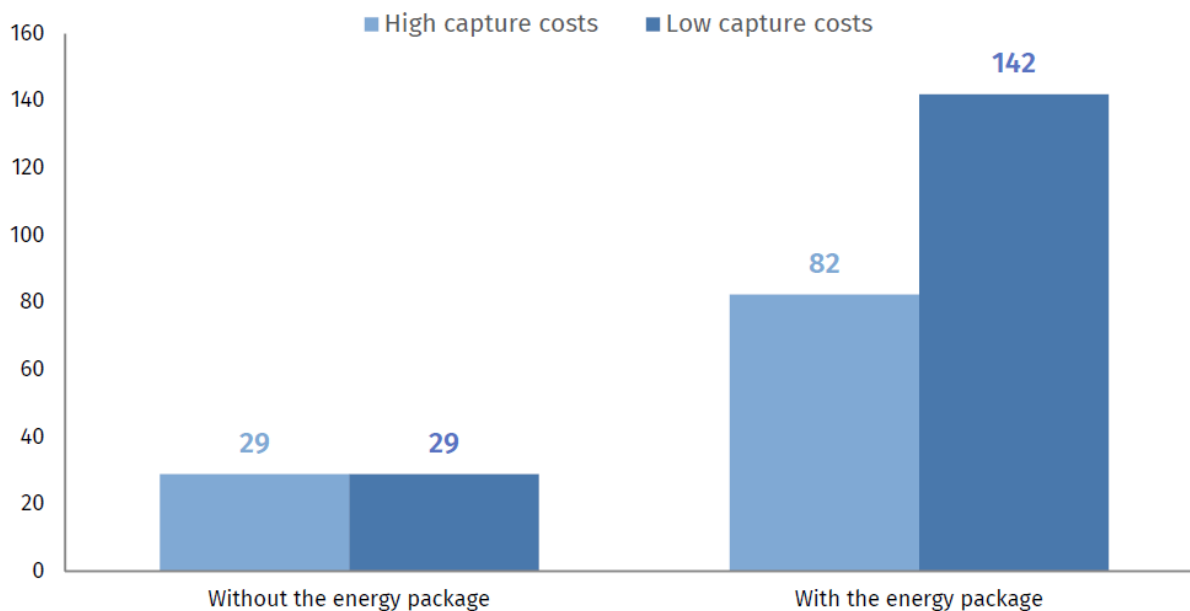
⁵

https://iea.blob.core.windows.net/assets/181b48b4-323f-454d-96fb-0bb1889d96a9/CCUS_in_clean_energy_transitions.pdf

capacity that would not have happened if not for this legislation⁶. That is a significant impact as the U.S. captures only 25 million tonnes per year currently.

Industrial carbon capture deployment through 2031

Cumulative million tons of capture capacity



Industrial carbon capture deployment through 2031⁷

Expanding and extending the 45Q credit is an idea that has been led by Republicans, and is now gaining bipartisan appeal due to the potential benefits. While the existing 45Q credit is expected to have a significant impact at reducing emissions from certain industrial facilities, additional value is needed to motivate carbon capture at scale. Currently, there are a variety of proposals, many of them bipartisan, that have been introduced to do just that. These proposals address a number of issues, that if implemented, could enable widespread deployment of carbon capture:

- A higher credit level would help make carbon capture relevant to a wider portfolio of emissions sources, help cover costs associated with transportation and storage infrastructure, and incentivize carbon capture at scale. According to the National Petroleum Council's 2019 report entitled Meeting the Dual Challenge: A Roadmap to At-Scale Deployment of Carbon Capture, Use, and Storage, extending and expanding current policies to achieve a combined level of ~\$90/tonne could incentivize an additional 75 to 85 million tonnes per year of capture capacity, bringing the total U.S. capacity to ~150 million tonnes per year. And to achieve carbon capture deployment at scale, policies that support financial incentives of ~\$110/tonne are needed and could

⁶ <https://rhg.com/research/climate-progress-in-the-year-end-stimulus/>

⁷ Ibid

enable an additional 350 to 400 million tonnes per year of capacity, bringing the total U.S. capacity to ~500 million tonnes per year.⁸

- Increasing the maximum credit payment period from 12 years to 20 years would better align the incentive with the expected lifetime of facilities and improve certainty for project developers.
- Reducing or eliminating the minimum capture eligibility thresholds would remove the arbitrary requirements limiting the pool of potential capture sources and enable smaller capture technologies to claim the credit.
- Implementing a direct pay elective would enable the pool of investors to increase since the ability to claim the credit would not be restricted to those who have a tax liability.
- Extending the date for projects to begin construction would provide project developers much-needed security that projects can meet the deadline to claim the credit, as well as enable even more projects to be developed within this timeframe.

A permanent extension (effectively a removal of the commence construction date, aligned with a bill introduced by Representatives Schweikert, Wenstrup, and Miller in April 2021 as part of Leader McCarthy's energy and climate package) generated gigatons of emissions reductions and new investments in both the power and industrial sectors.

Here are five key points from their analysis:⁹

- Up to 157,000 job-years by 2035. Deployment could encourage new construction and operations jobs at existing manufacturing facilities and new power plants.
- Up to 52 GW of power sector carbon capture deployment by 2050. The 45Q credit could incentivize the build out of ultra-efficient fossil power plants with carbon capture, more than half the size of our current U.S. nuclear fleet. For a sense of scale, that'd be more than 170 zero-emission NET Power Allam cycle natural gas plants.
- Deployment in 30+ states¹⁰. The 45Q credit could facilitate new carbon capture projects in a host of new states. For reference, a plant that captures 0.1 million metric tons is a large facility by the Global CCS Institute's standards and is eligible for claiming the credit.
- Up to 4 gigatons of emission reductions by 2050 collectively from the power and industrial sectors. That's equivalent to the emissions produced by 29 million cars for 30 years, or more than all the emissions produced from all U.S. coal and natural gas power plants produced over the last two years.
- \$42 per MWh. Advanced carbon capture is cost-competitive with many other clean energy sources in the power sector. Unlike variable renewable energy sources, it also

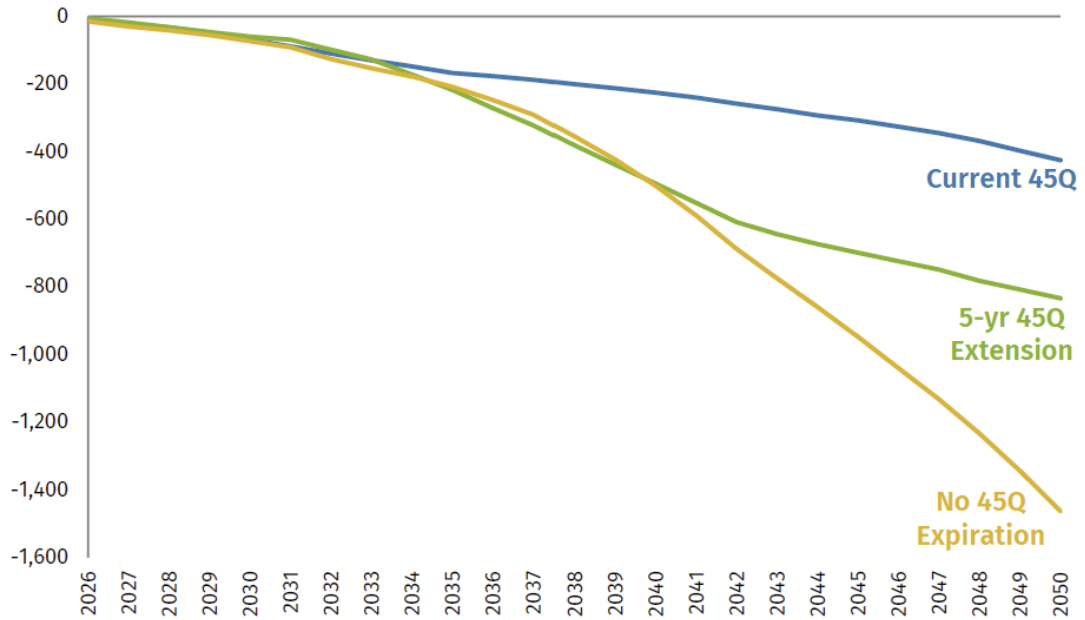
⁸ <https://dualchallenge.npc.org/>

⁹ <https://rhg.com/research/opportunities-for-advancing-electric-power-sector-carbon-capture/>

¹⁰ <https://rhg.com/research/industrial-carbon-capture/>

does not require additional batteries or other investments to provide around-the-clock electricity.

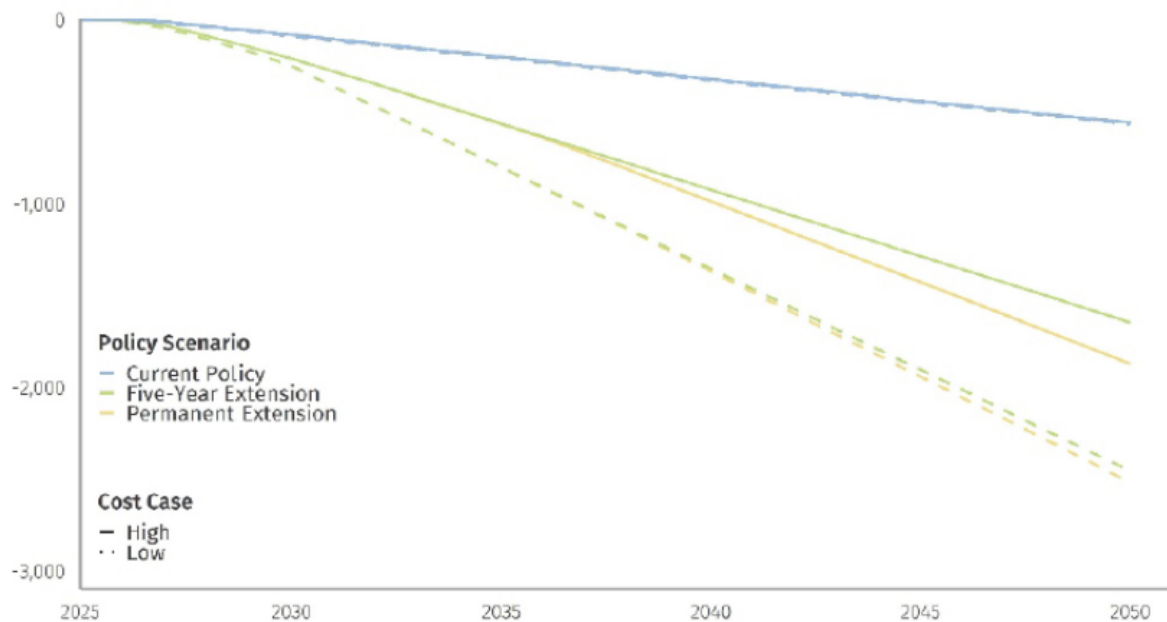
FIGURE 4
Net cumulative avoided CO₂ emissions in low technology cost cases, 2025-2050
Million metric tons of CO₂ avoided



Source: Rhodium Group analysis

Note: Figure 4 only shows the power sector net cumulative avoided CO₂ emissions.

FIGURE 6
Net cumulative avoided industrial CO₂ emissions with a 45Q credit, 2025-2050
 Million metric tons of CO₂ avoided



Source: Rhodium Group analysis

Note: Figure 6 only shows the industrial sector net cumulative avoided CO₂ emissions.

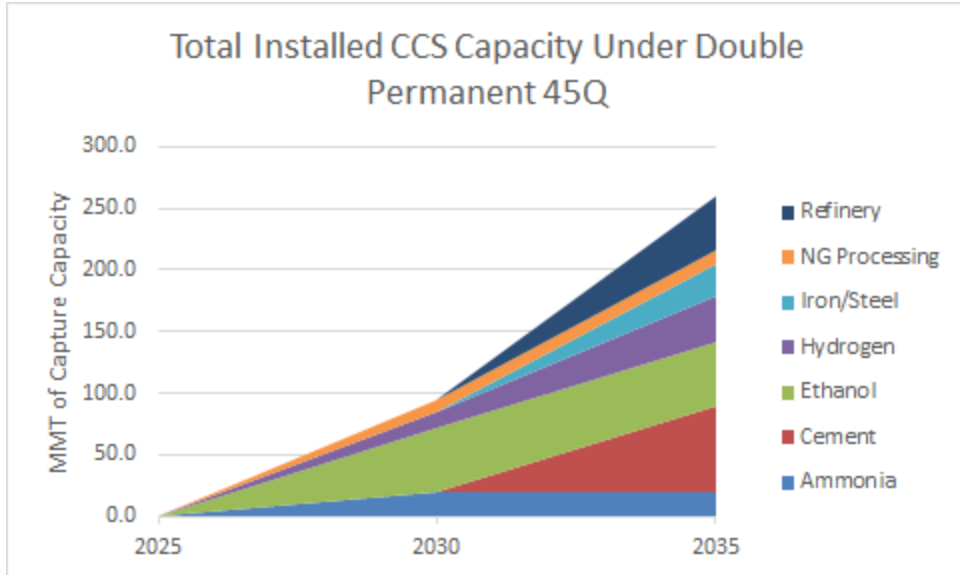
One reason 45Q is so effective: it can incentivize emissions reductions in both the power sector and the industrial sector, such as heavy industrial processes like cement and chemicals manufacturing, and the transportation fuel sectors – unlike renewable energy tax credits.

Expected deployment could catalyze emissions reductions totalling more than one-tenth of all U.S. industrial sector emissions.

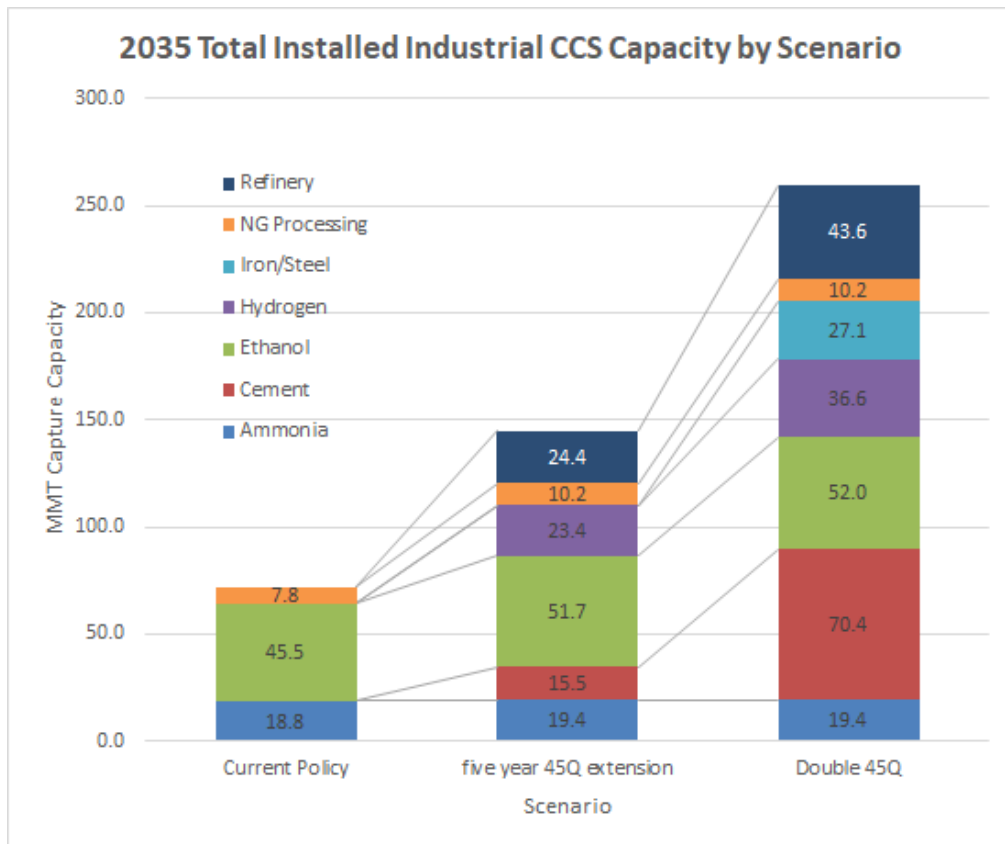
Support for carbon capture is diverse. Many states have recently implemented enabling carbon capture policies — from Wyoming to California. A recent National Petroleum Council carbon capture report – led by companies like Shell, Valero, and Southern Company – highlighted the 45Q extension as one of its top policy recommendations.¹¹

Carbon capture technology is on the cusp of a step change. And as you can see from the Rhodium analyses — building on 45Q can help make that goal a reality.

¹¹ <https://dualchallenge.npc.org/>



U.S. industrial carbon capture deployment through 2035 under a permanent, doubled 45Q by sector¹²



U.S. industrial carbon capture deployment through 2035 by sector under three different 45Q scenarios¹³

¹² Rhodium Group modeling commissioned by ClearPath

¹³ Ibid

Energy Sector Innovation Credit (ESIC) is a Game Changer

This week, Members of the U.S. House Ways and Means Committee, including Reps. Tom Reed (R-NY), Jimmy Panetta (D-CA), David Schweikert (R-AZ), Josh Gottheimer (D-NY), Darin LaHood (R-IL), and Tom Suozzi (D-NY) are expected to introduce the Energy Sector Innovation Credit (ESIC) Act, a bipartisan energy tax proposal to encourage innovation in the clean energy sector. A companion bill in the U.S. Senate is also expected to be introduced by Finance Committee Ranking Member Mike Crapo (R-ID) and Finance Committee member Sheldon Whitehouse (D-RI), among others.

The bipartisan Energy Sector Innovation Credit creates incentives for breakthrough innovation for power generation and storage technologies across the clean energy spectrum – a game-changing market signal for private sector innovators.

ESIC is motivated by the need to rapidly scale and diversify American clean energy technologies through innovation as a means to achieve long-term emissions targets, create jobs, and provide safe and reliable energy. The credit is designed to help nascent technologies overcome the incumbency advantages of established technologies, including suboptimal resource location relative to existing grid infrastructure, lack of economies of scale, and the absence of existing constituencies.

The bill would establish a production incentive system for promising new power sector clean energy technologies needed to tackle climate change. For each breakthrough technology, the incentive automatically ramps down as individual technologies scale up in the commercial marketplace, not an arbitrary date like traditional energy credits. This credit could incentivize gigawatts of new clean energy generation needed to accelerate the U.S. power grid towards deep emissions reductions, including advanced nuclear, carbon capture, enhanced geothermal systems, offshore wind, long-duration storage and next-generation solar energy.

By making the credit proportional to how much a project earns from market sales, the credit eliminates the unintended ‘negative pricing’ distortions other credits have had on power markets.

The policy also would bolster the initial deployment of industrial carbon capture and direct air capture technologies, identified as an essential piece of the net-zero strategy of multiple U.S. utilities and corporate entities like Xcel Energy, U.S. Steel and Microsoft.

Strong Bipartisan Clean Energy Record

Finally, I cannot underscore this enough, partisan only climate policy is not sustainable. It results in short-term uncertainty and does not provide the market signals we need to move to a clean energy economy. We must work to have sustainable climate policy that includes the buy-in from both political parties in congress.

In addition to the bipartisan authorizations in the Energy Act of 2020, the most recent FY20 & 21 appropriations bills are great successes to build on. They included critical programmatic direction and eagle-eyed investments in enhanced geothermal, advanced nuclear, carbon capture, grid-scale storage and other clean energy technologies included.

If you pair bipartisan efforts like the Energy Act of 2020 with incentive policy, like 45Q and ESIC, Congress will send an undeniable message that lawmakers are serious about keeping the U.S. in the top tier of countries pursuing clean and reliable energy breakthroughs.

Again, we must think globally when approaching this challenge. Partisan regulations will not pass the political sustainability test needed for climate solutions. Likewise, halting pipelines or placing moratoriums on oil and gas drilling on federal lands also has little to no impact on actual carbon dioxide emissions reductions in the U.S., let alone the rest of the world – particularly if we are simultaneously pushing OPEC+ for expanded oil and gas production globally. And none of that will make us more competitive with China. We agree, the cost of inaction on climate is high, and finding bipartisan common ground on clean energy innovation policy is priceless.

Thank you again for the opportunity to provide remarks. ClearPath is eager to assist the Select Committee in developing policies that help innovation reach the market place in the service of a stable global climate.