



## **Carbon Capture, Utilization, and Storage: Incentives**

The Texas energy industry faces a significant challenge today. The oil and gas industry is being asked to continue to provide reliable energy for an increasing population as well as for developing and emerging economies who strive to lift themselves out of 'energy poverty', while simultaneously meeting growing calls to reduce carbon emissions and address climate change. The pressure from financial institutions, in concert with federal regulatory agencies, means that the state must incentivize large-scale deployment of carbon capture technology.

It is a recognized fact that energy demand has and will continue to grow. Specifically, the U.S. Energy Information Administration (EIA) projects a close to 50% increase in world energy use by 2050.<sup>1</sup> The EIA projects that total volumes of fossil fuels consumed in the United States will increase by 10% between now and 2050 and that 74% of America's energy will still come from fossil fuels in 2050. Further, the EIA projects that by 2050 fossil fuels will still supply 69% of the world's energy. As demand for fossil fuel energy continues to rise around the world, well-funded groups, financial institutions and regulatory agencies are making significant efforts to drastically reduce or even eliminate fossil fuels in an attempt to solve the carbon emissions issue. The result of such a course of action would undermine efforts to expand energy supply, increase energy poverty and make the current energy shortages around the world look miniscule in comparison.

The fossil fuels industry is faced with the dual problems of meeting increasing fossil fuels energy demand while also dealing with increased market - and - regulatory pressure to reduce greenhouse gas emissions. To address these problems, new technology and innovation is being advanced in the industry. One of these processes, Carbon Capture, Utilization, and Storage (CCUS) has been billed as part of a viable solution to achieve carbon neutrality without undermining the advancements of mankind's quality of life to which the abundance and use of fossil fuels have dramatically contributed over the last 150 years. However, CCUS is a costly and complex process. For Texas to take advantage of the opportunity CCUS provides, Texas has a unique opportunity to achieve – continued robust production of energy, but with lowered carbon emissions – with the addition of critical incentives.

### **What is "CCUS"?**

Carbon Capture, Utilization, and Storage ("CCUS") is the process of capturing carbon dioxide emissions produced from industrial sources to be used to increase hydrocarbon recovery, utilized for various industrial applications, or to be stored underground. Dedicated carbon storage is possible through the process of deep injection into secure geological formations, some of which may be depleted crude oil and/or natural gas reservoirs, brine-



filled aquifers or mineralized basalt formations.<sup>ii</sup> Many projects in the United States and around the world have been developed, as industry has seen CCUS as a way to reduce emissions while increasing production to meet demand.

### **The Opportunity for Texas**

For CCUS, the existence of reservoirs and available pore space in Texas play a key role in their feasibility. Columbia University’s Center on Global Energy Policy released a case study<sup>1</sup> on possible industry efforts to achieve significant CO<sub>2</sub> reduction and removal. The study focuses on the idea of “net-zero industrial hubs” as a pathway to reducing emissions, focusing on Texas’ potential, particularly regarding storing carbon when it comes to CCUS:

Texas is also home to an important natural resource required for a net-zero industrial hub: subsurface pore volume for CO<sub>2</sub> storage. The combined onshore and offshore saline formation capacity along the Gulf Coast alone is estimated above 1 trillion tons capacity—more than 10,000 times the annual emissions of Houston—and the Gulf of Mexico pore-volume storage resources is the largest in the United States.<sup>iii</sup>

Due to its storage resources available, and current infrastructure already in place, Texas stands to play a significant role in the development and advancement of CCUS.

### **Possible Incentives**

Because CCUS is complex and still emerging as an industry, it requires significant integration across technical and legal disciplines as well as large capital investment for companies during the development, construction and operation phases. Costs for CCUS projects are estimated to cost approximately \$400 million per 1 million tons per annum, captured and stored, divided among the cost of capture, transportation, and storage. This significant cost requires some type of financial incentive for companies looking to enter the CCUS industry, particularly as the regulatory, legal, and economic frameworks are still being developed or need clarification both on a federal and state level. A GAO report on CCUS from December 2021 cites several barriers to CCUS development on the economic level, including viability risks of the host industrial emission point source, volatility in the fossil fuel commodities market, high expected project costs, and uncertainty within carbon markets and tax incentives, making it difficult to estimate economic viability.<sup>iv</sup>

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<sup>i</sup> <https://www.energypolicy.columbia.edu/research/publication/industrial-hubs>



In the International Energy Agency (IEA)'s report<sup>2</sup> on CCUS in Clean Energy Transitions, the agency notes that several policy developments will be necessary to support this new industry:

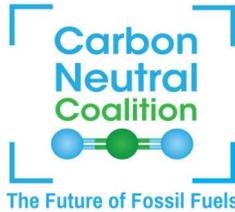
A range of policy instruments are at policy makers' disposal to support the establishment of a market for CCUS and address the investment challenges. In practice, a mix of measures is likely to be needed. These measures include direct capital grants, tax credits, carbon pricing mechanisms, operational subsidies, regulatory requirements and public procurement of low-carbon products from CCUS-equipped plants. Continuous support for innovation is also needed to drive down costs, and develop and commercialize new technologies.<sup>v</sup>

Establishing sufficient incentives, on a federal and state level, could provide not only financial support but also certainty in pursuing new CCUS projects. CCUS is equivalent to making existing industrial activities carbon-free, whether for electric power, transportation fuels, petrochemicals, fertilizers, ammonia, methanol, and hydrogen. These existing sectors are large employers, particularly with well-educated, technical workforces in both the corporate and field levels.

### **Federal Incentives**

At the federal level, the tax credit for carbon dioxide sequestration (referred to by its Internal Revenue Code section, "45Q") is a credit based on metric tons of carbon captured and sequestered when that carbon would have otherwise been released into the atmosphere. The captured carbon must be disposed of in "secure geological storage" to be credited.<sup>vi</sup> The credit has been expanded several times since its passage and remains a major incentive on the federal level for carbon capture projects.

Recent federal legislation increasing incentives will make an impact on CCUS funding but will not completely close the gap for companies seeking to enter the new industry. New federal regulation increases the 45Q credit to \$85 per ton from \$50 per ton for captured and stored carbon, \$60 per ton for beneficial use of captured carbon emissions, and \$60 per ton for carbon stored in oil and gas fields.<sup>vii</sup> The bill also increases credits for direct air capture projects, from \$50 per ton of carbon captured to \$180 per ton for carbon stored in geological formations, \$130 per ton for utilization projects, and \$130 per ton for storage in oil and gas fields. However, the cost of the technology, compounded with current inflation rates that will significantly impact the installed costs of CCUS infrastructure, make the current 45Q levels inadequate to encourage many companies to engage in new CCUS projects.<sup>viii</sup> Accordingly,



industry seeking to adapt and deploy CCUS technologies should be able to turn to state-level programs to supplement and induce CCUS projects.

## **State Incentives**

### **1. Tax Credit for Clean Energy**

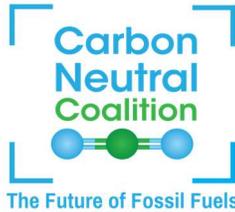
The Legislature created a tax credit for clean energy projects in 2013, aimed at coal projects. Though now expired, the statute provides a good framework to build upon for the clean energy project that is CCUS. The statute provided a tax credit equal to the lesser of 10% of capital costs of the projects or \$100 million, and was limited to three projects, to be carried forward for no more than 20 consecutive years. The statute had a requirement that the project must sequester at least 70% of the carbon dioxide resulting from the project. In recent CCUS projects, the capture rate can vary depending on the type of CO<sub>2</sub> facility, from 60% up to 85%. With input from industry, designating a required capture rate could work to limit the amount of eligible projects or applying categories of required capture rates with different levels of incentives, would help in capping the financial expense to the state while still supporting major CCUS projects.

### **2. “Prop 2” Pollution Control**

Another potential for tax relief falls under the Tax Relief for Pollution Control Property Program, called “Prop 2”, which provides tax relief for facilities using certain property or equipment for pollution control. The TCEQ program offers tax relief for pollution control property or facilities that are used to “meet or exceed laws, rules, or regulations adopted by any environmental protection agency of the United States, Texas, or a political subdivision of Texas, for the prevention, monitoring, control, or reduction of air, water, or land pollution.”<sup>xiii</sup>

To receive the tax exemption, applicants must request a use determination by TCEQ. Upon receiving a positive use determination, applicants then apply to their local property tax appraisal district for the property tax exemption.<sup>ix</sup> Currently, statute provides that property used to capture carbon dioxide is eligible for the tax credit but includes a limiting factor that the property is eligible if the Environmental Protection Agency (EPA), permitting authority, or other entity adopts rule or regulation regulating carbon dioxide as a pollutant.<sup>x</sup>

Rather than rely on various regulations subject to change, the state should remove the limiting factor to ensure that CCUS projects are eligible for the credit. Statute should also provide for a minimum amount of property tax relief rather than relying entirely on a determination by local appraisers with the floor increasing depending on the scale of the project. In addition, because the tax exemption is a constitutional provision, a constitutional amendment will also be required in order to amend the tax relief provision. If CCUS is



considered a pollution control project or equipment, Prop 2 could provide another opportunity for tax relief when it comes to the cost of CCUS.

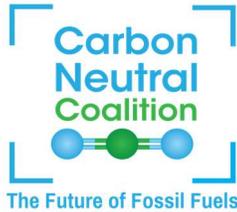
### **3. TERP**

The Texas Emissions Reduction Program (TERP) offers financial incentives to eligible businesses and others for the reduction of emissions from vehicles and equipment. Texas Council on Environmental Quality (TCEQ) administers the program, funded by revenues from fees and surcharges relating to certain off-road equipment and on-road vehicles. TERP is intended to help Texas meet the goals of reduced pollution and improved air quality.

With amendment, CCUS could be considered eligible for several current grant programs in TERP, such as the New Technology Implementation Grant Program (NTIG) or the Emissions Reduction Incentive Grants (ERIG). Under the NTIG Program, there are several categories where CCUS could be applied, and should be included. “Advanced Clean Energy Projects” include projects that involve electricity generation through fuels such as coal or biomass, natural gas and use new technologies to reduce certain emissions from stationary sources. With the inclusion of natural gas in the category and a required reduction of carbon dioxide, a CCUS project should be considered eligible. Eligible projects under the “New Technology – Stationary Sources” category are projects that reduce emissions of regulated pollutants from stationary sources, including pollutants subject to TCEQ permitting. Carbon dioxide, as one of the major greenhouse gases, is currently permitted through TCEQ. Through either a new facility or the retrofit of an already existing facility, CCUS is a new technology that could be applied here and should be specifically included. “New Technology – Oil and Gas Projects” is another area CCUS may be applicable, as it is aimed at reduction of emissions from upstream and midstream oil and gas activities. The Emissions Reduction Incentive Grant Program (ERIG), providing grants for the upgrading or replacing of certain equipment to reduce emissions, may be another avenue for CCUS incentives. Establishing the avenue for TERP funding to apply to CCUS can help TCEQ and the state achieve the goal of reduced emissions while also allowing the state to continue its robust energy production.

### **4. Purchasing Preferences**

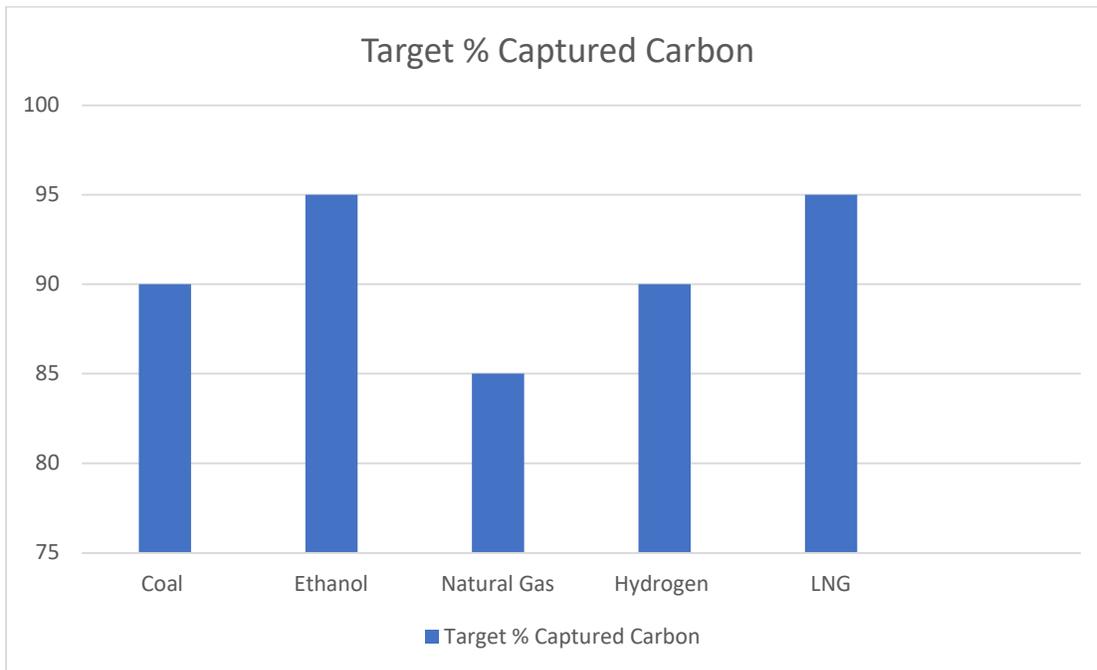
There are several provisions dealing with procurement that might aid in incentivizing the purchase of products developed from captured carbon, or other low carbon processes, like hydrogen. For example, for contracts performed in nonattainment areas, the comptroller and state agencies may give preference to goods or services of a vendor that meets or exceeds environmental standards relating to air quality, when the cost would not exceed 105 percent of the cost of another vendor.<sup>xi</sup> Another provision gives a preference for some recycled, remanufactured, or environmentally sensitive products when certain factors allow, such as price, quantity and quality.<sup>xii</sup> Amending either of these provisions, or creating a new



provision, pertaining to products produced through low carbon efforts, could help incentive the market for low carbon products.

### **Limits on Incentives**

To make CCUS incentives feasible on a state level, limiting factors are necessary, especially as the industry is developing in the state. Various metrics could apply to limit the total funds expended by the state, such as limits based on percentage of carbon captured or the size of the project. Pictured below are estimated target percentages of carbon captured per type of processing plant. As an example, the state could target plants capturing 90%-95% of carbon emitted.



In addition to applying limits based on the size of the project or the amount of carbon captured, projects in non-attainment areas could be a priority. Non-attainment areas are those that do not currently meet National Ambient Air Quality Standards (NAAQS).



## **Incentives Around the Country**

Several other states have created incentives meant to encourage a reduction in carbon emissions, some related directly to CCUS projects, and others related to and encompassing CCUS through enhanced oil recovery projects (EOR). Below is a summary of the tax incentives, bond authority, and eminent domain powers that have been enacted in other states to help support and develop CCUS. While bond amounts in each state are unknown, similar ideas could serve as a framework to be tailored to Texas. Importantly, this white paper does not cover other states' initiatives concerning other elements of CCUS, namely pore space ownership and long-term liability ownership. These topics are summarized by CNC white papers elsewhere, whose conclusions with those offered herein are intended to advocate for comprehensive policy.

### **1. Illinois**

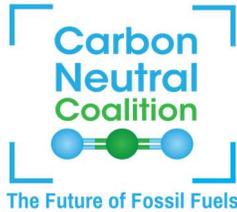
In 2007, Illinois authorized the Illinois Finance Authority to issue bonds to finance the development and construction of coal-fired plants with carbon capture projects. Utilities in the state were also authorized to charge a fee to customers for deposit to the Renewable Energy Resources Trust Fund and Coal Technology Development Assistance Fund. Per the statute, the funds are to support the capture of emissions from coal-fired plants and the development of further capture and sequestration of carbon emissions.

### **2. California**

California has a broad system regulating emissions, which incentivize CCUS projects as means in which to meet benchmark emissions standards in the state. California also provides an enhanced oil recovery tax credit that is similar to the federal enhanced oil recovery credit. In California, the credit is equal to 5 percent of the qualified enhanced oil recovery costs for qualified oil recovery projects within the state. However, this credit does not apply to taxpayers that are retailers of oil or natural gas or refiners of crude oil if daily refinery output exceeds 50,000 barrels.

### **3. Kansas**

Kansas allows a five-year exemption from property taxes for property used for carbon dioxide capture, sequestration or utilization, and any electric generation unit used to capture and sequester carbon dioxide emissions. Kansas also allows for accelerated depreciation on CCUS machinery and equipment. There are also deductions from adjusted gross income available, starting with 55 percent of the amortizable cost down to 5 percent in following years for a 10-year period.



#### **4. Louisiana**

Louisiana provides a Sales and Use tax exemption for anthropogenic carbon dioxide used in a tertiary recovery project, once approved by their Office of Conservation in the Department of Natural Resources. The exemption does not specifically require geologic sequestration to qualify. The state also allows a 50 percent reduction on severance tax for the production of crude oil from a tertiary recovery project using anthropogenic carbon dioxide.

#### **5. North Dakota**

North Dakota classifies CO<sub>2</sub> pipelines as common carrier, thereby granting them the right of eminent domain. The state also provides an exemption from their Sales and Use tax, a rate of 5 percent, for all gross receipts from the sale of carbon dioxide used for enhanced recovery of oil or natural gas. Another exemption from the Sales and Use tax is allowed for gross receipts from sales of tangible personal property used to build or expand a system used for carbon dioxide storage, transportation, or for use in enhanced recovery of oil or natural gas. The property must be incorporated into a new system rather than be used to replace an existing system, although there are exceptions for expansion purposes.

North Dakota also provides a property tax exemption for pipelines and related equipment for the transportation or storage of carbon dioxide for use in enhanced recovery or geologic storage, during construction and the following ten years.

An ad valorem tax exemption applies to coal conversion facilities and any carbon dioxide capture system located there, plus any equipment directly used for geologic storage of carbon dioxide or enhanced recovery of oil or natural gas classified as personal property. The exemption does not apply to tangible personal property incorporated as a component part of a carbon dioxide pipeline, but this restriction does not affect eligibility of such a pipeline for the carbon dioxide pipeline exemption.

Finally, carbon dioxide capture credits are available for coal conversion facilities that capture 20 percent of carbon dioxide emissions during a certain period. The owner of such a facility may take from a 20 percent reduction of the North Dakota privilege tax, a tax levied on operators of coal conversion facilities, up to a maximum of a 50 percent reduction when 80 percent or more of carbon dioxide emissions are captured. The tax reduction is available for ten years from the date of the first capture or ten years from the date the facility is eligible for the tax credit. <sup>xiii</sup>

### **Summary**

Texas has the opportunity to lead the way in showing that the fossil fuel industry is ready to continue to provide affordable energy, electricity, and a vast array of products for the



benefit of consumers while still improving our environment through lower carbon emissions. Consumers will continue to need fossil fuels for electricity, fuels, and products, but their production and use can become carbon neutral through CCUS. CCUS can be the answer to meeting government-mandated reductions in emissions, without harming the vital fossil fuel industry.

On both the federal and state level, renewable energy has benefitted from substantial subsidies.<sup>xiv</sup> As Texas has focused on incentivizing wind and solar energy in part to help reduce emissions, a new focus on enabling the oil and gas industry to utilize CCUS to reduce emissions will achieve similar goals, while still affording the state the ability to produce reliable, affordable energy. In addition, Texas' existing workforce will be protected while also new technical jobs will be created. With a dedicated focus, the Texas energy industry stands to be the model toward reliable and secure energy production, and carbon neutrality, through CCUS.

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<sup>i</sup> <https://www.eia.gov/todayinenergy/detail.php?id=41433>

<sup>ii</sup> <https://www.energy.gov/carbon-capture-utilization-storage>

<sup>iii</sup> [Columbia | SIPA Center on Global Energy Policy | Evaluating Net-Zero Industrial Hubs in the United States: A Case Study of Houston](#)

<sup>iv</sup> <https://www.gao.gov/products/gao-22-105111>

<sup>v</sup> <https://www.iea.org/reports/ccus-in-clean-energy-transitions>

<sup>vi</sup> <https://fas.org/sgp/crs/misc/IF11455.pdf>

<sup>vii</sup> <https://www.jdsupra.com/legalnews/key-climate-and-energy-provisions-in-5560526/>

<sup>viii</sup> <https://www.catf.us/2022/06/inflation-creates-new-urgency-for-passage-of-45q-enhancements/#:~:text=In%20the%20most%20recent%20draft,for%20inflation%20beginning%20in%202027.>

<sup>ix</sup> <https://www.tceq.texas.gov/airquality/taxrelief>

<sup>x</sup> Tex. Tax Code § 11.31

<sup>xi</sup> Tex. Govt. Code Tit.10, Ch. 2155.451

<sup>xii</sup> Tex. Govt. Code Tit. 10, Ch. 2155.455

<sup>xiii</sup> [FTI Orrick USEA CCUS Report.pdf](#)

<sup>xiv</sup> <https://www.dsireusa.org/>