

# Proposed Hickory CCS Hub

Economic Development Opportunities in Warren County

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October 17, 2023



# About Tenaska

- ▶ Private, independent energy company founded in 1987
- ▶ Headquartered in Omaha, Nebraska
- ▶ Reputation for developing safe, responsible energy projects (natural gas, wind, solar, battery storage, carbon capture & storage)



**AMONG THE  
LARGEST PRIVATE  
U.S. COMPANIES**

(Forbes)



**22,002 MW**

Generation Developed,  
Managed, And/Or Operated  
By Tenaska Since 1987

# Tenaska & Indiana

## We're invested in Indiana

### Solar Energy

- ▶ Has or is advancing 8 solar energy projects currently in mid- to late-stage development
- ▶ Based on economic estimates, this represents more than \$3 billion of investment

### Battery Storage

- ▶ Advancing 2 battery storage projects currently in early to mid-stage development

### Natural Gas/Electric Marketing

- ▶ Exclusive natural gas fuel supplier to over 1,500 MW of electric generation in Indiana
- ▶ Managing a variety of renewable, thermal generation and load resources for commercial and industrial customers, electric cooperatives, independent power producers and municipal electric utilities in Indiana

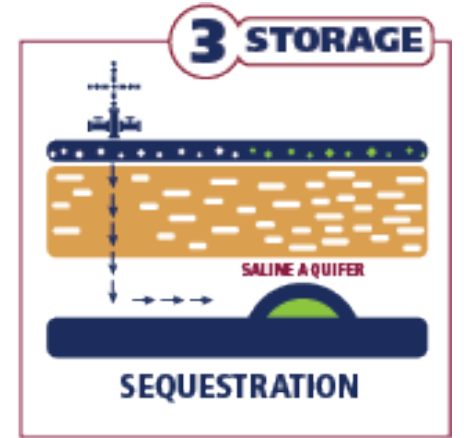
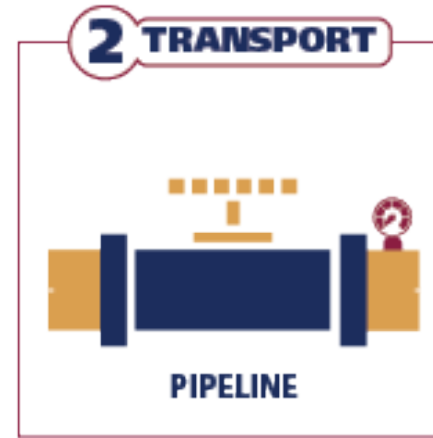
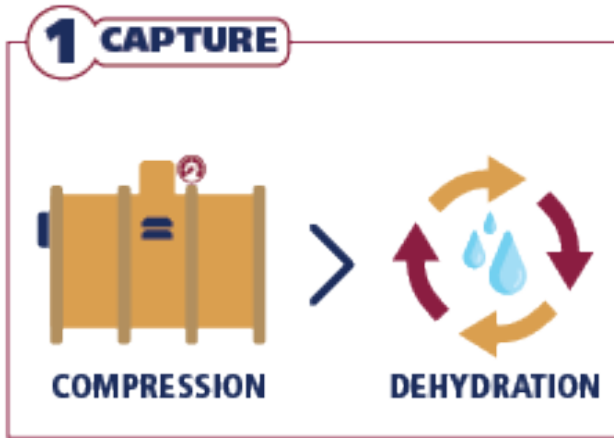
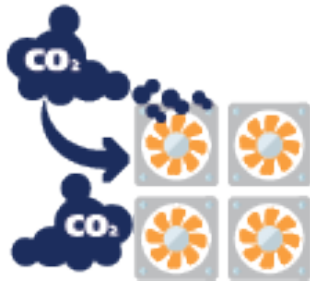
## What Are We Proposing?

- ▶ Tenaska is considering the development of a Carbon Capture and Storage project – called Hickory CCS Hub – that could store carbon dioxide (CO<sub>2</sub>) from manufacturers, industrial producers and generating facilities in the region
- ▶ This CO<sub>2</sub> would be captured and transported to geologically secure storage locations deep underground in Warren County



**HICKORY  
CCS HUB**

# The CCS Process



## CO<sub>2</sub>

CO<sub>2</sub> is produced as a byproduct of the manufacturing process.

## CAPTURE

CO<sub>2</sub> is captured, dehydrated, and compressed into a liquid.

## TRANSPORTATION

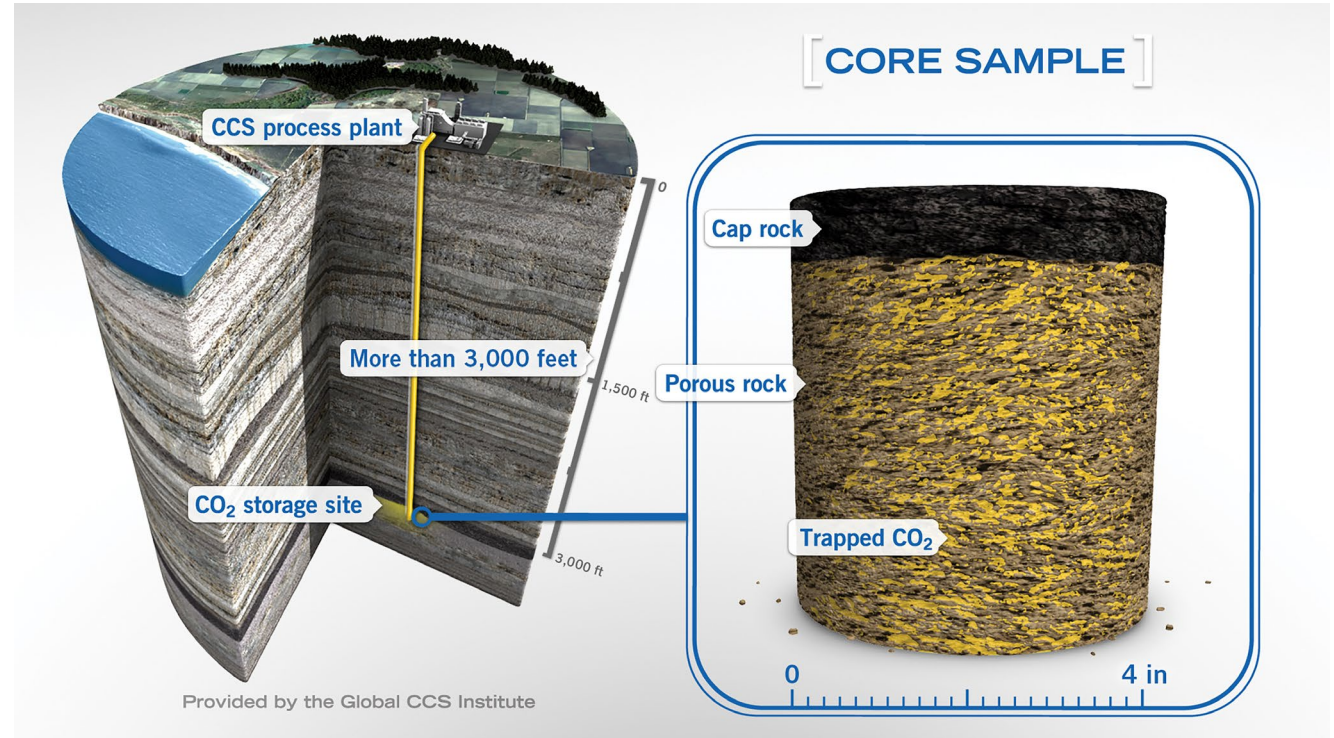
Liquid CO<sub>2</sub> is gathered from each connected facility and transported in a steel pipeline to the sequestration site.

## SEQUESTRATION

CO<sub>2</sub> is injected more than a mile below the ground, far below water resources used by communities and farms, for permanent storage.

# Geologic Storage (Sequestration)

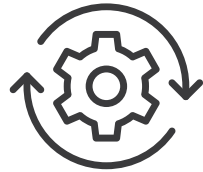
- ▶ Proven technology that has been in use for over 45 years
- ▶ One of the safest, cleanest and most efficient ways to prevent CO<sub>2</sub> emissions from going into the atmosphere
- ▶ Responsibly stored and monitored about 1 mile below surface



# Proven Technology



- ▶ CCS projects have been in operation around the world since the mid-1990s



- ▶ 30 CCS projects in operation today



- ▶ 5,000 miles of active CO<sub>2</sub> pipelines across the U.S., safely moving 68 million tonnes per year



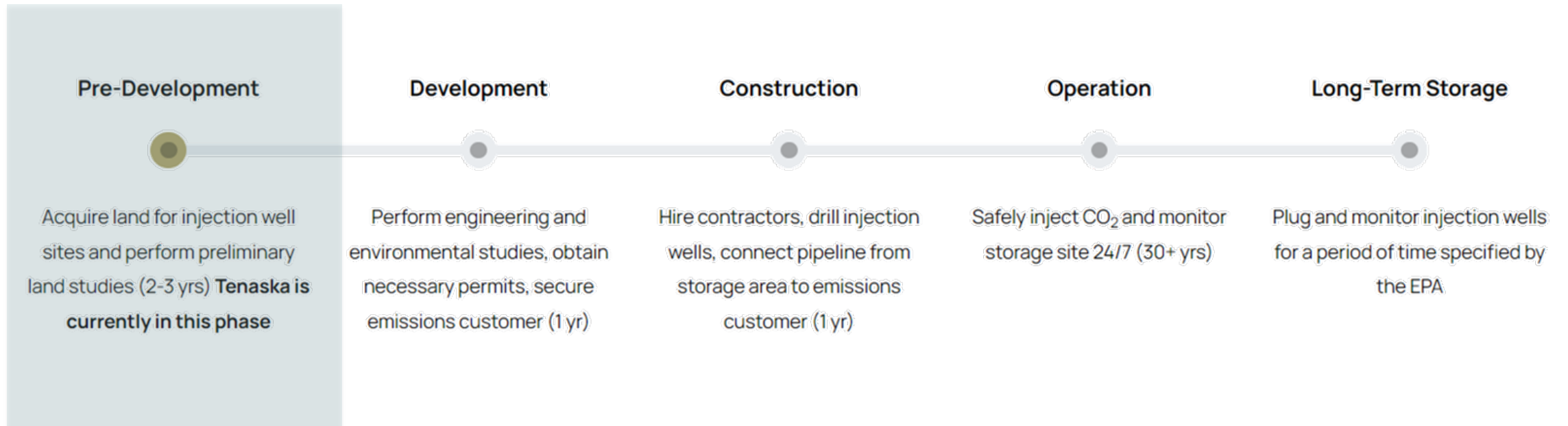
# Why Warren County?

- ▶ Initial geologic data indicates the underground geology here is suitable for storage
- ▶ Interest from regional businesses that are in need of an emissions solution
- ▶ Compatible with Warren County's 2022 Comprehensive Plan (p. 66)
- ▶ Indiana has proven friendly to energy development





# Phases of a CCS Project

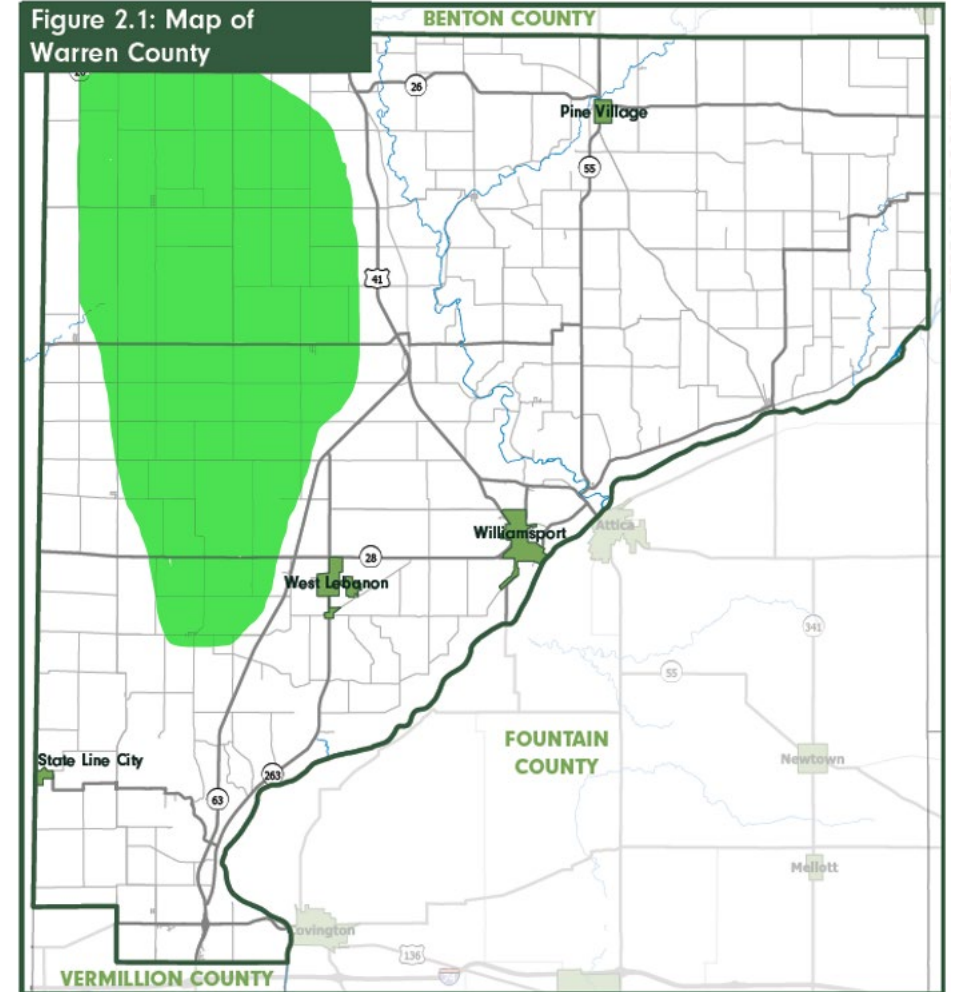


# How Can Warren County Benefit From CCS?

- ▶ CCS helps existing businesses address increasingly strict environmental regulations and remain stable regional employers and taxpayers
- ▶ CCS offers little to no impact on above-ground land use while contributing to the local economy through landowner payments, property tax revenue, construction and operations jobs, vendor opportunities and more
- ▶ CCS brings the potential to attract magnet industries and additional economic investments

# Proposed Hickory CCS Hub

- ▶ Tenaska is assessing the feasibility of locating a geologically secure CO<sub>2</sub> storage facility deep underground in northwest Warren County
- ▶ Local landowners have signed voluntary agreements to allow us to study the underground geology
- ▶ As envisioned, the project would include:
  - 3-5 injection wells
  - 6-10 monitoring wells
  - 25,000 acres of underground storage space



# Minimal Above-Ground Impact



# Proposed Hickory CCS Hub

- ▶ If this project moves forward, it represents **an investment of \$150 million-\$500 million** for the injection wells, storage site and pipeline infrastructure
- ▶ Construction would bring jobs and contractor opportunities
  - Storage site: 160 construction jobs
  - Pipeline: 300 construction jobs
- ▶ Local economic benefits during the 30-year operational life would include:
  - Estimated \$1-2 million annually in increased property tax revenue
  - Millions of dollars in payments to local landowners
  - Operations jobs

# Economic Development Agreement

- ▶ Economic Development Agreement (EDA) structure allows the county to establish parameters that maximize the local benefits, yet protect the project's viability
- ▶ Examples include requirements for:
  - Road Use Agreement
  - Safety & Security Plan
- ▶ EDA could also memorialize royalty fees to the county and other payments, such as first-responder funding and/or a community fund

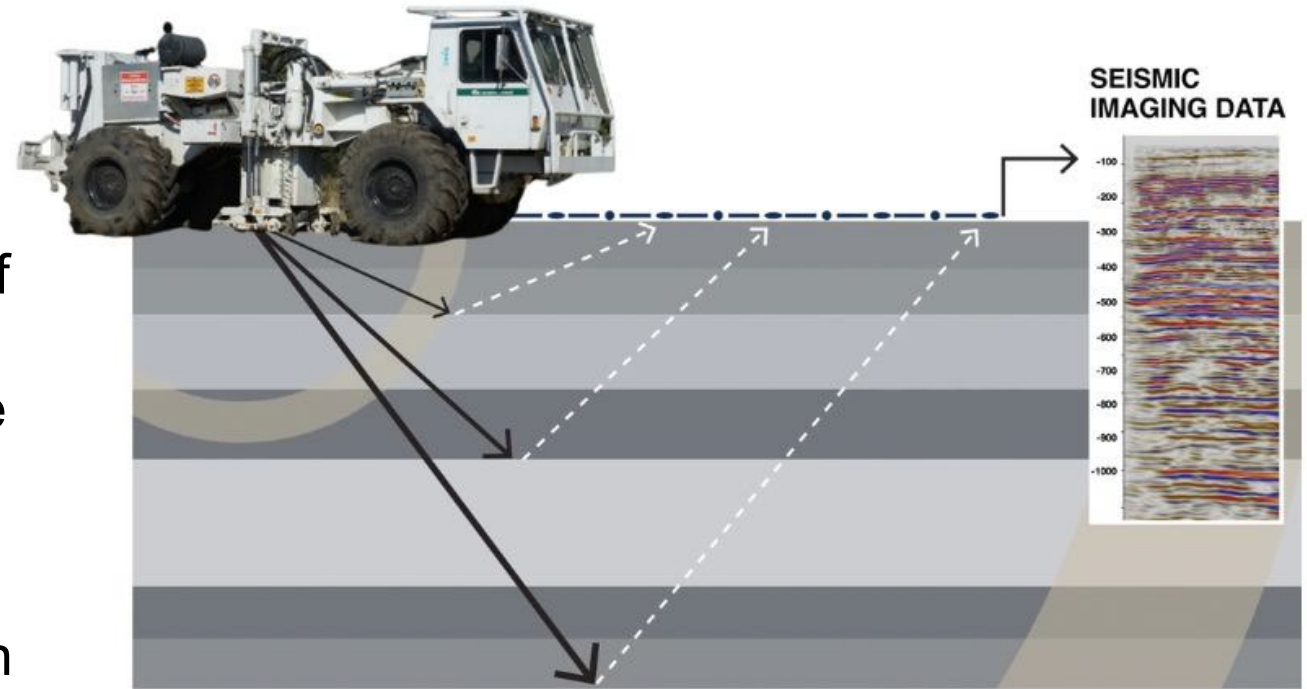


## What's Next?

- ▶ To assess the feasibility of locating the Hickory CCS Hub in Warren County, seismic surveying is required as a next step
- ▶ Seismic surveys are used to determine if the underground geology is suitable for safe and secure long-term storage of CO<sub>2</sub>
- ▶ Once we have seismic surveys and confirm this is a viable location, we can then plot out the development timeline, required permits and other details

# What is Seismic Surveying?

- ▶ Seismic surveys create localized vibration or “waves” in a limited area to collect seismic data that will determine if the geology is suitable for CCS
- ▶ Waves bounce off the multiple layers of rock formations underground and are recorded by sensors to create accurate maps of the complex layers underground
- ▶ The seismic data is then combined with maps, published studies and rock samples to determine if the area is safe and secure for CO<sub>2</sub> storage



Crews place geophone sensors in 1.5-inch-diameter holes approximately 3 inches deep, spaced every 20 to 40 feet along a bar ditch. A vibroseis truck lowers its pads and sends pulses into the ground.

# What Can Residents Expect?

- ▶ Residents will see a vibroseis truck along approved roadways
  - Trucks weigh approximately 60,000-70,000 lbs., equivalent to a standard water truck or less than a loaded tractor trailer (~ 80,000 lbs) that passes over county roads regularly
- ▶ If in close proximity (100 feet or less), one may feel slight vibrations from the truck
  - The vibrations are less than what would be felt from a passing freight train and pose no risk to the public, property, drain tiles or roadways
- ▶ Seismic surveying would likely take about 30 days, with the seismic truck on the roads for about half of that time
- ▶ Once completed, there should be no sign at the surface that crews have been in the area

# Safety

- ▶ Storage sites and pipeline networks are permitted and regulated by federal and state agencies, and many years of planning are required to ensure these projects are designed and operated in a safe manner
- ▶ Once implemented, storage sites are monitored 24/7, 365 days a year by pressure sensors that can detect upward migration of CO<sub>2</sub> and immediately implement measures to address it
- ▶ We have met with, and will prioritize working with, the Emergency Management team in Warren County to share our safety plans as they develop, get their input and answer their questions

**Note:** ADM has been operating a CCS facility in Decatur, Illinois for over 10 years – safely storing over 3.5 million metric tonnes of CO<sub>2</sub>

# State and Federal Regulations

- ▶ CCS storage fields are regulated by the U.S. Environmental Protection Agency (EPA)'s Underground Injection Control Program, which sets and monitors regulations for injection well siting, construction and operation to ensure drinking water and human health are protected
- ▶ CCS pipelines must meet requirements laid out by the Pipeline and Hazardous Materials Safety Administration (U.S. Department of Transportation)
- ▶ Additional permitting and safety regulation by:
  - Indiana Department of Natural Resources
  - Indiana Department of Environmental Management
  - Indiana Utility Regulatory Commission

# Myths About CCS

Myth	Fact
CCS is unproven.	CCS technology has been in use for more than 50 years, and around 300 million tonnes of CO <sub>2</sub> have already been successfully captured and injected underground.
CCS is unsafe.	The capture, transport, and storage of CO <sub>2</sub> is well regulated and empirically proven to be safe.
CCS is too expensive.	The cost of CCS is quickly declining as the breadth of deployment increases and additional policy and financial incentives are made available.
There is not enough space to safely store all the CO <sub>2</sub> captured by CCS projects.	The world has more than enough capacity for CO <sub>2</sub> .

Source: Global CCS Institute (GLOBALCCSINSTITUTE.COM)



## More Information

- ▶ Contact Information

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- ▶ Project website: [HickoryCCS.com](http://HickoryCCS.com)



**HICKORY  
CCS HUB**