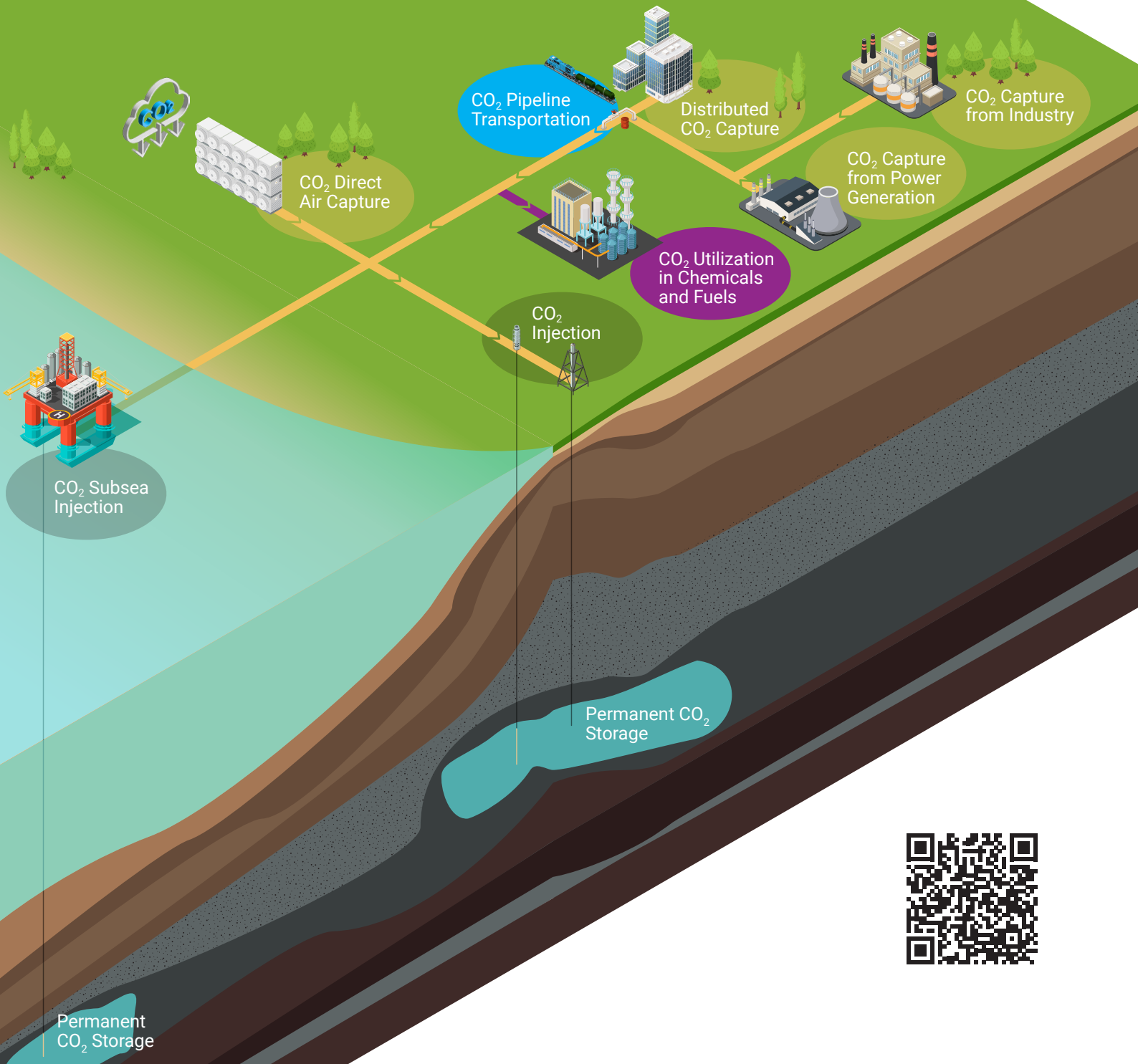


# CARBON MANAGEMENT SOLUTIONS

## Innovations in Carbon Dioxide Capture and Removal, Transport, Storage, and Utilization



**GTI Energy** is a leading technology development organization with a long-standing commitment to carbon management. With decades of collaboration experience with governments, academia, industry partners, and local communities, we develop reliable, efficient, affordable, low- and zero-carbon energy solutions that improve lives, economies, and the environment.

As demand grows for governments and companies around the world to implement decarbonization strategies, GTI Energy confronts the carbon challenge with purpose-driven research and development (R&D) and technical services in support of high-performance carbon management technologies. GTI Energy has extensive competencies and capabilities in carbon dioxide (CO<sub>2</sub>) capture, utilization and conversion into valuable products, safe and resilient transportation, and reliable CO<sub>2</sub> storage.

## OUR CARBON MANAGEMENT PORTFOLIO

GTI Energy has proven experience designing, leading, and managing complex large-scale R&D programs, engineering studies, and field demonstration programs focused on low-carbon, low-cost solutions. We bring a technology-agnostic perspective, covering early-stage innovations as well as near-commercial technology developments and validations.

Large-scale carbon capture, utilization, and sequestration (CCUS) demonstration projects and hubs require capture, handling, transport, use, and geologic sequestration. GTI Energy has the experience and capabilities to fully address all of these essential elements of an integrated CCUS project.



## CARBON CAPTURE AND REMOVAL

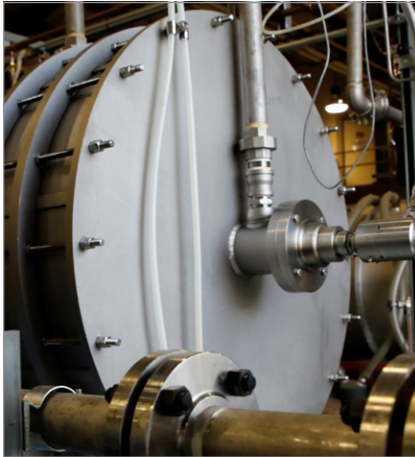
We support CO<sub>2</sub> capture through technology development and commercialization of our own novel approaches, and by collaborating with academia and industry to advance and commercialize other technologies.

GTI Energy has a portfolio of solutions for capturing CO<sub>2</sub> from power and industrial sources, along with expertise in pre-combustion carbon capture, oxy-combustion, and direct air capture. Our membrane- and solvent-based CO<sub>2</sub> capture approaches are now being demonstrated under real-world conditions to accelerate commercial scale deployment readiness.



### IMPACT

We collaborate with the National Energy Technology Laboratory, Ohio State University, and other partners on developing a transformational Facilitated Transport Membrane technology that will reduce the cost and energy penalties of carbon capture. It will be demonstrated at pilot scale at the Wyoming Integrated Test Center in Gillette, Wyoming, and also at the Holcim U. S. cement plant in South Carolina with funding from the U.S. Department of Energy under two project awards.



### IMPACT

The modular and compact ROTA-CAP™ CO<sub>2</sub> capture technology minimizes size requirements for power and industrial system applications, significantly lowers emissions, and reduces carbon capture costs. We have been awarded U.S. Department of Energy funding to test it at United States Steel Corporation's Edgar Thomson facility in Pennsylvania.

## CARBON DIOXIDE TRANSPORT

GTI Energy has over eight decades of experience leading R&D efforts focused on pipeline safety and infrastructure integrity. We leverage our intimate understanding of safe and efficient pipeline operations along with our comprehensive materials and component compatibility testing and analysis to address the impact of impurities captured at various source points in carbon dioxide pipelines, and to safely enable integration of new CO<sub>2</sub> sources into new and existing infrastructure.





### CARBON DIOXIDE STORAGE

GTI Energy has a rich legacy of managing complex public-private field programs and developing and deploying solutions for unconventional oil and gas resources, and the team is applying that subsurface experience to underground CO<sub>2</sub> storage. GTI Energy's subsidiary, Projeo Corporation, complements that expertise with geotechnical competencies and operational/management services to ensure secure, efficient, and cost-effective carbon dioxide containment. Together we are leading DOE Carbon Storage Assurance Facility Enterprise (CarbonSAFE) projects in Sutter County Northern California and in the Permian basin of West Texas aimed at developing carbon dioxide geologic storage sites.

#### IMPACT

Projeo team members have played an important role in executing a large-scale CO<sub>2</sub> injection into a saline formation in the Illinois Basin-Decatur Project that started over a decade ago. The project was the first to secure and operate with a U.S. EPA Class VI injection well permit. Projeo continues to be deeply involved in screening studies to help de-risk sites and supporting ongoing commercial operations of Class VI injection wells.



### CARBON UTILIZATION

GTI Energy is growing our portfolio of technologies for CO<sub>2</sub> utilization, leveraging our deep technical knowledge of catalytic process technologies. Taking captured CO<sub>2</sub> and using it as chemical feedstock to produce low-carbon-intensity chemicals and plastics is a prime example of effective carbon conversion and utilization. We are also working with partners around the globe on efforts to produce sustainable transportation and heating fuels from captured CO<sub>2</sub>.



#### IMPACT

GTI Energy's carbon reuse processes combine captured CO<sub>2</sub> with hydrogen to produce energy-dense, drop-in fuels that are compatible with the pipeline infrastructure and end-use devices and can utilize renewable energy to produce a family of products with low carbon intensities.

#### IMPACT

GTI Energy is evaluating an innovative technology that captures carbon from building heating system exhaust directly at the point of use for Canadian company CleanO2. CARBiN-X uses a chemical process to convert the CO<sub>2</sub> into a stable carbonate to produce soaps and detergents for the consumer market.



**Markus Lesemann**  
Senior Director, Business Development  
mlesemann@gti.energy, +1 847.768.0914

**GTI Energy**  
www.gti.energy  
1700 S Mount Prospect Road  
Des Plaines, IL 60018 USA  
1-24\*