

Banpu's CCUS Technology in the United States: Driving Business Growth and Sustainable Goals

Natural gas plays a crucial role in the global energy shift from traditional fuels towards cleaner energy sources in the future. With extensive experience across versatile energy sectors in nine countries, **Banpu Public Company Limited** became the pioneering Thai investor in the U.S. natural gas market in 2015, marking continuous growth ever since. Currently, Banpu has diversified into gas-fired power generation and the implementation of **Carbon Capture, Utilization, and Sequestration (CCUS)** projects. This strategic expansion not only enhances revenue stability but also promotes sustainable growth by mitigating environmental impacts associated with energy production. Moreover, Banpu stands as **the first Thai company to successfully initiate a CCUS project in the United States**, starting in 2023.

Carbon Capture, Utilization, and Sequestration (CCUS) technology represents a pivotal advancement in the energy industry, recognized for its role in reducing carbon dioxide (CO₂), which is a type of gas that produces in natural gas production. Simply put, in natural gas production, various gases are generated concurrently. Utilization of CCUS begins with the capture of CO₂ from other gases in the gas processing units. Then, the captured CO₂ is subsequently permanently stored in underground rock formations.

Banpu's CCUS Projects in the United States

Banpu currently operates two significant CCUS projects in the United States. **The first, “Barnett Zero,”** achieves an impressive average carbon dioxide sequestration rate of 210,000 tons of CO₂e per year.

To contextualize, this project captures CO₂ equivalent to the emissions of up to 40,000 cars per day.¹ The second project, "Cotton Cove," has a sequestration rate of 45,000 tons of CO₂e per year. This project focuses on separating, disposing of, and geologically sequestering CO₂ generated as a byproduct of Banpu's natural gas production in the Barnett shale. Moreover, the Company can enhance this project for utilizing in the gas-fired power generation which is the midstream business of Banpu Group. With the potential of the existing projects and new studies such as "High West", Banpu's gas business aims to expand its capacity to capture and sequester 30 million metric tons of CO₂e per year by 2030s.

Advancing Sustainability through CCUS in Banpu's Gas Business

Aligned with its dedication to addressing climate change, Banpu's gas business strives for carbon neutrality concerning Scope 1 and 2 by 2030, with a net zero of greenhouse gas emissions target in the upstream business for Scope 3 by 2030s. The integration of CCUS technology plays a pivotal role in achieving these ambitious goals. It offers the potential to enhance the Company's business across various dimensions, including:

- **Drive Sustainable Decarbonization Goals of Banpu's Gas Business:** CCUS technology not only enhances Banpu's business value chain in the United States but also mitigates pollutant emissions in operational processes, aligning with sustainability principles or ESG (Environmental, Social, and Governance).
- **Generate Long-Term Additional Income:** By separating CO₂ from produced gas before pipeline entry, CCUS creates carbon-sequestered gas (CSG), a premium natural gas for sale to customers seeking cleaner energy, potentially commanding higher prices. Through this process, CSG is recorded in the blockchain system database and converted into tokens. These

¹ According to data from the United States Environmental Protection Agency (EPA) website, an average vehicle emits approximately 0.0126 tons of carbon dioxide per day. In contrast, the Barnett Zero project can capture and sequester approximately 600 tons of carbon dioxide per day.

tokens are considered Carbon Credits and are certified by external agency, allowing Banpu to transfer the credits to the buyers along with the sale of natural gas. For future plans, the Company can expand carbon capture and sequestration services to other companies and industries.

- **Leverage Future Synergies in Power Generation Business:** CCUS technology is internationally recognized for its efficiency in reducing CO₂ emission. Its process of CO₂ capture and sequestration can be beneficial to gas-fired power business, both power plants within Banpu's business ecosystem and other power producers in the near future.

Mr. Sinon Vongkusolkit, CEO of Banpu Public Company Limited, commented, "Banpu prioritizes achieving a balance between generating stable income and delivering responsible energy to society. This is our roadmap of sustainable energy transition. As one of the top 20 natural gas producers in the U.S. and a pioneer in deploying permanent commercial CCUS projects in the U.S., we foresee CCUS projects can contribute a significant enhancement in business value and strengthen cash flow. In addition, these initiatives also support the consistent reduction of carbon dioxide emissions in Banpu Group's business operations."

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About Banpu

Banpu Public Company Limited is a leading international versatile energy provider, operating 3 core groups of businesses - energy resources, energy generation, and energy technology in Thailand, Indonesia, China, Australia, Lao PDR, Mongolia, Japan, the United States of America and Vietnam.

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