

Power Generation and CO₂ Storage in Southern Tier NY

Methane extraction and carbon dioxide sequestration in Marcellus and Utica shales

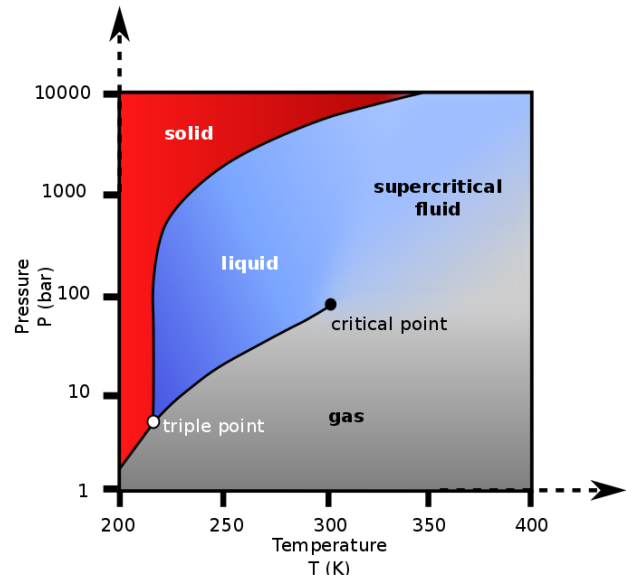
By Brian Brock

Overview

This proposal combines two uses of waste CO₂: increase fossil fuel production and sequester this greenhouse gas underground. Southern Tier Solutions wants to do both by drilling with sCO₂ and then swapping CO₂ for CH₄ in the black shales. In addition, the company is looking to use much of that CH₄ to generate electricity where the gas is produced. Over the projected lifetime of 35 years, STS plans a buildout of thousands of horizontal wells to source CH₄ for a dozen or so zero-emission electric generating stations and to sink the CO₂ from their exhaust as well as from industry and air capture.

Well Drilling and Completion

STS plans to use [supercritical CO₂](#) (sCO₂) to drill and produce natural gas wells. (Supercritical fluids have properties of both liquids and gasses.) The company claims that this is an alternative method to High-Volume Hydraulic Fracturing (HVHF) for producing CH₄ from the black shales in the Marcellus and Utica formations. (The use of HVHF has been banned in New York state since 2014.) Supposedly, the low viscosity and negligible surface tension of sCO₂ would allow deep penetration into natural fractures, and its corrosiveness would open-up pores. As with conventional gas wells, water-based mud would be used to drill the vertical and transitional segments of the well, and water-based concrete would be used to case them. However, recirculated sCO₂ would be used to drill the horizontal segments, referred to as “closed loop drilling” by STS.



STS claims that at depth, the flow of sCO₂ would be dense enough to turn the drill bit at the end of the drill stem, despite it being much less dense than drilling mud. In addition, that it would cool the drill bit. While CO₂ is supercritical at depth, it returns to a gas near the surface. Would the debris from horizontal drilling be blown out of the well bore by high-pressure CO₂ gas, similar to air drilling of shallow wells. Even if so, then how would this dirty gas be captured, cleaned, and recycled down the well, similar to what happens with drilling mud.

In 2008, Governor Paterson imposed a moratorium on HVHF to allow investigations. The NYSDEC [Final SGEIS](#) of 2015 only evaluated completing wells using water-based fracs of more than 300,000 gallons. STS claims that their process of drilling and completing would use no additives, either chemicals or sand, unlike HVHF. Background literature on using CO₂ as the drilling fluids is thin, but a 2021 [review article](#) in the Journal of Petroleum Science and Engineering on CO₂ fracturing discusses some of the issues of using CO₂ underground. The company does not cite any example in this country of a well that used supercritical CO₂ as a drilling fluid.

Without HVHF completions of wells, STS would not need huge volumes of water. The company claims that therefore it would be able to drill wells under the existing regulations. STS wants to spud test wells in the summer of 2024 or at worst of 2025. (Its primary leases run three years.) The company estimates the cost of exploratory drilling at \$60 million.

STS plans to tap into the black shales by horizontal drilling from multi-well pads as is standard practice. Presumably, the existing spacing would apply for wells on multi-well pads in Marcellus and Utica fms. This permits spacing units of no more than a square mile (640 ac) with a setback of at least 330' of horizontal wellbores from unit boundaries.

What sort of approval will NYS Department of Environmental Conservation require? Would the department be satisfied with a simple drilling permit; or would it require that for the first test well STS submit a site-specific environmental impact statement; or would governor Hochul impose another statewide moratorium until a supplemental generic environmental impact statement (SGEIS) was written for this novel process?

In November, Assemblywoman Lupardo (D, 123rd district of Binghamton, Union, and Vestal) and State Senator Webb (D, 52nd district of Broome, Cortland, and Tompkins) sent a [letter](#) to Commissioner Seggos asking how DEC would oversee the STS proposal. In [response](#), he assured them that if STS apply for a drilling permit, then the department would conduct a “thorough and transparent review process” and consult with any states that have relevant experience with sCO₂. The project must comply with the NYS Climate Leadership and Community Protection Act including “addressing whether the project is inconsistent with or interfere with the statewide greenhouse gas emission limits.”

In December, dozens of environmental groups have [written](#) to Commissioner Seggos to express their concerns of the possible return of fracking. This despite STS stating that they will not use fracking to complete wells. In January, a dozen activists protested outside of Governor Hochul’s office in Manhattan. Currently, legislation to ban fracking using CO₂ or C₃H₈ (propane) is being considered.

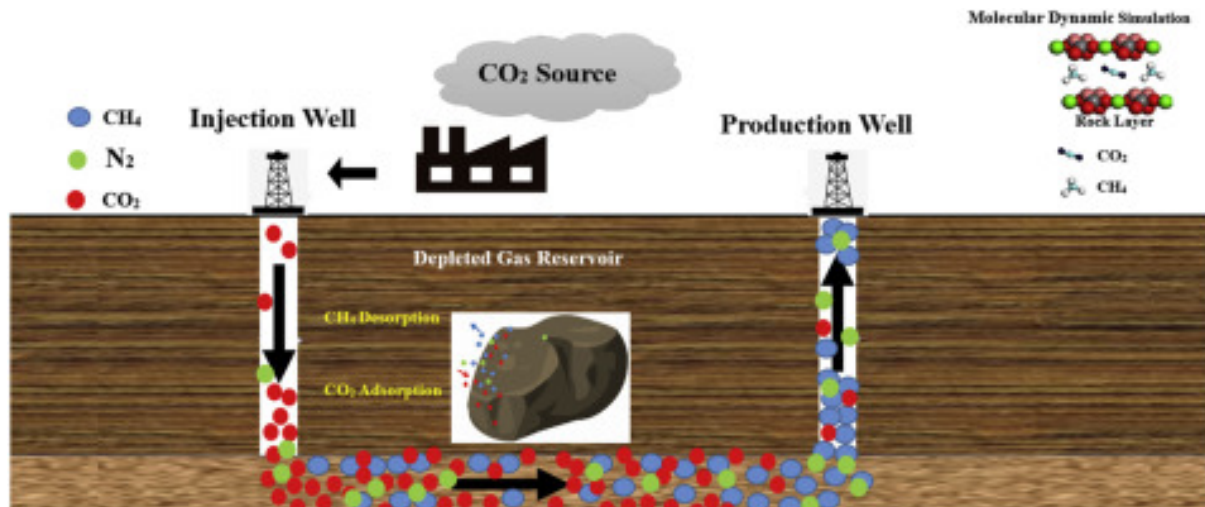
During an interview on WHCU in mid-February, Seggos replied that “We have not gotten any outreach from the company, there’s no application in front of us. All we know is pretty much what we’ve read in the papers. ... I am skeptical because of that, skeptical of its ability to comply with the law because we know nothing about it.”

Methane Production

While unclear, likely that CO₂ would be used continuously during production to flush CH₄ out of the black shale by pumping CO₂ down one well and collecting the mixed gas that come up out of others. STS cryptically refers to "reservoir pressure management operations." A similar technique has long been used for tertiary recovery of oil, but DEC confirms that this flooding to produce gas from rock formation (CO₂ – Enhanced Gas Recovery) has never been used in New York state. After leasing, STS would allot at least two years to evaluate the geology, drilling, and production.

Initially, the CO₂ that is required for the drilling and producing would have to be purchased and imported. At first, it would be sourced from the Gulf Coast and delivered to the Southern Tier in tankers by railroad and then truck, but later, possibly from Pennsylvania by pipelines. Unclear if during testing, this CO₂ would be captured and recycled. Eventually, the CO₂ would be captured from the air on site or come from industries in New York, although currently there are no candidates.

Starting with the first test well, there would be volumes of drill cuttings to dispose of. If the vertical and transitional legs are drilled using mud, then those contaminated rock chips would have to go to a suitable landfill such as the one in [Chemung County](#) run by Casella Waste Systems Inc. However, if the horizontal leg is drilled with pure sCO₂, then maybe those chips could be used locally as fill.



The proposed collection of natural gas requires that any CH₄ produced would have to be separated from the admixed CO₂, which would then be recycled to produce more CH₄. Options to remove CO₂ from CH₄ include dissolving in chemical solvents, adsorption on solid substrate, diffusion through semi-permeable membranes, and cryogenic precipitation. Liquid Natural Gas facilities use a combination of chemical and physical entrapment to remove the small fraction of CO₂ impurities. Like with so many technicalities, STS has not said which process it would use.

Also, STS has said nothing about its use of flaring.

If tests of drilling, completion, and production are successful, then the company plans on a density of drilling similar to that envisioned for HVHF a decade ago, with thousands of wells across the fairway, although the boundaries of their fairway have not been delineated. STS would organize the drilling around a dozen or so industrial hubs. They have not located these hubs, which would in part depend on where they can lease enough land, access the infrastructure of roads & rails, pipelines, powerlines, etc.

Carbon Capture and Sequestration (CCS)

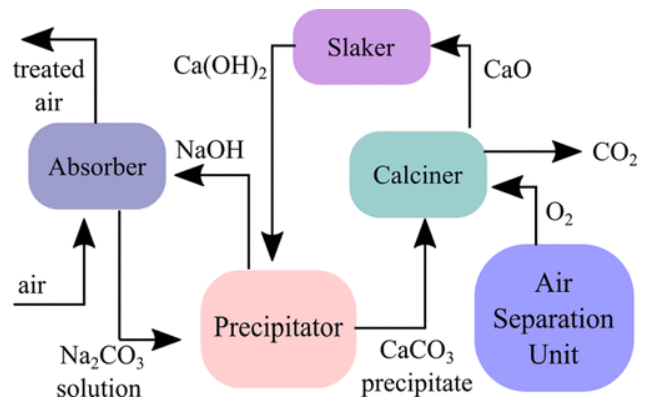
STS plans are more grandiose than the usual practice of extraction of CH₄. They plan on building Direct Air Capture (DAC) facilities to provide some of the CO₂ that they will use to produce the CH₄ and to be sequestered underground. Eventually the company anticipates drawing additional CO₂ from unspecified New York industries via pipelines.

Because there is not empty space underground, just pumping the rocks full of CO₂ would raise the ground surface. However, STS claims that instead the CO₂ would get bound to the shale minerals. That review article cited a sequestration of 9.4 cubic meters of CO₂ per metric ton of shale, although that may be theoretical. By this odd measure, that is roughly one eighth of a cubic foot of CO₂ (a cube 6" on a side) stored in a pound of shale, which is a piece the size of your fist. A more useful measure is an estimate by STS that the shale formations could hold 2,000 tons of CO₂ per acre.

Government money for CCS could be used to subsidize gas drilling, which is currently unprofitable in New York. [New York State Oil, Gas and Mineral Resources 2020 Annual Report](#) is the most recent. There have been few if any gas wells drilled annually since 2015, and therefore gas production has been declining for more than a decade.

The company envisions building DAC units that could capture 400,000 to 1 million metric tons of CO₂ annually. Currently, the cost for DAC to remove one tonne of CO₂ out of the air is typically hundreds of dollars, which is far from economic.

STS provides no details on how it would capture CO₂ from the air. A popular wet method involves blowing air through an alkaline solution in the absorber unit, thereby dissolving the atmospheric CO₂. In solution, it reacts with NaOH to form Na₂CO₃. Then in the next stage, that reacts with Ca(OH)₂ to form CaCO₃, which precipitates as calcite. Finally, CaCO₃ is dried and roasted in the calciner to release the CO₂, which is captured. Then the residual CaO is recycled into the process by reacting it with H₂O in the slaker. Both the cryogenic ASU and the heating in the calciner are energy intensive.



The company expects that a third of the sequestered CO₂ would be a byproduct of their power generation, third from their DAC units, and a third gathered from surrounding industries.

Worldwide, billions of dollars have been poured into CCS projects by governments and industries, but these commercial-scale projects have consistently failed to reach their promised rates of sequestration. Only 27 commercial CCS facilities are operating worldwide, of which almost half are in the United States. Of these dozen U.S. facilities, only the Illinois Industrial Carbon Capture and Storage Project run by Archer Daniels Midland in Decatur stores the captured CO₂ underground but in a saline formation. Annually, it has failed to reach its goals

CCS has been a Crazy Carbon Scam for decades. It is expensive to capture and liquify the CO₂, and the scale of capture that would be necessary to measurably reduce atmospheric carbon is mind-boggling. What is more, there is the question of whether the carbon sequestration would be only temporary because the ground leaks. Is the residence time decades, centuries, or millennium? STS argues that because the black shales contain CH₄ now, they have been sealed for millions of years. However, that assumes that there was not more that had since leaked. Traces of methane and oil show up in surface waters throughout the Southern Tier, and most of the region is dry land where methane can escape without a trace.

In the most recent NYS Oil, Gas, and Mineral Resources Report, there is nothing about operating with sCO₂ or using wells for CCS. In the past few years, the Division of Mineral Resources (DMN), which has been belatedly working on supplemental findings concerning the plugging of abandoned wells, finished that report March 2023.

In the accounting of the carbon balance for their operation, STS neglects CH₄. Methane will need to be flared and can leak from wells and pipelines. In addition, the company plans to sell CH₄ when there is capacity in pipelines. Before the gas turbines are built, CH₄ can only be exported.

Project Fairway

There are thousands of gas wells in the Medina Formation in western New York. Why does the company not want to try to sequester carbon there? Possibly because many of those wells are used for underground gas storage, and STS does not want CO₂ leaking into the stored fuel. From Erie to Chemung, there are 27 methane and 3 propane storage fields utilizing almost a thousand wells. Also, there are tens of thousands of orphaned wells in that region, most of which are unmapped and many of which are not properly sealed. Ground must leak like a sieve. And the reservoir of the Medina Fm. is not a shale, so it would not sequester carbon in the same way.

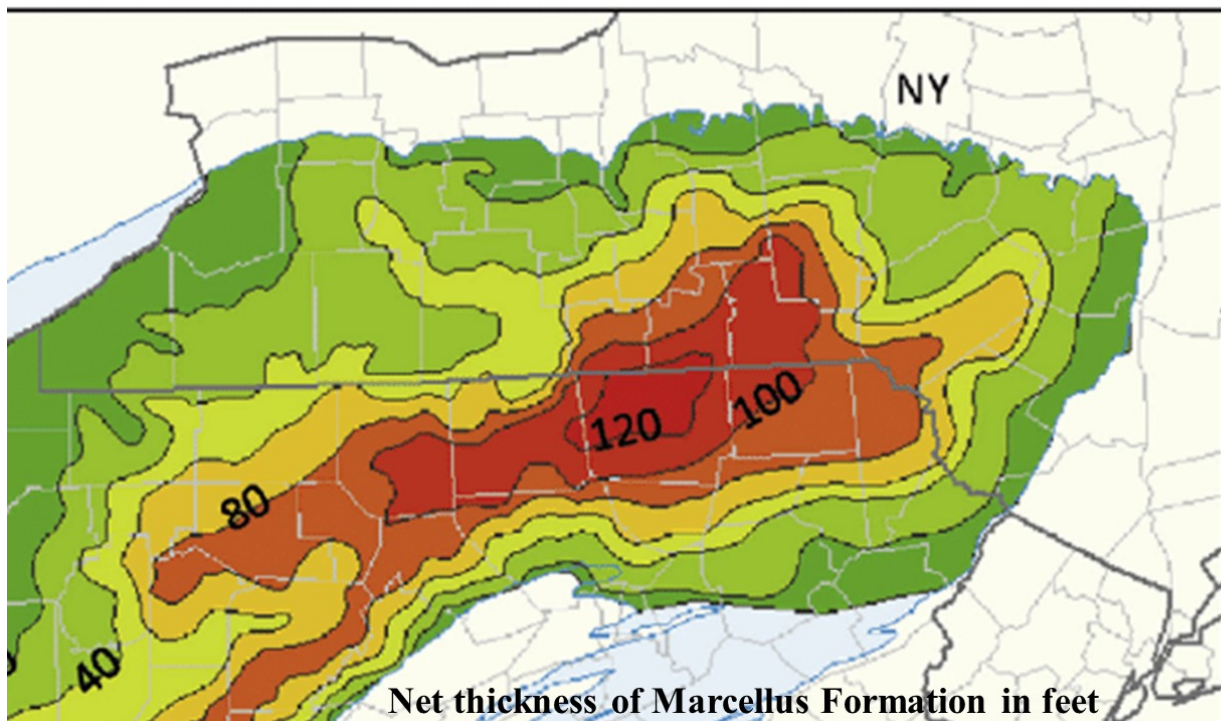
Where CH₄ could be economically recovered from black shales depends on depth, thickness, and thermal maturity of the formations, among other factors.

Southern limit. Much of the land south of the border of New York is already leased, and those leases may not provide for CO₂ sequestration. Also, this drilling using sCO₂ might not work at depths greater than 5,000', such as where you find the Marcellus in the Northern Tier of Pennsylvania.

Northern limit. CO₂ is supercritical only at pressures greater than 7.4 MPa (73 atm or 73 bars or 1,100 psi), so this process could work only at depths greater than about 2,500'. While the Marcellus outcrops north of the Finger Lakes and along the Mohawk Valley, likely STS would only drill where the shales are deep enough, which is south of the Finger Lakes. What is more, the formation thins northward.

Western limit. Marcellus is over 50' thick from Chemung County eastward through Broome County. Generally, 50' is the minimum practical thickness for horizontal drilling.

Eastern limit. There is little or no economically-recoverable gas below Delaware County and points east, except maybe in the Deposit area. In the east, the Marcellus is cooked, having been heated so that most of the CH₄ has been oxidized to CO₂ and H₂O.



The target for STS is along the border with Pennsylvania: Chemung, Tioga, and Broome counties. This fairway confirms the estimates that our group made for HVHF of the Marcellus years ago. Operations could be extended farther to the west into Steuben County if the company drilled the deeper Utica Fm.

This fairway is west of the Catskill region and south of the Finger Lakes region, thereby excluding these popular tourist destinations. Pushback from populations in those regions was instrumental in banning HVHF.

If STS manages to get these novel drilling and production techniques working, then it is possible that it could expand the fairway somewhat.

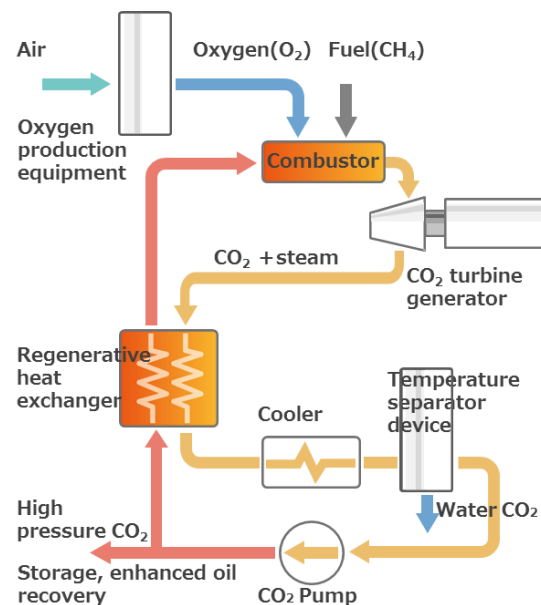
Power Plants and Pipelines

Exporting for sale all the CH₄ that would be produced is not practical. It has become impractical to build transmission pipelines in New York state, and existing pipelines are near capacity. However, STS would utilize pipelines such as the Dominion and Millenium as capacity becomes available. The company has not explained how this exporting of CH₄ would subtract from its efforts to sequester carbon.

STS plans to build generating plants to power an all-electric operation and to export any excess electricity, although that would require building transmission lines. Thereby, they could profit from the high prices of electricity in New York. Also, selling CH₄ would be plagued by the cycle of boom-and-bust prices.

In [Allam-Fetvedt cycle](#) generators (aka Allam cycle), instead of hot air, hot sCO₂ is used to spin the turbine. A mixture of CH₄ and O₂ is burned to heat the CO₂, resulting in a mixture of 97% CO₂ and 3% H₂O flowing through the turbine. Then this exhaust is captured and cooled, the H₂O extracted, and the CO₂ recycled through the closed-loop system.

Burning CH₄ in pure oxygen prevents NO_x pollutants. Unfortunately, the cryogenic separators that produce O₂ requires 20% of the electrical power, which reduces plant output.



An [experimental turbine](#) (50 MW_{th}, 25 MW_e) using the Allam cycle was built in 2018 at La Porte, Harris County TX by Net Power in partnership with Toshiba Corporation, Exelon Corporation, and CB&I using a design developed by 8 Rivers Capital LLC and Palmer Labs LLC. The NET NS1 power plant had run 1,500 hours before being successfully synced to the grid in 2021.

In Odessa TX, a 370 MW generating plant using this NET Oxy-Combustion Power Cycle is to begin construction in the third quarter 2024. NET plans on commissioning this plant in the third quarter of 2026. Occidental Petroleum will transport the CO₂ and annually sequester 860,000 tons of it in the Permian Basin.

STS plans to build several 200 to 300 MW power plants. A standard issue gas-powered turbine generating station would take a few years to design, build, test, and commission. How much

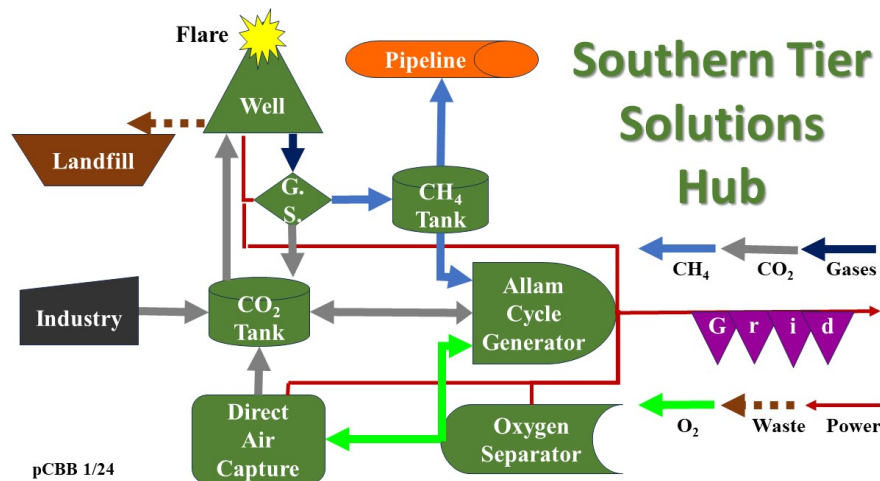
longer for one of a novel design? Until then, the company would have to sell the gas via pipelines – hardly net-zero

Hub and Spoke

STS is planning to build at least ten hubs which could require as much as a million acres of leases to support. Each hub could sprawl over 150 sq miles. At the center would be an industrial core of direct air capture units, electric-powered drilling rigs, an EV well-service fleet, CO₂/CH₄ gas separator (G.S.), bulk CO₂ and CH₄ working storage, O₂ separators, electrical generation plants, and transmission lines. This would be connected by the spokes of a subsurface network of CO₂ and CH₄ distribution/collection pipelines to/from dozens of multi-well pads, which could stretch-out 5 to 10 miles.

Such a pipeline network is not without the risk of leaks. Lighter than air, CH₄ is both a flammable and explosive. Heavier than air, CO₂ pools in low places and is an asphyxiant. Both are greenhouse gases.

For both gases, between the transportation pipelines to the hubs and distributions to the wellheads, there would be tanks for working storage.



Primary target of STS is the Marcellus Fm in the three counties of Chemung, Tioga, and Broome stretching about 150 miles along the southern border of New York. Additionally targeting the Utica Fm could extend drilling to Steuben County. The company has projected leasing of a half million to a million acres. Chemung has 411 sq mi, Tioga has 523 sq mi, and Broome has 716 sq mi for a total of 1,650 sq mi or about 1,056,000 acres. The company has plans for drilling under much if not most of the landscape.

STS expects that the build-out of one industrial hub, pipeline spokes, and scores of well pads would take seven to nine years, progressing from the center outward. It plans to operate this network for 35 years, maybe as much as 50 years.

Full buildout of the ten hubs and spoke networks could cost \$12 to 16 billion according to the company. The president of STS, Bryce Phillips, said “There are some big banks and private equity on the sidelines that like what we’re thinking.”

With all the required infrastructure, could enough CH₄ be recoverable so that the project would turn a profit? The most recent report from NYS Division of Mineral Resources has no gas wells spudded or completed in 2020. STS claims that their process could be more productive than HVHF, although evidence is thin. This proposal depends heavily on federal grants and tax credits that are available for CCS. Also, recently there has been a shift to greenwashing of O&G production. Both government and

industry are trying to market the potential for burning fossil fuels as net-zero with liquifying the CO₂ and pumping it underground, aka carbon capture and sequestration.

Company

Southern Tier CO₂ to Clean Energy Solutions was incorporated as a New York LLC in April 2023, NYSDOS ID: 6802221. It is commonly referred to as Southern Tier Solutions or STS. Also, company is registered in Texas as a foreign LLC, Texas File Number: 0805275551

STS has a polished and informative [website](#) with tabs for Home, About, Leasing, FAQ, Library, and Contact. Recently, the tab on News has been removed.

As of now, it has no offices in the Southern Tier, operating out of a hotel room and with a Binghamton PO Box. Principal address of STS is listed as the Houston TX office of Incfile, which is a full-service, online legal document preparation and filing service. Incfile offers a virtual address and mail forwarding service for those lacking a physical office and needing a professional address.

Bryce P. Phillips of Fort Worth TX is president, managing member, or governing person of Phillips Land Associates, Inc. (2003), Inland Scout, LLC (2003), Tsavoil LLC (2019), and Southern Tier CO₂ to Clean Energy Solutions, LLC (2023) as well as half a dozen now-defunct companies. [Phillips Land Associates](#) owns O&G leases in Texas. Phillips says that he has been in the O&G industry since the 90s, starting as a landman and then moving to production as a geologist, geophysicist, and later operations manager across various western states.

He claims that STS is owned by CO₂ To Clean Energy Solutions LLC of Wyoming – although there is no trace of that company. According to Phillips, this parent company will cover the estimated costs of \$60 million for the pilot project. "We're not out looking for partners."

In an interview on Capitol Pressroom, Mr. Phillips assured that STS had begun talking to the US EPA and NYS DEC in November. Commissioner Seggos contradicted him, stating that the company had not as of December 8th. Phillips clarified that STS had not received a response from DEC.

Leasing

This project came to light only when STS began mailing [letters](#) from downtown Binghamton to landowners in October.

STS has mailed to over 6,000 owners of 30 or more acres in the fairway, inviting them participate for a flat \$10 per parcel for the primary lease. (The distribution of these letters would reveal the extent of the core of the fairway.) In late 2023, it planned to hosted two public meetings in each of the three targeted counties. The last meeting in Binghamton, Broome County was cancelled.

These leases are atypically because they lease land for both extracting CH₄ and storing CO₂. They are marked BPP/NY Southern Tier Special.

Since being incorporated, STS's activities in New York have focused on leasing. Those backers from Wyoming are willing to spend a year or so and a few million dollars to see if the company can lease enough land to make the first commercial installation feasible, a minimum of 30 to 50,000 acres but as much as 100,000 acres.

At \$10 per lease and an average size of parcel of 40 acres, then STS could lease enough land for only about \$10,000.

If it can lease the necessary 10,000s of acres by spring, then STS will proceed with applying for permits for the test wells. To date, at least 1,000 landowners have expressed an interest in the lease, and several dozen have signed agreements according to the company. Phillips said, "I haven't heard anyone say no."

In the company's FAQ, it is misleading to say that landowners will not be forced to lease:

22) Q. What happens if I don't sign a lease?

A. You have absolutely no obligation to sign a lease. This is your land and your decision, and if you do not feel that our plan is in your best interest, the best interest of your family, the best interest of the environment, or the best interest of your community, then we will respect your decision."

New York has compulsory integration (aka forced pooling) whereby once the driller has leased at least 60 percent of the spacing unit, he can integrate the rest of the land, a form of eminent domain. (All 39 states that produce O&G have some form of compulsory integration, but the minimum percentage of leasing ranges from 25 percent in Kentucky to 90 percent in Ohio.) Even if the owners do not lease their land, it could become integrated into a drilling unit, although they would be compensated.

Legislation

Bill [A8866/ S8357](#) would add only three words to Environmental Conservation Law, Section 1, Paragraph (a) of Subdivision 3 of Section 23-0501 that bans HVHF with water: "or carbon dioxide."

(a) No permits shall be issued authorizing an applicant to drill, deepen, plug back, or convert wells that use high-volume hydraulic fracturing **OR CARBON DIOXIDE** to complete or recomplete natural gas or oil resources.

Legislation that will not solve a problem that does not exist -- perfect Albany.

Assessment

Likely that the meager reserves of CH₄ are not sufficient to support a dozen hubs. Even a few would be problematic.

Besides supply limitations, some critical technologies are untested and might not exist

- Horizontal drilling with sCO₂
- Producing CH₄ utilizing sCO₂ flooding
- Separating the produced gas stream into CH₄ with CO₂

To date, we have yet to see that STS is more than one Texan with a website and a PO Box. Likely that expenses have been in the low six figures.

Already leasing, the next milestone for STS will be its application for a drilling permit from NYSDEC.

Disclaimer

To make the STS proposal coherent, I have inferred many of the essential technical details, which are wholly lacking in presentations by Phillips. How STS would implement these processes may differ.

Unanswered Questions

1. What is the extent of the region where STS plans to drill, i.e. the fairway?
2. Where in the U.S. have horizontal legs of wells been drilled using sCO₂?
3. Which industrial landfill would STS use to dispose of drilling cuttings?
4. Would cuttings from sCO₂ drilling be clean enough to use a local fill?
5. After drilling, how would STS produce CH₄ using sCO₂?
6. How would NYSDEC regulate these novel methods of drilling and producing that use sCO₂?
7. Which process would STS use to separate the produced gas into CH₄ from CO₂?
8. Can this horizontal drilling and flooding using sCO₂ produce CH₄ economically?
9. Which process would STS use to capture CO₂ from the air?
10. Can flooding black shales with CO₂ retain significant volumes of this gas?
11. Would an infrastructure of wells, DAC plants, CO₂/CH₄ separators, electrical generators, and pipelines sequester more carbon than escapes?
12. How much CH₄ does STS plan to export via pipelines, and how does this affect the carbon budget of the operation?
13. Would production of CH₄ from the Marcellus and Utica fairways in New York sustain 35 to 50 years of operation?
14. Does the professed parent company of STS, CO₂ to Clean Energy Solutions LLC of Wyoming, exist, and if so, then who is backing it?

Illustrations

- | | |
|---|--|
| 1. Phase diagram of CO ₂ | Wikipedia |
| 2. Enhanced gas recovery with CO ₂ | Journal of Petroleum Science and Engineering |
| 3. Direct air capture, Na wet process | American Physical Society |
| 4. Net thickness of Marcellus Fm. | Wrightstone, G. (2008) AAPG, Eastern Section |
| 5. Allam-cycle generation | Toshiba Corporation |
| 6. STS production hub | Author |

Resources

November 11, 2023

[Massive Southern Tier Gas Drilling Spree Proposed; 6,500 Land Leases Sought for Plan to Extract Methane and Store CO₂](#)

By Peter Mantius, WaterWatch

November 17, 2023

[Plan for Gas Drilling Spree in Southern Tier Draws Muted Response from DEC, State Reps; But Green Groups Outraged](#)

By Peter Mantius, WaterWatch

December 5, 2023

[Southern Tier's natural gas eyed for extraction \(again\)](#)

By David Lombardo, Capitol Pressroom

December 6, 2023

[Is Proposal to Store CO₂ in Southern Tier Gas Wells New York State's Clean Energy Future ... or Just Another Gas Bubble?](#)

By Peter Mantius, WaterWatch

January 5, 2024

[Texas-based company hopes to build power plants with carbon sequestration in Southern Tier](#)

By Susan Arbetter, Capitol Tonight

January 12, 2024

[New York's Fracking Ban Threatened by CO₂ 'Loophole,' Environmentalists Say](#)

By Mariana Simões, City Limits

January 26, 2024

[Could a Proposed New York Carbon Dioxide Injection Program Work in Pennsylvania?](#)

By Brendan O'Donnell, Houston Harbaugh, P.C., JDSupra

February 2, 2024

[New York state lawmakers seek to ban new fracking technique](#)

By Rosemary Misdary, Gothamist

February 14, 2024

[Webb, Lupardo lead legislative effort to ban carbon dioxide fracking](#)

By Marco Flores, Pipe Dream

February 15, 2024

[DEC responds to reports of CO₂ drilling in Southern Tier](#)

SAGA Communications, WHCU

February 16, 2024

[Bill That Would Ban New Fracking Method Advances in Assembly](#)

By Dylan Murphy, The Legislative Gazette

February 21, 2024

[The STS CO₂ “fracking” proposal](#)

By Irene Weiser

February 26, 2024

[Firm Planning Drilling Spree in Southern Tier Goes Silent as Lawmakers Seek to Ban Use of CO₂ in Quest for Gas](#)

By Peter Mantius, WaterWatch