Ohio River Valley Institute

The Methanol Industry at a Crossroads

A Volatile Industry's Volatile Future

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July 2026

Introduction

Over the past 15 years, the United States has transformed into one of the world's leading producers and exporters of methanol, a keystone of the petrochemical industry used in the production of myriad things from formaldehyde to fragrances. Since 2011, US methanol capacity has grown from less than 1 million metric tons to more than 13 million metric tons.

While most of the growth in US methanol capacity has been along the Gulf Coast, Appalachia has not escaped notice. Aided by a $10 million loan from the West Virginia Economic Development Authority,[1] the 240,000 metric ton capacity Liberty Methanol plant in Institute, West Virginia began construction in 2017 and operations in 2022.[2] This represents about 2 percent of total US capacity.

And even as leaks at other chemical plants in Kanawha County cause death and injury,[3] there are plans, currently on pause, to expand the Liberty Methanol facility to take advantage of its proximity to logistics operations and to transport methanol by rail, truck and barge.[4]

Now, the Iran War is simultaneously upending and accelerating the global macroeconomic trends for every fossil fuel derivative, including methanol. Prior to the war, Iran was the single largest exporter of methanol,[5] with nearly 90% of its exports destined for China.[6] The longer the war keeps the Strait of Hormuz closed, and the more fossil fuel infrastructure is destroyed,[7] the greater the opportunity for methanol producers across North America to replace lost supply from the Persian Gulf States. The rapid agreement to and collapse of a June 2026 Memorandum of Agreement designed to reopen the Strait shows that the geopolitical situation remains as volatile as the chemicals produced by the industry itself.[8] Would-be North American methanol producers would be advised to be wary about building out more methanol capacity than there is long-term demand, especially if and when Persian Gulf methanol capacity is again connected to the global market.

Within this context, this report provides an overview of what methanol is, how it is used, and the impacts of its production. The report analyzes the recent growth of methanol capacity and exports in North America. Finally, the report compiles a list of the proposed new methanol facilities across North America and concludes with a brief discussion of what a volatile future may have in store for this volatile chemical.

I. Methanol 101

Methanol (CH_3OH) is a colorless, volatile petrochemical that is one of the foundational blocks of the chemical industry. It is used to produce a variety of other chemicals and products, such as formaldehyde, acetic acid, and plastics (polyethylene and polypropylene).[9] Methanol can be used directly as a fuel or blended with gasoline.[10] Methanol can also be used to produce olefins (ethylene, propylene, butylene), which typically are produced from petroleum. Olefins are in turn used to create all sorts of further products: food packaging, tile and flooring, antifreeze, detergents, tires, plastic gloves, latexes, and more.[11]

In short, methanol is a key intermediate chemical as raw fossil fuels are transformed into myriad consumer products: polyester carpet, aerosols, disinfectants, fragrances, decorative laminates, car paints, medical gowns, pharmaceutical drugs.[12]

Methanol is produced from syngas ($CO + H_2$), which is primarily manufactured from natural gas through steam methane reforming (or, in some places, from coal through gasification). While natural gas currently accounts for around 60% of methanol global feedstock in 2026,[13] practically all US methanol production is sourced from natural gas. Depending on the efficiency of the methanol plant, each metric ton of methanol requires between 27,000 and 30,000 cubic feet of natural gas,[14] or between 0.56 and 0.62 metric tons of gas per metric ton methanol.[15] For example, the 5,000 metric ton per day Natgasoline methanol plant in Beaumont, TX, consumes 150 million cubic feet of gas per day, or 30,000 cubic feet per metric ton of methanol produced.[16]

To put this in context, a typical household in the US that uses gas consumes about 54,344 cubic feet of gas per year.[17] Given that the US now produces more than 10 million metric tons of methanol per year,[18] this means methanol production is equal to the gas consumption of more than 5.5 million households.

Finally, less than 1% global production comes from “green” methanol,[19] produced from syngas sourced from sustainable biomass sources or from “green” hydrogen produced from water and electrolysis combined with captured carbon dioxide.[20] The Methanol Institute estimates that renewable methanol production will increase to between 5 and 12 million metric tons per year by 2030, a significant increase from the 0.2 million metric tons of renewable methanol produced in 2020.[21]

However, scaling up production of “green” methanol remains a challenge.[22] For example, producing the “green” hydrogen used in producing “green” methanol requires immense amounts of electricity, which must come entirely from renewable sources if it is to qualify as “green”.[23] The high cost of producing “green” hydrogen means that the industry remains dependent on government subsidies to be competitive.[24] Further, as an energy source hydrogen is highly inefficient compared to the amount of electricity required to produce it.[25]

II. Impacts of Methanol Production

Producing and combusting methanol from natural gas emits a total of 2.1 kg CO2 per kg of methanol, according to the Methanol Institute.[26] The emissions breakdown is as follows: when it is combusted methanol releases about 1.375 kilograms of CO2 per kilogram of methanol.[27] These “end of life” emissions are a baseline for overall lifecycle emissions. Producing methanol from natural gas adds about 0.75 kg CO2 per kg methanol for a total of 2.1 kg CO2/kg methanol.

Practically all of the existing methanol facilities in the US produce methanol from natural gas, and about half of the new proposed capacity will also use natural gas as feedstock. Discussed in the next section, the US recently surpassed 10 million metric tons of annual methanol production. Producing and combusting 10 million metric tons of methanol from natural gas emits 21 million metric tons of CO2, equivalent to the annual emissions of 4.5 million passenger vehicles[28] or 50 percent more than the annual emissions of the 2,933 MW capacity coal-fired John E. Amos power plant in Putnam County, WV.[29]

Methanol is toxic to humans and inhaling or ingesting methanol can have adverse health effects, such as neurological damage, blurred vision, dizziness, and nausea.[30] However, exposure to methanol typically comes from vehicle exhaust fumes or contact with consumer products like paint thinners or cleaners.

Methanol is tied to deleterious environmental and human health impacts from its production from natural gas or coal. Extracting, transporting, and burning natural gas has myriad negative environmental and human health impacts.[31] Natural gas pollutes the air with nitrogen oxides, which can combine with other pollutants in the air to form particulate matter, which can cause respiratory diseases, cardiovascular diseases, and cancers. Fracking for gas can pollute groundwater, further negatively impacting both nearby communities and their environments.

After it is produced, methanol can be transported by rail or truck in specialized storage tanks.[32] For bulk transportation via cargo ship, methanol is shipped in similarly specialized tanks.[33]

III. Recent US Methanol Capacity Growth

Over the last 20 years, the US methanol industry has transformed from a bit player to one of the largest producers and exporters in the world. This transformation has been driven by increased domestic and global demand for methanol derivatives across the automotive, construction, and electronics industries.[34]

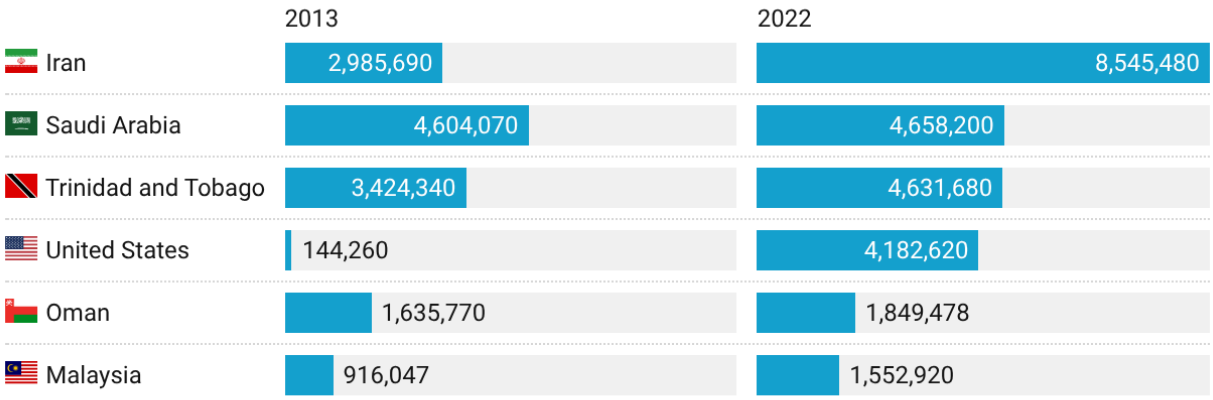
In 2005, methanol capacity in the US was a relatively tiny 785,000 metric tons per year.[35] Capacity stayed at that level until 2011, when the 878,400 metric ton capacity OCI Beaumont methanol plant restarted. Including that plant, since 2011, more than 12.4 million metric tons of capacity has been built.[36]All of the new methanol capacity built since 2011 has been located in the Gulf Coast, with the exception of the 240,000 metric ton US Methanol Liberty One plant in Kanawha County, WV.[37]

Table 1: Recent Capacity Additions

Facility	Location	Capacity	Year Operational	Feedstock
Beaumont Methanol Restart	Jefferson County, TX	878,400	2011	Natural gas
Channelview Methanol Reformer	Harris County, TX	818,466	2013	Natural gas
Beaumont Methanol Process Unit	Jefferson County, TX	219,600	2015	Natural gas
Geismar Methanol Plant	Ascension Parish, LA	2,190,000	2015	Natural gas
Clear Lake Methanol Plant	Harris County, TX	1,433,000	2015	Natural gas
Beaumont Methanol Plant	Jefferson County, TX	2,007,500	2018	Natural gas
Koch Methanol St. James Plant	St. James Parish, LA	1,806,750	2021	Natural gas
US Methanol Liberty One	Kanawha County, WV	241,265	2022	Natural gas
Clear Lake Methanol Plant Expansion	Harris County, TX	187,000	2023	Natural gas (By-product CO2)
Koch Methanol St. James Plant Expansion	St. James Parish, LA	456,250	2024	Natural gas
Geismar Methanol Plant Expansion	Ascension Parish, LA	2,246,940	2024	Natural gas

As capacity increased, so have exports. Publicly available data from the World Bank's World Integrated Trade Solution database shows that the US methanol exports increased from 144,000 metric tons in 2013 to over 4 million metric tons in 2024.[38]

Figure 1: The US has become the world's fourth largest methanol exporter.
Top global methanol exporters, 2013 and 2022

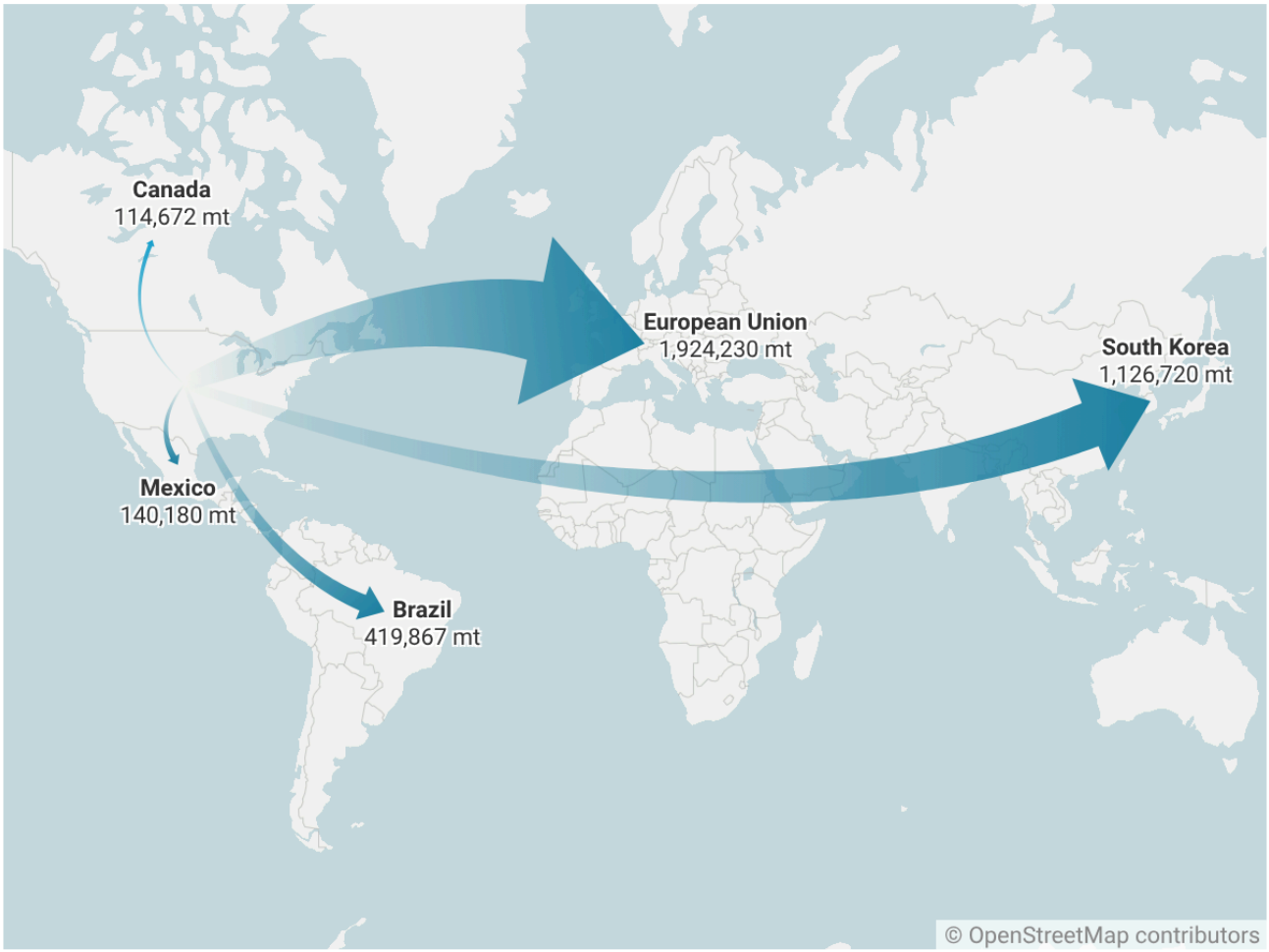


Source: World Bank

The balance of trade changed, too. In 2013, the US was a net importer of 4.9 million metric tons of methanol, mostly from Trinidad and Tobago. Fast forward to 2024 and the US was a net exporter of 2.8 million metric tons, with about half of US exports destined for the EU and more than a quarter destined for South Korea.

Figure 2: Where do US methanol exports go?

Top US methanol export destinations by volume, 2024

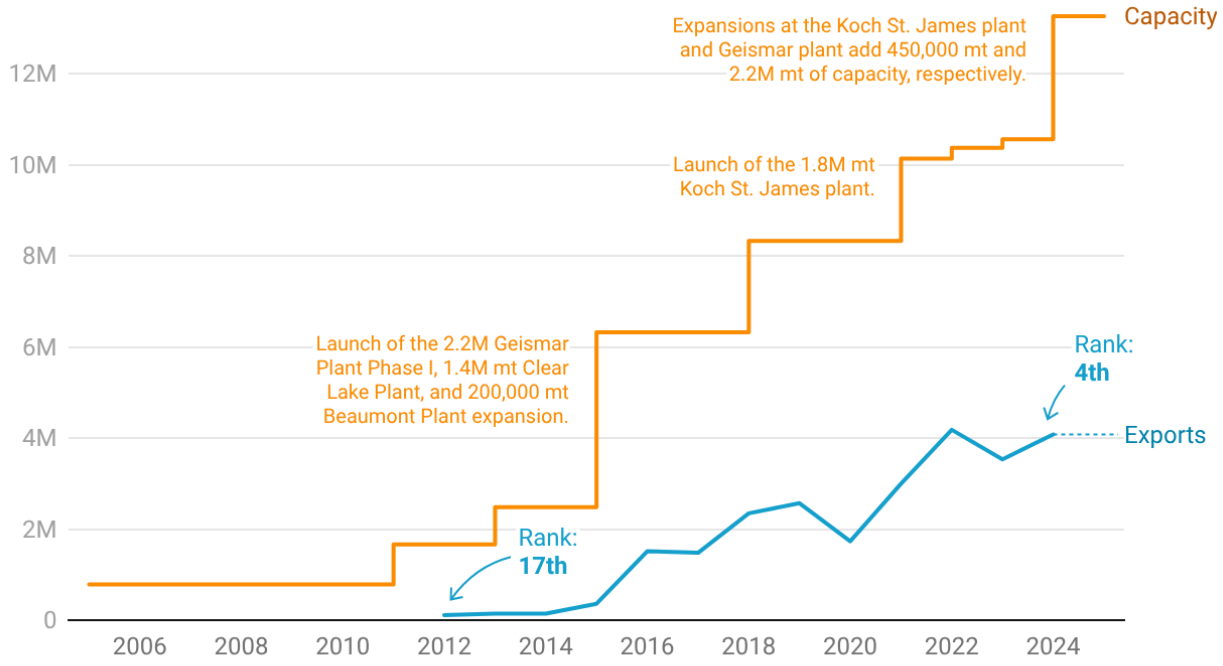


Note: 355,281 metric tons of US methanol were distributed to other countries in 2024.

Exports to South Korea jumped from less than 1,000 metric tons in 2015 to over 626,000 metric tons in 2016 after the 2.2 million metric ton capacity Methanex Geismar facility became operational. Methanex maintains storage in South Korea as a hub for exporting to customers across East Asia.[39] The Geismar facility expanded in 2024 to become the largest methanol facility in the country, and can now produce more than 4.4 million metric tons of methanol per year.[40]

As of June 2026, there is approximately 13.3 million metric tons of methanol capacity in the United States,[41] accounting for nearly 10 percent of the 145 million metric tons of global capacity.[42] While most detailed methanol production data is proprietary, Argus Media estimates that methanol production was at 78% of capacity across North and South America in 2025, much higher than the global rate of 65%,[43] yet much lower than the Chinese methanol industry's production rate of 90%.[44] At that production rate, US production in 2025 can be estimated at around 10.4 million metric tons.

Figure 3: The US has climbed from 17th to 4th in global methanol exports since 2012.
US methanol capacity (2005-2025) and exports (2012-2024)



However, the methanol industry has not been all growth all the time. Many proposed projects in recent years have been canceled, equivalent to more than two thirds of the proposed new methanol capacity of the last decade (Table 2). Just seven of the methanol projects that have been canceled would have added a combined 25.5 million metric tons of capacity, which would have more than tripled US capacity. The biggest of these were the 7.3 million metric ton IGP Gulf Coast Methanol Complex in Plaquemines Parish, LA, and the 7.2 million metric ton Northwest Innovation Works Methanol Plant in Tacoma, WA.[45]

The Northwest Innovation Works Methanol plant ran into fierce opposition from community activists in the Pacific Northwest and ran into myriad permitting lawsuits. The company ultimately announced it was cancelling the project in June 2021,[46] after being denied a shoreline permit by the Washington State Department of Ecology a few months prior.

The IGP Gulf Coast Methanol Complex, on the other hand, received its permits to build in Louisiana. The permits were rescinded because the company did not begin construction in the allotted timeline.[47] No reason was given, though it is likely that the company views the market as unattractive as to merit such a massive investment.[48]

Table 2: Canceled capacity

Facility/Project	Location	Capacity	Year Canceled
Northwest Innovation Works Methanol Plant	Tacoma, WA	7,200,000	2021
Kalama Methanol	Cowlitz County, WA	3,650,000	2021
IGP Gulf Coast Methanol Complex	Plaquemines Parish, LA	7,300,000	2021
St. James Methanol Plant	St. James Parish, LA	2,190,000	2022
Bishop Methanol Plant Expansion	Nueces County, TX	1,300,000	2022
Marcellus Methanol Plant	Marshall County, WV	58,400	2022
Big Lake Fuels Methanol Plant	Calcasieu Parish, LA	1,825,000	2024

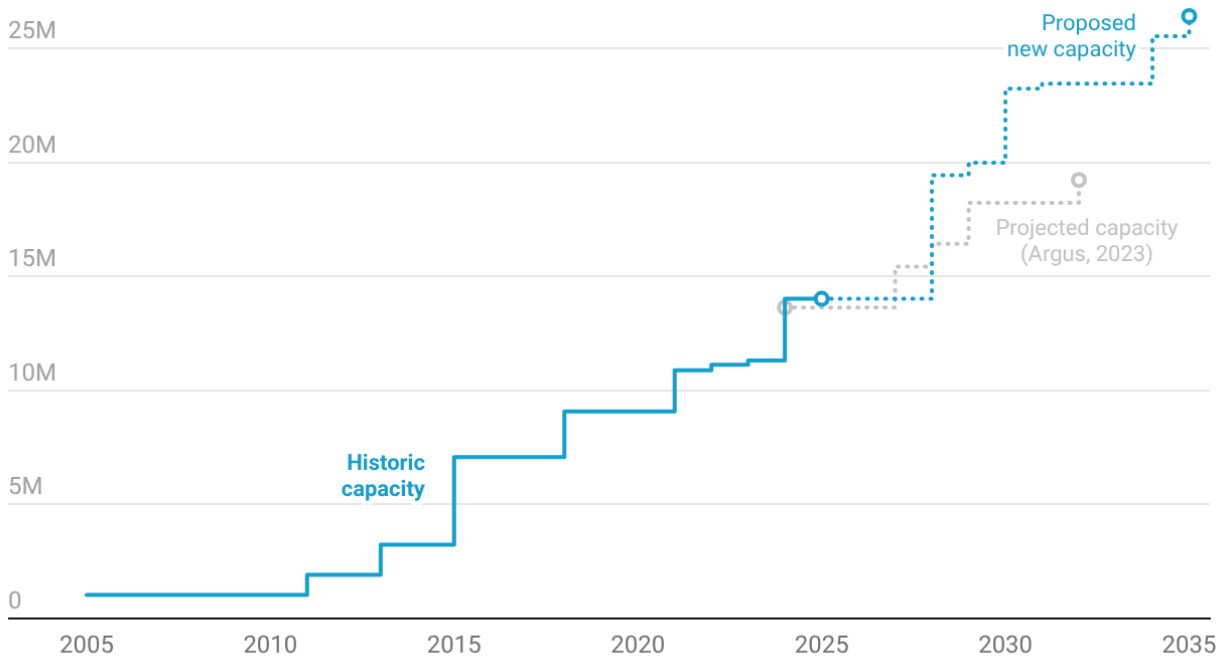
IV. Future North American Methanol Capacity Growth Remains Uncertain

Industry analysts are split on how quickly methanol production and demand might grow in North America. (More than 90 percent of North American methanol production capacity is located in the US.[49]) According to market research firm IMARC, methanol demand in North America reached 11.6 million metric tons in 2025, and is projected to grow more than 6% per year to more than 20 million metric tons by 2034.[50] But Argus Media's 2023 analysis states that North America demand in 2023 was 7.7 million metric tons, and just 7 million metric tons in the United States. Argus Media in 2023 projected that US methanol demand would reach 8.2 million metric tons by 2032.[51]

This is a massive uncertainty in projected North American methanol demand. Methanol plant developers appear to be banking on the higher projection, as there are 10.1 million metric tons of proposed new methanol capacity, as tracked by the Environmental Integrity Project in March 2026. Additionally, there is a $3.3 billion, 2.1 million metric ton methanol plant proposed on the Pacific Coast in Sinaloa, Mexico.[52] That project will be supplied by 160 million cubic feet per day of Texas gas.[53]

Given this uncertainty, developers may also target global markets, in which global methanol demand is projected to increase by between 2.7% and 4.3% annually from 2026 through 2035.[54] The strongest driver of this growth is the methanol-to-olefins and methanol-to-propylene sector,[55] as well as growth in the construction industry and its demand for textiles, plywood, and molded plastics, all of which rely on formaldehyde-based resins and coatings.

Figure 4: Planned North American methanol capacity would almost double current capacity.
Historic and projected methanol capacity, 2005-2035



Source: Argus

However, not all of these projects may be built, and Argus Media's 2023 analysis suggests that North American methanol capacity would only increase by 5.6 million metric tons from 2025 through 2032.[56] Additionally, Argus's 2025 analysis notes that globally only 65% of total methanol capacity is currently used.[57] Increased demand could be met by increasing utilization rates of existing methanol plants instead of building new capacity.

Aside from demand factors, methanol production costs may rise due to the continued growth of US natural gas exports, which is causing domestic natural gas prices to gradually converge with global gas prices.[58] Gas prices are also being driven up by rising demand for gas-powered electricity due to rapid data center expansion.[59] These rising costs may make the economics of some projects untenable.

The four largest proposals account for more than 85% of total proposed capacity: the 3.65 million tonne Lake Charles Methanol Plant in Calcasieu Parish, LA,[60] the 2.3 million tonne Southern Energy Renewables Clean Fuels Facility in St. Charles Parish, LA,[61] the 1.8 million tonne Project Helix in Matagorda County, TX,[62] and the 1.1 million tonne INEOS Sandpiper Blue Methanol plant in Galveston County, TX.[63]

Just as with the methanol capacity built in the last decade, most of the new projects are planned for the Gulf Coast. However, two projects are proposed in Appalachia: a 150,000 metric ton capacity

expansion (currently on hold) of the US Methanol Liberty Plant in Kanawha County, WV,[64] and a new 328,000 metric ton capacity plant in Pleasants County, WV.[65]

About half of the proposed capacity (5.1 million metric tons) would be sourced from natural gas, though companies claim that they will capture and sequester carbon emissions, also known as “blue” methanol. For example, the $1.7 billion, 1.1 million metric ton per year Sandpiper “blue” methanol plant.[66] The company claims that it will capture and sequester 97% of the carbon emitted from the natural gas used to produce the methanol.[67] This is a dubious claim, as commercial scale carbon capture and sequestration technology has not yet been proven to work at commercial scale.[68] Producing 5.1 million metric tons of methanol from gas would consume 152 billion cubic feet of gas, which is the same amount of gas used by 2.3 million homes in a year.[69]

Table 3: Proposed capacity additions

Facility/Project	Location	Capacity	Expected Operating Year	Feedstock
Lake Charles Methanol Plant	Calcasieu Parish, LA	3,650,000	2028	Natural gas
HIF Matagorda eFuels Plant Project Helix	Matagorda County, TX	1,768,635	2028	Green hydrogen
Koch Methanol St. James Plant efficiency expansion	St. James Parish, LA	Unknown	2028	Natural gas
Galveston Bay Clean Fuels	Galveston County, TX	Unknown	2028	Natural gas
Beaver Lake Renewable Energy Plant Project Memorial	Rapides Parish, LA	553,000	2029	Biomass
Sandpiper Blue Methanol Plant	Galveston County, Tx	1,095,000	2030	Natural gas
Pacifico Mexinol Blue Methanol	Sinaloa, MX	1,800,000	2030	Natural gas
Pacifico Mexinol Green Methanol	Sinaloa, MX	350,000	2030	Green hydrogen
Southern Energy Renewables Clean Fuels Phase 1	St. Charles Parish, LA	220,000	2031	Biomass
Southern Energy Renewables Clean Fuels Phase 2	St. Charles Parish, LA	2,080,000	2034	Biomass
Orsted Star E-Methanol Plant	TBD, TX	300,000	Unknown	Green hydrogen
US Methanol Liberty Two expansion	Kanawha County, WV	150,000	Unknown	Natural gas
Port of Victoria E-Methanol Plant Project Nightshade	Victoria County, TX	100,000	Unknown	Green hydrogen
Pleasants County Methanol Plant	Pleasants County, WV	328,500	Unknown	Natural gas
Vast Renewables Project Bravo	Southwest USA	Unknown	Unknown	Green hydrogen

North American capacity growth exceeding production is part of a global trend. From 2018 to 2023, worldwide methanol capacity increased by 30 million metric tons while demand grew only 6 million

metric tons. Globally, there is 145 million metric tons of capacity,[70] more than half of that in China at an estimated 75 million metric tons.[71] However, production in 2023 was roughly 90 million metric tons. This means that methanol plants are operating at a little more than 60 percent capacity, on average.[72] (This excludes China's estimated 25 million metric ton internal coal-to-olefins and coal-to-propylene sectors,[73] in which methanol is produced as the in-between link from coal and the final products.)

Even discounting those internal Chinese sectors, China is by far the largest producer and consumer of globally traded methanol. China consumed more than half of globally traded methanol in 2023. Including its internal CTO and CTP sector, China consumed 70% of all methanol produced in 2026.[74]

After China, the regions with the most capacity in 2023 were the Middle East (25 million metric tons), and Latin America and the Caribbean (12 million metric tons, including 6 million metric tons in Trinidad and Tobago).[75]

Notably, Iran is the largest methanol exporter, with 13 million metric tons of methanol capacity located at Asaluyeh,[76] about 250 miles up the Persian Gulf from the Strait of Hormuz. In 2022, Iran exported 8.5 million metric tons of methanol,[77] with 7.5 million metric tons destined for China. However, Iran's methanol infrastructure may be damaged: petrochemical facilities at Asaluyeh were damaged by Israeli strikes in early April.[78] The longer the war goes on, and the more methanol facilities are damaged, the greater the opportunity for methanol producers in other parts of the world to fill the gap in Middle Eastern methanol supply. However, as discussed above, this gap may be more easily filled by increasing production from under-utilized existing facilities than by constructing new ones.

V. Conclusion

The United States methanol industry has transformed over the last 15 years from a bit player to one of the largest exporters on the planet, with the potential for even more growth.

But regardless of the status of the Strait of Hormuz, there are two major reasons to doubt that all these proposed methanol projects will be built.

First, the closure of the Strait of Hormuz is likely a short term disruption, even in the event that significant methanol infrastructure is destroyed before the end of the war. The decision to build new methanol capacity will be based on long-term profitability, not to address a short-term problem.

Second, half of the proposed capacity is dependent on biomass or green hydrogen as feedstock, which would be astronomic growth compared to the small fraction of methanol production that these methods currently produce.

But in the event that methanol demand grows at the most bullish projection, and US methanol exports continue to rise even in the face of global underutilization of existing capacity, the challenges facing the green hydrogen industry mean that this growth would primarily be of a benefit to the fossil fuel industry.

For communities from Appalachia to Louisiana to Sinaloa, Mexico, it will be another setback and prolonging of the myriad negative human health and environmental impacts caused by continued gas extraction and petrochemical production and transportation.

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