Introduction

The Philadelphia LNG Task Force is a creation of the Pennsylvania General Assembly and was established under Act 133 of 2022, formerly HB 2458. The Task Force is charged with examining and making recommendations regarding obstacles, economic feasibility, economic impact, and security that would be "involved with making the Port of Philadelphia an LNG export terminal." Under section 7 of the statute, a report on these issues is required within one year of the passage of the act. Section 7(b) permits a rebuttal statement to be made by any member or members who disagree with the majority report. This Minority Report is being submitted pursuant to that section.

As set forth below, there are myriad concerns with siting an LNG facility within the geographical area covered by the Philadelphia Port. In fact, the impracticality of any site directly within the area of the Port of Philadelphia (PhilaPort) was recognized at an early stage, and the Task Force was primarily focused on a site in Chester, Pennsylvania. That site also has a direct limitation, making an LNG facility impractical, to say the least, and most likely impossible. The property at 800 W. Front Street, Chester, PA 19013 has a restrictive covenant placed on it by the Delaware County Commissioners, who conveyed the land with the proviso and requirement that it NOT be used for an LNG facility. This lack of a suitable site anywhere in the Southeastern Pennsylvania region, let alone within the purview of the Port of Philadelphia, should be sufficient to lay to rest any consideration of an LNG facility pursuant to this legislation. However, if the lack of a suitable location is not enough, we have also set forth reasons why an LNG facility is unwise based on economic feasibility, economic impact, safety and security, and environmental justice.

Task Force Process

Before addressing the substance of the work of the Task Force, it is important to note concerns with the process of how that work was conducted. HB 2458 was passed by the House of Representatives on April 13, 2022, by a vote of 124-74. It passed the Senate on October 25, 2022, by a vote of 37-12 and was signed into law by the Governor on November 3, 2022. Under

the statute, an initial organizing meeting was held on January 13, 2022. It is noted that at the time, no appointment to the Task Force had been made from several stakeholders. In particular, the Democratic Speaker of the House had not appointed a member from the House of Representatives yet. The statute requires that the initial meeting be called by the member who was appointed by the Speaker. The January 13, 2022 meeting was called by the member of the House of Representatives who had been appointed by the previous Speaker. At that meeting, the quorum present voted that person, Representative Martina White, the prime sponsor of HB2458, to be the Chair of the Task Force. The initial failure to follow the process dictated by the statute and the holding of the first meeting called by a member who was arguably not authorized to do so was never addressed in the subsequent proceedings and meetings of the Task Force.

It is also notable that at several points during the public meetings there were concerns expressed at the ability for people in the affected community to participate – notably in Chester, Pennsylvania. Those concerns were addressed, at least in part, by holding a final public hearing on August 22, 2023, in the City of Chester where some concerned residents gave their testimony. On this point, this Minority Report includes a section addressing environmental justice because Chester has been identified by both the federal Environmental Protection Agency and the Pennsylvania Department of Environmental Protection as an environmental justice area. Given the fact that the only potentially realistic physical location for an LNG was in the City of Chester, we have decided that it is appropriate to add a layer of review to account for its status as an environmental justice community.

Testimony

ORAL TESTIMONY

April 20, 2023

The first public hearing of the Philadelphia LNG Task Force was held on April 20, 2023, focusing on the security of LNG export facilities. A summary of the oral testimony is as follows:

David Cuff, President of the Pilots' Association for the Bay and River Delaware, was the first to testify, regarding the training of ship pilots and the safety of vessels being navigated on the Delaware River. He stated:

> "Ships the size of the anticipated LNG carriers would be piloted from the mouth of the Delaware Bay to the intended berth only by the most qualified and experienced first-class pilots. These full-time professional mariners have all successfully gone through a multi-year training and apprentice program and passed intensive examinations…Over the course [of their training], they have each safely piloted thousands of large ships including LPG carriers, petroleum tankers, chemical tankers, container vessels, car carriers, and many more."

Lisa Himber, President of the Maritime Exchange for the Delaware River and Bay, was the next to testify, providing an overview of the Exchange and discussing the impacts associated with establishing an LNG terminal in the Philadelphia area. She noted that the Exchange has three primary roles - 1. Recording ship movements and providing vessel intelligence, 2. Advocating for the business community, and 3. Acting as an information hub for the port.
She also stated that the foremost benefit of a new LNG facility from the Exchange's perspective must be the economic impact for the region:

> "With global demand for LNG increasing every year, a new LNG terminal here can only strengthen the port's competitive position…With its strong history as an energy port, Philadelphia is ideally situated to capture a share of this growing market."

Representative Hohenstein then directed a question to Cuff:

> "…I know in other places there are things like bridge lockdowns, limitations on the activity in the port and the ability of traffic to go up and down the river while that ship is going up and down itself…I'd like to hear your perspective on that."

Cuff replied:

> "We currently export LPG out of Marcus Hook...When these vessels load they take a tug escort vessel so from whatever berth they sail from down to a couple miles below the Delaware Memorial Bridge…The Coast Guard does escort some of them but not all of them."

Cuff went on to say:

> "Okay in regards to other traffic on the river, obviously we have not had LNG here yet. I can only speak of speaking to the pilots and the Coast Guard in Maryland…that it does not disrupt any traffic down there. I believe they do have certain Coast Guard escorts, but again this is stuff that we're all learning…"

Adam Nagel, Campaign Manager for Penn Future in the city of Philadelphia, was the next to testify, stating concerns regarding the inherent danger of the proposed facility.

> "A routine part of LNG storage is venting, which occurs as heat naturally enters the tanks and transforms some of the LNG into natural gas…This means that natural gas, mainly the greenhouse gas methane, is released directly into the atmosphere…What's more is that LNG is highly flammable, burning at extreme temperatures so hot that a fire fueled by LNG cannot be extinguished. It must simply be allowed to burn out…Some experts liken a large-scale explosion of this material to the impact of a nuclear bomb…LNG is a highly explosive substance and is considered by experts to be too dangerous for large-scale rail transport…
>
> Given the Port of Philadelphia's proximity to residential neighborhoods, any incident would cause significant damage and result in injuries or even death. These are neighborhoods that have contended with health and environmental effects of historic industrial activity focused on the Delaware River. In the case of a serious incident, the surrounding area would require significant assistance from the city to ensure that residents are safe and healthy."

Former Congressman Tim Ryan, co-chair of Natural Allies For a Clean Energy Future was the next to testify, on the benefits of natural gas and defeating global coal use. He stated:

> "Pennsylvania has a great opportunity here to continue as a leader in the energy sector…Pennsylvania can be a leader in the global emissions reduction strategy. And this is especially true looking at places like China who have abundant sources of coal and no abundant supply of natural gas…And John Kerry, a US climate envoy in the Biden administration, has said that there's nothing anyone else in the world can do to keep global temperature rise under one and a half degrees Celsius unless China pulls back its planned coal construction."

Next to testify was **Dustin Meyer, VP for Natural Gas Markets, American Petroleum Institute**. He stated:

> "What we do here in the United States can serve as a model for other countries in how to reduce emissions while bolstering energy security and maintaining reliable and affordable energy access. U.S. natural gas is at the core of this effort, and Pennsylvania, as the second largest gas producing state is uniquely well positioned to play an outsized role."

May 19, 2023

The second public hearing of the Philadelphia LNG Task Force was held on May 19, 2023. A summary of the testimony follows:

Mark Freeman, President of Labor's Local 413, located in Chester, PA, was the first to testify. He stated:

> "This plant brings opportunities for our members to make affordable living wages and to continue to send their children to college and just have the liberties of being able to take care of their families…The construction industry has kind of slowed down over the last few years and the LNG project would give a much-infused help to our members."

Rep. Hohenstein asked Mr. Freeman:

> "Has anybody taken a look at how many jobs would specifically get added in or is there a study out there that would tell you how many new jobs for your local might get created by something like this?"

Freeman replied:

> "I believe there was some talk of about 1,200 construction jobs. I'm not all clear on how many permanent jobs that there will be on the maintenance side either."

Hohenstein then asked:

> "How do you feel about the potential environmental impact [of the proposed LNG facility]?"

Freeman replied,

> "It's mixed. We definitely want to do things in a safe and healthy way."

State Representative Carol Kazeem was the next to testify.

> "My community where I still reside along with my children and family has been promised economic salvation each time an industrial plant is proposed. It happened with the paper mill and it happened with the trash incinerator. It has happened a dozen subsequent times. And what did we get? A 27% childhood asthma rate, an increase in health risks and illness amongst our seniors, a decrease in jobs in companies…and also a 19.3% infant mortality rate. What we didn't get was the promise of permanent jobs and also financial emancipation."

Kazeem further stated:

> "For those that are not aware, in 2020, there was a plant like this, it was the Freeport LNG in Texas. And it didn't go well. It ended up in a big explosion and they are still trying to repair that. And with Chester City being a five-mile radius, I'm very concerned about what that would look like for the lives of the people in Chester…Not only is this project not a long-term financial solution for the city of Chester, but it will also serve as a further detriment to the lives and welfare of my friends, cousins, and neighbors."

The next testifier was **David Callahan, President of the Marcellus Shale Coalition**.

> "I'll focus my comments on challenges which have impacted production levels to date and impeded the ability to site and build critical infrastructure. First and foremost, we need pipelines. The development of shale gas resources in the Northeastern United States has been a game changer. But these not-so-new areas of production here in Pennsylvania need additional pipelines to reach markets, both within our Commonwealth and regionally."

Callahan further stated:

> "Permitting improvements at the state level are critically necessary as well. Natural gas projects are among the most regulated among any in this state. A myriad of permits are required for shale gas development…Far too often, permit decisions are not made within the time frames which they are promised, or in some cases, statutorily mandated."

David Wachtner, partner and co-head of the Global LNG Practice at K&L Gates Law Firm was next to testify. He stated, in summary:

> "The comprehensive federal regulatory structure over LNG exports plays a critical role in ensuring safety, environmental sustainability, and market stability. The U.S. has emerged as a global leader in LNG exports, and the development of LNG facilities has significant positive domestic, economic, geopolitical, and environmental implications, allowing key strategic allies to reduce carbon emissions and eliminate reliance on Russian natural gas supplies."

Stephanie Wissman, Executive Director of the American Petroleum Institute, asked Wachtner about his opinion of a recent policy statement released by the Department of Energy regarding the DOE's approach to granting extensions for LNG export.

Wachtner replied, in part:

> "There have been a number of LNG export projects that have applied for DOE authorization, got authorization to export, and did not build…In other words, they've authorized so much more LNG to be exported than what we're actually exporting…And the Department of Energy says we don't think we should be exporting more volumes because we've said yes to this much already. They're trying to clean that up."

August 22, 2023

The Final LNG Task Force Hearing was held on August 22, 2023. A summary of the testimony follows:

Carl Marrara, Executive Director of the Pennsylvania Manufacturers Association, was the first to testify. Referring to an economic analysis based on the Cove Point, MD LNG facility, he stated:

> "...the construction of the facility would support a total of 28,249 direct, indirect, and induced jobs. This totals more than $2.3 billion in labor income, $2.8 billion in gross state product or value added, and $4.8 billion in total output. Over the four years of construction, the tax obligation would be around $527 million in total, with 80 of that

going to the state, 392 federal, and the remaining to local governments. The full-time ongoing operations of the facility consist of 204 industrial gas manufacturing jobs."

Marrara's analysis was based on numbers relating to the Cove Point, Maryland LNG facility, which has a production capacity of 5.75Mtpa (million tons per annum).[1] The goal for a potential Pennsylvania site would be an output of 7Mtpa.[2]

Marrara outlined five areas of concern. 1. Permitting reform for pipelines and other infrastructure. 2. Permitting reform for the construction of new manufacturing or commercial facilities. 3. A focus on workforce training programs. 4. The complete lack of U.S.-flagged LNG carriers, currently barring American LNG from being transported between U.S. ports. 5. A need to enhance Pennsylvania's business competitiveness.

Zulene Mayfield, Chair of Chester Residents Concerned for Quality Living was the next to testify. Mayfield read a statement from **Fermin Morales**, **member of the IBEW (Local 98)** which stated, in part:

> "Instead of calling for another scheme that may put money in the pockets of certain people, they should look at the overall picture of the damage that LNG will bring to the community of Chester…They should look into the real dangers of LNG as a fossil fuel…Setting up an LNG facility in our neighborhoods would bring spills, explosions and contamination on top of the damage already being done to our air quality and atmosphere…The idea that we were not allowed to speak at this task force previously in April on issues of safety and security, that matter is a testament that you have no interest in what the communities most impacted have to say…We have a right to dissent on issues that matter to us…Renewables are now cheaper than coal, and LNG renewables have been a creator of jobs tenfold compared to fossil fuels, including LNG."

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[1] *LNG terminal profile: Cove Point Export LNG Liquefaction Terminal, US*, Offshore Technology (Updated July 30, 2023). https://www.offshore-technology.com/data-insights/cove-point-export-lng-liquefaction-terminal-the-us/?cf-view

[2] Kenny Cooper, Susan Phillips, *Could Delco get a major LNG export terminal? How Biden's plans to increase LNG exports could clash with its environmental justice goals in Chester*, WHYY (Updated June 16, 2022). https://whyy.org/articles/delco-major-lng-export-terminal-environmental-justice-chester/

Mayfield then gave her own testimony. She addressed concerns regarding the health and safety of Chester residents, stating:

> "The American Lung Association consistently rates the air quality [in Chester] either a "D" or "F…The taskforce has not allowed public testimony from community scientific experts and others that would enhance the education of the legislators…
> Repeatedly, committee members, including the chair, stated that Chester specifically has been targeted for an LNG [facility]. Proposed, it would be the largest LNG terminal on the East Coast. Chester is five miles…with roughly 33 to 36,000 people. A very densely populated area. The Elba Island [Georgia] LNG sits on 840 acres of land. Coal Point [Maryland] sits on 1,000 acres of land. Yet, Penn America has proposed to you all that they intend to produce just as much as two of these other LNG facilities. And they're going to do it on 100 acres of land?" [If Penn America's proposal] creates a buffer for this community…the buffer would be displacing all of us, businesses, and churches. 805 homes to be exact, four churches, a daycare, and numerous businesses, and in fact, possibly the local 413 building."

Next to testify was **Stefan Roots, City Councilman for Chester.** He stated:

> "There are 35,000 reasons I don't want a liquefied natural gas export facility in the region of Chester…I take public health and public safety very seriously for the 35,000 residents I represent here…New polluting industries are not welcome in Chester…LNG will discourage new investment in homes and businesses. An LNG terminal will result in population depletion…A real partnership is forming between city, county, state, and federal elected officials to create a new Chester. Chester wants to stop predators from devaluing our assets. Just because we have a river doesn't mean you can use it to put our public safety and public health at risk."

Neil Chatterjee, former commissioner and chair of the United States Federal Energy Regulatory Commission (FERC), gave the final testimony of the day, summarizing the authorization process for LNG export. He stated, in part:

> "FERC's authority in evaluating applications for the financial gas export facilities comes from the Natural Gas Act…The Natural Gas Act requires companies wanting to export

> US natural gas to obtain an authorization. The firm has authority over construction and operation of the export facility…Other parties, for instance, environmental NGOs, safety groups, health groups, can request intervention status in a FERC energy export application, and FERC has historically always granted these interventions in order to prepare the draft environmental impact statement. Once the draft environmental impact statement is done, there are public meetings near the project site, and a formal comment period…After this very rigorous process is completed, the agency can prepare a final environmental impact statement and then make it public…I want stakeholders who have their concerns to understand the agency listens and pays attention and really, really does heavily scrutinize these projects."

SUPPLEMENTAL TESTIMONY

In addition to the oral testimony provided at the three hearings, some supplemental written testimony was submitted. Summaries of the written testimonies are as follows:

April

Fred Millar, environmental safety advocate, national policy analyst and consultant, who was denied the opportunity to testify in person, provided written testimony. He wrote:

> "Federal agency experts have recently raised alarms that the US LNG industry has been 'building larger facilities, on smaller sites, and closer to populations' and ignoring the special huge risks posed by LNG export facilities also storing large quantities of flammable "heavy hydrocarbon" refrigerants such as propane and butane…We thus have a born-yesterday, learning on the job, disaster risk-imposing US industry and weak government at the federal level [states and localities have no safety say] which minimize the appearance of risk, and which are heedless of the decades-old Congressional directive [not regulation] for the proponents of new LNG facilities to 'seek remote siting.'"

Thomas D. Schuster, Director of the Sierra Club Pennsylvania Chapter, also provided written testimony. In addition to highlighting the risks of pipeline explosions, vapor cloud

explosions, and other catastrophic risks of LNG transport (likening a potential explosion to the equivalent of an atomic bomb), he also highlighted concerns over climate disruption. He wrote:

> "Expanding the number of LNG export facilities will put this climate mitigation goal out of reach. The Sierra Club estimates that lifecycle emissions from full operation of just the existing LNG export facilities are approximately 516 million metric tons of carbon dioxide equivalent (MMT CO2e) annually, equal to over 111 million cars or 138 coal plants."

He also addressed the need for additional U.S. exports of LNG to Europe, writing:

> "Although the European Commission has asked for additional gas deliveries immediately, Europe does not need additional gas in the medium or long term. The International Energy Agency has concluded that heat pumps, building efficiency, and similar measures can significantly reduce the European Union's gas use, and thus reliance on Russian energy, this year, with greater reductions each following year…The IEA has explained that further expansion of global LNG exports cannot be part of the path to net-zero emissions."

August

Dr. Marilyn Howarth, Director of Community Engagement at the Center of Excellence in Environmental Toxicology at the Perelman School of Medicine at the University of Pennsylvania, wrote:

> "Siting an LNG export facility in or near Chester would increase risks to an already environmentally overburdened community… for the immediate residents of Chester, they would expect increases in asthma, heart attacks, strokes, and cancer due to the air pollution added by the LNG plant."
>
> "Safety issues should also be considered. Pipeline rupture although rare raises additional concerns for people living and working in and beyond Chester. Freeport LNG explosion of June 2022 resulted in a 450 ft high fireball. Its location on Quintana Island far from residences allowed its impact to be contained on site. This is not the situation found in Chester where residences are nearby. Explosions and fires would impact residents directly and immediately…"

> "Our Center researchers used multiple publicly available data sources which ranked Chester among the highest zip codes for lung cancer risk due to air toxics alone…Adding to the air toxics in Chester by emissions from LNG would increase lung cancer risk."

Dustin Meyer, Senior Vice President of American Petroleum Institute, provided a follow-up letter to address questions presented during his oral testimony. He wrote:

> "During questioning, Senator Williams requested information about how the industry is working to mitigate methane emissions across the natural gas value chain. The American Petroleum Institute (API) supports efforts to mitigate methane emissions, and thanks to innovation and concerted industry action, average methane emissions intensity declined by nearly 66 percent across all seven major producing regions from 2011 to 2021."

He also provided supplemental documentation outlining strategies to reduce emissions at LNG facilities, as well as during loading, transport and delivery. These strategies include high efficiency gas turbines, electrification, waste heat recovery, seal gas recovery, leak detection and recovery, and other efficiency initiatives.

Christine Reuther from **Delaware County Council** provided a recorded Declaration of Deed Restrictions, effective as of May 6th, 2022, regarding the property where the LNG facility is being proposed (known as 800 W. Front Street, Chester, PA 19013). It states, in part:

> "For a period of twenty (20) years from the date of this Declaration of Deed Restrictions as set forth at the top of this page, there shall be no use of the Property as a liquified natural gas plant…"

Task Force Objectives

EXISTING OBSTACLES

Restrictive Covenant on Proposed Chester Site

The Delaware County Recorder of Deeds has recorded a Declaration of Deed Restrictions dated and effective as of May 6th, 2022, in reference to the location of the proposed LNG facility in Chester. (800 W. Front Street, Chester, PA 19013). The Declaration states, in part: "For a period of twenty (20) years from the date of this Declaration of Deed Restrictions as set forth at the top of this page, there shall be no use of the Property as a liquified natural gas plant…"[3]

Tanker Size

A large LNG facility such as the proposed Penn America LNG facility in Chester, or any other large facility being considered by the Philadelphia LNG Export Task Force will require large scale operations. Limits on the size of shipping vessels could markedly reduce the facility's operational capacity.

Modern LNG vessels are significantly larger than the average tankers that traverse the Delaware River to ports in the Philadelphia region. The average LNG vessel is approximately 300 meters (~984 feet) long and 43 meters (~141 feet) wide.[4] The largest tankers currently navigating the Delaware River this far up the river are "Dragon Class" ships which are approximately 180 meters (~590 feet) long and 26 meters (~85 feet) wide.[5] For perspective, this is a 60% difference in ship size.

A fully laden LNG vessel can reach 12.5m "maximum draft," which is 41 feet. This means that the LNG tankers that use the river's navigation channel would be just 4 feet from the bottom of the artificially deepened 45-foot navigation channel in the Delaware River, increasing chances of accidental grounding, clashes with debris, or the dangers of shifting depths caused by

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[3] Delaware County Recorder of Deeds, Instrument No. 2022028312, Recorded May 13, 2022.

[4] Yong Bai, Wei-Liang Jin, Marine Structural Design (Second Edition), 2016, p49-71. https://www.sciencedirect.com/topics/engineering/natural-gas-carrier#:~:text=A%20typical%20modern%20LNG%20carrier,125%2C000%20and%20150%2C000%20m3.

[5] *Dragon Class Liquid Transport Vessels,* Ship Technology (Dec. 29, 2016). https://www.ship-technology.com/projects/dragon-class-liquid-gas-transport-vessels/?cf-view&cf-closed

storm events. It may also increase environmental impacts such as ship strikes with marine species, including those protected by the federal government as federally endangered species (such as the Delaware River's unique ecotype of Atlantic sturgeon).

Distance from the Ocean

Another consideration regarding river logistics and obstacles is the distance of an LNG terminal located in southeastern PA from the ocean. LNG facilities are typically located on a coast, with direct access to the ocean, both for safety reasons and for the economic advantage of getting quickly into the ocean voyage.

A terminal in the Delaware River ports would be about 84 river miles or 70 nautical miles upriver from the Atlantic Ocean. For a good portion of the river travel, about 30 miles of the 84 river miles, ships would have to traverse the relatively narrow and shallow river, utilizing the navigation channel until the river gradually widens into the Bay. This increases the risk of shipping accidents and exposes densely populated communities on adjacent land to the loaded ships. It may also increase costs for the shipper (and reduce profits) due to the extra time required for the journey and the possible limits on the size of the LNG carrier that can be practically used.

Parcel Size

The issue of space for such a large facility is illustrated by examining the available parcels along the southeastern Pennsylvania riverfront. There is no unused parcel that is large enough or remote enough in Chester, or the surrounding area, to accommodate the facility and the infrastructure required for an LNG processing plant and export terminal.

Penn America LNG is proposing a new LNG facility in the Chester, PA area, however, there is no appropriate site for such a facility. The currently proposed site is only 100 acres, in a densely populated area. LNG facilities that would produce the amount of LNG Penn America says they are planning (7 million metric tons per year) require much more land. For instance, the Elba Island, GA LNG processor and export terminal has an export capacity of about 1/3 of that amount (2.5 mmt/year) and uses 140 acres.[6] Cove Point, MD's LNG liquefaction plant is smaller

[6] *Elba Island LNG Terminal,* Global Energy Monitor Wiki (last edited Oct. 13, 2023). https://www.gem.wiki/Elba_Island_LNG_Terminal

(export capacity of 5.25 mmt/year), about 75% of the size of the proposed Chester facility and sits on 1000 acres in a much more remote area.[7] Cove Point's active facility doesn't use the entire 1000 acres, but the acreage provides a safety buffer from populated areas. 1000 acres is 1/3 of the entire City of Chester, a city with a population of over 32,600 residents as of the 2020 Census.

Infrastructure

New or expanded pipeline delivery systems would be required to bring natural gas to Southeastern PA. LNG processing requires enormous volumes of natural gas because the gas is reduced by 620 times when it is frozen into liquid form.

The Penn America plan for a Chester LNG facility would likely require an expansion of one of the existing market pipelines that currently bring gas to the Marcus Hook region.[8] Additionally, there would need to be a new connector pipeline built from the current line to Chester.[9] Originally named the Greater Philadelphia Lateral Expansion Pipeline, this Enbridge (formerly Spectra) pipeline project seems to be dormant. The webpage has been taken down from the ENBRIDGE website; it was outdated by 2023 with an "in-service" date of 2019. They would need to get easements for about 5 miles for a new "greenfield" connector pipeline from the existing market pipeline in Chester County. This entails the company acquiring easements and other rights of way and multiple regulatory approvals. The Eagle Compressor, shown below on the map from the pipeline site, exists at 310 Fellowship Rd., Chester Springs, PA 19425.

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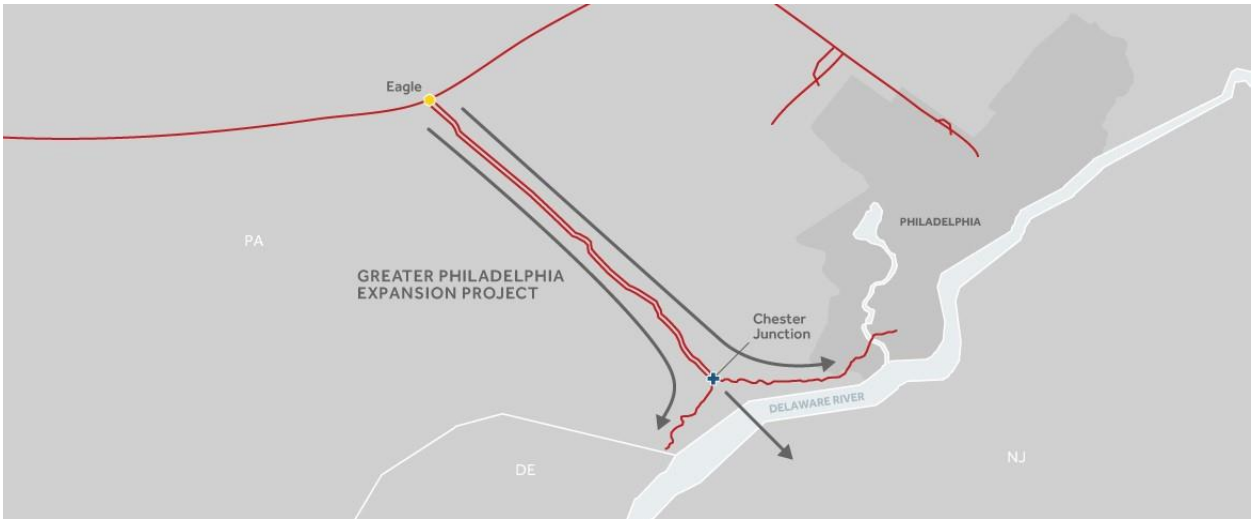
[7] *Cove Point LNG Terminal,* Global Energy Monitor Wiki (last edited Oct. 12, 2023). https://www.gem.wiki/Cove_Point_LNG_Terminal

[8] *Economic Impact Analysis (EIA): City of Chester LNG Project*, *Executive Summary*, Penn America Energy (August, 2016).

[9] *Id.*



Map [source: https://www.enbridge.com/investment-center/faqs](https://www.enbridge.com/investment-center/faqs)

Other means of transporting natural gas to an LNG processing facility on the river could include trucks or rail. Trucks would be cumbersome and slow, and the quantities needed to transport the amount projected to be produced by Penn America at Chester would not be possible or feasible. Transporting LNG by rail is not allowed under federal regulations at this time, but a rule that could allow this under certain conditions is planned to be released for public comment by the US DOT's Pipeline and Hazardous Materials Safety Administration in early 2024. The public safety rule that lifted the longstanding ban on LNG by rail was adopted under the Trump Administration but was suspended by the Biden Administration this year. It is not clear if rail could potentially be used to transport already-liquefied methane, or LNG, in the future.

Whatever the means of transport, the natural gas would have to be transported from other parts of Pennsylvania since there is no natural gas or fracking in the Delaware River Basin, New Jersey, or Delaware. The closest gas wells are located in the Susquehanna River Basin which are several hundred miles distant. This adds expense, and time, and is logistically complex. It also expands the footprint of the project with infrastructure and/or transportation resulting in adverse environmental and community impacts throughout the infrastructure's pathway.

In addition to the processing plant, storage tanks, chemical storage, on-site pipelines and other operating necessities for an LNG facility, a deepwater wharf would need to be built in the river for marine tankers to access for filling and export shipping. The river is not dredged to the required 45-foot depth except for the navigation channel, which would require the company to dredge the Delaware from the navigation channel to the export dock. This is a major undertaking

in terms of permitting and capital investment and carries a host of adverse environmental impacts.

ECONOMIC FEASIBILITY/VIABILITY

There is no guaranteed long-term viability for a LNG facility in Pennsylvania.

Numerous LNG Projects Already in the Works

There is no need for additional LNG facility proposals. The Oil and Gas Journal predicts increased exports from the Gulf Coast as new projects, already in development for many years, come on line.

> "The agency forecasts US LNG exports to average 12 billion cubic feet per day (bcfd) in 2023 and 13.3 bcfd in 2024, as two new LNG liquefaction projects are expected to come online: QatarEnergy and ExxonMobil Corp.'s 18 million tons per year (tpy) Golden Pass, and Venture Global LNG Inc.'s 20 million tpy Plaquemines plants. Global economic conditions and demand for natural gas in Europe and Asia may affect this forecast."[10]

U.S. exports will be buoyed by Gulf Coast exports over the next year and the international LNG industry is making a place for its business wherever there is demand. The U.S. may find itself with plenty of LNG terminals with not enough places to send it, an economic boondoggle.

The June 15, 2023 IEEFA article explains, referring to Rio Grande LNG, a proposed LNG facility in Brownsville Texas on the Gulf Coast:

> "If NextDecade is able to secure financing for Rio Grande LNG, it will be the seventh LNG project under construction that relies on U.S. natural gas. Two facilities are currently being built in Mexico, both sourced with U.S. gas. Three brand new U.S. terminals are under construction: Golden Pass LNG, spearheaded by ExxonMobil and Qatar Petroleum; Sempra Energy's terminal in Port Arthur, Texas; and Venture Global's

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[10] *Natural gas deliveries to US LNG plants increased in first-half 2023,* Oil & Gas Journal (July 14, 2023). https://www.ogj.com/pipelines-transportation/lng/article/14296427/natural-gas-deliveries-to-us-lng-plants-increased-in-firsthalf-2023 and *The EU's Imports of Russian LNG Surged by 40% in the First Half of 2023*, Oilprice.com (August 30, 2023). https://oilprice.com/Latest-Energy-News/World-News/The-EUs-Imports-Of-Russian-LNG-Surged-By-40-In-The-First-Half-Of-2023.html

Plaquemines LNG project in Louisiana. There's an expansion underway at Cheniere's Corpus Christie LNG plant, as well.

If all seven projects are put into service, U.S. LNG export capacity—already high enough to create pain for U.S. consumers—will grow by 80 percent. The U.S. could be exporting as much as 22 billion cubic feet of gas per day, or more than one-fifth of all gas currently produced in the U.S. Additional LNG projects also are waiting in the wings, crossing their fingers that they'll get a financial green light."[11]

This projected increase in LNG exports doesn't include all the additional LNG export projects already in the bureaucratic queue, waiting for required approvals from the many agencies that have jurisdiction over LNG export projects and terminals. "Federal regulators have already approved 12 new plants that would redouble America's already vast LNG export capacity."[12]

Additional LNG export facilities will put all climate-mitigation efforts out of reach. According to testimony provided to the Philadelphia LNG Task Force by Thomas Schuster, Director of the Sierra Club PA Chapter, lifecycle emissions from currently existing LNG export facilities are approximately 516 million metric tons of carbon dioxide equivalent annually, equal to over 111 million cars or 138 coal plants. There are currently 22 proposed LNG export projects – emissions for the 22 proposed projects would be equivalent to that of 440 coal plants or over 354 million cars. That means that the full proposed LNG buildout could contribute to the climate crisis as much as 578 coal plants or 465 million cars.[13]

Poor Long-Term Market

Officials within the oil and gas industries claim there is an increasing market for U.S. LNG exports, particularly in Europe and Asia, but research suggests otherwise. No new LNG facilities are needed to meet the demand that officials say Europe requires during the current military crisis. Existing terminals in the United States are already pumping out LNG at an

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[11] Clark Williams-Derry, *Rio Grande LNG project could raise U.S. gas prices—and add to a looming global glut,* Institute for Energy Economics and Financial Analysis (June 15, 2023). https://ieefa.org/resources/rio-grande-lng-project-could-raise-us-gas-prices-and-add-looming-global-glut

[12] Clark Williams-Derry, *LNG exports may spell trouble on horizon for U.S. consumers,* Institute for Energy Economics and Financial Analysis (April 24, 2023). https://ieefa.org/resources/lng-exports-may-spell-trouble-horizon-us-consumers

[13] Thomas Schuster written testimony, provided to Philadelphia LNG Task Force on April 20, 2023.

increased rate; the U.S. exceeded the extra 15 billion cubic meters (BCM) in 2022 that was promised to the European Union by President Biden without new facilities.[14] Data from the U.S. Department of Energy and S&P Global showed that the 15 BCM goal had been met and surpassed by mid-August 2022—less than five months after the pledge.[15]

Economists predict that the increased exports don't have a positive sustainable financial position considering the market outlook for LNG in the coming years. The June 15, 2023 IEEFA article continues to address the lack of a long term market for more LNG from any U.S. location:

> "One of the many ironies of the ongoing LNG buildout is that the global market may not actually need Rio Grande's capacity at all. The U.S. is not the only country that is building LNG export plants. Qatar, which produces the world's cheapest LNG, is in the middle of a massive expansion. Meanwhile, Canada, Russia, and Australia all have LNG projects under construction, as do Mozambique, Indonesia, Senegal, Nigeria, and Gabon."[16]

There is more likely an LNG glut globally than a need for more. The United States, and Pennsylvania's' Marcellus shale, move in a global market that is not under our control. Long term contracts from other nations' supply will continue to feed LNG to those who want it. Spot pricing of LNG will continue to be unstable and not a reliable predictor for financial planning and long-term contracts are already committed in a world economy that doesn't include Marcellus.

Global Movement Away from LNG

On the world stage, LNG's reputation has suffered, no matter the source. As stated in this December 20, 2022 IEEFA article:

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[14] Jarret Renshaw, Scot Disavino, *Analysis: U.S. LNG exports to Europe on track to surpass Biden promise,* Reuters (July 26, 2022). https://www.reuters.com/business/energy/us-lng-exports-europe-track-surpass-biden-promise-2022-07-26/

[15] Clark Williams-Derry, *The liquefied natural gas (LNG) boom in Europe isn't all good news for U.S. exporters*, Institute for Energy Economics and Financial Analysis (Dec. 20, 2022). https://ieefa.org/resources/liquefied-natural-gas-lng-boom-europe-isnt-all-good-news-us-exporters

[16] Clark Williams-Derry, *Rio Grande LNG project could raise U.S. gas prices—and add to a looming global glut,* Institute for Energy Economics and Financial Analysis (June 15, 2023). https://ieefa.org/resources/rio-grande-lng-project-could-raise-us-gas-prices-and-add-looming-global-glut

> "At this point, sky-high prices and supply glitches have saddled LNG with a reputation as an unreliable and volatile energy source, curbing LNG-to-power plans in Asia and forcing energy forecasters—including Bloomberg, ICIS, and IEA, among others—to slash their projections for Asian LNG demand growth."[17]

The article continues:

> "[T]he [European] continent is responding mostly by cutting demand for gas, by using the fuel more efficiently while ramping up substitutes such as wind and solar. Those shifts are likely to last for the long haul, and are being supercharged both by high prices and by the continent's ambitious climate goals, which call for major cuts in gas consumption. The European economic think tank, Bruegel, projects that cuts in European gas demand by 2030 could be so steep that most of the continent's LNG import infrastructure will be unneeded."[18]

The future for LNG from any source is dim. The need for LNG will lessen until it is far too expensive and polluting to be marketable. As IEEFA says, by 2030 the rejection of LNG by current buyers could leave unneeded infrastructure standing and unused. It is not a viable pathway to a thriving port here on the Delaware River and it is not a sound economic investment for Pennsylvania.

ECONOMIC IMPACT

Increase in Local LNG Prices

Expansion of LNG exports will cause financial concerns for U.S. consumers. The April 24, 2023 IEEFA report states:

> "Although it's unlikely that all of those projects will move forward, the projects that are already under construction could create massive headaches for U.S. consumers. Exports are locked into contracts for 20 years. Even if the U.S. gas industry can boost production

[17] *Id.*
[18] *Id.*

for a while, it seems exports eventually will lift demand, put pressure on supply, and create price chaos in domestic gas markets."[19]

The cost of residential home heating with natural gas markedly increased in 2022 since the Ukraine war began. Economists point out that the price spike is linked clearly to U. S. exports of LNG to Europe, where producers have gotten about seven times more profit for the gas.[20] President Biden's agreement with the European Commission to increase LNG exports from the U.S. to Europe was an effort to help replace Russian gas,[21] but a secondary effect is a significant increase in domestic natural gas home heating costs because companies are finding higher profits overseas. Exporting LNG from the Delaware River ports would contribute to the increase in our home heating bills and other domestic energy needs.

Domestic gas prices for consumers can be expected to rise as exports rise, as stated in the IEEFA article of June 15, 2023:

"With every new LNG export project that's completed, U.S. gas markets move one step closer to shortages, volatility, and higher prices. America's gas export surge forced U.S. consumers to compete with overseas buyers, pushing U.S. natural gas prices to their highest levels in well over a decade."[22]

Consumers at home are not capable of winning in a bidding war with overseas buyers. The reason LNG companies are exporting overseas is not to be patriotic or generous, it is to fetch the highest profits possible.

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[19] Clark Williams-Derry, *LNG exports may spell trouble on horizon for U.S. consumers,* Institute for Energy Economics and Financial Analysis (April 24, 2023). https://ieefa.org/resources/lng-exports-may-spell-trouble-horizon-us-consumers

[20] Matt Egan, *Us natural gas prices spike to 14-year high. Here's why,* CNN Business (Aug. 17, 2022). https://www.cnn.com/2022/08/17/energy/natural-gas-inflation-heat-wave/index.html

[21] *Joint Statement between the United States and the European Commission on European Energy Security*, Whitehouse.gov (March 25, 2022). https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/25/joint-statement-between-the-united-states-and-the-european-commission-on-european-energy-security/

[22] Clark Williams-Derry, *Rio Grande LNG project could raise U.S. gas prices—and add to a looming global glut,* Institute for Energy Economics and Financial Analysis (June 15, 2023). https://ieefa.org/resources/rio-grande-lng-project-could-raise-us-gas-prices-and-add-looming-global-glut

SECURITY/SAFETY

Unique Dangers of LNG

LNG is a liquefied cryogenic flammable gas when cooled to at least -260 degrees F. It is classified as extremely flammable (Category 1, the most dangerous class) under the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).[23] LNG is also classified as Hazardous under OSHA regulations and in accordance with United States Department of Transportation regulations.[24] As reported by the federal Pipeline and Hazardous Materials Safety Administration (PHMSA), which has jurisdiction over LNG handling (PHMSA), "LNG poses potential hazards as a cryogenic liquefied flammable gas, including cryogenic temperature exposure, fire, and asphyxiation hazards."[25]

If LNG is released into the atmosphere, it has extremely dangerous hazardous effects and the potential for catastrophic impacts. The released LNG creates an extremely cold vapor cloud that robs oxygen from the air. If in an enclosed space, it asphyxiates, causing death.[26] Metal can become embrittled by exposure to the cold vapor, compromising structures such as bridges or railways.[27]

"[M]ethane is odorless, and LNG contains no odorant, making instant detection of a release resulting from an incident difficult without a detection device," explains PHMSA.[28] Released LNG *may* appear to be visible as the methane mixes with atmospheric moisture, or it can be completely invisible. This makes it difficult to predict or locate the cloud during the critical period following release.

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[23] *Safety Data Sheet: Liquefied Natural Gas (LNG)*, PGW (Issued June 6, 2015). Retrieved from: https://www.pgworks.com/uploads/pdfs/LNGSafetyData.pdf

[24] *Id.*

[25] PHMSA, *Hazardous Materials: Suspension of HMR Amendments Authorizing Transportation of Liquefied Natural Gas by Rail*, p. 46 (Sept 1, 2023). Retrieved from: https://www.federalregister.gov/documents/2023/09/01/2023-18569/hazardous-materials-suspension-of-hmr-amendments-authorizing-transportation-of-liquefied-natural-gas

[26] SP 20534 Special Permit to transport LNG by rail in DOT-113C120W rail tank cars. Final Environmental Assessment. Docket No. PHMSA-2019-0100. December 5, 2019. p. 11.

[27] SP 20534 Special Permit to transport LNG by rail in DOT-113C120W rail tank cars. Final Environmental Assessment. Docket No. PHMSA-2019-0100. December 5, 2019. p. 9.

[28] PHMSA, *Hazardous Materials: Suspension of HMR Amendments Authorizing Transportation of Liquefied Natural Gas by Rail*, p. 46 (Sept. 1, 2023). Retrieved from: https://www.federalregister.gov/documents/2023/09/01/2023-18569/hazardous-materials-suspension-of-hmr-amendments-authorizing-transportation-of-liquefied-natural-gas

This danger is amplified because if the extremely flammable cloud is ignited, it will burn back to the original source of release, exposing the entire area to a fire that cannot be extinguished. The rapid expansion to ~620 times its original volume moves the cloud far beyond the point of release, increasing the likelihood of it reaching an ignition source.[29] An LNG vapor cloud can erupt with only a small ignition source, such as a spark or static electricity.[30]

Need for Remote Siting

The Congressional Research Service has issued several publications detailing the unique dangers posed by the transport and storage of LNG. The CRS has found that:

> "[A] major spill would likely result in a...serious fire."[31] CRS also notes that counterterrorism advisors have "asserted that terrorists have both the desire and capability to attack LNG shipping with the intention of harming the general population."[32]

The US Emergency Response Guidebook advises in the case of an LNG fire to initially evacuate a 1-mile radius.[33] In the recent Plymouth, WA LNG fire, they evacuated a 2-mile radius.[34] The extremely hot fire caused by a LNG leak or spill can cause fatal injuries to people as far as 2 miles away under certain conditions.[35]

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[29] James D. Narva, Executive Director, National Association of State Fire Marshals to PHMSA re. Docket Number PHMSA-2018-0025 (HM-264) – LNG by Rail. P.6

[30] *Safety Data Sheet: Liquefied Natural Gas (LNG)*, PGW (Issued June 6, 2015). Retrieved from: https://www.pgworks.com/uploads/pdfs/LNGSafetyData.pdf

[31] CONGRESSIONAL RESEARCH SERVICE, Liquefied Natural Gas (LNG) Import Terminals: Siting, Safety, and Regulation Dec. 14, 2009. p. 6. https://www.everycrsreport.com/files/20091214_RL32205_e95cb50c88dbd56a2c8f706b2d521ef7ae81ee00.pdf

[32] CONGRESSIONAL RESEARCH SERVICE, Liquefied Natural Gas (LNG) Import Terminals: Siting, Safety, and Regulation, p. 23 (Dec. 14, 2009). https://www.everycrsreport.com/files/20091214_RL32205_e95cb50c88dbd56a2c8f706b2d521ef7ae81ee00.pdf

[33] USDOT, PHMSA, Emergency Response Guidebook, 2020.

[34] Tarika Powell. *Williams Companies Failed to Protect Employees in Plymouth LNG Explosion,* Sightline (June 3, 2016). https://www.sightline.org/2016/06/03/williams-companies-failed-to-protect-employees-in-plymouth-lng-explosion/

[35] "DELAWARE COASTAL MANAGEMENT PROGRAM AND FINAL ENVIRONMENTAL IMPACT STATEMENT". [From the U.S. Government Printing Office, www.gpo.gov]. U.S. DEPARTMENT OF COMMERCE, National Oceanic and Atmospheric Administration, Office of Coastal Zone Management, *41T4 O74f. UNITED STATES DEPARTMENT OF COMMERCE, the Assistant Secretary for Science and Technology, Washington, D.C. 20230 (July 2 1979). P. 225 of PDF.

A release of LNG from a storage container, tank, or processing facility in a densely populated area would not allow for an evacuation in time to avoid human health impacts, including injuries and potential deaths at a catastrophic level. The placement of any LNG facility within the southeastern region of Pennsylvania or within any of the Delaware River ports would not be feasible due to the inability to evacuate or avoid significant harm to inhabitants, infrastructure, and the environment within the impact area.

ENVIRONMENTAL/COMMUNITY IMPACT

Environmental Justice Zone – Health Risks

The proposed LNG facility falls within a documented Environmental Justice Zone in the City of Chester. It will have a significant impact on the approximately 70,000 people living within a 3-mile radius, some of them living outside the city limits of Chester (the population of Chester is 32,605 as per the 2020 Census). 41% of those residents are low-income, and 58% are people of color.[36]

The Chester community already experiences high levels of air pollution, and the introduction of an LNG facility will further increase residents' exposure to pollutants. In addition to the safety risks involved in operating a LNG facility in a populated area, the pollution from the facility will further put residents' and workers' health at risk. Air pollution is a known cause of adverse human health conditions. According to the U.S. EPA:

> "Decades of research have shown that air pollutants such as ozone and particulate matter (PM) increase the amount and seriousness of lung and heart disease and other health problems."[37] Dangerous pollutants would be emitted into the air by an LNG processing facility, putting nearby residents at risk."

EPA continues:

> "Research has shown that some people are more susceptible than others to air pollutants. These groups include children, pregnant women, older adults, and individuals with pre-existing heart and lung disease. People in low socioeconomic neighborhoods

[36] *Penn LNG Liquefaction and Export Terminal,* Oil & Gas Watch (last accessed Oct. 18, 2023). https://oilandgaswatch.org/facility/5224

[37] *Research on Health Effects from Air Pollution,* EPA (last updated Jan. 26, 2023). https://www.epa.gov/air-research/research-health-effects-air-pollution

> and communities may be more vulnerable to air pollution because of many factors. Proximity to industrial sources of air pollution, underlying health problems, poor nutrition, stress, and other factors can contribute to increased health impacts in these communities."[38]

EPA explains about the principal criteria air pollutants:

> "EPA sets National Ambient Air Quality Standards (NAAQS) for six principal criteria air pollutants—nitrogen oxides, sulfur oxides, particulate matter, carbon monoxide, ozone and lead—all of which have been shown to be harmful to public health and the environment."[39]

These principal criteria air pollutants are the very pollutants, some of them the precursors to ozone, which would be emitted by the processing of LNG. All but lead would be emitted into the air by an LNG processing facility and would increase air pollution in Delaware County and Chester.

The Chester community is already overburdened with air pollutants and other environmental burdens because of current air emissions from the Covanta Delaware Valley LP Incinerator and other industrial facilities. For instance, at the Covanta incinerator nitrogen oxides (NOx) are emitted from the facility's six (6) waste combustors and NOx would also be emitted from an LNG processing facility. Nitrogen Oxides or NOx are a group of poisonous, highly reactive gases.[40] These gases form when fuel is burned at high temperatures.[41] NOx and volatile organic compounds (VOC) react in the atmosphere with sunlight to produce ground-level ozone (smog), fouling the air. Of the six pollutants that are measured by national air quality standards, particle pollution and ground-level ozone have the most widespread health threats.[42] NOx can

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[38] *Research on Health Effects from Air Pollution,* EPA (last updated Jan. 26, 2023). https://www.epa.gov/air-research/research-health-effects-air-pollution

[39] *Id.*

[40] *Nitrogen Oxides (Nox) Control Regulations*, EPA (last updated July 13, 2023). https://www3.epa.gov/region1/airquality/nox.html

[41] *Id.*

[42] *US EPA Nonattainment Areas and Designations*. Data.gov (last updated Aug. 30, 2023). https://catalog.data.gov/dataset/us-epa-nonattainment-areas-and-designations

cause respiratory distress and irritation and burns to the eyes and skin at higher levels. After prolonged exposure, NOx can cause fluid buildup in the lungs, and even death.[43]

The Delaware Valley region, including Delaware County and Chester, is a non-attainment area for ozone and particle pollution[44], meaning it does not meet federal air standards that are set to protect human health and the environment.

A recent study was released that confirms what other studies have found – that "Higher prenatal ambient air pollution exposure has been associated with impaired neurodevelopment in preschoolers and school-aged children."[45] The study further explored "the relationships between prenatal ambient air pollution exposure and neurodevelopment during infancy."[46]

Another study has linked exposure to air pollution to an increased risk of dementia, as published in the *Journal of Alzheimer's Disease*. Specifically, high levels of $PM_{2.5}$ and NO_2/NO_x in the air can lead to inflammation in the brain, related to dementia or cognitive decline in adults.[47]

Released in September 2023, a new study examined the increase worldwide of antimicrobial resistance (AMR) to bacteria and found a surprising link to air pollution: "Airborne fine particulate matter, we usually call it PM2.5, contains a cocktail of microorganisms," says Hong Chen, professor of environmental engineering at Zhejiang University and corresponding author of the study.[48]

Adding any pollution to the Delaware County and Chester region is unacceptable and will worsen air quality conditions for residents and workers. This will lead to more harm to

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[43] *ToxFAQs*, Agency for Toxic Substances and Disease Registry (April 2002). https://www.atsdr.cdc.gov/toxfaqs/tfacts175.pdf

[44] *Air Quality Programs*, Delaware Valley Regional Planning Commission. https://www.dvrpc.org/airquality/ and *Current Nonattainment Counties for All Criteria Pollutants*, EPA (current as of Sept. 30, 2023). https://www3.epa.gov/airquality/greenbook/ancl.html

[45] Z.E.M. Morgan, M.J. Bailey, D.I. Trifonova, D.I. et al. *Prenatal exposure to ambient air pollution is associated with neurodevelopmental outcomes at 2 years of age.* Environ Health **22**, 11 (2023). Published January 24, 2023. https://doi.org/10.1186/s12940-022-00951-y

[46] *Id.*

[47] Ruth Peters et al. *Air Pollution and Dementia: A Systematic Review*, Journal of Alzheimer's Disease (Published online Aug. 13, 2019). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6700631/

[48] Gabriel Spitzer, *Superbugs catch a ride on air pollution particles. Is that bad news for people?* NPR (Sept. 7, 2023). https://www.npr.org/sections/goatsandsoda/2023/09/07/1198007048/superbugs-catch-a-ride-on-air-pollution-particles-is-that-bad-news-for-people?utm_campaign=Hot%20News&utm_medium=email&_hsmi=273478921&_hsenc=p2ANqtz-_lMuCzBzdq5b27q1PBERqkOOpKR7GBVYxsY9dryalqmosel_ceBsJhmwcO138EfSzyWVSh6qWoJN8Bobi3mbsS0YDGF_hmef0kK7IKBQWsSnZnDLc&utm_content=273478921&utm_source=hs_email

peoples' health from exposure to these damaging air pollutants. The line must be drawn somewhere and should be drawn whenever any air pollutant will add to this overburdened region.

Community Impact

According to the news outlet DeSmog, architectural renderings of the proposed facility include an approximately 25-acre parkland buffer to be added in front of the terminal. The addition of that buffer zone would displace at least three churches, a daycare center, numerous businesses, and multiple dozens of families in homes within the proposed zone.[49] Zulene Mayfield, Chairperson of Chester Residents Concerned for Quality Living, provided oral testimony before the Philadelphia LNG Task Force in August, 2023, stating that the actual number of homes that would be destroyed in order to build the proposed facility and buffer zone would be over 800.[50] If this proposal is approved, it would effectively displace a large portion of the surrounding population, and it would subject the remainder to dangerous pollutants.

Climate Concerns

Methane, released by LNG throughout its life cycle, is a huge contributor to the greenhouse gases that are warming the atmosphere, exacerbating negative effects of climate change. LNG proponents use faulty figures to support their claim that LNG is "clean" and emits less carbon or greenhouse gases than other fossil fuels. The math is incorrect that these supporters have been using, as data and new reports show.[51]

The NRDC published a report explaining that expansion of the LNG export industry is an ineffective strategy to reduce greenhouse gas emissions:

> "Overseas export of U.S.-produced liquefied natural gas (LNG), gas kept in a liquid form for ease of transport, is rapidly expanding. Historically, gas has been considered a "bridge

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[49] Edward Donnelly, *As EU Weans Itself From Russian Energy, U.S. Shale Gas Industry Pushes New LNG Export Plant in Pennsylvania,* DeSmog (Aug. 17, 2023). https://www.desmog.com/2023/08/17/u-s-shale-gas-industry-pushes-lng-export-plant-in-pennsylvania-to-europe/

[50] Zulene Mayfield Oral Testimony, provided to the Philadelphia LNG Task Force on Aug. 22, 2023.

[51] Aaron Clark, *Methane From Oil and Gas Are Worse Than Reported to UN, Satellites Show,* Bloomberg (Sept. 14, 2023). https://www.bloomberg.com/news/articles/2023-09-14/satellites-expose-holes-in-global-rules-for-methane-reporting#xj4y7vzkg "Observed methane releases from global oil and gas operations are 30% higher than what countries estimate in reports to the UN, according to a new study that analyzed satellite observations of the potent greenhouse gas."

> fuel"—cleaner and with lower carbon dioxide emissions than coal or oil—and a potential tool to help address climate change. However, LNG is neither clean nor particularly low in emissions. In addition, the massive investments in new infrastructure to support this industry, including pipelines, liquefaction facilities, export terminals, and tankers, lock in fossil fuel dependence, making the transition to actual low-carbon and no-carbon energy even more difficult.
>
> Our analysis shows that using LNG to replace other, dirtier fossil fuels, is not an effective strategy to reduce climate-warming emissions. In fact, if the LNG export industry expands as projected, it is likely to make it nearly impossible to keep global temperatures from increasing above the 1.5 degrees Celsius threshold for catastrophic climate impacts."[52]

The development of natural gas will further exacerbate the climate crisis. The composition of natural gas is about 95% methane. Methane leaks or is vented or flared at all stages of the natural gas process (extraction/production, gathering, processing, transmission, storage, local distribution and consumption). Methane is 86 times more powerful than carbon at heating the atmosphere on a 20-year time scale, 104 times more powerful than carbon over a 10-year period.[53]

Scientific reports, including the IPCC 2021 Working Group Report, warns that we must reduce greenhouse gas emissions to keep the atmosphere from warming past critical meltdown.[54]

> "The report shows that emissions of greenhouse gases from human activities are responsible for approximately 1.1°C of warming since 1850-1900, and finds that averaged over the next 20 years, global temperature is expected to reach or exceed 1.5°C of warming. This assessment is based on improved observational datasets to assess

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[52] Amy Mall, *Sailing to Nowhere: Liquefied Natural Gas is Not and Effective Climate Strategy,* NRDC (Dec. 8, 2020). https://www.nrdc.org/resources/sailing-nowhere-liquefied-natural-gas-not-effective-climate-strategy

[53] Myhre, G. et al. 2013. *Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Stocker, T.F., D. Quin, G.K. Plattner, M.Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P.M. Midglet (eds). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. and https://en.wikipedia.org/wiki/Global_warming_potential

[54] *Climate change widespread, rapid, and intensifying*, IPCC (Aug. 9, 2021). https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/

historical warming, as well progress in scientific understanding of the response of the climate system to human-caused greenhouse gas emissions."[55]

Greenhouse gas emissions must address methane, which means curtailing natural gas development. According to recent reports tracking greenhouse gases,

> "…energy-related carbon dioxide emissions were at a record high last year and new renewable power capacity has stalled after years of strong growth. At the same time, methane, a more potent greenhouse gas than carbon dioxide, has risen in recent years due to oil and gas production, including fracking."[56]

Atmospheric methane levels rose steadily during the last few decades of the 20th century before leveling off for the first decade of the 21st century.[57] Since 2008, however, methane concentrations have again been rising rapidly. This increase, if it continues in coming decades, will significantly increase global warming and undercut efforts to reach the COP21 target of < 2 degrees C above the pre-industrial baseline.[58] Limiting warming to 1.5C will be even more difficult, if not impossible.

Natural gas systems emit more anthropogenic methane than any other source in the United States and are the third highest source for carbon dioxide emissions nationally.[59] Natural gas, considered "clean" or a "bridge fuel" is, in fact, a bigger problem than other fossil fuels due to uncontrolled and uncontrollable leaks, intentional flaring and venting. "Methane is far more potent than carbon dioxide in contributing to climate change. That makes it particularly harmful to the environment when it is discharged into the atmosphere. In the U.S. alone, the methane that leaks or is released from oil and gas operations annually is equivalent to the greenhouse gas emissions from more than 69 million cars, according to a Wall Street Journal analysis using

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[55] *Id.*

[56] *Greenhouse Gas Emissions Must Be Halved by 2030 to Avoid 3C Warming: Scientists,* Insurance Journal (June 19, 2019). https://www.insurancejournal.com/news/international/2019/06/19/529839.htm

[57] Robert W. Howarth, *Ideas and perspectives: is shale gas a major driver of recent increase in global atmospheric methane?* Biogeosciences (16), 3033-3046 (published Aug. 14, 2019). https://www.biogeosciences.net/16/3033/2019/bg-16-3033-2019.pdf

[58] Ibid.

[59] *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014,* EPA (last updated May 3, 2023). https://www.epa.gov/ghgemissions/us-greenhouse-gas-inventory-report-1990-2014

conversion formulas from the Environmental Protection Agency and emissions estimates for 2015."[60]

Methane's impact on atmospheric warming is much shorter and simpler than carbon, as explained in a VOX.com article:

> "Reduced emissions [of methane] have an almost immediate climate impact. It's a short-term climate lever, and if the countries of the world are going to hold rising temperatures to the United Nations' target of "well below" 2 degrees Celsius above the preindustrial baseline, they're going to need all the short-term climate levers they can get."[61]

According to Dr. Howarth of Cornell University, the planet is going to continue to warm to 1.5 degrees C in 12 years and to 2 degrees C in 35 years or less unless we substantially cut methane emissions.[62] He points out that the planet responds much faster to methane than carbon dioxide. There is already so much carbon in the atmosphere that the only hope of meeting global climate targets is to address methane because that can quickly reduce greenhouse gases and slow the warming of the atmosphere.[63]

On a local level, the Delaware River Watershed is already experiencing the effects of climate change. Reports about the Delaware River Basin show "the potential for changes in the seasonality and volume of stream flows, as well as the potential for sea level rise to impact the location of the salt front and the availability of storage to manage salinity in the Delaware River Estuary."[64] 1.7 million people in the City of Philadelphia and the Greater Philadelphia Region draw their drinking water from the Delaware River, and keeping the salt levels in drinking water below EPA and health guidelines is essential. Multiple millions of dollars, upstream impoundments and decades of management by the Delaware River Basin Commission (comprised of the Governors of the four states and the Army Corps of Engineers for the federal

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[60] Rebecca Elliott, *The Leaks That Threaten the Clean Image of Natural Gas*, The Wall Street Journal (Aug. 8, 2019). https://www.wsj.com/articles/the-leaks-that-threaten-the-clean-image-of-natural-gas-11565280375

[61] David Roberts, *Fracking may be a bigger climate problem than we thought,* Vox (Updated Aug. 29, 2019). https://www.vox.com/energy-and-environment/2019/8/15/20805136/climate-change-fracking-methane-emissions

[62] Dr. Robert Howarth, Cornell University, *COP21 Reflections on the Historic Paris Climate Agreement.* http://events.cornell.edu/event/cop21_reflections_on_the_historic_climate_agreement

[63] Ibid.

[64] *Climate Change,* DRBC (last modified July 14, 2023). https://www.nj.gov/drbc/programs/flow/climate-change.html#2

government)[65] have kept the salt line from encroaching northward into the water intakes.[66] All efforts need to be made to prevent local impacts of climate change so that this irreplaceable water supply is not jeopardized. These reports on climate impacts on the Delaware River communities have been produced by the Delaware River Basin Commission,[67] the United States Army Corps of Engineers,[68] the United States Geological Survey[69] and others.

Sea Level rise translates into river level rise in the Delaware estuary and bay due to tidal influences. In the absence of adaptation, more intense and frequent extreme sea level events, together with trends in coastal development, will increase expected annual flood damages by 2-3 orders of magnitude by 2100.[70] The Delaware Valley Regional Planning Commission (DVRPC) reports that "…water levels of the tidal section of the Delaware River will rise as sea level rises along the Atlantic Coast. Rising water levels will be a permanent change and will introduce new flooding vulnerabilities along the Delaware that communities will need to address."[71]

In an earlier DVRPC report, the study on the effects of sea level rise concluded: "The study concludes that a three- to four-foot rise in sea level during the next 100 years will have a wide range of impacts. Rising seas will inundate almost all of Pennsylvania's 1,500 acres of tidal wetlands. The salt line in the Delaware River will migrate further upstream, threatening Philadelphia's drinking water supply. The pollutants found in contaminated sites may be released into estuary waters. Efforts to increase public access to the waterfront may be jeopardized by rising waters."[72]

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[65] *About DRBC,* DRBC (last modified July 3, 2023). https://www.nj.gov/drbc/about/

[66] *Salt Front,* DRBC (last modified Oct. 16, 2023). https://www.nj.gov/drbc/programs/flow/salt-front.html

[67] Amy Shallcross, *Analyzing Climate Change Impacts to Water Resources in the Delaware River Basin - Big Picture Risks*, DRBC (Nov. 1, 2018). https://www.nj.gov/drbc/library/documents/Shallcross_climate-change-wrm_WRADRBnov2018.pdf

[68] Billy Johnson, *Report prepared for: U.S. Army Engineer District, Philadelphia: Application of The Delaware Bay and River 3d Hydrodynamic Model to Assess the Impact of Sea Level Rise on Salinity* (2010). Available from U.S. Army Engineer District, Philadelphia or Delaware River Basin Commission.

[69] Tanja N. Williamson et al., *Summary of hydrologic modeling for the Delaware River Basin using the Water Availability Tool for Environmental Resources (WATER),* U.S. Geological Survey Scientific Investigations Report 2015–5143, p. 68, (2015). https://pubs.usgs.gov/sir/2015/5143/sir20155143.pdf

[70] *The Ocean and Cryosphere in a Changing Climate.* Intergovernmental Panel on Climate Change (2019), Retrieved from https://www.ipcc.ch/site/assets/uploads/sites/3/2022/03/06_SROCC_Ch04_FINAL.pdf at 4-4.

[71] *Coastal Effects of Climate Change in Southeastern PA, Introduction and Project Background,* DVRPC (Nov. 5, 2019). https://www.arcgis.com/apps/MapSeries/index.html?appid=8080c91a101d460a9a0246b90d4b4610

[72] *Sea Level Rise Impacts in the Delaware Estuary of Pennsylvania,* DVRPC, Product No.: 04037 (June 2004). https://www.dvrpc.org/Products/04037/

A report on the Delaware Bay and estuary communities in New Jersey showed that more intense and frequent extreme weather events, together with trends in coastal development, will increase expected annual flood damages.[73] The damage to buildings in all the counties along Delaware River tidal waters has increased due to climate impacts since 1980 according to the study. These climate change-driven events will cause more hurricane-force wind damage and flooding and increases in building damage from rising tidal waters. These impacts will likewise be experienced on the Pennsylvania side of the estuary and bay.

Conclusion

The bottom line is, there is simply no suitable location for an LNG facility in Philadelphia or Southeastern Pennsylvania. Even before considering the impacts to neighboring communities and the environment, the obstacles are daunting. There is no space at the proposed site, in addition to a restrictive covenant that provides a significant legal obstacle. The economics of this project are also in question over the long-term, taking into account the number of LNG export terminals in the queue globally and anticipated future declines in natural gas demand. The proposed site would require substantial infrastructure investments in pipelines and dredging.

In addition to these issues, the impacts to the surrounding community would exacerbate decades of environmental injustice in this area. There are 70,000 people living within a 3-mile radius of the proposed site in Chester. Even if we were to ignore the public health impacts of adding yet another major source of pollution to this community, locating an LNG export terminal in an urban area next to a very busy waterway is a recipe for disaster. LNG is a volatile substance, and for good reason these facilities are generally built in remote locations.

For all of the reasons stated above, we make the recommendation to the General Assembly against any further resources being committed to investigating an LNG facility in Philadelphia or elsewhere in Southeastern Pennsylvania. The sooner we recognize reality, the sooner we can take the steps we need to continue to secure Pennsylvania's energy independence in ways that benefit all Pennsylvanians.

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[73] *New Jersey's Rising Coastal Risk,* Rhodium Group (Oct. 2019). Pages 2, 3, and 4. https://rhg.com/wp-content/uploads/2019/10/Rhodium_NJCoastalRisk_Oct2019final.pdf