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December 10, 2024

VIA E-MAIL

File Number. 94NM-384134

Ms. Amy Sweeney Director, Office of Regulation, Analysis, and Engagement U.S. Department of Energy Office of Fossil Energy and Carbon Management FE-34 - ROOM 3E-056 1000 Independence Avenue, S.W. Washington, D.C. 20585 E-Mail: fergas.gov

Re: Gato Negro Permitium Dos, S.A.P.I. de C.V., Docket No. 24-87 LNG

Dear Mrs. Sweeney:

Enclosed for filing on behalf of Gato Negro Permitium Dos, S.A.P.I. de C.V. ("Gato"), please find attached Gato's Answer to Protest of Public Citizen, Inc. in the referenced docket

Please contact me if you have any questions.

Sincerely,

<u>/s/ Mark F. Sundback</u> Mark F. Sundback Attorney for Gato Negro Permitium Dos, S.A.P.I de C.V.

SMRH:4927-9228-5187.1

cc: Jennifer Wade Peri Ulrey

UNITED STATES OF AMERICA DEPARTMENT OF ENERGY OFFICE OF FOSSIL AND CARBON MANAGEMENT

Gato Negro Permitium Dos, S.A.P. I. de C.V.

) Docket No. 24-87-LNG

ANSWER OF GATO NEGRO PERMITIUM DOS, S.A.P. I. de C.V. TO NOVEMBER 25, 2024 MOTION TO INTERVENE AND PROTEST OF PUBLIC CITIZEN, INC.

Pursuant to Sections 590.303(e) and 590.304(f) the Department of Energy ("DOE") regulations,¹ Gato Negro Permitium Dos, S.A.P. I. de C.V. ("Applicant" or "Gato")² hereby answers the "Motion To Intervene and Protest of Public Citizen, Inc." ("Protest") filed in the captioned docket on November 25, 2024 ("Answer"). Gato respectfully requests DOE's Office of Fossil Energy and Carbon Management ("DOE/FECM")³ reject the unfounded contentions in the Protest and instead to expeditiously issue long-term authorization to export via pipeline initially to Mexico up to 0.647 billion cubic feet ("Bcf") per day of natural gas, and ultimately re-export for delivery to any country that has not signed a Free Trade Agreement with the United States ("FTA") (such countries are "non-FTA Countries") up to 0.556 Bcf/d (or 203 Bcf/yr) of liquified natural gas ("LNG"). Applicant requests this authorization to commence on the date of first exportation and terminate on December 31, 2050, on its own behalf and as agent for affiliates of Applicant who may hold title to the natural gas at the time of export.

The Project will improve the U.S. balance of trade, currency flows between the U.S. and

¹ 10 C.F.R. Part 590.

² Big River Energy, LLC, an affiliate of Applicant, was granted authority under a Blanket Authorization to Export Natural Gas to Mexico in FECM Docket No. 22-151-NG on December 15, 2022. See DOE/FECM Order No. 4938.

³ Authority to regulate the imports and exports of natural gas, including liquefied natural gas, under section 3 of the NGA (15 U.S.C. § 717b) has been delegated to the Assistant Secretary for FECM in Redelegation Order No. S4-DEL-FE1-2021, issued on March 25, 2021. On July 4, 2021, the Office of Fossil Energy changed its name to the Office of Fossil Energy and Carbon Management.

other countries, and strategic alliances with Pacific Rim countries important for counterbalancing major power competition in region. Increased U.S. LNG exports provide access to lower-cost natural gas supply in the global market.⁴ Increased U.S. exports allow developing Asian countries, such as India, Malaysia, Vietnam, or Indonesia, to consider natural gas-fired power plants to meet their growing electricity demand. U.S. climate envoys have previously encouraged developing countries to transition their plans for future electricity generation from new coal to natural gasfired power plants. "While not as low-GHG intensive as renewable energy projects, every coal plant replaced by a natural gas-fired one reduces the power plant's smokestack GHG emission profile by more than 50%. Additionally, natural gas-fired power plants have proven superior to their coal-fired counterparts in efficiently integrating higher shares of renewable energy generation." "Reliable access to low-cost U.S. natural gas supply can be an essential tool for a quicker transition to lower-GHG-intensive fuels and to help mitigate the global impacts of climate change."⁵ Gas-fired generation has a far greater capability to expeditiously ramp its electric output up and down to follow the dynamic demands on the electric grid. Granting the requested authorization will allow valuable unavoidably-produced natural resource by-products now sold at negative prices in the Permian Basin to instead be deployed to higher and better uses such as displacing natural gas produced from Russia (lacking U.S. environmental protections)⁶ and coal.

The Protest should be rejected. It opposes issuance of export authority based upon

⁴ In 2021, most U.S. LNG cargoes were bound for East Asia, primarily Japan and South Korea. Both countries have publicly announced that they will reduce their reliance on coal and replace it with LNG and renewables. Additionally, following Russia's invasion of Ukraine, both countries have sought to diversify their natural gas supply and will rely more heavily on U.S. LNG in the upcoming years as new U.S. LNG projects are completed. "Impact Analysis of U.S. Natural Gas Exports on Domestic Natural Gas Pricing," Energy Ventures Analysis ("EVA") (March 2024), p. 29, contained in Exh. A hereto.

⁵ See Exh. A at p. 30.

⁶ See Exh. B hereto. See Appendices E, F and G to Gato's August 21, 2024 "Application For Expeditious Long-Term Authorization to Export Natural Gas to and Consume as Fuel in Mexico from the United States and Upon Liquefaction, Re-export LNG from Mexico to Non-Free Trade Agreement Countries" in the captioned docket.

erroneous arguments wholly at odds with a sound analysis. It relies on a linear extrapolation of natural gas demand from data centers (*see* Protest at pp. 3-4), when that presumption is undermined by technological change in data center cooling operations (*see* Part V, *infra*), and new developments that will deploy fuels other than natural gas for data centers (*see* Part VI, *infra*), as detailed below. The Protest ignores pertinent facts, such as the continued *negative* pricing of Permian natural gas that will be produced regardless of price, and the underlying causes of those prices (*see* Part I, *infra*). Instead, the Protest points to prices of gas, produced 1500 miles away from the Waha Hub, in the Marcellus region, in a conceptually flawed report (*see* Part II, *infra*). The Protest alleges that the Project may pose issues regarding distributional equity, but provides no evidence to support its supposition. Ample evidence points in exactly the opposite direction. *See* Part II, *infra*. None of the Protest's contentions has merit in the context of the specific facts of this project.

I. WAHA OVERSUPPLY

As Public Citizen acknowledges - - in *other* contexts - - there "must be a geographic assessment of . . . price impacts . . . [b]ecause different regions of the country have unique energy profiles. . . ."⁷

However, this pertinent observation is not repeated in Public Citizen's Protest in this case. Public Citizen's recognition of the importance of different geologic and geographic regions undercuts the Protest's one-size-fits-all arguments advanced here based on homogenized national data. For instance, whatever the validity of the Protest's claims about Pennsylvania customers,⁸ they have no applicability to Waha. While selectively citing FERC's "Winter Energy Market and

⁷ See Exh. C, Public Citizen, Testimony before the Joint Subcommittee on Environment [etc.] (2/7/23) at p. 8.

⁸ The claims about impacts on Pennsylvania customers are based on prices at *Henry Hub* located 1000 miles away from Pittsburgh. *See* Exh. D at p. 5, referencing another source's model, in which the input is Henry Hub spot prices (*see* lines 30 and 40-41 of the source's spreadsheet, attached hereto as Exh. E).

Electric Reliability Assessment" (11/21/24),⁹ the Protest overlooks that document's projection of natural gas prices at *Waha*. That projection shows lower prices at Waha this winter than last winter, which in turn had lower prices than in the winter of 2022-23. *See id.*, at p. 13, Slide 8, contained in Exh. F. Similarly, the Protest omits from its citation to the Winter Assessment, the statement that "[t]oward the end of last winter, natural gas prices at the Henry Hub fell to record lows"¹⁰

The Protest mentions the Permian Basin only once (p.6), in passing, discussing electric demand.¹¹ The Protest never mentions associated gas or casinghead gas, or the Waha trading hub. Without understanding the importance of these terms, it would be impossible to judge the impact of the Project, which explains the analytical failure embedded in the Protest.

EIA notes that "Record U.S. crude oil production in 2023 generated large volumes of associated natural gas. The Permian Basin in West Texas and southeastern New Mexico accounted for 46% of U.S. crude oil production in 2023 and was the largest source of U.S. associated gas production last year at 11.5 Bcf/d. In 2023, around two-thirds of total U.S. associated natural gas production came from the Permian region, similar to 2022." U.S. associated natural gas production increased nearly 8% in 2023.¹²

The key point is that Permian natural gas is largely produced despite or regardless of

⁹ "Winter Assessment" (see Exh. F).

¹⁰ *Id.* at pp. 13-14.

¹¹ While suggesting higher electricity prices will result, the Protest appears to have overlooked EIA's observation that:

Certain large-load facilities, primarily cryptocurrency mining facilities but also data centers and some industrial factories, have entered into voluntary curtailment agreements with ERCOT to temporarily reduce their power consumption during periods of particularly high system demand or low generator availability. As part of the program, LFL facilities can participate in ERCOT's energy and ancillary service markets. This flexibility in large-load operations can help mitigate some of the effects that strong growth in electricity demand is having on the ERCOT system. [See Ex. G. hereto].

¹² In-Brief Analysis (Nov. 13, 2024) Today in Energy. *See* Exh. H.

negative prices, given that it is associated gas, the by-product of oil production.¹³ According to EIA's publication just days ago, while "[p]roduction in the Haynesville and Appalachia regions is driven by natural gas prices, which reached record lows in early 2024, gas production in the Permian region, which is mostly associated natural gas from oil wells, is driven by crude oil production and has *continued to grow amid low natural gas prices*."¹⁴ "In the Permian region, unlike the Appalachia and Haynesville regions, growth in natural gas production is primarily the result of associated gas produced during oil production."¹⁵ Associated natural gas is produced from wells predominantly producing oil, but is commingled in the well bore and output of the well. The value of the oil determines whether the well will be produced. The by-product of associated natural gas to such predominantly oil wells is incidental to the value of the oil.

"Crude oil prices drive drilling activities in crude oil-rich basins, which impacts associated natural gas production, such as in the Permian Basin. Crude oil prices are forecast to be higher during winter 2024-2025 as compared to last winter. However, incremental production activity typically lags price changes. . . . "¹⁶ Nonetheless, according to EIA 45 days ago, "As more oil and natural gas are released within a well, the [gas-to-oil ratio] tends to progressively increase, increasing the volume of associated natural gas produced per every barrel of oil" That EIA publication showed Permian natural gas production of less than .200 million barrels of oil equivalent per day for natural gas ten years ago, but now that amount exceeds 3 Bcf/d.¹⁷ The

¹³ Natural gas production has surged since 2010. "[T]he massive growth in natural gas production in shale plays primarily focused on oil exploration like the Permianbasin[], among others. This so-called associated natural gas production accounted for almost 30% of gross natural gas production in 2022.". See Exh. A, March 2024 study, at p. 9.

¹⁴ STEO, p. 10 (Nov. 2024) (emphasis added). *See* Exh. I.

¹⁵ EIA, "U.S. natural gas production grew by 4% in 2023, similar to 2022" (March 27, 2024) ("In-Brief Analysis"), See Exh. J.

¹⁶ Winter Energy Market and Electric Reliability Assessment: A Staff Report to the Commission (11/21/24) at 16. reproduced in Exh. F.

¹⁷ "Share of natural gas production in U.S. tight oil plays increased over decade" (10/31/24). See Exh. J1 hereto.

Permian Basin is the top crude-producing region in the United States, accounting for more than 40% of total U.S. crude oil production; the Permian Basin is also the second-largest natural gas producing region, and produces the largest amount of U.S. associated gas.¹⁸ The proportion of natural gas per unit of oil production has been rising in key Permian oil fields. Exh. K. In those key fields, associated natural gas production has increased from under 100 million cubic feet per day to nearly 14,000 million cubic feet per day. Exh. K.

This gas might overwise be flared. "[I]ncreased U.S. natural gas exports allow for previously flared and vented natural gas to be used efficiently in other sectors domestically and abroad. . . . [A] substantial amount of natural gas produced in primary oil fields, such as the Permian and Bakken basins, is currently vented or flared due to the lack of existing takeaway capacity or nearby demand to consume the excess associated natural gas production. Increased U.S. natural gas exports to Mexico, which, in turn, will supply the newly proposed Mexican LNG terminals along the Pacific and Gulf coasts, will result in lower amounts of natural gas being wasted through venting or flaring and instead be used beneficially in other sectors around the world. As a result, the U.S. and global greenhouse gas (GHG) inventory will be reduced due to the increased beneficial use of natural gas."¹⁹

According to the World Bank, flaring and venting are "a waste of a valuable natural resource that should either be used for productive purposes, such as generating power, or conserved. . . . The gas could be put to good use and potentially displace other more polluting fuels, such as coal and diesel, that generate higher emissions per energy unit. . . . Research from the European Geosciences Union indicate that gas flaring . . . may contribute 40 percent of the

¹⁸ EIA "Today in Energy" (Dec. 6, 2023). <u>https://www.eia.gov/todayinenergy/detail.php?id=61043</u>. See Exh. K.

¹⁹ See Exh. A, March 24 study, p. 29.

annual black carbon deposits in the Arctic."20

"We expect U.S. marketed natural gas production will resume growing in 2025 ... led by a *6% increase in the Permian region* and a 5% increase in the Eagle Ford compared with 2024."²¹ EIA's related graph showed Permian natural gas production surging from 2022 to 2023 by about 30 % (*e.g.*, from about 3 BCF to nearly 4 BCF). *See, id.* As EIA reported this year, "[s]ince early 2023, the Permian region has had more active rigs than the rest of the Lower 48 states and has continued to complete hundreds of wells (or prepare them for production) each month."²²

An article entitled "The cheapest natural gas price on earth" (published by the LNG Hub), noted that "Waha hub prices fell to an all-time low of minus \$7/mmbtu at the end of August, with gas oversupply effectively chocking [sic: choking] the Permian gas hub." (Sept. 2024).²³ Exh. N1. According to Reuters and the Pipeline and Gas Journal, last month "U.S. spot natural gas prices dropped into negative territory for a record 47th time at the Waha hub in West Texas, according to pricing data" "U.S. Natural Gas Prices Hit 25-Year Low at Henry Hub, Drop into Negative at Waha", Pipeline and Gas Journal (Nov.11, 2024). Exh. N2. "Next-day prices at the Waha hub *plunged about 431% to a negative \$1.06 per MMBtu.*" "Those negative prices arose even though pipeline constraints have eased since the new 2.5-Bcf/d Matterhorn gas pipe entered

²⁰ World Bank Group, "Global Flaring and Methane Reduction Partnership" <u>https://www.worldbank.org/en/programs/gasflaringreduction/gas-flaring-explained</u>. Exh. L.

²¹ STEO, p. 10. *See* Exh. M.

²² "Permian production forecast growth driven by well productivity, pipeline capacity, "Today in Energy," EIA (8/21/24). See Exh. N.

²³ Ironically, starting in 2020, some projections heralded a "future production drop due to COVID-19 while major pipelines begin commercial operation. According to these flawed projections, new Permian fundamentals have ushered in an era of more competitive Waha Hub prices. . . . With production currently at 10.45 Bcf/d and expected to remain flat through 2021, we are entering an era where the Permian has ample (and possibly even excess) gas pipeline capacity." The conclusion of this observer was that "Waha Hub's local natural gas production and pipeline capacity has shifted from surplus to deficit." "The Glut is Over: Waha Hub Natural Gas", Bison Interests Whitepaper, October 15, 2020. Obviously, the anticipated absence of production growth in the 2020 article (plateauing at 10.45 Bcf/d) bore no resemblance to what is actually happening in the Permian (*i.e.*, roughly 26 Bcf/d next year).

service in recent months. The Matterhorn moves gas from the Permian to the Houston area." *Id.* (emphasis added).

"In the Permian, productivity increases indicate significant efficiency gains and technological advancements in the drilling and completion process Growing well productivity suggests that operators in the Permian are successfully implementing more advanced drilling and completion techniques, including longer lateral lengths, optimized well spacing, and enhanced fracturing designs." "[We] forecast that marketed natural gas production in the Permian region will rise by 1.9 Bcf/d in 2024 and by 1.0 Bcf/d in 2025 to average 25.8 Bcf/d in 2025. Most of the natural gas production in the Permian is associated natural gas and comes from oil-directed wells. We expect crude oil prices will remain sufficiently high to support growth in crude oil production and associated natural gas production in the region."²⁴

If the gas is to be produced, then it should be sold for a positive price, not as a product which requires the producer to pay another entity to take the gas away, which is what has been happening at Waha. The current result is illogical and promotes inefficient use of gas that is not just free, but effectively subject to a rebate. Attached hereto are illustrative trade press reports showing negative prices, or *de minimis* (*e.g.*, 0.10/MBtu) prices in West Texas. *See* Exh. O.²⁵

II. THE PROTEST INCORRECTLY CITES DISTRIBUTIONAL EQUITY

The Protest opposes the Gato project because of what it contends are concerns about a "distributional analysis." Protest at p. 8. The Protest's contentions on this score are completely bereft of merit.

²⁴ "Permian production forecast growth driven by well productivity, pipeline capacity," EIA "Today in Energy" (8/21/24) Exh. N.

²⁵ See Order Further Clarifying Policy Statement on Natural Gas and Electric Price Indices, 112 FERC ¶ 61,040 (2005).

The Protest provides neither data nor any distributional analysis. This is perhaps not surprising given available data. One study concluded that wages are distributed more evenly across income scales of workers in the oil and gas extraction industry than is the case for the national average.²⁶ The data show jobs in the oil and gas industry reflect wages that span a wide range of levels, *id.* and provide opportunities for individuals who have not received a college degree to nonetheless obtain higher than average incomes. This means it is an important pathway for non-college-educated individuals to achieve economic success. E&P workers are paid on average about \$42-43/hr. and averaged about 47 hrs. per week, according to the Bureau of Labor Statistics, which represents an alternative career path to attending college. Exh. Q.

The "distributional analysis" argument of the Protest is equally devoid of information regarding second-level effects. These effects are enormous. In an article headlined "Texas Oil and Gas Pays \$26.3B in State and Local Taxes, Royalties" the *Odessa American* noted

[The industry paid] \$26.3 billion state and local tax revenues and royalties. . . [that] translates to . . . \$72 million every day . . . for . . . schools, universities, roads, first responders and [more]. . . .

In FY 2023, Texas school districts received \$2.81 billion in property taxes from mineral properties producing oil and natural gas, pipelines, and gas utilities. Counties received an additional \$885.6 million in these property taxes....

Since 2007, ... the Texas oil and natural gas industry has paid more than \$230.3 billion in state and local taxes and state royalties, a figure that *does not include the hundreds of billions of dollars in payroll for some of the highest paying jobs in the state, taxes paid on office buildings and personal property, and the enormous* economic ripple effect that benefits other sectors of the economy.

²⁶ USA: oil and gas extraction, wage distribution table. [Data for 2022 DATA USA uses public US governmental data and is analyzed by Deloitte.] <u>https://datausa.io/profile/naics/oil-gas-extraction</u>. See Exh. P.

[See Exh. R hereto (emphasis added)]

Texas economic activity – including food and materials purchases, hotel, travel to drilling sites, etc. – are stimulated by the hydrocarbon industry. "In 2023, the industry employed more than 480,000 Texans who earned an average of \$124,000 a year — nearly twice the average paid by the rest of Texas' private sector. Conservative estimates indicate that each of these jobs generates approximately two more jobs, *with more than 1.4 million total jobs supported across the Texas economy*. Some economists say this number could be as high as three more jobs supported and total over 2 million jobs in Texas." *Id* (emphasis added). The article noted that in numerous counties and independent school districts in the Permian Basin in Texas, oil and natural gas taxes make up as much as 95% of the tax base. *See* Exh. R hereto.

As to impacts on consumers, the Protest once again misses important points. Natural gas that sells for negative prices in the Permian Basin is far in excess of the needs of that region. An extra .5 Bcf a day of supply for an already over-supplied region does not materially enhance the welfare of residential customers in that region, just as having a fifth automobile does not materially enhance the welfare of its owner. Negative prices are inefficient and will induce sub-optimal wasteful use of the resource. The circumstances causing negative Permian Basin natural gas prices are uncontested, and discussed at pp. 3-8, *supra*; 19 *infra*.

The Protest also ignores the integrally-related and inevitable consequences of enhanced production of natural gas. Entrained in the gaseous stream of methane are heavier hydrocarbons, which are stripped out once the stream of gas is brought to the surface and from which are obtained natural gas liquids. As discussed pp. 5-6 and 8 *supra*, Permian production is heavily tilted to liquids, and thus more propane. Natural gas liquids include propane, butane and ethane and the building blocks for other valuable by-products. Greater associated natural gas production will

result in greater availability of natural gas liquids, depressing the price of the latter, all other things equal.

According to EIA, "propane use is most common in rural areas and mobile homes. About 83% of households with propane heating are located in rural areas that are typically beyond the reach of natural gas distribution infrastructure. In the Midwest, the rural share is greater than 90%. Additionally *those living in mobile homes are twice as likely to heat with propane as those and other housing unit types.*"²⁷ In other words, the prime beneficiaries of enhanced natural gas liquid production will be mobile home residents and rural residents in remote communities. This is not a fact that is discussed, much less considered, anywhere in the Protest.

The Protest advances a flawed economic argument that ignores other important distributional analysis data as well. Rather than discussing the actual facts of this Project, using natural gas produced in West Texas and Eastern New Mexico, Public Citizen cites its own assertions as a basis for contending there will be costs to consumers from Gato's exports, by citing to alleged cost increases to Pennsylvania consumers as a case study.²⁸ Of course, Pennsylvania heating customers and electric generation consumers generally are not being served with Permian natural gas production.²⁹

EIA Energy: "beyond natural, gas and electricity; more than 10% of US homes use heating oil or propane," November 28, 2011) (emphasis added)). Exh. S.

²⁸ Protest at p. 3.

²⁹ The Protest (at pp. 4-5) purports to quantify increased costs to Pennsylvania consumers using a method developed by another source. That source acknowledged its quantification "*is an extreme scenario*.... based on a *simple* supply/demand elasticity" balance based on an Excel spreadsheet. The spreadsheet and any assumption baked into it "has not been formally peer reviewed" *See* Exh. E (emphasis added). The source (whose calculations are cited by the Protest) states with regard to its calculations the following cautionary note, which the Protest fails to reproduce or acknowledge:

the scale of effects estimated here is likely larger than the real-world impact [based on two assumptions, but], *neither assumption is likely*. Permit approval does not necessarily mean a project will enter operation (as evidenced by the large number of approved-but-not-yet-built projects), and where permit approval leads to construction, the newly-approved capacity may ultimately displace another already permitted project that would have otherwise eventually secured offtake and financing and entered operation instead. *It is thus an extreme case to assume that 100% of pending capacity would ultimately constitute additional US LNG export*

The Protest does not even recognize the associated Pennsylvania state and local taxes, such as property tax revenue,³⁰ income tax revenue on royalties (\$6.3 billion/yr.), income taxes on wages associated with income from exploration and production activity, state impact fee charges,³¹ income of pipeline operations and taxes thereon, and sales tax revenues on sales of natural gas to non-residential purchasers, that offset these costs.³² As the Protest's irrelevant arguments concerning Pennsylvania, a state with zero relationship to the production and operation of natural gas volumes in the Permian Basin here at issue, illustrate Public Citizen's incomplete, superficial and flawed approach to analysis of exports.

More relevant to the analysis here is that Texas takes a 7.5% severance tax on natural gas market value. From 2018 to 2023 Texas received severance tax revenues of more than \$13.4 billion Exh. T, p. 30, (Exh. 9 in original). Of course, natural gas valued at or below \$0.00 will produce no severance tax revenue. Bringing Permian volumes up to just East Texas gas prices would yield billions in additional severance tax revenue. For instance, in the November 6, 2024 edition of Gas Daily price tables (*see* Exh. O) Henry Hub prices averaged \$1.80, which if applicable to reported deals in the Permian at prices of *negative* \$.83 to *negative* \$.18 would have yielded more than \$6.5 million in incremental revenue for that one day in excess of \$0.³³ This quantification ignores the sales of gas not in the spot market. But the Protest never even

capacity. [Exh. E, emphasis added.]

These limitations are not disclosed in the Protest, however.

³⁰ Pennsylvania's average property tax fee is 1.33%; Texas' is 1.20%. *See* Exh. T at p. 18 in the original.

³¹ Counties receiving the most revenue from the impact fees also included the counties with the highest rates of poverty, *e.g.*, Fayette (\$34.4 million in '23), Greene (\$141 million), Bradford (\$191.5 million) and Tioga (about \$110 million). *See* Exhs. U, and T (p. 42 in the original).

³² E&P operations in Pennsylvania generate \$5.8 billion in tax revenue, to say nothing of the impact fee amounts. "Natural Gas Impact Tax Returns . . ." Marcellus Shale Coalition (6/18/24). The Protest also ignores LIHEAP funds available to Pennsylvania residents. See Exhs. V& W.

³³ Volumes of 2305 (Waha), 86 (Transwestern, Permian), 697 (El Paso, Permian), 573 (El Paso, West Texas) totaled 3,661,000 MMbtu times \$1.80 equals \$6,589,800 in that one day just for spot purchases.

acknowledged this point. Texas also imposes a clean-up regulatory fee on natural gas, yielding even more revenue for the benefit of state residents. Exh. T at p. 15 in original.

The Protest repeatedly cites a 2023 Annual Energy Outlook "Issues in Focus: Effects of Liquefied Natural Gas Exports on the U.S. Natural Gas Market" publication (5/23/23) ("2023 Issues") to make claims about Gato's potential impact. The Protest's citations are misdirected. The 2023 Issues publication concluded that the variation in impacts on U.S. annual natural gas prices under several LNG volume scenarios "was narrower than recent . . . history [projected] in our AEO 2023, despite a wide variety of U.S. LNG export volumes" (*id.*, p. 3 in original, "Executive Summary"). *See* Exh. X hereto. In total, "U.S. natural gas consumption changed only slightly across the cases . . . Total consumption varied from a 0.4% increase . . . to a 0.8% decrease . . . relative to the Reference case." *Id.*, p. 4.

The Protest ignores two other critical benefits, without the consideration of which, it has failed to offer a credible critique. As the Congressional Budget office ("CBO") has noted, increased production from shale sources "confers an economic benefit that raises the standard of living in the United States . . . [I]ncreased net export of natural gas . . . boost the value of the dollar, making imports cheaper and allowing consumers to buy more and businesses to invest more "³⁴ Additionally, the CBO notes that such production boosts "federal tax revenues . . as shale development boosts GDP." *Id.* at p. 18. Again, the Protest simply ignores these benefits.

A. Public Citizen's claims of increased costs are misleading

The Protest's arguments regarding a purported increase in natural gas prices also ignores other important data. Claims that natural gas prices have increased 52% since 2016 (Protest at p. 8) are not credible. To support such claims, Public Citizen cites itself as a credible source.

³⁴ See "the Economic and Budgetary Effects of Producing Oil and Natural Gas From Shale" Congressional Budget Office (Dec. 2014). Exh. Z.

Nowhere in the Protest does it mention that price indices for consumers during 2016-2024 are up 28%- 31% on average, depending on the index selected. *See* Exh. AA. The American Public Power Association reported that natural gas prices fell 62% from 2022-2023, notwithstanding "increased exports, with LNG export volumes increasing 12% and pipeline exports increasing 9%." *See* Exhibit BB.

Another EIA data set demonstrates the errors baked into the Protest. EIA citygate price data – which omit the costs of local gas distributors' pipeline refurbishment/replacement and the effects of state commission cost allocations among different classes of customers – is revealing. EIA data show the annual average citygate price was \$3.71/mcf in 2016, and the sum of monthly averages for the last 12 consecutive months (Oct. 2023 through Sept. 2024) is \$4.22/Mcf (*see* Exh. CC)), a 12.1% increase, well *below the 28-31% level of inflation* reflected in Exh. AA.³⁵

A March 2024 study, which extensively reviewed natural gas exports' impacts, concluded that notwithstanding a record level of natural gas exports during the first six months of 2023, Henry Hub prices averaged \$2.48 per MMBtu, the lowest six-month average in over 35 years (outside of the COVID-19 pandemic). "Despite U.S. natural gas exports and domestic consumption reaching all-time highs in recent years, domestic residential natural gas prices remained among the lowest in the world Put simply, growing demand begets growing supply."³⁶ Noting that anti-export

³⁵ The Protest also attempts to link LNG to Winter Storm Uri's effects are an attempt that's both appalling and illogical. The costs and tragedy associated with impacts of Winter Storm Uri are not attributable to Gato and attempts to link the two is a sign of analytical error and allowing a desire to influence an outcome to overwhelm the scope of reasonable advocacy.

The Protest's citations to Dominion are irrelevant to Permian Basin; Dominion's gas is largely from Appalachia. Dominion hosts the world's largest collection of data farms. Citing Dominion reveals the lack of seriousness of the Public Citizen pleading. Similarly, it should not be surprising that E&P companies issue press releases concerning potential growth in demand for their product, but that does not actually demonstrate the demand (*see* Protest at p. 5 citing EQT and p. 4 citing Anterro). A similar note of caution is warranted as to quotations from individual politicians from producing states (*id.*). Canada's imports' purported loss (Protest at p.7) is preposterous. Canada's natural gas resource base is estimated to be 1,368 Tcf, or "an amount equal to over 200 years of current annual demand." <u>https://www.cga.ca/Natural-gas-statistics/natural-gas-facts/</u>. *See* Exh. DD.

³⁶ "Impact Analysis of U.S. Natural Gas Exports on Domestic Natural Gas Pricing" by Energy Ventures Analysis,

advocates point to the substantial rise in U.S. natural gas prices in 2022 which they attribute to LNG exports, the March 2024 study report demonstrated that "[n]atural gas prices at Henry Hub have averaged roughly \$4.10/MMBtu for the last ten years, a reduction of more than 54% compared to the prior decade. "*Id.* at p. 3.

Virtually unchanged LNG export terminal utilization from 2021 to 2023 and the substantial disconnect between domestic and international natural gas prices illustrated U.S. natural gas exports' minimal impact on domestic natural gas pricing.

Completion of U.S. LNG export terminals has had minimal impact on short-term domestic natural gas pricing due to their lengthy construction times as well as unique long-term financing and contracting structure. In fact, increases in natural gas exports have benefitted the U.S. [*Id.* at p. 2].

Increased U.S. natural gas exports have and will continue to create massive economic

benefits for U.S. communities while providing global access to the reliable U.S. natural gas supply needed to further the global energy transition from higher greenhouse gas (GHG) emitting fuels to lower-GHG emitting natural gas.³⁷ "[W]hile LNG exports rose by roughly 14 Bcf/d between 2016 and 2023, dry gas production jumped by 31 Bcf/d. Despite total U.S. natural gas consumption almost doubling from 2010 to 2023, the 2023 average natural gas price of \$2.54 per MMBtu was the second-lowest level in over 35 years, only exceeding 2020 COVID-19 pandemic lows by a few cents." *Id.* at p. 4.

The March 2024 study demolishes the Protest's attempt to correlate LNG exports with alleged high natural gas prices. The report summarized its data thusly:

U.S. natural gas consumers have enjoyed the lowest natural gas prices in U.S. history over the last decade. Excluding the pricing anomaly of 2022, ... U.S. natural gas prices at Henry Hub averaged \$4.10/MMBtu over the last decade, a decline of over 54% from the first decade of this century, when natural gas prices averaged almost

Exh. A, p. 3.

³⁷ Exh. A, p. 2; *see also id.* at p. 4.

\$9/MMBtu.

* * *

Furthermore, despite U.S. natural gas exports growing rapidly since 2016, natural gas prices have continued to decline. During the six years leading up to the rise in U.S. natural gas exports (2010 to 2016), natural gas prices at Henry Hub averaged \$4.58/MMBtu. During the following six years (2017 to 2022), natural gas prices averaged less than \$4.00/MMBtu. During the first half of 2023, when U.S. natural gas exports averaged a record 20.4 BCF/d, natural gas prices at Henry Hub averaged \$2.43/MMBtu, the lowest 6-month average in this century outside of the height of the COVID-19 pandemic (April to October 2020). [*Id.* at p. 16]

The Protest did not conduct any meaningful test of causation to support its presumption

that LNG exports caused a price increase during 2022. See e.g., Protest at pp. 2-3. However,

when meaningful factors driving natural gas prices are analyzed, the cause of the 2022 price

anomaly that the Protest relies on becomes clear:

Due to the labor shortage and the large, accumulated debt of natural gas exploration companies, corporate austerity in capital spending ... delayed [a] supply response to the increasing natural gas prices as natural gas demand returned in 2021. U.S. natural gas prices at Henry Hub doubled from about \$2.50/MMBtu in March 2021 to over \$5.00/MMBtu at the end of September, while the shortfall of natural gas inventories to the 5-year average continued to widen. Once U.S. natural gas production responded towards the end of Q3 of 2021, the storage shortfall began to decline, resulting in prices falling below \$4.00 in December 2021. [March 2024 study at p. 20.]

The March 2024 study also refutes the Protest's efforts (see pp. 7-8) to connect U.S. natural

gas prices with international market LNG prices:

the United States is the primary supplier of LNG to the European market. However, before the Russia-Ukraine War, Europe received most of its natural gas at a lower cost than LNG from Russia via pipeline. Therefore, U.S. LNG has historically been Europe's marginal natural gas supply. As a result, any change in U.S. natural gas prices was and still is often reflected in European natural gas prices. As U.S. gas prices rose throughout September and into October, European natural gas prices followed suit. However, U.S. and European natural gas prices disconnected in November 2021. Meanwhile, Europe required additional natural gas from other LNG exporting countries, as signaled by increasing European natural gas prices. [*Id.* at p. 22 (emphasis added)].

In addition to these analytical mistakes, the Protest simply misquotes some sources. For instance, at p. 3 it states: "Wood McKenzie found that Henry Hub price volatility has been on a clear upward trend over the past decade, mainly due to a lack of storage and *sharply increased LNG exports*" (emphasis added). The Wood McKenzie study actually links increased price volatility to a "lack of storage buffer as the U.S. market expands." It never mentions "LNG exports."³⁸ In fairness, the same report states that "LNG export capacity provides expensive synthetic storage." *Id.* p. 6. In any event, price volatility (which can entail prices going down or up, not just up) can be managed by entering into long term fixed price contracts. Price volatility at Henry Hub for spot supplies tells us nothing about whether prices at Waha are increasing, especially under longer term contracts, even ignoring the distortion of source materials by the Protest.

B. The Protest's arguments about economic impacts on U.S. households is completely wrong.

The Protest presumes the securities of companies that would benefit from LNG volumes would only be those of liquefaction companies owned by the most affluent 1% of U.S. citizens. *See* Protest at p. 7. This type of error is symptomatic of the Protest's general approach.

In fact, 81% of the 19 million state and local government workers in the U.S. have a workplace retirement plan. 93% of those employees participate in a retirement plan and a pension plan. 11% of the 126 million private sector employees participate in a pension plan, and 53% participate in a workplace retirement plan (or about 14 million pensions and about 67 million

³⁸ See p. 7 thereof <u>go.woodmac.com/l/131501/2024-11-14/33fr6f/131501/1731594470zMZZa8ma/</u> Wood Mackeinzie North America Winter Gas Market Outlook.pdf

retirement plans).³⁹ Additionally, the benefits of not only reducing the U.S.' natural gas imports, but of exporting additional natural gas, for foreign exchange purposes (*see* p. 13, *supra*) and upon federal tax proceeds (by generating positive income, rather than a net loss by selling output at negative prices) is never mentioned in the Protest. The Protest ignores the benefits U.S. citizens and taxpayers receive by maintaining the U.S. dollar as the world's reserve currency, and by tying countries to U.S. energy supplies long term. Larger international coalitions and alliances mean we have more resources and allies to array against increasing belligerent adversaries.

These plans invest in, and count on, pipeline companies, drilling and oilfield services companies, E&P companies as well as lodging and food services companies and the publicly-traded engineering and accounting firms that are beneficiaries of hydrocarbon industries. The Protest's purported distributional analysis simply ignores these concrete benefits, and thus forfeits any pretense of logic.

C. The importance of the economic contribution of these industries is ignored in the Protest

"Increased U.S. natural gas exports have and will continue to create massive economic benefits for U.S. communities while providing global access to the reliable U.S. natural gas supply needed to further the global energy transition from higher greenhouse gas (GHG) emitting fuels to lower-GHG emitting natural gas. The strong growth in U.S. natural gas production, transportation, and exports has brought substantial economic prosperity to regions (Haynesville, Permian, Bakken, Appalachia) previously known for high unemployment rates and low economic activity, benefitting local U.S. communities through royalty and tax payments, while increasing local employment.... Access to U.S. natural gas ... allows other countries to accelerate their transition

³⁹ See Exh. EE (https://pensionrights.org/resource/how-many-american-workers-participate-in-workplace-retirement-plans/).

away from coal, which was consumed at a record-setting level of 8.3 billion tonnes in 2022, to natural gas and renewables, reducing global GHG emissions while the economic benefits remain with U.S. communities."⁴⁰

The Protest ignores the beneficial effects of Gato on U.S.'s southern border. More jobs and revenue in Mexico means less pressure to immigrate unlawfully to U.S. and more economic stability in Mexico, affecting our nearly 2000 mile-long border with Mexico. Lower U.S. taxpayer expenditures will result. Greater employment, prosperity and political stability south of that border will benefit the U.S.

III. EFFORTS BY THE PROTEST TO CLAIM NATURAL GAS AND LNG ARE CULPRITS IN RISING ELECTRICITY PRICES ARE MISPLACED.

The Protest mentions the Permian Basin exactly once, to wring its verbal hands over "[e]lectricity demand in the Permian Basin." Protest at p. 6. But according to the latest Levelized Cost of Energy study by Lazard, onshore wind teamed with batteries' LCOE ranges from \$45-133/MWh, undercutting gas peakers which range in cost from \$110-228/MWh, and tying gas combined cycle capacity costs which also range between \$45-108/MWh. Solar plus storage has an even greater advantage over gas-fired generation, ranging from \$29-92/MWh. The foregoing figures *do not include the effects of tax benefits*, which would further disadvantage gas-fired generation. *See* Exh. FF hereto. Obviously, if gas is already out-of-the-money, the advantage points to renewable generation and storage.

These conclusions are buttressed by EIA findings. According to the EIA's Short Term Outlook ("STEO"):

U.S. solar generation grows in the forecast by 34% in 2024 and 31% in 2025. Rising solar generation also cuts into natural gas generation next year. Solar generating capacity is growing fastest in Texas along with associated battery storage projects. The forecast regional

⁴⁰ See Exh. A at p. 6 thereof.

increase in solar generation, which is growing faster than overall electricity demand, *will require less electricity generation from natural gas in Texas*.⁴¹

IV. LIMITATIONS ON EXPORT PRICE CALCULATION IN THE RELEVANT MODEL

In addition it is important to recognize a set of limitations in the EIA analysis of LNG exports. EIA uses its Natural Energy Modeling System ("NEMS"). "We model U.S. energy markets explicitly in NEMS."⁴² LNG capacity is added after 2027 "based on price differentials between international LNG prices and the cost of exporting LNG from the United States for delivery in Asia and Europe." Within limits, "this price differential drives the amount of U.S. LNG that is exported within the model." *Id*.

For starters, Gato does not involve exporting LNG from a U.S.-based liquefaction terminal. And Gato has not staked its economic justification upon European market sales. Critically, the Gato project is not anchored by supplies from Henry Hub, while NEMS generally models LNG from the U.S. Gulf Coast.

While NEMS models, and solves by, balancing U.S. supplies and U.S. demand to arrive at price and an ultimate volume, *id.*, p. 2, that is *not* how the LNG export market simulation operates in NEMS. In U.S. modeled markets, prices are *outputs* of the NEMS simulation. NEMS projects "production, imports, exports . . . consumption, and *prices of energy* . . . NEMS produces a general equilibrium solution for energy supply and demand *in the U.S. energy markets*" Exh. II, "National Energy Modeling System: An Overview," Introduction, p. 4 (May 2023) (emphasis added).⁴³

⁴¹ STEO, p. 12 (Nov. 2024) (emphasis added). See Exh. GG hereto.

⁴² Exh. HH hereto, "Analyses Design and Case Description," Annual Energy Outlook 2023, "Issues in Focus: Effects of Liquefied Natural Gas Exportation on the U.S. Natural Gas Market." (May 23, 2023) (hereinafter, "2023 Issue paper").

⁴³ NGMM models the transmission, distribution, and pricing of natural gas in NEMS. The model code is a

NEMS' Oil and Gas supply Module "projects *domestic* oil and natural gas production" (*id.*, p. 8, emphasis added). As to production, EIA notes that the interaction of supply and demand affects prices, as do "exogenous inputs" which "include resource levels, finding-rate parameters, costs, production profiles and tax rates - all of *which are critical determinants* of the oil and natural gas supply outlook in the OGSM." Exh. II, p. 8 in original (emphasis added).

According to the 2023 Issues paper, the NEMS "analysis *does not model international energy markets and so does not account for interactions between U.S. natural gas exports and world natural gas markets. We do not model constraints* such as regasification capacity abroad, the availability of LNG tanker vessels, and *potential competition from LNG exports originating in other countries*, any one of which could affect U.S. LNG export volumes. In addition, we do not project the destination of U.S. LNG exports, nor do we account for shocks to the market."⁴⁴ Regardless of the strength or weakness of NEMS in modeling U.S. markets and prices, the international analysis used by NEMS is of a wholly different provenance, and is not as detailed.

The EIA's conclusions regarding price impacts in the 2023 Issues discussion do not refer to prices at Waha in Texas at all, instead looking about 600 miles to the East, to Henry Hub in Erath Louisiana (*see e.g.*, 2023 Issues, Exh. HH, p. 8 in original). "Most of the projected increase in natural gas production in the [alternative scenarios labeled] High LNG Price and the Fast Builds

quadratic program that maximizes consumer plus producer surplus, minus transportation costs, subject to linear mass balance and capacity constraints. For all months in a year, NGMM determines the production, flows, and prices of natural gas in a state-level representation of the U.S. pipeline network and a regional-level representation of the Canada's and Mexico's pipeline network.

End-use natural gas consumption by sector, storage, and liquefied natural gas (LNG) export terminals are all integrated into the network by demand region. NGMM accepts various exogenous inputs. For instance, imports of LNG into North America are set to historical levels in the United States and set exogenously for Canada and Mexico, according to results from our International Energy Outlook. NGMM also receives inputs from other NEMS modules such as macroeconomic variables from MAM, expected production of non-associated natural gas and associated dissolved natural gas from OGSM, and the amount of commercial floorspace by census division from CDM. [See Exh. II hereto, containing excerpts of The National Energy Modeling System: An Overview, 05/23, at p. 8]

⁴⁴ 2023 Issues paper, "Analysis And Projections," Exh. HH.

Plus High LNG Price cases *occurs in the Gulf Coast producing region*, which includes the Eagle Ford and Haynesville plays *The Gulf Coast supplies most of the incremental natural gas destined for LNG export terminals in Texas and Louisiana* because of favorable drilling economics, available existing natural gas pipeline capacity, and less expensive pipeline transportation. *All new LNG capacity added through 2050 in these cases is in either Texas or Louisiana*." (*Id.*, p. 10) (emphases added). That document presumes that "Natural gas production on the Gulf Coast is the most economical supply source to meet higher LNG export volumes." *Id.*, p. 9. Obviously, that is not the same as modeling Waha and its distinctive negative pricing.

V. IMPROVING DATA CENTER COOLING AND COMPUTING EFFICIENCIES

The Protest is completely silent regarding the incentives that are pressing data centers to become more efficient, change their cooling profiles and technologies, and to move to fuels aside from natural gas for electric generation. These omissions are fatal to the vitality of its arguments.

Google just debuted its latest quantum chip, Willow, which it claims can perform calculations in five minutes that would take the world's fastest supercomputers 10 septillion years. Said another way, Willow is 1,051,200,000,000,000,000,000,000,000,000 faster than the world's fastest supercomputer. Quantum chips operate at near-absolute-zero temperatures for superconductivity.

Unlike conventional bits of information in a classical computer, which represent a value of "0" or "1", quantum bits can represent "0" and "1" simultaneously. Quantum computers allow for faster solutions to more complex calculations. Because the computation time is cut to an extraordinary degree, data centers won't need as many of them. Nor will they draw on their energy sources for so long. The resulting energy savings will be immense. Speeding up process times will materially reduce hardware requirements as well. An early signal of these effects was that

crypto markets fell -5% on the news, as the new Willow chips will produce far more coins using far less chips

Moreover, according to data center trade press, liquid cooling offers superior efficiency, in contrast to the currently-prevalent mode of data center air cooling. According to the trade press, water has 4.2 times the ability to absorb heat of air and consequently "small volumes of liquid can be pumped in close proximity to . . . [data center] components to more directly extract from them" heat from data processing.

This approach offers several relevant benefits:

- Higher chip power densities;
- Higher liquid temperatures in the facility cooling loop, creating the potential for more free cooling and re-use because the liquid is segregated from the occupied environment;
- Less energy is needed expending lower energy than fan-based technologies; and
- Central and graphics processing units can operate at optimal temperatures more effectively.

Source: "Forget Atlantis: how data centers can use liquid above ground to stay cool" by Mark Seymour (August 22, 2024). *See also* "Evolving Data Center Cooling for AI Workloads" by David Watkins (August 8, 2024) T Tech Radar Pro. *See* Exh. JJ hereto.

For instance, a multi-national technology company that specializes in the design, manufacturing and marketing of electronic equipment has begun promoting a new liquid cooling solution for servers, "enabling organizations to build and run accelerated computing for generative AI while reducing data center power consumption by up to 40%."⁴⁵

⁴⁵ Exh. KK hereto, containing "Liquid cooling solutions gain momentum as AI workloads turn up the heat in data centers" by Wayne Williams (November 2, 2024) T. Tech Radar Pro (emphasis added).

Another technological development is the introduction of the micro heat pumps situated next to individual chips that can adjust for specific workload and heat output. Reports indicate that this technology can boost chip performance by 30% while reducing overall energy consumption, because the energy is targeted to those areas where the heat occurs and cooling is needed.⁴⁶

Just over a month ago, results of University of Texas researchers' innovations in improved thermal interface materials indicated a reduction of cooling energy usage by 65%.⁴⁷

Processing changes also may eliminate 95% of AI's power consumption. Instead of Floating Point Multiplication, engineers have introduced an approach labeled Linear Complexity Multiplication. Linear Complexity Multiplication is "still able to maintain high accuracy and precision" while dramatically reducing power consumption. Exh. NN.

These changes herald an era of increased focus on data center operations, costs and constraints. Presuming a "business as usual" approach for future data center efficiency, operation and design is analytically unjustified. Just as battery storage, wind and solar technology have grown increasingly efficient, data cooling and processing is responding to price signals.

VI. CHANGES IN FUEL USED TO POWER DATA CENTERS

The Protest wholly ignores the transition from more conventional power sources to nuclear power to support AI and data centers.

In an "In Brief Analysis" in October 2024. EIA noted that it expects "Data center owners [to] turn to nuclear [power] as [a] potential electricity source." The EIA also recognized "several

⁴⁶ "As the AI era heats up, this startup has generated a novel way to cool data center microprocessors" by Todd Bishop, GeekWire (November 8, 2024). Exh. LL hereto.

⁴⁷ See Exh. MM, containing "UT researchers develop thermal interface . . ." (Nov. 5, 2024) by Dan Swinhoe in Date Center Dynamics; see also The Cool Down, "New Thermal Interface Material Could Cool Down Energy-Hungry Data Centers," The University of Texas Austin School of Engineering (October 22, 2024).

uncertainties, including how much data center capacity will be built . . . and how energy efficiency will improve as data center technology and design evolve." *See* Exh. PP. As to evolving data center technology and efficiency, *see* Part V, *supra*.

Google announced that it would underwrite nuclear energy from Kairos Power in the form of small modular reactors ("SMR"). Amazon has announced that it had signed three new agreements also involving SMRs. The agreements included contractual undertakings with the Energy Northwest "consortium of state development entities seeking to construct advanced" SMRs. The agreement was between Amazon, 29 public utility districts/munis and Energy Northwest.⁴⁸ The generation capacity of just these projects would amount to 320 MW. *Id*.

According to reports, X-Energy Reactor Company, LLC, a leading enterprise in advanced nuclear reactor and fuel technology, received approximately \$500 million, anchored by Amazon.com, Inc. ("Amazon") will support future carbon-free projects that will use X-Energy's Xe-100 advanced small modular nuclear reactors.

Amazon and X-energy are also collaborating to bring more than 5 *gigawatts* of new power projects online across the United States by 2039, representing the largest commercial deployment target of SMRs to date. The efforts will help meet growing energy demands in key locations through direct project investments and long-term power purchase agreements to help power Amazon operations. Further, X-energy and Amazon plan to establish and standardize a deployment and financing model to develop projects in partnership with infrastructure and utility partners.⁴⁹

Meta announced an RFP for 1-4 gigawatts of nuclear power. "At Meta, we believe nuclear

⁴⁸ See Exh. QQ from the Utility Dive, (Oct. 16, 2024).

⁴⁹ Exh. RR, "Amazon Invests in X-Energy to Support Advanced Small Modular Nuclear Reactors and Expand Carbon-Free Power", X-Energy (October 16, 2024).

power will play a pivotal role in the transition to a cleaner, more reliable and diversified grid." *See* Ex. SS. DOE's Secretary is urging big tech to consider nuclear generation. "We have a golden nuclear regulatory regime in this country and we know we can do it safely" she stated. Exh. TT.

The Nuclear Energy Administration ("NEA")'s small modular reactor [2024] update stated: "For this second edition of the NEA SMR Dashboard, the NEA's comprehensive global review identified *98 SMR technologies* around the world. Fifty-six SMRs are included in this complete edition of the NEA SMR Dashboard; these are the SMRs for which the requisite publicly available information was assessable and for which the relevant designers were willing to participate....

"SMRs are expected to have an increasingly important role to play in nuclear energy's contribution to net zero targets and may simultaneously contribute to alleviating energy poverty and promoting economic development and prosperity. *There are already SMRs deployed and operating in China and Russia, as well as one test reactor in Japan.*"⁵⁰

Initial findings show that Russia and China are leading on first-ofa-kind deployment, but rapid and real progress is underway in North America and Europe. . . . Three additional SMR designs have received regulatory approval: VOYGR by NuScale in the United States, SMART by KAERI in Korea and Hermes by Kairos Power in the United States. North America and Europe are home to the headquarters of many SMR designers. The United States is home to the largest number of SMR design organizations, with nearly 35% of the field. . . . SMRs [are] operating and/or under construction in Russia, China, Japan and Argentina, and a large number of earlier stage siting discussions and negotiations advancing in North America and Europe. [*Id.*, p. 14].

Of course, Constellation Energy, which bills itself as America's largest producer of "clean,

carbon-free energy," announced in September 2024 that it had signed its largest-ever power

⁵⁰ Exh. UU, The NEA Small Modular Reactor Dashboard: Second Edition, OECD NEA 2024, pp. 11-12.

purchase agreement with Microsoft.⁵¹ Amazon previously signed an agreement to co-locate a data center facility next to the Talen Energy's nuclear facility in Pennsylvania, which will directly power data centers with carbon-free energy, and helps preserve this existing reactor. Exh. YY.

Former Microsoft CEO Bill Gates invested \$1 billion in a nuclear power plant that broke ground in Kemmerer, Wyo., in June. The plant will power homes and AI.⁵²

In an article entitled "AI is pushing data centers toward a nuclear-powered future", the COO of an owner of numerous data centers observed that "we are now edging into a future that is going to be powered by nuclear". *See* Exh. AAA, containing an article posted on Quartz, 11/5/24 by Rocio Fabbro.

In October, the "Electric Power Research Institute . . . unveiled an initiative to 'explore how data centers can support the electric grid, enable better asset utilization, and support the clean energy transition.' " Participants include Google, Meta, NVIDIA, Compass Datacenters, QTS Data Centers, Constellation Energy, Duke Energy, the Electric Reliability Council of Texas, the New York Power Authority, NRG Energy, Pacific Gas and Electric, PJM Interconnection, Portland General Electric, Southern Co. and Vistra. The effort will "coordinate real-world demonstrations of flexibility" between data centers and electricity markets at several "flexibility hubs" that can provide "innovative data center and power supplier strategies," beginning in the first half of next year.⁵³ The up to 10 "flexibility hubs" associated with the initiative are intended to demonstrate innovative data center and power supplier strategies, the Electric Power Research Institute said. "*Id.* Amazon and other technology companies have pledged to become carbon-free,

⁵¹ Exh. XX, "Constellation to Launch Crane Clean Energy Center, Restoring Jobs and Carbon-Free Power to The Grid," (September 20, 2024).

⁵² See Exh. ZZ containing "Three Mile Island nuclear plant will reopen to power Microsoft data centers," September 20, 2024 1:40 PM ET by C Mandler, NPR.

⁵³ See Exh. BBB, Utility Dive, "EPRI launches data center flexibility initiative with utilities, Google, Meta, NVIDIA," by Robert Walton, (October 30, 2024).

and nuclear is an obviously path towards that destination.

The US has prioritized nuclear as a crucial power source. Last month, the Biden administration launched a roadmap to support the deployment of 200GW of nuclear power in the US by 2050. The roadmap would add 35GW by 2035 and see nuclear plants restarted, upgraded, and wholly built from scratch. It expects 15GW to be added per year by 2040.

Last month, the DOE announced \$900 million in funding for small modular nuclear reactor projects. It is also pumping \$2.5 billion into an Advanced Reactor Demonstration Program. *See* "Meta launches nuclear power RFP, targets 1.4GW for data centers – DCD", https://www.datacenterdynamics.com/en/news/meta-launches-nuclear-power-rfp-targets-14gw-for-data-centers/(September 30, 2024). Additionally, Microsoft has signed an agreement with nuclear power producer Constellation Energy, to bring a data center in Boydton Virginia closer to operating on 100 percent carbon-free energy round the clock. "Microsoft signs 24/7 nuclear power deal with Constellation for Boydton data center – DCD" (June 30, 2023).

Instead of considering any of these factors, the Protest appears to use a linear projection based on technology currently relevant in data centers and ignores fuel-switching. Just as presuming no change in technology and efficiency in exploration and production of U.S. hydrocarbons in 2005 was a mistake of historic dimensions given the economic costs and revenue trends that brought a surge of production that has yet to peak, so too is the presumption that the status quo is the future for data center operation. But that is the Protest's erroneous presumption.

VII. THE SITE OF A PARTICULAR LNG PLANT WITHIN A LOCALITY IN MEXICO THAT IS SPECIFIED IN GATO'S DOE APPLICATION NEED NOT BE PUBLICLY DISCUSSED

The Protest argues that it must know the exact address of Gato's project in Manzanillo, Mexico, over 750 miles from the U.S.-Mexico border. The Protest fails to explain why Public Citizen needs to know if the facility is on the equivalent of Oak Street or Pine Street in Manzanillo. It appears there is no cognizable reason, other than to oppose Gato Dos' Application, for the Protest's demand for this information. The siting of an LNG plant in Central Mexico is not adjacent to, or subject to jurisdiction of agencies of, the U.S. Instead, Mexican authorities are responsible for siting/zoning/authorization, not Public Citizen.

Nonetheless, if Public Citizen wished to have pursued lawful means of obtaining that information, such as a FOIA request or signing a Protective Agreement, it could have proposed such an approach, but it did not.

VIII. CONCLUSION

Gato reserves its rights to supplement this Answer and to file any additional materials in response to "updated analyses" regarding natural gas export authorization that the DOE or portions thereof, such as the Office of Fossil Energy and Carbon Management, may issue.

WHEREFORE, Gato Dos respectfully requests that the Office of Fossil Energy grant the authorization as sought by Gato Dos to export volumes to non-FTA countries, and reject as without merit the Protest's opposition to the requested authorization.

Respectfully submitted,

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Dated: December 10, 2024

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that I have this day served the foregoing document upon each person

designated on the official service list compiled for this proceeding

Dated at Washington, D.C. this 10th day of December, 2024.

<u>/s/ Mark F. Sundback</u> Mark F. Sundback Sheppard, Mullin, Richter & Hampton LLP 2099 Pennsylvania Avenue, NW, Suite 100 Washington, D.C. 20006-6801 Telephone: 202.747.1946 Fax: 202.747.1901 Email: msundback@sheppardmullin.com