

Filed Electronically

Secretary Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

March 26, 2017

RE: Commonwealth LNG Project; Notice of Intent to Prepare an Environmental Impact Statement for the Commonwealth LNG Planned Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Session (PF17-8-000)

Secretary Bose:

The Sabin Center for Climate Change Law (“Sabin Center”)¹ submits these comments on the scope of the proposed environmental impact statement (“EIS”) for the Commonwealth LNG Project, announced by the Federal Energy Regulatory Commission (“FERC” or the “Commission”) in March 2018.

For the limited purposes of these comments, the Sabin Center takes no position on the export of liquefied natural gas (“LNG”) or on whether FERC should approve the Commonwealth LNG Planned Project (the “Project”). Rather, consistent with the scoping process’s goal of identifying significant issues for FERC to consider, the Sabin Center’s comments focus on the potential impacts of climate change on the Project—impacts not identified in FERC’s Notice of Intent. The Sabin Center is additionally concerned by the short 15-day window allotted for public comment and recommends that FERC allow additional time for public input.

A. NEPA and Climate Change

Pursuant to its obligations under the National Environmental Policy Act (“NEPA”), the Commission must consider the environmental impacts of sea level rise and associated storm surge, flooding, and erosion risks, as exacerbated by increased frequency and intensity of hurricanes and tropical storms. In addition, it would be consistent with the purposes of NEPA for the agency to also assess the indirect impacts of upstream and downstream Project-related activities and to disclose the greenhouse gas emissions associated with them. These phenomena may additionally affect other issues already identified by FERC as pertinent to environmental review, such as endangered and threatened species; water resources, fisheries, and wetlands; cultural resources, vegetation and wildlife, cumulative impacts, and public safety. The Sabin Center urges FERC to robustly consider the impacts of climate change on the Project and the Project’s greenhouse gas emissions as part of the agency’s environmental review.

¹ The Sabin Center for Climate Change Law at Columbia Law School develops legal techniques to fight climate change, trains law students and lawyers in their use, and provides the public with up-to-date resources on key topics in climate law and regulation. The Sabin Center works closely with the scientists at Columbia University’s Earth Institute and with governmental, nongovernmental, and academic organizations. See <http://web.law.columbia.edu/climate-change>. Please contact the Sabin Center for assistance locating any sources.

NEPA’s implementing regulations provide that agencies must consider significant and reasonably foreseeable indirect and cumulative environmental impacts.² Agencies must define an appropriate baseline for considering projected environmental impacts; such a baseline should incorporate anticipated environmental conditions.³ Accordingly, the Commission must consider sea level rise, the increasing frequency and severity of hurricanes, and their combined effects on storm surge as future baseline environmental conditions. Several federal courts have confirmed that NEPA regulations require federal agencies to evaluate the impacts of a changing climate on their actions.⁴ Consideration of climate change impacts has accordingly become an essential part of the NEPA process.⁵ Furthermore, the withdrawal of the CEQ guidelines does not affect judicially upheld obligations as was explicitly noted in the withdrawal notice.⁶

FERC itself has already recognized the relevance and importance of climate change impacts to similar and similarly situated facilities in Louisiana and elsewhere. For instance, FERC required consideration of climate change impacts in connection with a proposed LNG export facility in flood-prone coastal Louisiana (the “Mississippi River LNG Project”).⁷ After the applicant for the Mississippi River LNG Project submitted draft resource reports to the Commission, FERC directed the applicant to supplement the reports with information regarding potential impacts of sea level rise and storm impacts for the design life of the facility.⁸ Similarly, FERC’s Environmental Assessments—not even full Environmental Impact Statements—of the Dominion Cove Point LNG export facility on the Chesapeake Bay and the Cameron LNG facility in coastal Louisiana both consider several implications of climate change for their respective facilities.⁹ Nothing about the Commonwealth LNG Project makes it less susceptible to

² See 40 C.F.R. §§ 1508.7 (defining “cumulative impact”), 1508.8 (defining “effects” as including direct and reasonably foreseeable indirect effects), 1508.25(c) (providing that EISs must consider direct, indirect, and cumulative impacts); see also CEQ, *Considering Cumulative Effects under the National Environmental Policy Act* (1997) [hereinafter “Considering Cumulative Effects Under NEPA”], available at <http://1.usa.gov/JLkM2I>.

³ See *Considering Cumulative Effects under NEPA*, *supra* note 2, at 41; 40 C.F.R. 1502.15 (defining “affected environment”).

⁴ *AquaAlliance, et al., v. U.S. Bureau of Reclamation*, No. 1:15-CV-754-LJO-BAM, 2018 WL 903746, at *38-39 (E.D. Cal. Feb. 15, 2018) (finding that the Bureau failed to adequately account for effects of climate change on water management project); *Idaho Rivers United v. United States Army Corps of Engineers*, No. C14-1800JLR, 2016 WL 498911, at *17 (W.D. Wash. Feb. 9, 2016) (finding the USACE analysis of the effect of climate change on sediment disposition was adequate); *Kunaknana v. U.S. Army Corps of Engineers*, No. 3:13-CV-00044-SLG, 2015 WL 3397150, at *10-12 (D. Alaska May 26, 2015) (finding the USACE reasonably concluded, based on a supplemental information report, that a supplemental EIS was not necessary); *Kunaknana v. U.S. Army Corps of Engineers*, 23 F. Supp. 3d 1063, 1092-98 (D. Alaska 2014) (determining that USACE should consider whether to prepare supplemental EIS for issuance of § 404 permit in light of new information on climate change).

⁵ See e.g., *AquaAlliance* 2018 WL 903746 at *38-39 (“Nonetheless, the FEIS/R fails to address or otherwise explain how this information about the potential impacts of climate change can be reconciled with the ultimate conclusion that climate change impacts to the Project will be less than significant: . . . [T]his amounts to a ‘failure to consider an important aspect of the problem’ . . .”) (internal citation omitted).

⁶ *Withdrawal of Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*, 82 Fed. Reg. 16576 (April 5, 2017), available at <https://www.federalregister.gov/documents/2017/04/05/2017-06770/withdrawal-of-final-guidance-for-federal-departments-and-agencies-on-consideration-of-greenhouse-gas> (“The withdrawal of the guidance does not change any law, regulation, or other legally binding requirement.”).

⁷ Louisiana LNG Energy, LLC, Proposed Mississippi River LNG Project (PF14-17-000).

⁸ Letter to Louisiana LNG Energy, LLC providing comments on Draft Resource Reports 2 through 9 re the Mississippi River LNG Project under PF14-17 (Nov. 24, 2014) (enclosed).

⁹ See FERC, Environmental Assessment for the Cove Point Liquefaction Project, Dominion Cove Point LNG, LP Docket No. CP13-113-000, at 40, 169–171 (May 2014), <http://bit.ly/1k5fNM0> (“Climate change in the northeast

climate change than these earlier examples of FERC-licensed LNG infrastructure projects. Accordingly, its EIS must take the effects of climate change into account.

Several federal courts have also confirmed that NEPA regulations require federal agencies to evaluate the climate change-related impacts of their actions—such as the impact of greenhouse gas emissions on climate change.¹⁰ Accordingly, the Commission should consider the downstream greenhouse gas emissions caused by fossil fuel combustion,¹¹ as well as the other life cycle emissions from the facility’s production and transportation of LNG.¹² Recent decisions from the D.C. Circuit have left a fundamental gap in accounting for the greenhouse gas emissions resulting from export-induced increases in domestic production associated with new export facilities,¹³ and FERC should fill this gap using its authority under the Natural Gas Act as designated lead agency for NEPA compliance.¹⁴

region could have two effects that may cause increased storm surges: temperature increase of the Chesapeake Bay waters, which would increase storm intensity; and a rising sea level. The final grade elevation of the Liquefaction Facilities Project site would range between 70 and 130 feet above mean sea level. Therefore, even with increased sea levels due to climate change and increased storm surge, the Project facilities would not be vulnerable to even a 100-year climate change-enhanced storm surge because of its significant elevation above sea level.”); FERC, Environmental Assessment for the Cameron LNG Expansion Project, Cameron LNG, LLC Docket No. CP15-560-000, at 115 (Feb. 2016), <https://perma.cc/7MA8-DW2W> (“Climate change in the region would have two effects that may cause increased storm surges, increased temperatures of Gulf waters, which would increase storm intensity, and a rising sea level. In Louisiana, relative sea level changes have been estimated by the NOAA to be about 14 inches by 2050. This is greater than the global average because of regional ground subsidence. The Cameron LNG Terminal is designed for a 500-year storm surge elevation level of 12.4 feet amsl. Given that the Expansion Project’s process equipment minimum elevation point of support would be 12.5 feet amsl and the LNG storage tank (T-205) would be 14.0 amsl at top of the elevated pile cap, climate change-enhanced sea level rise and subsidence are considered adequately addressed in the Expansion Project design.”).

¹⁰ *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008) (finding that “[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct”); *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 548-50 (8th Cir. 2003) (finding that degradation in air quality was a reasonably foreseeable indirect effect of a project that would increase the supply of coal to power plants); *High Country Conservation Advocates v. United States Forest Serv.*, No. 13-CV-01723-RBJ, 2014 WL 2922751, at *8-11, 13-15 (D. Colo. June 27, 2014) (holding that it was arbitrary and capricious for federal agencies to omit analysis of GHG emissions and related costs in EISs for mining exploration projects); FERC, Guidance Manual for Environmental Report Preparation for Applications Filed Under the Natural Gas Act, FN 15, 4-123—4-127 (Feb. 2017), <https://perma.cc/7DAW-BX9P> (instructing “[y]ou should provide the data needed to support our NEPA analysis (e.g., the project’s contribution to GHG emissions; local or state GHG emissions; and any local, state, or regional goals for GHG emissions or climate change,” and requiring reporting on greenhouse gas emissions from construction and operation of facilities).

¹¹ *Sierra Club v. Fed. Energy Regulatory Comm’n*, 867 F.3d 1357, 1373–74 (D.C. Cir. 2017) (“We conclude that the EIS...should have either given a quantitative estimate of the downstream greenhouse emissions that will result from burning the natural gas that the pipelines will transport or explained more specifically why it could not have done so. As we have noted, greenhouse-gas emissions are an indirect effect of authorizing this project, which FERC could reasonably foresee, and which the agency has legal authority to mitigate.”). See also, *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir. 2003) (finding in NEPA review for coal railway, STB must account for greenhouse gas emissions and air quality effects from foreseeable increase in coal consumption and combustion).

¹² *Sierra Club v. United States Dep’t of Energy*, 867 F.3d 189, 201–02 (D.C. Cir. 2017)(noting that as part of its review “the Department evaluated the upstream and downstream greenhouse-gas emissions (CO2 and methane) from producing, transporting, and exporting LNG in its Life Cycle Report”).

¹³ *Id.* (finding the Department of Energy did not need to consider export-induced increases in natural gas production); *Sierra Club v. Fed. Energy Regulatory Comm’n*, 827 F.3d 36 (D.C. Cir. 2016)(finding that FERC did

The Commission should further use the Social Cost of Carbon, Methane, and Nitrous Oxide¹⁵ to evaluate the costs of the Project’s greenhouse gas emissions. The utility of these metrics was recognized in a recent dissent from FERC Commissioner Richard Glick, who noted that “[t]he Commission’s refusal to incorporate the Social Cost of Carbon in the environmental review or even to assess the impact GHG emissions from the Project fails to fulfill its responsibilities under the NGA and NEPA.”¹⁶

B. Complementary Legal Authorities and Policies Supporting Consideration of Climate Impacts

Complementing NEPA requirements, state law also supports consideration of climate change adaptation in the proposed EIS. In response to hurricanes Katrina and Rita, the Louisiana Legislature passed Act 8 of the First Extraordinary Session of 2005 (Act 8). Act 8 which established the Coastal Protection and Restoration Authority (CPRA). The CPRA is legally required to develop and implement a comprehensive coastal protection plan, consisting of a master plan (revised every five years) and annual plans.¹⁷ In June 2017, the Louisiana State Legislature unanimously approved the state’s 2017 Coastal Master Plan.¹⁸ Additionally, under Louisiana Executive Order JBE2016-09, signed by the Governor in April 2016, all state agencies, departments, and offices must carry out their regulatory programs, practices, grants, and contracts “in a manner consistent with the Coastal Master Plan and the public interest to the maximum extent possible.”¹⁹

Federal guidance also directs assessment of climate change impacts. The Securities and Exchange Commission (“SEC”) has issued guidance regarding publicly traded companies’ obligation to disclose the impacts that climate change may have on their operations.²⁰ FERC can

not need to consider emissions that would only occur if the Department of Energy approved the facility for LNG export).

¹⁴ 15 U.S.C. § 717n(b)(1)(designating the Commission to be “the lead agency for the purposes of coordinating all applicable Federal authorizations and for the purposes of complying with the National Environmental Policy Act”); *see also* 42 U.S.C. § 7172(a)(2)(B).

¹⁵ *See* Interagency Working Group on the Social Cost of Greenhouse Gases, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 (May 2013, Revised August 2016); Interagency Working Group on the Social Cost of Greenhouse Gases, Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide (Aug. 2016).

¹⁶ Order on Remand Reinstating Certificate and Abandonment of Authorization, Docket No. CP14-554-002, et al. (FERC, issued March 14, 2018), Glick dissent at 2, *available at* <https://www.ferc.gov/CalendarFiles/20180314230126-CP14-554-002.pdf>.

¹⁷ LA. STAT. ANN. § 49:214.5.2-3 (Current through the 2017 Second Extraordinary Session).

¹⁸ Coastal Protection and Restoration Authority, *State Legislature Approves 2017 Coastal Master Plan* (June 2017), http://coastal.la.gov/wp-content/uploads/2017/06/2_Whats-New-Legislature-Approves-Coastal-Master-Plan_2017-04-25_final.pdf (last visited Dec. 5, 2017).

¹⁹ State of Louisiana, Exec. Order No. JBE 2016-09, Consistency with Louisiana’s Comprehensive Master Coastal Plan to Ensure a Sustainable Integrated Coastal Ecosystem (April 4, 2016), *available at* <http://gov.louisiana.gov/assets/ExecutiveOrders/JBE16-09.pdf>.

²⁰ SEC, *Commission Guidance Regarding Disclosure Related to Climate Change* (2010) (“Significant physical effects of climate change... have the potential to affect a registrant’s operations and results. For example, severe weather can cause catastrophic harm to physical plants and facilities and can disrupt manufacturing and distribution processes.... Registrants whose businesses may be vulnerable to severe weather or climate related events should

facilitate such disclosure by conducting an analysis of climate change impacts on the proposed facility.

C. Primary Climate Impacts Pertinent to Environmental Review of the Project

1. Sea Level Rise

As anthropogenic greenhouse gas emissions warm the planet, causing glaciers and ice sheets to melt and oceans to absorb increasing volumes of heat, global sea levels will continue to rise, and will do so at increasing rates.²¹ In the next several decades, storm surges and high tides will combine with sea level rise and, in some locations, land subsidence to increase flooding, threatening coastal communities and industries.²² Though the proposed location for the Project is not directly on the coast, its location still leaves it vulnerable to storm surge—especially in light of the rapid subsidence and loss of wetlands along the coast.²³

Sea level rise is occurring particularly rapidly along the western gulf coast²⁴ contributing to a particularly high vulnerability for Louisiana’s coasts.²⁵ The Coastal Protection and Restoration Authority (CPRA) has data specifically examining the flood risk, economic risk, severe coastal erosion effects, and adaptation efforts for the Cameron area.²⁶ The CPRA projects that ten years from now much of the area surrounding the Commonwealth LNG site will experience 10 or more feet of flooding during 100 year storm events.²⁷ Regionally, coastal counties, and parishes in Alabama, Mississippi, Louisiana, and Texas already face significant losses from hurricane winds, land subsidence, and sea level rise that annually average \$14

consider disclosing material risks of, or consequences from, such events in their publically filed disclosure documents.”), available at <http://www.sec.gov/rules/interp/2010/33-9106.pdf>.

²¹ Walsh et al., *Ch. 2: Our Changing Climate*, in *Climate Change Impacts in the United States: The Third National Climate Assessment* at 44 (J. M. Melillo et al., eds., U.S. Global Change Research Program, 2014) [hereinafter “Third National Climate Assessment Chapter 2”]; see also, Wuebbles, D.J., et al., 2017: Executive summary, in *Climate Science Special Report: Fourth National Climate Assessment, Volume I* 12-34 (Wuebbles, D.J., et al. eds., U.S. Global Change Research Program, 2017).

²² Third National Climate Assessment Chapter 2 at 45; Kate Gordon et al., *The Risky Business Project, Risky Business: The Economic Risks of Climate Change in the United States* at 20 (2014) [hereinafter “Risky Business”], available at <http://bit.ly/1GxEZc>.

²³ Nienhuis, J. H. et al., *A New Subsidence Map for Coastal Louisiana*, 27 *GSA Today* 58-59 (June 2017), available at <http://www.geosociety.org/gsatoday/groundwork/G337GW/article.htm>; Blum, M.D., and Roberts, H.H., *Drowning of the Mississippi Delta Due to Insufficient Sediment Supply and Global Sea-Level Rise*, 2 *Nature Geoscience* 488–491 (2009), available at <https://www.nature.com/articles/ngeo553>.

²⁴ NOAA, *U.S. Sea Level Trend Map* (2016) [hereinafter “NOAA Sea Level Trend Map”], available at <https://tidesandcurrents.noaa.gov/sltrends/slrmap.html>.

²⁵ Hammar-Klose, E., and E. Thieler, 2001: *National Assessment of Coastal Vulnerability to Future Sea-Level Rise: Preliminary Results for the US Atlantic, Pacific and Gulf of Mexico Coasts*. US Reports 99–593, 00-178, and 00-179. U.S. Geological Survey, available at <http://woodshole.er.usgs.gov/project-pages/cvi/>.

²⁶ Coastal Protection and Restoration Authority (CPRA), *Master Plan Data Viewer*, available at <http://cims.coastal.louisiana.gov/masterplan/>; *Coastal Protection and Restoration Authority of Louisiana, Louisiana’s Comprehensive Master Plan for a Sustainable Coast* (2017), [Hereafter “Louisiana’s Coastal Plan”], available at http://coastal.la.gov/wp-content/uploads/2017/04/2017-Coastal-Master-Plan_Web-Single-Page_CFinal-with-Effective-Date-06092017.pdf; *Louisiana’s Coastal Plan Appendices* (2017), available at <http://coastal.la.gov/our-plan/2017-coastal-master-plan/>.

²⁷ *Id.*; Coastal Protection & Restoration Authority’s *Master Plan Data Viewer Flood Risk Map*, showing map of future flooding risk in Cameron (accessed March 21, 2017) (enclosed).

billion.²⁸ The same study estimates that future losses for the 2030 timeframe could reach between \$18 billion to \$23 billion with approximately 50% of the increase in the estimated losses related to climate change.²⁹

Many sources provide current and credible data regarding sea level rise and its potential consequences generally and in Louisiana in particular. As relevant examples, the Sabin Center directs the Commission's attention to:

- Intergovernmental Panel on Climate Change (“IPCC”), Chapter 2.2.3 Ocean, Cryosphere and Sea Level, in *Climate Change 2014 Synthesis Report, Fifth Assessment Report*, at 65, *available at* <https://perma.cc/9K4F-LDFC>³⁰
- Intergovernmental Panel on Climate Change (“IPCC”), Chapter 13 Sea Level Change, in *Climate Change 2013: The Physical Science Basis*, *available at* <https://perma.cc/EK2J-WSLX>³¹
- The Third National Climate Assessment, at 44–45, 119, 396–417, 579–618, *available at* <http://nca2014.globalchange.gov>³²
- U.S. Global Change Research Program, *Climate Science Special Report: Fourth National Climate Assessment, Volume I*, at 333-363, *available at* <https://science2017.globalchange.gov/>³³
- Coastal Protection and Restoration Authority of Louisiana, *Louisiana's Comprehensive Master Plan for a Sustainable Coast*, *available at* <https://perma.cc/LC5J-Z7UN>
- Climate Central, *Surging Seas: Sea Level Rise Analysis*, *available at* <https://perma.cc/D7GV-BUTQ>
- *Risky Business: The Economic Risks of Climate Change in the United States*, *available at* <https://perma.cc/U62D-KRVG>
- America's Wetland Foundation, America's Energy Coast, and Entergy, *Building a Resilient Energy Gulf Coast: Executive Report*, *available at* <https://perma.cc/NZ33-9ZUC>

²⁸ America's Wetland Foundation, America's Energy Coast, and Entergy, *Building a Resilient Energy Gulf Coast: Executive Report* (2010), *available at* www.entergy.com/content/our_community/environment/GulfCoastAdaptation/Building_a_Resilient_Gulf_Coast.pdf.

²⁹ *Id.*

³⁰ Intergovernmental Panel on Climate Change, *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (R.K. Pachauri and L.A. Meyer, eds., 2014).

³¹ J.A. Church et al., *Sea Level Change*, 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* (T.F. Stocker et al., eds., 2013).

³² U.S. Global Change Research Program, 2014: *Climate Change Impacts in the United States: The Third National Climate Assessment* (Melillo, Jerry M. et al., eds., 2014).

³³ Sweet, W.V. et al., *Sea Level Rise*, in 2017: *Climate Science Special Report: Fourth National Climate Assessment, Volume I* 333-363 (Wuebbles, D.J., et al. eds., U.S. Global Change Research Program, 2017).

2. *Increasing Frequency and Severity of Hurricanes and Tropical Storms*

Since the early 1980's, Atlantic hurricane activity has substantially increased by measures including intensity, frequency, and duration as well as the number of strongest (Category 4 and 5) storms.³⁴ Warming sea surface temperatures in the Atlantic are linked to this increase in hurricane activity.³⁵ Human-induced emissions of heat-trapping gases and particulate pollution influence these local sea temperatures.³⁶ As noted above, the combination of sea level rise with more severe and frequent hurricanes will affect storm surge and coastal damages, especially in the Gulf Coast. The previously listed resources describe these impacts and costs.

The 2017 hurricane season was particularly catastrophic with 17 named storms, 10 of which became hurricanes, including three category 4 storms that made landfall in the U.S.³⁷ By early estimates it is the most costly hurricane season on record in the U.S.³⁸ Global models project further increases in intensity, precipitation rate, and wind speed for tropical cyclones over the 21st Century.³⁹

3. *Upstream and Downstream Impacts*

Commonwealth LNG proposes to construct and operate a LNG liquefaction facility that would consist of a 3.7-mile-long natural gas receiving pipeline; four 2.0 MTPA gas pre-treatment trains; eight liquefaction trains, with a nominal LNG production capacity of approximately 1 MTPA each; six LNG storage tanks, each with a capacity of 40,000 cubic meters (m³); an electric plant powered by a 80-megawatt gas turbine; a boil-off gas handling system, utilities, and communications system; and a marine berth sized to accommodate LNG carriers up to about 215,000 m³ in capacity. Extracting natural gas from wells, processing it for transport, cooling it for loading into tankers, transporting it in those tankers, and, of course, combustion by end-users, are all activities that will occur as a result of the Project. Each of these component activities has predictable environmental impacts.⁴⁰ Further, these activities will

³⁴ National Climate Assessment at 41-42; Christensen, J.H., et al., *Climate Phenomena and their Relevance for Future Regional Climate Change*, 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., et al. eds.) (See especially 14.3.4-5, 14.6, 14.8.3); see also Kossin, J.P. et al., *Extreme storms*, in 2017: *Climate Science Special Report: Fourth National Climate Assessment, Volume I 257-276* (Wuebbles, D.J., et al. eds., U.S. Global Change Research Program, 2017) [hereinafter "NCA 4 Extreme Storms"].

³⁵ *Id.*

³⁶ *Id.*

³⁷ Brian Sullivan, *The Most Expensive U.S. Hurricane Season Ever: By the Numbers*, Bloomberg (Nov. 26, 2017), available at <https://perma.cc/R3JM-PXAY>.

³⁸ *Id.* (estimating \$202.6 billion in U.S. damages for the 2017 hurricane season).

³⁹ *Supra* note 34, NCA 4 Extreme Storms.

⁴⁰ See, e.g., Timothy Vinciguerra et al., *Regional air quality impacts of hydraulic fracturing and shale natural gas activity: Evidence from ambient VOC observations*, 110 *Atmospheric Env't* 144 (2015) (identifying natural gas hydrofracture drilling operations as sole plausible cause for increase in ambient emissions of ethane and VOCs—and, by inference, methane—in region downwind of drilling operations in Pennsylvania and West Virginia); Victor M. Heilweil et al., *Stream Measurements Locate Thermogenic Methane Fluxes in Groundwater Discharge in an Area of Shale-Gas Development*, 49 *Env'tl. Sci. & Tech.* 4057 (2015) (measuring migration of fingerprinted methane, i.e., gas not attributable to sources other than drilling, into waters near shale-gas development operations); Christopher W. Moore et al., *Air Impacts of Increased Natural Gas Acquisition, Processing, and Use: A Critical Review*, 48 *Env'tl. Sci. & Tech.* 8349 (2014) (discussing several case study-based natural gas lifecycle emissions assessments).

contribute to the Project's upstream and downstream greenhouse gas emissions. DOE has analyzed the life cycle impacts of greenhouse gas emissions from U.S. LNG export facilities.⁴¹ In a 2014 addendum analyzing the upstream greenhouse gas emissions of LNG export facilities, DOE estimated that that each incremental increase in natural gas production of 1 trillion standard cubic feet (scf) per year will generate an additional 6.8 million metric tons of CO_{2e} per year.⁴² While the exact downstream emissions of combusting natural gas may depend on several uncertain variables, FERC should engage in "reasonable forecasting" and provide a quantitative estimate of the downstream greenhouse emissions, or else a complete explanation for why it cannot provide the estimate.⁴³

The direct greenhouse gas emissions from the 80-megawatt gas turbine must also be calculated and their cost should be considered using the social cost of carbon. DOE provides a coefficient for the average natural gas combustion turbine of 604.2 kg of CO₂/MWh.⁴⁴ Using this coefficient, if the Commonwealth LNG LLC's turbine were to run at 100% capacity, 24 hours per day, and 365 days per year, then it would produce 423,423.36 metric tons of CO₂ emissions per year. If the facility is scheduled to run at a lower capacity or less frequently, the calculation can easily be redone to fit the circumstances. As noted earlier, the Commission should use the Social Cost of Carbon, Methane, and Nitrous Oxide to estimate the costs of the project's emissions.

* * *

To adequately protect the Commonwealth LNG Project and its surrounding environment from future climate change impacts, the Commission should consider the risks arising from increasing frequency and severity of hurricanes combined with sea level rise and associated storm surge, flooding, and erosion risks. Consideration of such risks by a federal agency would not be a novel undertaking,⁴⁵ and is especially exigent here given that the Project will support the compression and transport of combustible and potentially explosive gas.

Specifically, the Commission should assess the projected range of sea level rise and related potential for storm surge and erosion throughout the planned life of the Commonwealth Project, and should identify ways to effectively manage the associated risks. Similarly, the Commission should assess projected changes to frequency and severity of hurricanes in the vicinity of the Project and identify engineering solutions capable of managing the host of risks that extreme weather poses to sensitive infrastructure.

⁴¹ U.S. Dept. of Energy, Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States, 79 Fed. Reg. 32,260 (June 4, 2014), *available at* <https://perma.cc/V353-JDYZ>.

⁴² U.S. Dept. of Energy, Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States, 79 Fed. Reg. 48,132 (Aug. 15, 2014), *available at* <https://perma.cc/7Y6A-PM5Z>.

⁴³ *Sierra Club v. Fed. Energy Regulatory Comm'n*, 867 F.3d 1357, 1373–74 (D.C. Cir. 2017); *see also Delaware Riverkeeper Network v. F.E.R.C.*, 753 F.3d 1304, 1310 (D.C. Cir. 2014).

⁴⁴ U.S. Dept. of Energy, Office of Energy Policy and Systems Analysis, Environment Baseline, Volume 1: Greenhouse Gas Emissions from the U.S. Power Sector, 18 (June 2016), *available at* <https://www.energy.gov/sites/prod/files/2017/01/f34/Environment%20Baseline%20Vol.%201--Greenhouse%20Gas%20Emissions%20from%20the%20U.S.%20Power%20Sector.pdf>.

⁴⁵ *See, e.g.,* Department of Interior, Seward Peninsula - Nulato Hills - Kotzebue Lowlands Rapid Ecological Assessment, Final Report II-3-c (Oct. 2012), *available at* <http://bit.ly/207u2Rk>.

In its projections of the future state of coastlines, the Commission should take note of the West Gulf Coast's high rate of sea level rise relative to other regions of the U.S. and the world⁴⁶ coupled with its vulnerability to hurricanes and tropical storms. Louisiana lost approximately 4,833 square kilometers of land along its coast between 1932 and 2016, equal to a loss of 25% of the 1932 land area.⁴⁷ High wetland loss rates occurred during the 2005 and 2008 hurricane seasons, which were particularly hard on the Louisiana Coast.⁴⁸ During Hurricane Rita, storm tides brought flooding of 12-14 feet in the Lake Calcasieu area surrounding the Project.⁴⁹ The baseline of the Project's future environmental circumstances should reflect that the area surrounding the project appears to be highly sensitive to storm surge, climate change, subsidence, and the worsening synergistic impacts of these forces.

Thank you for the opportunity to submit comments on the Commonwealth LNG Project. Please feel free to contact the Sabin Center with any questions.

Sincerely,



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enclosures:

- FERC's Letter to Louisiana LNG Energy, LLC providing comments on Draft Resource Reports 2 through 9 re the Mississippi River LNG Project under PF14-17 (Nov. 24, 2014)
- Coastal Protection & Restoration Authority's Master Plan Data Viewer Flood Risk Map, showing map of future flooding risk in Cameron (accessed March 21, 2017)

⁴⁶ NOAA Sea Level Trend Map.

⁴⁷ Couvillion, B.R., et al., *Land Area Change in Coastal Louisiana from 1932 to 2016*, U.S. Geological Survey Scientific Investigations Map 3381, 16 p. pamphlet, available at <https://pubs.er.usgs.gov/publication/sim3381>.

⁴⁸ *Id.*

⁴⁹ Berenbrock, C. et al., Mapping Hurricane Rita and Inland Storm Tide, U.S. Geological Survey at 78-5 (May 2008), available at <https://water.usgs.gov/osw/pubs/MappingHurricaneRita.pdf>.