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

September 23, 2021

RE: LA Storage, LLC; Notice of Intent To Prepare an Environmental Impact Statement for the Proposed Hackberry Storage Project, Request for Comments on Environmental Issues, and Schedule for Environmental Review (CP21-44-000)

Secretary Bose:

The Sabin Center for Climate Change Law (“Sabin Center”)¹ submits these comments on the notice of intent to prepare an environmental impact statement for the proposed Hackberry Storage Project (the “Project”), announced by the Federal Energy Regulatory Commission (“FERC” or the “Commission”) in September 2021.

LA Storage, LLC proposes to convert three existing salt dome caverns to natural gas storage service and develop one new salt dome cavern for the same purpose in Cameron and Calcasieu Parishes, Louisiana. In addition to these storage caverns, the proposed Project would include the construction and operation of on-site compression facilities; up to six solution mining water wells; the Hackberry Pipeline, which would consist of approximately 11.1 miles of 42-inch-diameter natural gas pipeline connecting the storage caverns to the Port Arthur Pipeline Louisiana Connector pipeline; the Cameron Interstate Pipeline Lateral, an approximately 4.9-mile-long, 42-inch-diameter natural gas pipeline connecting the storage caverns to the existing Cameron Interstate Pipeline; and an approximately 6.2-mile-long, 16-inch-diameter brine disposal pipeline that would transport brine from the caverns to four saltwater disposal wells located on two pads north of the facility. The Project would have the capacity to store 25.5 billion cubic feet (“BcF”) of natural gas, 20.03 BcF of that being working gas, and would be designed to inject and withdraw natural gas into storage at a maximum rate of roughly 1.5 BcF/day.²

For the limited purposes of these comments, the Sabin Center takes no position on whether FERC should approve the Project. Rather, consistent with the notice’s goal of gathering information concerning impacts affecting the quality of the human environment, the Sabin Center’s comments focus on the potential impacts of the Project’s greenhouse gas emissions,

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* <https://climate.law.columbia.edu/>. Please contact the Sabin Center for assistance locating any sources.

² LA Storage, LLC, Application for Certificate of Public Convenience and Necessity [hereinafter “Application for Certificate of Public Convenience and Necessity”], Docket No. CP21-44-000 (Jan. 29, 2021) at 11.

along with the potential impacts of climate change on the Project. Our recommendations to FERC can be summarized as follows:

- FERC should quantify all greenhouse gas emissions that will foreseeably result if the Project is approved, including the project’s upstream emissions, the downstream greenhouse gas emissions that will result from use of natural gas stored at the project site, and potential methane leakage from the Project facilities.
- FERC should disclose the potential impacts associated with the emissions that would be generated as a result of the Project. Several tools are available to assess the consequences of greenhouse gas emissions that would occur if the Project is approved.
- FERC should ensure that its environmental review reflects the unique risks to the Project and the surrounding environment due to observed and anticipated sea level rise, storm surge, and erosion in the region.
- FERC should analyze the temporary and permanent wetlands impacts associated with the project in terms of their role in protecting Southwest Louisiana from storms and flooding, along with their role in carbon sequestration.

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 associated with climate change.³ In addition, the Commission should assess the indirect impacts of upstream and downstream Project-related activities, disclose the greenhouse gas emissions associated with them, and assess the impacts of those emissions. Climate-related phenomena identified in these comments—including but not limited to sea level rise, storm surge, wetland destruction, and methane leakage—may additionally affect other issues identified by the Commission as pertinent to environmental review, such as endangered and threatened species; water resources and wetlands; cultural resources; socioeconomics; land use; vegetation and wildlife; reliability and safety; and air quality and noise. The Sabin Center urges FERC to robustly consider the impacts of climate change on the Project and the impacts of the Project’s greenhouse gas emissions as part of the agency’s environmental review.

NEPA’s implementing regulations provide that agencies must consider “all changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives.”⁴ Multiple

³ See U.S. Council on Env’t Quality, Final Guidance on Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews [“2016 Guidance”] at 20–27 (2016); *see also* U.S. Council on Env’t Quality, National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions, 86 Fed. Reg. 10252 (Feb. 19, 2021) (withdrawing Trump administration-era draft guidance and directing agencies to consider “as appropriate and relevant, the 2016 GHG Guidance”).

⁴ See 40 C.F.R. § 1508.1(g).

federal courts have confirmed that NEPA regulations require federal agencies to evaluate the impacts of their actions on climate change,⁵ and federal courts have also confirmed that NEPA regulations require federal agencies to evaluate the impacts of climate change on their actions.⁶ Furthermore, acting on President Biden’s directive,⁷ the Council on Environmental Quality (“CEQ”) recently withdrew Trump administration-era draft guidance in order to reinstate its 2016 Final Guidance on Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews, which had been designed to help agencies account for greenhouse gas (“GHG”) emissions and the effects of climate change in conducting environmental impact review under NEPA.⁸ In its February 2021 notice, CEQ announced that it will separately review and potentially update the 2016 GHG guidance, but that “[i]n the interim, agencies should consider all available tools and

⁵ *Vecinos para el Bienestar de la Comunidad Costera v. FERC*, 6 F.4th 1321, 1329 (D.C. Cir. 2021) (“Because the Commission failed to respond to significant opposing viewpoints concerning the adequacy of its analyses of the projects’ greenhouse gas emissions, we find its analyses deficient under NEPA and the APA”); *Sierra Club v. Fed. Energy Regulatory Comm’n*, 867 F.3d 1357, 1363 (D.C. Cir. 2017) (“FERC’s environmental impact statement did not contain enough information on the greenhouse-gas emissions that will result from burning the gas that the pipelines will carry.”); *Ctr. for Biological Diversity v. Bernhardt*, 982 F.3d 723, 738 (9th Cir. 2020) (“This is insufficient to satisfy NEPA’s requirements. Emissions resulting from the foreign consumption of oil are surely a “reasonably foreseeable” indirect effect of drilling at Liberty, just as foreseeable as the emissions resulting from the consumption of oil produced at sites other than Liberty, which the market-simulation model already considers. Even if the extent of the emissions resulting from increased foreign consumption is not foreseeable, the nature of the effect is”); *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”); *Sovereign Inupiat for a Living Arctic v. Bureau of Land Mgmt.*, No. 3:20-CV-00290-SLG, 2021 WL 3667986, at *12 (D. Alaska Aug. 18, 2021) (“In short, BLM’s greenhouse gas emissions analysis suffers from the same flaws the Ninth Circuit identified in *Liberty*. Accordingly, the Court finds BLM’s exclusion of foreign emissions in its alternatives analysis in the Willow EIS was arbitrary and capricious”); *Utah Physicians for a Healthy Env’t v. U.S. Bureau of Land Mgmt.*, No. 2:19-CV-00256-DBB, 2021 WL 1140247, at *6 (D. Utah Mar. 24, 2021) (“The socioeconomics section may not lay out the economic benefits from the proposal without analyzing the socioeconomic costs of GHGs together with climate change”); *San Juan Citizens All. v. United States Bureau of Land Mgmt.*, 326 F. Supp. 3d 1227, 1249 (D.N.M. 2018) (“in considering the potential impacts of the full amount of greenhouse gas emissions which are indirect effects of issuing the leases in this case, BLM must not rely on outdated scientific tools and analyses”); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 51 (D.D.C. 2019) (“Having reviewed the record and the relevant law, the Court concludes that— withholding judgment on whether BLM’s leasing decisions were correct—BLM did not sufficiently consider climate change when making those decisions”); *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).

⁶ *AquAlliance, et al., v. U.S. Bureau of Reclamation*, 287 F. Supp. 3d 969, 1032 (E.D. Cal. 2018) (concluding that 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 that agency properly analyzed the effect of climate change on sediment disposition); *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) (holding that 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 environmental impact statement (“EIS”) for issuance of § 404 permit in light of new information on climate change).

⁷ Exec. Order No. 13990, 86 Fed. Reg. 7037, 7042 (Jan. 25, 2021).

⁸ 86 Fed. Reg. 10252 (Feb. 19, 2021); see also 2016 Guidance, *supra* note 3.

resources in assessing GHG emissions and climate change effects in their proposed actions, including, as appropriate and relevant, the 2016 GHG Guidance.”⁹

1. The Need to Assess the Effects of Climate Change on the Project

NEPA requires that agencies define an appropriate baseline for considering projected environmental impacts, and that baseline must incorporate anticipated environmental conditions.¹⁰ Climate change will affect the environment surrounding the Project through sea level rise, increasing frequency and severity of hurricanes, and their combined effects on storm surge. The Commission must accordingly consider these climate-driven changes as future baseline environmental conditions.

FERC itself has already recognized the relevance and importance of climate change impacts to similar and similarly situated facilities located along the Gulf Coast and elsewhere. For instance, FERC required consideration of climate change impacts in connection with two proposed LNG export facilities in flood-prone coastal Louisiana (the “Commonwealth LNG Project” and the “Mississippi River LNG Project”).¹¹ After the applicants for the two projects submitted draft resource reports to the Commission, FERC directed the applicants to supplement the reports with information regarding potential impacts of sea level rise and storm impacts for the design life of the facilities.¹² FERC requested similar information on sea level rise when assessing the Port Arthur LNG Train Expansion Project in coastal Texas.¹³ Moreover, FERC’s Environmental Assessments of the Port Arthur LNG Expansion Project, Dominion Cove Point LNG export facility on the Chesapeake Bay, and the Cameron LNG facility in coastal Louisiana all consider several implications of climate change for those facilities.¹⁴ Similarly, the EIS that FERC prepares for the Project should account for the effects of climate change.

⁹ *Id.*

¹⁰ See 2016 Guidance, *supra* note 3, at 20–21 (“The current and projected future state of the environment without the proposed action (i.e., the no action alternative) represents the reasonably foreseeable affected environment, and this should be described based on authoritative climate change reports . . . Agencies should remain aware of the evolving body of scientific information as more refined estimates of the impacts of climate change, both globally and at a localized level, become available”); CEQ, *Considering Cumulative Effects under the National Environmental Policy Act* (1997) [hereinafter “Considering Cumulative Effects Under NEPA”] at 41, available at <https://bit.ly/34duKDd>; see also *W. Watersheds Project v. Bureau of Land Mgmt.*, 552 F. Supp. 2d 1113, 1128 (D. Nev. 2008) (EA must “succinctly describe the environment”) (quoting 40 C.F.R. § 1502.15).

¹¹ Commonwealth LNG, LLC, Commonwealth LNG Project (CP19-502-000); Louisiana LNG Energy, LLC, Proposed Mississippi River LNG Project (PF14-17-000).

¹² Letter requesting Commonwealth LNG, LLC to file environmental information within 20 days to assist in FERC’s analysis of the application for the Commonwealth LNG Project under CP19-502 (Oct. 2, 2019), https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20191002-3030&optimized=false; 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), https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20141124-3034.

¹³ Letter to Port Arthur Pipeline, LLC providing comments on the draft Resource Report 11 & 13 for the Port Arthur LNG Train 3 and 4 Expansion Project under PF19-5 (Jan. 22, 2020), https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20200122-3053&optimized=false.

¹⁴ See FERC, Environmental Assessment for the Port Arthur LNG Expansion Project, Port Arthur LNG, LLC, LP Docket No. CP20-55-000, at 121–124 (Jan. 2021); 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) (“Climate change in the northeast region could have two effects that may cause increased storm surges: temperature

2. The Need to Assess and Quantify the Project's Greenhouse Gas Emissions

In addition to considering the effects of climate change on the Project, the Commission must consider the effects on the project on climate change. Recently, the Environmental Protection Agency (“EPA”) submitted comments on the Commission’s environmental impact review of a compressor station expansion in Pennsylvania and two pipeline projects in Louisiana and New York,¹⁵ as well as on the Commission’s Notice of Inquiry into its natural gas infrastructure certification practices.¹⁶ In its comments, EPA strongly recommended the Commission to apply the social cost of greenhouse gases in its assessments of proposed projects;¹⁷ to conduct thorough analyses on the local and regional impacts of methane; to consider upstream emission estimates, including by utilizing generic estimates for upstream emissions from natural gas production developed by the Department of Energy’s National Energy Technology Laboratory and Energy Information Agency if specific information is unavailable; and to discuss projects’ GHG emissions in the context of national and state GHG emission goals.¹⁸ Consistent with EPA’s recommendations, the Commission should robustly consider the life cycle emissions from the facility’s storage and transportation of LNG,¹⁹ including upstream emissions and the downstream greenhouse gas emissions caused by fossil fuel combustion.²⁰

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.”).

¹⁵ Env’t Prot. Agency, Comment Letter on the Draft EIS for East Lateral Xpress Project (FERC Docket No. CP20-527) (July 2, 2021), <https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=334766>; Env’t Prot. Agency, Comment Letter on the Draft EIS for the Iroquois Pipeline Enhancement by Compression Project (FERC Docket No. CP20-48) (Aug. 9, 2021), <https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=332880>; Env’t Prot. Agency, Comment Letter on the Draft EIS for the Marcus Hook Electric Compression Project (FERC Docket No. CP21-14) (Aug. 9, 2021), <https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=334344>.

¹⁶ Env’t Prot. Agency, Comment Letter on the FERC’s NOI on the Certification of New Interstate Natural Gas Facilities (FERC Docket No. PL18-1-000) (May 26, 2021), https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20210526-5267.

¹⁷ See *infra* for a discussion of the social cost of greenhouse gases.

¹⁸ See *supra* notes 14, 15.

¹⁹ *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”); see also Michael Burger & Jessica Wentz, Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review, 41 Harv. Envtl. L. Rev. 109 (2017).

²⁰ *Sierra Club*, 867 F.3d at 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

LA Storage has asserted that the Project would provide storage capacity to meet expected growth in LNG exports, noting that there are more than a dozen new or expanded LNG export projects approved and/or under construction in the area.²¹ The Project is thus connected to those new export projects, and “when determining the contents of an . . . EIS, an agency must consider all ‘connected actions.’”²² Furthermore, “[a]n agency impermissibly ‘segments’ NEPA review when it divides connected . . . federal actions into separate projects and thereby fails to address the true scope and impact of the activities that should be under consideration.”²³ FERC’s review of the Project should thus include an assessment of the Project’s impact on LNG exports.

Under current NEPA regulations, relevant “[e]ffects or impacts” of a project include all “changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, . . . and may include effects that are later in time or farther removed in distance from the proposed action or alternatives.”²⁴ FERC’s action in approving four natural gas storage facilities and associated pipeline infrastructure would not be justified without an expectation that the Project would support LNG export in the region,²⁵ and expanded LNG export would not occur in the absence of sufficient gas storage nearby.²⁶ Furthermore, a natural gas storage facility has no independent utility absent utilization of that gas. As the designated lead agency for NEPA compliance,²⁷ FERC should not just assess, but fully quantify upstream and downstream indirect emissions resulting from the additional exports of LNG that would occur if the Project were approved,²⁸ along with emissions associated with the other planned uses of the stored gas: providing natural gas to electric generation facilities and other customers in the region.²⁹ Further, FERC should ensure that its assessment does not rest on flawed analysis pertaining to potential displacement of coal consumption. As the Sabin Center has previously submitted to the Department of Energy (DOE), past DOE and FERC analysis on this point has been flawed for

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); 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 greenhouse gas 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).

²¹ Application for Certificate of Public Convenience and Necessity at 15.

²² *Del. Riverkeeper Network v. FERC*, 753 F.3d 1304, 1314 (2014)

²³ *Id.* at 1313.

²⁴ 40 C.F.R. § 1508.1(g).

²⁵ *See* Application for Certificate of Public Convenience and Necessity at 14–17.

²⁶ *See* 40 C.F.R. § 1508.1(g)(2).

²⁷ 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).

²⁸ *See* Michael Burger & Jessica Wentz, *Evaluating the Effects of Fossil Fuel Supply Projects on Greenhouse Gas Emissions and Climate Change Under NEPA*, 44 Wm. & Mary Env’tl. L. & Pol’y Rev. 423 (2020) (providing further information regarding federal agencies’ obligation to assess greenhouse gas emissions resulting from fossil fuel transportation projects under NEPA).

²⁹ *See* Application for Certificate of Public Convenience and Necessity at 14–15.

multiple reasons.³⁰ These reasons include, first, that the analysis has relied on faulty estimates of methane emissions during natural gas production and transportation, and second, that it has ignored the significant adoption of renewable energy in Europe and elsewhere.

Moreover, FERC should disclose the consequences of the Project's greenhouse gas emissions, in addition to including indirect and cumulative effects in its accounting of those emissions, in order to inform decision-makers and the public about the scale of the emissions impact from the Project.³¹ Simply comparing these emissions to the larger national total is inadequate. As the IPCC recently stated, "there is a near-linear relationship between cumulative anthropogenic CO₂ emissions and the global warming they cause,"³² and the Commission should use the below-listed tools to fully evaluate the effects of Project-related emissions.

There are a number of ways to assess the effects of a project's greenhouse gas emissions. Among the most useful are the "social cost of carbon" ("SCC"), "social cost of nitrous oxide" ("SCN"), and "social cost of methane" ("SCM").³³ Although they were developed for a rulemaking context, these metrics can readily be used in an environmental analysis to better understand the potential costs associated with greenhouse gas emissions. The cost estimates are a useful proxy for the actual impacts of climate change. In a recent executive order, President Biden directed agencies to "capture the full costs of greenhouse gas emissions as accurately as possible, including by taking global damages into account."³⁴ President Biden further encouraged the utilization of the SCC, SCN, and SCM in monetizing damages associated with

³⁰ Sabin Center for Climate Change Law, Comments on DOE's Proposed Revisions to its National Environmental Policy Act Implementing Procedures Regarding Natural Gas Exports at 7-9 (Docket ID DOE-HQ-2020-0017) (June 1, 2020), <https://climate.law.columbia.edu/sites/default/files/content/%5BFINAL%5D%20DOE%20Comment%20Letter%20%5B6-1-20%5D.pdf>.

³¹ See, e.g., *San Juan Citizens All.*, 326 F. Supp. 3d at 1247 (agency must evaluate potential impacts of greenhouse gas emissions caused by project in light of revised total greenhouse gas projections).

³² See, e.g., Intergovernmental Panel on Climate Change ("IPCC"), Climate Change 2021, The Physical Science Basis: Summary for Policymakers ["Summary for Policymakers"], at 36, available at https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

³³ The Social Cost of Carbon, Methane, and Nitrous Oxide are scientifically-credible and Presidentially-sanctioned estimates of the societal costs of greenhouse gas emissions, developed through a lengthy process of interagency consultation and peer review, and that cost is absolutely relevant to assessing the nature and significance of the proposed Project's environmental consequences. See Exec. Order No. 13990, 86 Fed. Reg. 7037, 7042 (Jan. 25, 2021); INTERAGENCY WORKING GROUP ON SOCIAL COST OF GREENHOUSE GASES, SOCIAL COST OF CARBON, METHANE, AND NITROUS OXIDE: INTERIM ESTIMATES UNDER EXECUTIVE ORDER 13990 (2021), https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf;

Zero Zone Inc. v. Dept. of Energy, 832 F.3d 654 (7th Cir. 2016) (upholding use of methodology for calculating social cost of carbon used by the Interagency Working Group on the Social Cost of Carbon); 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). See also *Montana Environmental Information Center v. OSM*, 274 F.Supp.3d 1074 (D. Montana 2017) (requiring disclosure of greenhouse gas costs in NEPA review where benefits were also disclosed, and citing the federal Social Cost of Carbon as an available disclosure tool); *High Country Conservation Advocates v. USFS*, 52 F.Supp.3d 1174 (D. Colo. 2014) (same)

³⁴ See Exec. Order No. 13990, 86 Fed. Reg. at 7040.

incremental increases in greenhouse gas emissions.³⁵ Implementing this portion of the executive order, the Interagency Working Group on Social Cost of Greenhouse Gases released its interim estimates on SCC, SCN, and SCM in February 2021.³⁶ And in August 2021, the D.C. Circuit remanded the Commission’s environmental impact review of two LNG export facilities for failure to adequately explain why it had refused to apply the SCC or another generally accepted method of quantifying greenhouse gas impacts.³⁷ While the Commission has previously refused to use the SCC, citing purported “methodological limitations,”³⁸ those concerns are misplaced in light of the tool’s rigorous development through an interagency working group representing twelve federal bodies,³⁹ its judicial approval,⁴⁰ and its express support from President Biden.⁴¹

Additional tools to understand the magnitude of greenhouse gas emissions’ impact include the EPA’s quantification threshold of 25,000 tons per year of carbon dioxide equivalent to identify major emitters for the purposes of greenhouse gas reporting (as noted by EPA, facilities that surpass this threshold are considered the “largest emitters” in the country).⁴² FERC should also consider using the EPA’s Greenhouse Gas Equivalencies Calculator, which can be used to compare emissions from the proposal with, for example, emissions from household electricity use or vehicle miles driven.⁴³ This tool provides a reference point that an agency can use to assess a proposed project’s impact on the climate. Finally, FERC could evaluate the Project’s greenhouse gas emissions in the context of global and national carbon budgets; estimates have been developed for both.⁴⁴

In assessing the Project’s potential climate impacts, FERC should use updated figures to properly assess the magnitude of greenhouse gas pollution that would result from the Project. FERC has recently used a global warming potential (“GWP”) of 25 for methane, based on a 100-year time horizon, in conducting NEPA analysis.⁴⁵ This GWP is flawed for two reasons. First, because methane remains in the atmosphere for under two decades,⁴⁶ a 20-year timeframe is

³⁵ *Id.*

³⁶ INTERAGENCY WORKING GROUP ON SOCIAL COST OF GREENHOUSE GASES, SOCIAL COST OF CARBON, METHANE, AND NITROUS OXIDE: INTERIM ESTIMATES UNDER EXECUTIVE ORDER 13990 (2021), https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf.

³⁷ *Vecinos para el Bienestar de la Comunidad Costera v. FERC*, 6 F.4th 1321, 1327–30 (D.C. Cir. 2021).

³⁸ See, e.g., Fed. Energy Regulatory Comm’n, No. CP17-458-000 Final Environmental Impact Statement for Midship Pipeline Company, LLC--Midcontinent Supply Header Interstate Pipeline Project, Volume 1 4-192 (2018), <http://perma.cc/4CAQ-LXAG>.

³⁹ INTERAGENCY WORKING GROUP ON SOCIAL COST OF GREENHOUSE GASES, *supra* note 36.

⁴⁰ See *Zero Zone, Inc. v. United States Dep’t of Energy*, 832 F.3d 654 (7th Cir. 2016).

⁴¹ See Exec. Order No. 13990, 86 Fed. Reg. at 7040

⁴² EPA, GHG Reporting Program Facts and Figures, <https://www.epa.gov/ghgreporting/key-facts-and-figures>.

⁴³ EPA, Greenhouse Gas Equivalencies Calculator, <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.

⁴⁴ See, e.g., Summary for Policymakers, *supra* note 32, at 36–41; Zeke Hausfather, *Analysis: What the New IPCC Report Says About When World May Pass 1.5C and 2C*, CarbonBrief (Aug. 10, 2021), <https://www.carbonbrief.org/analysis-what-the-new-ipcc-report-says-about-when-world-may-pass-1-5c-and-2c>; Daniel J. Hayes, The North American Carbon Budget, in *Second State of the Carbon Cycle Report: A Sustained Assessment Report* (Cavallaro et al. eds, USGCRP 2018).

⁴⁵ See, e.g., FERC, Alaska LNG Project, Draft Environmental Impact Statement (June 2019) at 4-878; FERC, Jordan Cove Energy Project, Draft Environmental Impact Statement (March 2019) at 4-666.

⁴⁶ IPCC, *Climate Change 2021, The Physical Science Basis*, Chapter 6, 23 (2021) (“Considering the full range of individual lifetimes, the total methane lifetime was assessed in AR5 to be 9.25 ± 0.6 years”).

more relevant than the 100-year span. At least one court has concluded that an “unexplained decision to use the 100-year time horizon,” even a decision based on EPA’s use of that timeframe, “when other more appropriate time horizons remained available, qualifies as arbitrary and capricious.”⁴⁷ The most recent Intergovernmental Panel on Climate Change (IPCC) Assessment Report estimates that fossil-based methane’s GWP is 82.5 +/- 25.8 over a 20-year timeframe.⁴⁸ FERC should use this figure. Second, the most recent IPCC Assessment Report estimates that fossil-based methane’s GWP over a 100-year time frame is 29.8 +/- 11.⁴⁹ Even though this time horizon is inappropriate, FERC should not use outdated science. Although the Greenhouse Gas Reporting Rule uses a GWP of 25 for methane,⁵⁰ courts have recognized the IPCC as authoritative,⁵¹ and “[t]he EPA considers the GWP estimates presented in the most recent IPCC scientific assessment to reflect the state of science.”⁵²

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), 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 six years at a minimum) and annual plans.⁵³ In June 2017, the Louisiana State Legislature unanimously approved the state’s 2017 Coastal Master Plan.⁵⁴ The CPRA is currently planning its 2023 Coastal Master Plan.⁵⁵ 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.”⁵⁶ More recently, Louisiana Executive Order JBE 2020-19 directed all agencies to update their strategic plans to integrate coastal change information from the master plan and

⁴⁷ *W. Org. of Res. Councils v. U.S. Bureau of Land Mgmt.*, CV-16-21-GF-BMM, 2018 WL 1475470, at *15 (D. Mont. Mar. 26, 2018).

⁴⁸ IPCC, *supra* note 46, at Chapter 7, 125.

⁴⁹ *Id.*

⁵⁰ 40 C.F.R. Pt. 98, Subpt. A, Tbl. A-1.

⁵¹ See, e.g., *Mass. v. Env. Protection Agency*, 549 U.S. 497, 508 (2007); *Ctr. For Biological Diversity v. National Highway Traffic Safety Admin.*, 538 F.3d 1172, 1190 (9th Cir. 2008).

⁵² *Understanding Global Warming Potentials*, ENV’T PROTECTION AGENCY, <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials> (last visited Sept. 15, 2021).

⁵³ LA. STAT. ANN. §§ 49:214.5.2, 49:214.5.3 (current through the 2021 Regular Session); see also COASTAL PROTECTION AND RESTORATION AUTHORITY, FISCAL YEAR 2022 ANNUAL PLAN (2021), https://coastal.la.gov/wp-content/uploads/2021/04/CPRA_FY22-AP_web.pdf.

⁵⁴ *State Legislature Approves 2017 Coastal Master Plan*, COASTAL PROTECTION AND RESTORATION AUTHORITY (June 2, 2017), <https://coastal.la.gov/news/state-legislature-approves-2017-coastal-master-plan/>.

⁵⁵ See *2023 Coastal Master Plan*, COASTAL PROTECTION AND RESTORATION AUTHORITY, <https://coastal.la.gov/our-plan/2023-coastal-master-plan/> (last visited Sept. 14, 2021).

⁵⁶ 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>.

prioritize resilience-building actions and investments.⁵⁷ Order JBE 2020-19 also created the position of Chief Resilience Officer in order “[t]o enhance and further the State's interest in developing a more comprehensive and coordinated response to the coastal crisis and to meeting the goals and objectives of the Coastal Master Plan.”⁵⁸

In addition to the aforementioned orders, Louisiana Executive Order JBE 2020-18 established the “Climate Initiatives Task Force” within the Office of the Governor—Coastal Activities.⁵⁹ Among other goals, this task force will investigate and make recommendations to assist Louisiana in achieving the following greenhouse gas emissions reduction goals:

1. By 2025, reduce net greenhouse gas emissions by 26–28% of 2005 levels;
2. By 2030, reduce net greenhouse emissions by 40–50% of 2005 levels; and
3. By 2050, reduce greenhouse gas emissions to net zero.⁶⁰

This task force arose from the recognition that in order “to improve our resilience, sustain our coast, and help avoid the worst impacts of climate change, Louisiana must proactively work to reduce the greenhouse gas emissions that are driving up global temperatures, raising sea levels, and increasing risks that threaten our health and safety, quality of life, economic growth, and vital habitats and ecosystems.”⁶¹ CEQ regulations direct agencies to assess “[p]ossible conflicts between the proposed action and the objectives of Federal, regional, State, Tribal, and local land use plans, policies and controls for the area concerned.”⁶² CEQ’s guidance further instructs that “[a]gencies should discuss relevant approved federal, regional, state, tribal, or local plans, policies, or laws for GHG emission reductions or climate adaptation to make clear whether a proposed project’s emissions are consistent with such plans or laws.”⁶³ FERC should accordingly review the proposed Project in light of Louisiana’s emissions targets and coastal protection plans.

Louisiana’s initiatives align with the Congressionally-authorized Southwest Coastal Louisiana Project.⁶⁴ Recognizing that Cameron and Calcasieu Parishes are at particular risk of hurricane storm surge and coastal erosion due to their low elevation and proximity to the Gulf of Mexico, Congress authorized the investigation of potential solutions to (1) provide hurricane protection and storm damage risk reduction, and (2) significantly restore the natural ecosystem of Southwest Louisiana.⁶⁵ In April 2016, the Army Corps of Engineers and the Louisiana Coastal

⁵⁷ State of Louisiana, Exec. Order No. JBE 2020-19, Coastal Resilience (Aug. 19, 2020), available at <https://www.doa.la.gov/media/vnoncopj/jbe-2020-19-coastal-resilience.pdf>.

⁵⁸ *Id.*

⁵⁹ State of Louisiana, Exec. Order No. JBE 2020-18, Climate Initiatives Task Force (Aug. 19, 2020), available at <https://www.doa.la.gov/media/pnwb01gh/jbe-2020-18-climate-initiatives-task-force.pdf>.

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² 40 C.F.R. § 1502.16(a)(5).

⁶³ 2016 Guidance, *supra* note 3, at 28–29.

⁶⁴ See U.S. ARMY CORPS OF ENGINEERS, SOUTHWEST COASTAL LOUISIANA STUDY (2014), <https://www.mvn.usace.army.mil/Portals/56/docs/PD/Projects/SWCoastal/SouthwestCoastalFactSheetJanuary2014FINAL.pdf>; see also Water Infrastructure Improvements for the Nation Act, Pub. L. No. 114-322, 130 Stat. 1715 (2016).

⁶⁵ U.S. ARMY CORPS OF ENGINEERS, SOUTHWEST COASTAL LOUISIANA: INTEGRATED FINAL FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT (2016) at ii, <https://www.mvn.usace.army.mil/Portals/56/docs/PD/Projects/SWCoastal/2016/SWC%20Main%20Report.pdf>.

Protection and Restoration Authority published their Integrated Final Feasibility Report and Environmental Impact Statement for the Southwest Coastal Louisiana Project.⁶⁶ In addition to discussing the damage that hurricanes and storm surges will do to the region’s infrastructure generally, the report realized specific risks facing oil and gas infrastructure in the region:

Erosion of wetlands could result in the displacement/damage of the region’s strategic O&G industry infrastructure, especially the extensive near-shore pipeline network, resulting in disruption of service and increased repair and maintenance cost. Potential damage to the pipeline network could increase the risk of unintended releases of petroleum products and the resulting ecosystem damage.⁶⁷

While construction designed to implement the study’s findings is still awaiting federal funding,⁶⁸ FERC should ensure that the Hackberry Storage Project does not interfere with these federal and state conservation activities.

Finally, federal guidance from the Securities and Exchange Commission (“SEC”) further directs assessment of climate change impacts. The SEC has issued guidance regarding publicly traded companies’ obligation to disclose the impacts that climate change may have on their operations.⁶⁹ The SEC has recently undertaken an effort to facilitate more “consistent, comparable, and reliable information on climate change.”⁷⁰ FERC can 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.⁷¹ In the next several decades, storm surges and high tides will combine with sea level rise to increase flooding, threatening coastal communities and

⁶⁶ *Id.*

⁶⁷ *Id.* at 1–28.

⁶⁸ See *Southwest Coastal Louisiana Project: Current Preconstruction, Engineering, and Design (PED) Effort*, COASTAL PROTECTION AND RESTORATION AUTHORITY, <https://cims.coastal.louisiana.gov/outreach/Projects/SWCoastal> (last visited Sept. 15, 2021).

⁶⁹ Sec. Exch. Comm’n, *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 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>.

⁷⁰ Public Statement, Acting Chair Allison Herren Lee, Sec. Exch. Comm’n, Public Input Welcomed on Climate Change Disclosures (March 15, 2021), <https://www.sec.gov/news/public-statement/lee-climate-change-disclosures>.

⁷¹ See, e.g., Intergovernmental Panel on Climate Change (“IPCC”), Chapter 9 Ocean, Cryosphere, and Sea Level Change, available at https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter_09.pdf; Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, B. DeAngelo, S. Doherty, K. Hayhoe, R. Horton, J.P. Kossin, P.C. Taylor, A.M. Waple, and C.P. Weaver, 2017: Executive Summary of the Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 26 pp. 12–34.

industries.⁷² The proposed location for the Project in low-lying southwest Louisiana and near the Gulf of Mexico makes it especially vulnerable to these threats.⁷³

Sea level rise is occurring particularly rapidly along the western Gulf Coast,⁷⁴ contributing to a high vulnerability for Louisiana's coasts.⁷⁵ The CPRA has data specifically examining coastal vegetation change, land change, flood risk, and social vulnerability in the Hackberry area, along with structural projects, non-structural projects, and restoration projects designed to temper flood risk there.⁷⁶ Much of the Project would be located in Cameron Parish, an area that the CPRA projects could experience over fifteen feet of flooding from a 100-year flood event.⁷⁷ The CPRA predicts that the Lake Charles area—which is slightly inland from the Project site—could be exposed to \$293 million in expected annual flood damage within twenty-five years and \$460 million in expected annual flood damage within fifty years if no action is taken.⁷⁸ 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

⁷² See, e.g., Intergovernmental Panel on Climate Change (“IPCC”), Chapter 11 Weather and Climate Extremes in a Changing Climate, available at https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter_11.pdf; Fleming, E., J. Payne, W. Sweet, M. Craghan, J. Haines, J.F. Hart, H. Stiller, and A. Sutton-Grier, 2018: Coastal Effects. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 322–352; 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://riskybusiness.org/report/national/>.

⁷³ See, e.g., Intergovernmental Panel on Climate Change (“IPCC”), Chapter 12 Climate Change Information for Regional Impact and for Risk Assessment, at 84–85, available at https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter_12.pdf; Kristina A. Dahl et al., *Sea Level Rise Drives Increased Tidal Flooding Frequency at Tide Gauges Along the U.S. East and Gulf Coasts: Projections for 2030 and 2045*, PLOS ONE, February 2017, at 1, 1–23; Reza Marsooli et al., *Climate Change Exacerbates Hurricane Flood Hazards Along Atlantic and Gulf Coasts in Spatially Varying Patterns*, Nature Communications, Aug. 2019, 1, at 1–9; Thatcher, C.A.; Brock, J.C., and Pendleton, E.A., 2013. Economic vulnerability to sea-level rise along the northern U.S. Coast. In: Brock, J.C.; Barras, J.A., and Williams, S.J. (eds.), *Understanding and Predicting Change in the Coastal Ecosystems of the Northern Gulf of Mexico*, Journal of Coastal Research, Special Issue No. 63, p. 234 Coconut Creek (Florida); U.S. Army Corps of Engineers, *supra* note 64, at 1-27.

⁷⁴ NOAA, U.S. Sea Level Trend Map (2017) [hereinafter “NOAA Sea Level Trend Map”], available at <https://tidesandcurrents.noaa.gov/sltrends/slrmap.html>.

⁷⁵ 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/>.

⁷⁶ 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-Book_CFinal-with-Effective-Date-06092017.pdf; Louisiana's Coastal Plan Appendices (2017), available at <http://coastal.la.gov/our-plan/2017-coastal-master-plan/>.

⁷⁷ *Id.*; Coastal Protection & Restoration Authority's Master Plan Data Viewer Flood Risk Map, showing map of future flooding risk in Cameron Parish, <https://cims.coastal.louisiana.gov/masterplan/> (accessed September 22, 2021).

⁷⁸ Louisiana's Coastal Plan at 88.

annually average \$14 billion.⁷⁹ 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.⁸⁰

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

- Intergovernmental Panel on Climate Change (“IPCC”), Chapter 9 Ocean, Cryosphere, and Sea Level Change, *available at* https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter_09.pdf
- Intergovernmental Panel on Climate Change (“IPCC”), Chapter 12 Climate Change Information for Regional Impact and for Risk Assessment, at 84–85, *available at* https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter_12.pdf
- Intergovernmental Panel on Climate Change (“IPCC”), Chapter 11 Weather and Climate Extremes in a Changing Climate, *available at* https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter_11.pdf
- The Fourth National Climate Assessment, Chapter 8 at 329, 335, 338, *available at* https://nca2018.globalchange.gov/downloads/NCA4_Ch08_Coastal-Effects_Full.pdf⁸¹
- The Fourth National Climate Assessment, Chapter 19 at 746, 749, 757–58, 761, *available at* https://nca2018.globalchange.gov/downloads/NCA4_Ch08_Coastal-Effects_Full.pdf⁸²
- National Oceanic and Atmospheric Administration, Sea Level Rise Viewer, *available at* <https://coast.noaa.gov/slr/#/layer/slr/1/-107113515.450289307/4456670.7823551595/4/satellite/none/0.8/2050/interHigh/midAccretion>
- Hackberry, LA, Climate Explorer, *available at* https://crt-climate-explorer.nemac.org/cards_home/?city=Hackberry%2C+LA&county=Cameron%2BParish&area-id=22023&fips=22023&zoom=7&lat=29.9960464&lon=-93.3420996.
- 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>

⁷⁹ America's Wetland Foundation, America's Energy Coast, and Entergy, *Building a Resilient Energy Gulf Coast: Executive Report* (2010), *available at* www.entropy.com/content/our_community/environment/GulfCoastAdaptation/Building_a_Resilient_Gulf_Coast.pdf.

⁸⁰ *Id.*

⁸¹ Fleming, *supra* note 72.

⁸² L., A. Terando, K. Dow, K. Hiers, K.E. Kunkel, A. Lascrain, D. Marcy, M. Osland, and P. Schramm, 2018: Southeast. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 743–808.

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.⁸³ Warming sea surface temperatures in the Atlantic are linked to this increase in hurricane activity.⁸⁴ Human-induced emissions of heat-trapping gases and particulate pollution influence these local sea temperatures.⁸⁵ 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.

Southwest Louisiana has been hit especially hard by recent hurricane seasons. In August 2020, Hurricane Laura hit the region with the second-strongest landfall in Louisiana on record by wind speed.⁸⁶ The storm resulted in at least fifty-four deaths,⁸⁷ with at least twenty-seven deaths in Louisiana alone.⁸⁸ Several industry facilities in Lake Charles suffered “critical damage,” leading to the release of plumes of chlorine gas.⁸⁹ In Cameron Parish, there was surge flooding of up to nineteen feet, and the region saw wind gusts between 100 and 135 miles per hour.⁹⁰ The storm led to a mandatory evacuation order in Calcasieu Parish,⁹¹ and Hackberry suffered significant damage.⁹² Then, in October of the same year, Hurricane Delta made landfall just 12

⁸³ 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), 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”].

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ *See National Climate Report – August 2020*, NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION, <https://www.ncdc.noaa.gov/sotc/national/202008> (last visited Sept. 14, 2021).

⁸⁷ *See* Teo Blašković, *Hurricane “Laura” Aftermath: At Least 54 People Dead, Widespread Destruction Across the Caribbean and US Gulf Coast*, WATCHERS (Aug. 30, 2020), <https://watchers.news/2020/08/30/hurricane-laura-2020-aftermath-damage-casualties/>.

⁸⁸ *See Louisiana Department of Health Verifies One Additional Hurricane-Related Death, Bringing Toll to 27*, LOUISIANA DEPARTMENT OF HEALTH (Sept. 9, 2020), <https://ldh.la.gov/index.cfm/newsroom/detail/5761>.

⁸⁹ *See* Tegan Wendland et al., *Inspection Reports Show ‘Critical Damage’ From Hurricane Laura at Several Industrial Facilities*, WWNO (Sept. 4, 2020), <https://www.wwno.org/latest-news/2020-09-04/inspection-reports-show-critical-damage-from-hurricane-laura-at-several-industrial-facilities>.

⁹⁰ *See Hurricane Laura the First Southwest Louisiana Category 4 Landfall on Record with Destructive Winds, Storm Surge*, WEATHER (May 28, 2021), <https://weather.com/storms/hurricane/news/2020-08-28-hurricane-laura-recap-louisiana-category-4-landfall>.

⁹¹ *See* Blašković, *supra* note 87.

⁹² *See* Erika Ferrando, *‘Rita & Ike Had Nothing on This—Nothing’ | Catastrophic Damage in Cameron Parish; Residents Prepare to Rebuild Again*, 4WWL (Sept. 3, 2020), <https://www.wvltv.com/article/weather/hurricane/catastrophic-damage-in-cameron-parish-residents-prepare-to-rebuild-again/289-a24253ea-2555-46ce-b832-abc931e025a5>.

miles to the east of where Laura did, bringing with it 100 mile per hour winds.⁹³ An insurance broker estimated that Hurricanes Laura and Delta caused \$20 billion in total damage.⁹⁴

This year, Hurricane Ida hit Louisiana with sustained winds, high storm surge, torrential rainfall, and flash flooding,⁹⁵ leading to over one million people in the state losing power⁹⁶ and President Biden declaring a state-wide emergency.⁹⁷ Only weeks after the arrival of Hurricane Ida, Tropical Storm Nicholas delivered additional heavy rain and flash flooding to the region, hindering efforts to restore power from Ida.⁹⁸ In line with these recent hurricane seasons, global models project further increases in intensity, precipitation rate, and wind speed for tropical cyclones over the 21st Century.⁹⁹

3. Wetlands Impacts

The Project as planned would disrupt 143 acres of wetland¹⁰⁰ and permanently eliminate over 70 acres.¹⁰¹ The destruction of wetlands has several important implications for climate change that the Commission should assess.

First, recent research indicates that most wetlands are net carbon sinks, and that the world's wetlands may sequester twelve percent of anthropogenic carbon emissions or 830 teragrams of carbon per year.¹⁰² In addition to the aforementioned carbon sequestration, wetlands provide many ecosystem services that may reduce fossil fuel consumption, including water quality improvement, flood mitigation, and coastal and storm protection.¹⁰³ Louisiana's wetlands are known to weaken storm surges during hurricanes, protecting New Orleans and other areas from even greater destruction and adding natural barriers between man-made flood defense

⁹³ See Jeff Masters, *A Look Back at the Horrific 2020 Atlantic Hurricane Season*, YALE CLIMATE CONNECTIONS (Dec. 1, 2020), <https://yaleclimateconnections.org/2020/12/a-look-back-at-the-horrific-2020-atlantic-hurricane-center/>.

⁹⁴ *Id.*

⁹⁵ See Josh Reiter & Noel Rehm, *Louisiana Looking to Rebuild After Hurricane Ida Leaves Behind a Path of Devastation*, ABC7 NEWS, (Aug. 30, 2021), <https://www.kswo.com/2021/08/30/louisiana-looking-rebuild-after-hurricane-ida-leaves-behind-path-devastation/>.

⁹⁶ See *Hurricane Ida: One Million People in Louisiana Without Power*, BBC NEWS (Aug. 30, 2021), <https://www.bbc.com/news/world-us-canada-58378788>.

⁹⁷ See Press Release, FEMA, HQ-21-173, President Joseph R. Biden, Jr. Approves Emergency Declaration for Louisiana (Aug. 27, 2021), <https://www.fema.gov/press-release/20210827/president-joseph-r-biden-jr-approves-emergency-declaration-louisiana>.

⁹⁸ See Erwin Seba, *Nicholas Deluges U.S. Gulf Coast with Heavy Rain, Flooding*, Reuters (Sept. 15, 2021), <https://www.reuters.com/world/us/nicholas-strengthens-into-hurricane-pounds-coastal-texas-louisiana-with-rain-2021-09-14/>; Alex Sosnowski, *Nicholas Makes Landfall in Texas, Threatens Major Blow to Gulf Coast*, ACCUWEATHER (Sept. 14, 2021), <https://www.accuweather.com/en/hurricane/tropical-storm-nicholas-forecast-flooding-rain-texas-louisiana/1016708>.

⁹⁹ Melillo, *supra* note 83.

¹⁰⁰ See LA Storage, LLC, Cumulative Impacts Analysis, Section 1.3.2 (Water Resources and Wetlands), attached to LA Storage's Application for Certificate of Public Convenience and Necessity.

¹⁰¹ See LA Storage, LLC, Draft Resource Report 2, Table 2.3-1 (Wetlands Affected by the Project), attached to LA Storage's Application for Certificate of Public Convenience and Necessity.

¹⁰² William J. Mitsch et al., *Wetlands, Carbon, and Climate Change*, 28 LANDSCAPE ECOLOGY 583, 595 (2013).

¹⁰³ *Id.*

systems and the Gulf of Mexico.¹⁰⁴ Nearer to the proposed location of the Project, marsh restoration projects have prevented Cameron Parish from greater destruction from recent storms such as Hurricane Laura.¹⁰⁵

Louisiana’s wetlands are already greatly threatened by sea level rise, and non-climatic anthropogenic influences such as the destruction of wetlands for construction render remaining wetlands more vulnerable to rapid transformation.¹⁰⁶ The Commission should therefore assess the climate implications of the wetland destruction associated with the project, including reduction in natural carbon sequestration, flood mitigation, and coastal and storm protection.

4. *Upstream and Downstream Impacts*

In its “Project Need” section of its application for a Certificate of Public Convenience and Necessity, LA Storage asserts that the Project will support expected growth in LNG exports.¹⁰⁷ LA Storage notes that there are currently four LNG export terminals operating in the Gulf Coast region, with more than a dozen new or expanded LNG export projects approved and/or under construction in the area.¹⁰⁸ Furthermore, within fifteen miles of the proposed Project location, there are gas supply pipelines serving a significant number of LNG export projects: Sabine Pass LNG, Cameron LNG, Golden Pass LNG, Port Arthur LNG, and Calcasieu Pass LNG.¹⁰⁹ LA Storage also claims that salt cavern storage facilities “are ideally suited to provide both a ‘sink’ and ‘source’ for gas supplies supporting the use of variably dispatched gas-fired power generation.”¹¹⁰

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 and its storage of natural gas for export and power generation purposes. Each of these component activities has predictable environmental impacts.¹¹¹ Further, these activities will contribute to the Project’s upstream and downstream

¹⁰⁴ See Chris Mooney, *Loss of Louisiana Marshes That Protect New Orleans Is ‘Probably Inevitable,’ Study Finds*, WASH. POST (May 22, 2020), <https://www.washingtonpost.com/climate-environment/2020/05/22/new-orleans-wetlands-climatechange/>.

¹⁰⁵ See Mike Smith, *‘No Way to Keep Up’: Efforts to Rebuilt Coastline in Cameron Parish May Be an Unwinnable Fight*, ADVOCATE (Aug. 22, 2021), https://www.theadvocate.com/lake_charles/article_2d607260-0066-11ec-a5b9-63acc42eea47.html.

¹⁰⁶ See Torbjörn E. Törnqvist et al, *Tipping Points of Mississippi Delta Marshes Due to Accelerated Sea-Level Rise*, SCIENCE ADVANCES, May 2020, 1, at 1–7, <https://www.science.org/doi/10.1126/sciadv.aaz5512>; Mooney, *supra* note 104.

¹⁰⁷ *Id.* at 14–17.

¹⁰⁸ *Id.* at 15.

¹⁰⁹ *Id.*

¹¹⁰ *Id.* at 16.

¹¹¹ 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*

greenhouse gas emissions.¹¹² 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 greenhouse emissions, or else a complete explanation for why it cannot provide the estimate.¹¹³ Finally, as discussed, FERC should assess the impacts of the direct and indirect greenhouse gas emissions associated with the Project.

5. Methane Leakage

Natural gas leakage from the Project could add to its climate change impacts. A recent study analyzed twelve cases of loss of tightness in salt caverns due to a leak through or along the cemented casing,¹¹⁴ including a Louisiana incident that led to the evacuation of thirty residents and the release of roughly 9.9 MNm³ (0.35 billions ft³) within hours.¹¹⁵ The authors asserted that the primary tightness risk facing salt caverns is associated with “the ‘piping’ connecting the cavern to surface, *i.e.*, the completion (casing and tubing) and cementation of the wells.”¹¹⁶ Greenhouse gas emissions from such storage facilities primary consist of methane,¹¹⁷ and EPA estimates that the transmission and storage of methane accounts for 19% of methane emissions from the oil and gas industry.¹¹⁸

The Commission’s review of the Project should include the climate impacts of potential gas leakage from the salt caverns or the associated pipeline infrastructure. In particular, the Commission should utilize the environmental review process to ensure that the Project takes climate-driven risks—such as the aforementioned sea level rise and storm surges—into account, thus minimizing the risk of increased methane leakage due to infrastructure damage.

Review, 48 *Envtl. Sci. & Tech.* 8349 (2014) (discussing several case study-based natural gas lifecycle emissions assessments).

¹¹² See *Transcontinental Gas Pipeline Co., LLC, Northeast Supply Enhancement Project*, Docket No. CP17-101-001, 171 FERC P 61031 at 61147 (Apr. 16, 2020) (Comm. Glick, dissenting) (“[a]t a minimum, we know that the vast majority, 97 percent, of all natural gas consumed in the United States is combusted—a fact that on its own might be sufficient to make downstream emissions reasonably foreseeable, at least absent contrary evidence”).

¹¹³ *Sierra Club*, 867 F.3d at 1373–74 (D.C. Cir. 2017); see also *Delaware Riverkeeper Network*, 753 F.3d at 1310.

¹¹⁴ Pierre Bérest et al., *Review and Analysis of Historical Leakages from Salt Cavern Wells*, OIL & GAS SCIENCE AND TECH. - REVUE D'IFP ENERGIES NOUVELLES, March 2019, 1, at 1–22, https://ogst.ifpenergiesnouvelles.fr/articles/ogst/full_html/2019/01/ogst180301/ogst180301.html.

¹¹⁵ *Id.* at 8.

¹¹⁶ *Id.* at 1.

¹¹⁷ ELIZABETH PARANHOS ET AL., CONTROLLING METHANE EMISSIONS IN THE NATURAL GAS SECTOR: A REVIEW OF FEDERAL & STATE REGULATORY FRAMEWORKS GOVERNING PRODUCTION, GATHERING, PROCESSING, TRANSMISSION, AND DISTRIBUTION at 39 (2015), <https://www.nrel.gov/docs/fy15osti/63416.pdf>.

¹¹⁸ Env’t Prot. Agency, Comment Letter on the Draft EIS for the Iroquois Pipeline Enhancement by Compression Project, *supra* note 15 (referencing ENV’T PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2019 (2021), <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019>).

* * *

To adequately protect the Hackberry Storage 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,¹¹⁹ and is especially exigent here given that damage to the Project could lead to significant methane leakage.

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 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.

In its projections of the future state of coastlines, the Commission should take note of the Gulf Coast's high rate of sea level rise relative to other regions of the U.S. and the world¹²⁰ coupled with erosion and 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.¹²¹ High wetland loss rates occurred during the 2005 and 2008 hurricane seasons, which were particularly hard on the Louisiana Coast.¹²² Near the Project's proposed location, portions of the shoreline along Cameron Parish have been impacted by severe erosion, losing anywhere from five to thirty feet per year since 1953.¹²³ 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.

Additionally, the Commission should take into account the impacts that the Project would have on climate change, including through upstream and downstream emissions, methane leakage, and wetlands destruction. In doing so, the Commission should use up-to-date GWP estimates and fully quantify the effects of the Project's greenhouse gas emissions.

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

¹¹⁹ See, e.g., Department of Interior, Seward Peninsula - Nulato Hills - Kotzebue Lowlands Rapid Ecological Assessment, Final Report II-3-c (Oct. 2012), *available at* https://landscape.blm.gov/REA_General_Docs/SNK_REA_Final_Report.pdf.

¹²⁰ See NOAA Sea Level Trend Map; *supra* Section C.1.

¹²¹ 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>.

¹²² *Id.*

¹²³ Louisiana's Coastal Plan at 38.

Sincerely,

A handwritten signature in black ink, appearing to read "Jacob Elkin". The signature is fluid and cursive, with the first name "Jacob" and last name "Elkin" clearly distinguishable.

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