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Elizabeth Littlefield
President & CEO
U.S. Overseas Private Investment Corporation

Margaret L. Kuhlow
Vice President, Office of Investment Policy
U.S. Overseas Private Investment Corporation

President Littlefield and Ms. Kuhlow:

Thank you for the opportunity to comment on the revision of OPIC's Environmental and Social Policy Statement. We appreciate the initial conversation that we had in December 2015, as well as the opportunity to provide more in depth comments. The comments below focus specifically on the impacts of natural gas and methane and supplement the comments that Friends of the Earth submitted on February 12, 2016 with 12 other groups.[1] Friends of the Earth is greatly concerned about OPIC's support of natural gas and aims to dispel the myth that it is a clean energy and a bridge fuel. Friends of the Earth recommends that OPIC take into account the following issues in order to improve the ESPS and end financing for natural gas (and other fossil fuels) and encourage even greater investment in renewables:

- **Climate Impact of Methane**

  According to the Intergovernmental Panel on Climate Change, methane is a greenhouse gas that is 87 times as potent as carbon dioxide over a 20 year timeframe.[2] Some calculations of methane's impact look at the longer timeframe of 100 years, but the shorter 20-year timeframe is more appropriate to properly reflect methane's stronger impact in the short-term due to its atmospheric lifespan of about 12 years. Considering that scientists have concluded that significant reductions must take place in the next decade in order to limit the worst impacts of climate change, it is imperative to take into account this warming impact of methane in the short-term.

  Using the 20-year time period, a Cornell University review of the scientific research found that both shale gas and conventional natural gas has a greater climate impact than coal or oil.[3] This conclusion was based on the fact that natural gas is composed largely of

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[1] Letter from Accountability Counsel et al. to Elizabeth Littlefield & Margaret Kuhlow, Feb. 12, 2016, http://webiva-downton.s3.amazonaws.com/877/96/e/7392/1/OPIC_ESPS_Group_Letter_final.pdf

[2] IPCC, WORKING GROUP I CONTRIBUTION TO THE IPCC FIFTH ASSESSMENT REPORT CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS (2013), http://www.climatechange2013.org/images/uploads/WGIAR5_WGI-12Doc2b_FinalDraft_All.pdf

[3] Robert W. Howarth, *A Bridge to Nowhere: Methane Emissions and the Greenhouse Gas Footprint of Natural Gas*, ENERGY SCI. & ENG'G (2014), http://www.eeb.cornell.edu/howarth/publications/Howarth_2014_ESE_methane_emissions.pdf; Robert W. Howarth, Renee Santoro & Anthony Ingraffea, *Methane and the Greenhouse-Gas Footprint of Natural Gas from Shale Formations*, CLIMACTIC CHANGE (2011), http://www.acsf.cornell.edu/Assets/ACSF/docs/attachments/Howarth-EtAl-2011.pdf

methane, which is far more effective at trapping heat in the atmosphere than is carbon dioxide; therefore, smaller amounts of methane emissions can lead to a larger climate footprint than similar carbon dioxide emissions. Even at low leakage rates, any climate benefit from switching from coal to natural gas is offset by methane leakage, as well as the displacement of renewables.[4]

- **Methane Leakage**

  Methane emissions are a major problem for the oil and gas sector with leakage occurring during extraction, transportation, and storage. Some estimates put methane leakage from oil and gas production at 17 percent.[5] Just because a well is newer does not mean that is it less likely to leak methane; in fact, in some instances newer oil and gas wells drilled between 2000 and 2012 are more likely to leak methane than older ones.[6] After the gas is extracted it then must be transported, usually via pipeline where even more methane is lost.[7] For LNG schemes, gas must be shipped, re-gasified, and transported still further via pipelines or other transportation, increasing the risk of methane loss.

  The pervasiveness of the problem is often overlooked because methane leakage is grossly underestimated. One study found that methane emissions in the United States are about 50 percent more than EPA has estimated.[8] One reason for this is that a device commonly used to measure the methane that leaks from industrial sources may greatly underestimate those emissions.[9] The problem is not only monitoring methods, but also the reporting of these emissions from the companies that operate these projects. A study that looked at methane and other emissions in Colorado found that companies were emitting three times

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[4] Christine Shearer et al., *The Effect of Natural Gas Supply on US Renewable Energy and CO2 Emissions*, 9 ENVTL. RES. LETTERS 1, http://iopscience.iop.org/article/10.1088/1748-9326/9/9/094008/pdf; Steven J. Davis & Christine Shearer, *Climate Change: A Crack in the Natural-Gas Bridge*, 514 NATURE 436 (2014), http://www.nature.com/nature/journal/v514/n7523/full/nature13927.html; Haewon McJeon, *Limited Impact on Decadal-Scale Climate Change from Increased Use of Natural Gas*, 514 NATURE 482 (2014), http://www.nature.com/nature/journal/v514/n7523/full/nature13837.html

[5] Oliver Schneising et al., *Remote Sensing of Fugitive Methane Emissions from Oil and Gas Production in North American Tight Geologic Formations*, 2 EARTH'S FUTURE 548 (2014), http://onlinelibrary.wiley.com/doi/10.1002/2014EF000265/pdf

[6] Anthony R. Ingraffea et al., *Assessment and Risk Analysis of Casing and Cement Impairment in Oil and Gas Wells in Pennsylvania, 2000–2012*, 111 PROC. NATURAL ACAD. SCI. 10,955 (2014), http://www.pnas.org/content/111/30/10955.full.pdf

[7] Kathryn McKaina et al., *Methane Emissions from Natural Gas Infrastructure and Use in the Urban Region of Boston, Massachusetts*, 112 PROC. NATURAL ACAD. SCI. 1,941 (2015), http://www.pnas.org/content/112/7/1941.full.pdf

[8] A. R. Brandt et al., *Methane Leaks from North American Natural Gas Systems*, 343 SCI. 733, 734 (2014), http://nature.berkeley.edu/er100/readings/Brandt_2014.pdf; *see also* A.J. Turner et al., *A Large Increase in U.S. Methane Emissions over the Past Decade Inferred from Satellite Data and Surface Observations*, 43 GEOPHYSICAL RES. LETTERS 2,218 (2016), http://onlinelibrary.wiley.com/doi/10.1002/2016GL067987/full (finding that U.S. methane emissions have increased by more than 30 percent from 2002 to 2014 even though EPA has estimated no significant increase).

[9] Touché Howard, *University of Texas Study Underestimates National Methane Emissions at Natural Gas Production Sites Due to Instrument Sensor Failure*, 3 ENERGY SCI. & ENG'G 443 (2015), http://onlinelibrary.wiley.com/doi/10.1002/ese3.81/pdf

more than they were reporting to the EPA.[10] These difficulties put into question the ability of project applicants to properly estimate and later monitor the emissions from natural gas extraction sites, plants, and related infrastructure, as well as liquefied natural gas export terminals.[11]

Even once natural gas is no longer being extracted from a certain site and the well is abandoned, those wells can remain a significant source of methane. Oil and gas infrastructure results in thousands and even millions of wells being abandoned. In the United States, for instance, there are at least three million abandoned wells.[12] These abandoned oil and gas wells can continue to leak significant amounts of methane emissions.[13]

An example of some of the risks associated with natural gas was the massive natural gas leak that erupted in October at a storage well near Los Angeles, resulting in the release of over 97,000 metric tons of methane.[14] During the height of the leak, the amount of methane released each day was equivalent to adding 7,000,000 cars to the road.[15] This single gas leak was California's largest contribution to climate change.[16] In addition to its climate impact, the leak also proposed a serious safety risk, forcing thousands of nearby families to evacuate their homes and causing Gov. Brown to declare a state of emergency.[17] If this type of leak is able to occur in the United States and take over four months to fix, it raises serious concerns about the capacity of developing countries to monitor, detect, and quickly cap such leaks.[18]

- **Export of Liquefied Natural Gas**

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[10] Gabrielle Pétron et al., *A New Look at Methane and Nonmethane Hydrocarbon Emissions from Oil and Natural Gas Operations in the Colorado Denver-Julesburg Basin*, 119 J. GEOPHYSICAL RES.: ATMOSPHERES 6,836 (2014), http://onlinelibrary.wiley.com/doi/10.1002/2013JD021272/full

[11] These measurements probably do not even properly reflect the full extent of methane leakage because these studies are often conducted with industry cooperation, meaning that they are often the sites with the lowest leakage rates. *E.g.*, Press Release, Robert Howarth, Cornell University, Allen et al., Paper in the Proceedings of the National Academy of Sciences, Sept. 11, 2013, http://desmogblog.com/sites/beta.desmogblog.com/files/Howarth%20press%20release%20on%20Allen%20et%20al.%20PNAS.pdf

[12] Brandt, *supra* note 8.

[13] *E.g.*, Mary Kang, et al., *Direct Measurements of Methane Emissions from Abandoned Oil and Gas Wells in Pennsylvania*, PROC. NATURAL ACAD. SCI. (2014), http://www.pnas.org/content/111/51/18173.abstract

[14] S. Conley et al., *Methane Emissions from the 2015 Aliso Canyon Blowout in Los Angeles, CA*, SCI. (2016), http://science.sciencemag.org/content/early/2016/02/25/science.aaf2348.full

[15] Suzanne Goldenberg, *A Single Gas Well Leak is California's Biggest Contributor to Climate Change*, THE GUARDIAN, Jan. 5, 2016, http://www.theguardian.com/environment/2016/jan/05/aliso-canyon-leak-california-climate-change

[16] *Id.*

[17] Haya El Nasser, *California Governor Declares State of Emergency at Gas Leak Site*, AL JAZEERA AM., Jan. 6, 2016, http://america.aljazeera.com/articles/2016/1/6/california-gov-jerry-brown-declares-emergency-at-gas-leak-site.html. Nearby residents complained of experiencing nosebleeds, headaches, nausea, and vomiting after the leak began. *Id.*

[18] Even in the United States, other dangerous leaks that can result from an increase in natural gas extraction have received far less attention and remediation. Neela Banerjee, *A Tale of Two Leaks: Fixed in California, Ignored in Alabama*, INSIDE CLIMATE NEWS, Mar. 17, 2016, http://insideclimatenews.org/news/16032016/mercaptans-eight-mile

The climate impacts of natural gas get even worse when natural gas is turned into liquefied natural gas, so that it can be exported and shipped abroad. Natural gas must be cooled to incredibly low temperatures of about -162 degrees Celsius in order turn it into a liquid.[19] Ten percent of the natural gas being exported must be used just to power the liquefaction process.[20] Once liquefied, LNG is then shipped to the receiving country where it is turned back into a gas and then usually distributed through pipelines. The entire process of production, transport, liquefaction, shipping, re-gasification, and power plant combustion is highly energy – and thus carbon – intensive. The upstream greenhouse gas emissions from LNG are almost double the greenhouse gas emissions of conventional natural gas according to the U.S. Department of Energy.[21] Another DOE study estimates that the liquefaction, transport, and re-gasification process increases the total lifecycle of greenhouse gas emissions from the natural gas industry by 15 percent.[22] The farther the destination is from the source of the natural gas, the higher the emissions as the gas must be kept cold and shipped for longer distances. For these reasons, a European Commission study concluded that LNG was worse for the climate than coal.[23]

In a carbon constrained world, there is significant danger that capital-intensive projects like these could become stranded assets as investment in emissions-heavy LNG outstrips requirements for reducing emissions. Projections indicate that as much as $379 billion in new LNG investments by 2035 could be incompatible with a 2 degree Celsius reductions target—itself a dangerously high threshold for acceptable warming.[24] Investing in these projects would be financially risky for OPIC because the over supply of LNG in the market is keeping the price of gas low and making it incredibly difficult for these giant, capital intensive projects to pay for themselves.[25] New investments financed today could

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[19] Joe Romm, *Exporting Liquefied Natural Gas Is A Dreadful Idea For The Climate*, THINK PROGRESS, Mar. 12, 2014, http://thinkprogress.org/climate/2014/03/12/3384911/exporting-lng-climate/

[20] U.S. ENERGY INFORMATION AGENCY, EFFECT OF INCREASED LEVELS OF LIQUEFIED NATURAL GAS EXPORTS ON U.S. ENERGY MARKETS (2014), https://www.eia.gov/analysis/requests/fe/pdf/lng.pdf; GWYNNE TARASKA & DARRYL BANKS, THE CLIMATE IMPLICATIONS OF U.S. LIQUEFIED NATURAL GAS, OR LNG, EXPORTS (2014), https://cdn.americanprogress.org/wp-content/uploads/2014/08/TaraskaLNG_report.pdf. The Taraska and Banks study noted that 2014 Skone et al. study incorrectly assumed a leakage rate that was too low, and, therefore, underestimated the climate impacts of LNG.

[21] TIMOTHY J. SKONE, ROLE OF ALTERNATIVE ENERGY SOURCES: NATURAL GAS TECHNOLOGY ASSESSMENT, DOE/NETL-2012/1539 (2012), http://www.netl.doe.gov/File%20Library/Research/Energy%20Analysis/Publications/DOE-NETL-2012-1539-NGTechAssess.pdf; ANTHONY ZAMMERILLI ET AL., ENVIRONMENTAL IMPACTS OF UNCONVENTIONAL NATURAL GAS DEVELOPMENT AND PRODUCTION, DOE/NETL-2014/1651 (2014), http://www.netl.doe.gov/File%20Library/Research/Oil-Gas/publications/NG_Literature_Review3_Post.pdf

[22] TIMOTHY J. SKONE ET AL., LIFE CYCLE GREENHOUSE GAS PERSPECTIVE ON EXPORTING LIQUEFIED NATURAL GAS FROM THE UNITED STATES, DOE/NETL-2014/1649 (2014), http://www.energy.gov/sites/prod/files/2014/05/f16/Life%20Cycle%20GHG%20Perspective%20Report.pdf

[23] B. KAVALOV, H. PETRÍC, & A. GEORGAKAKI, LIQUEFIED NATURAL GAS FOR EUROPE – SOME IMPORTANT ISSUES FOR CONSIDERATION (2009), http://publications.jrc.ec.europa.eu/repository/bitstream/JRC47887/eur%2023818%20en.pdf

[24] JAMES LEATON ET AL., CARBON SUPPLY COST CURVES: EVALUATING FINANCIAL RISK TO GAS CAPITAL EXPENDITURES 9 (2015), http://www.carbontracker.org/wp-content/uploads/2015/07/CTI-gas-report-Final-WEB.pdf

[25] Nick Cunningham, *LNG Glut Set To Worsen Considerably Over Next 3 Years*, OILPRICE.COM, Nov. 11, 2015, http://oilprice.com/Energy/Gas-Prices/LNG-Glut-Set-To-Worsen-Considerably-Over-Next-3-Years.html

become stranded assets either because of climate policy or because of the uncertain economics of LNG.

Based on the facts and studies presented above, Friends of the Earth recommends that OPIC update and strengthen its accounting methods for natural gas. Like other U.S. agencies, OPIC often relies on inaccurate data, monitoring and reporting methodologies regarding greenhouse gas emission levels and the impacts of natural gas projects. OPIC only requires a measurement of the direct emissions from a project, rather than a lifecycle analysis, which would give a more accurate assessment of a project's impacts. In addition, OPIC only considers the emissions during the period of OPIC financing even though a project continues to release greenhouse gas emissions for a decade or two or even longer past the end of the financing term. By only looking at the period of financing, the project appears to have less of a climate impact than it will have in reality.

Therefore, OPIC's environmental policies must require the use of up-to-date and complete accounting methods to have a proper understanding of the impacts of each metric ton of those emissions. If projects underestimate these emissions and their warming potential, then they will downplay the effects of these emissions on both local communities, as well as the climate. OPIC must also require pollution monitoring technology to have an accurate assessment of the amount of greenhouse gas emissions that a project will create for the entire duration of the project. If OPIC fails to do so, it will not be able to properly account for the environmental and social risks of the projects it is considering financing.

Friends of the Earth appreciates OPIC taking the time to consider our recommendations. We hope that OPIC will use these recommendations to revise the ESPS in such a way that encourages an end to financing for natural gas and all other fossil fuel projects that have devastating impacts on the climate. We welcome the opportunity to discuss and elaborate on our recommendations.

Sincerely,

Kate DeAngelis
International Policy Analyst
Friends of the Earth U.S.
1101 15th Street NW, 11th Floor
Washington, DC 20005
kdeangelis@foe.org
202-222-0747