Written testimony of

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Before the House Natural Resources Committee
Subcommittee on Energy and Mineral Resources

"What More Gulf of Mexico Oil and Gas Leasing Means for Achieving U.S. Climate Targets"

January 20, 2022

Chairperson Lowenthal, Ranking Member Stauber, and members of the subcommittee, thank you for giving me the opportunity to testify today about the climate implications of additional oil and gas leasing in the Gulf of Mexico. My name is Dr. Kristina Dahl, and I am a senior climate scientist in the Climate and Energy Program at the Union of Concerned Scientists. I have spent the last decade of my career working to understand how climate change will affect communities across the United States and how the choices we make today will shape the world that we ultimately pass along to our children and grandchildren.

The research my colleagues and I at the Union of Concerned Scientists have done and the research of thousands of dedicated scientists around the world makes clear that the ability for people, plants, and animals to thrive now and in the future depends on our ability to rein in heat-trapping emissions both nationally and globally. And indeed, future generations will be the inheritors of the choices we make today.

In my testimony today, I will address the current state of our climate; the current state of national and global emissions with a particular eye toward contributions from the oil and gas sector; the latest science on how emissions will need to decrease globally to limit dangerous levels of climate change; and the implications of increased oil and gas production for our climate, our health, the environment in which we live, and the ecosystems on which we depend.

We have precious little time to effect a wholesale shift in how we power our lives and our economy if we wish to avert the most dangerous consequences of climate change. We are decades late in making that shift, and we now find ourselves in a position where any additional increases in our heat-trapping emissions will make the narrow chance we have of averting those consequences even slimmer. The federal government can and must align its actions with what is needed to meet the climate challenge and therefore must not apply business-as-usual thinking to energy-related decisions, including those relating to leasing federal lands in the Gulf of Mexico.

Climate change is here, and it is a product of human activity

Earlier this month, the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA) released reports summarizing the state of our climate that serve as sobering reminders that we have already begun to live with the effects of climate change and that our society is underequipped for its consequences. Scientists at these agencies found that 2021 was the sixth-warmest year on record for the globe, with an average temperature of 1.5°F (0.84°C) above the 20th-century average, and that the last eight years have been the eight warmest since recordkeeping began in 1880.[1] The anomalously warm years we have experienced recently are the product of the decades-long warming trend that has resulted from human emissions from the burning of coal, oil, and gas.[2,3] At present, the average temperature of the Earth is about 1.8°F (1.0°C) warmer than the 1850–1900 average.[4]

The consequences of that warming were felt acutely around the world in 2021, including here at home in the United States, where 20 extreme weather and climate-related disasters causing $1 billion or more in damages cost at least $145 billion last year alone and claimed a record number of lives—nearly 700.[5] More than 40% of US residents live in counties that experienced climate-related disasters in 2021,[6] and millions of people experienced the toxic air from wildfires, power outages resulting from extreme heat or cold, or devastating floods. And this doesn't even capture the full toll—for example, the hundreds of deaths from the extreme heatwave in the Pacific Northwest last year are not included in that total.

The climate extremes we and others around the world have been experiencing bear the fingerprints of human-caused climate change. The heat waves that have become more frequent and intense, the hurricanes that intensify rapidly and dump record-breaking amounts of rain, and the wildfires of unprecedented scale are all in line with our expectations of how extreme weather and climate-related events respond to higher concentrations of heat-trapping gases in the atmosphere that result from the burning of fossil fuels.

Since the dawn of the Industrial Revolution in the mid-1800s to today, our collective burning of fossil fuels (primarily coal, oil, and gas) has emitted 2,390 gigatonnes of CO_2 ($GtCO_2$), with each gigatonne equaling one billion tonnes, or about twice the mass of all the people on Earth.[7] The United States alone is responsible for nearly 25% of all historical emissions[8] despite being home to just 4% of the world's population today,[9] which means that we bear a disproportionately large responsibility for the emissions and warming we as a planet have incurred.

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[1] https://www.ncdc.noaa.gov/sotc/global/202113
[2] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Headline_Statements.pdf
[3] https://blog.ucsusa.org/kristy-dahl/new-noaa-data-shows-just-how-abnormal-our-climate-has-become/
[4] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf
[5] https://www.ncdc.noaa.gov/billions/overview
[6] https://www.washingtonpost.com/climate-environment/2022/01/05/climate-disasters-2021-fires/
[7] https://energyeducation.ca/encyclopedia/Gigatonne#cite_note-1
[8] https://www.carbonbrief.org/analysis-which-countries-are-historically-responsible-for-climate-change
[9] https://data.worldbank.org/indicator/SP.POP.TOTL

In terms of annual emissions, the United States was the top emitter—by far—until the year 2006, when China's annual emissions began to exceed those of the United States.[10] While our total annual emissions are currently about half those of China's,[11] our per capita emissions are more than twice those of China.[12] The burning of oil and gas for US energy purposes accounted for the vast majority (81%) of total U.S. emissions in 2019 (the remaining 19% of energy-related emissions were derived from burning coal).[13]

In 2020, production on offshore federal lands amounted to 642 million barrels of oil (16% of all domestic oil production) and 910 million cubic feet of gas (3% of all domestic natural gas production).[14] Most of this offshore production takes place in the Gulf of Mexico.[15] Notably, however, the area of the Gulf of Mexico under lease has declined significantly over the last decade and 55% of leased acreage is non-producing, which indicates that the current leased acreage should be sufficient to meet demand for years to come.[16]

Recent assessments of the full lifecycle of oil, meaning from the time of production through the refining and transportation stages and the consumption or burning of that fuel, showed that the pre-consumption stages (producing, refining, and transportation) are responsible for between 10% and 30% of the full lifecycle emissions.[17] Similarly, those pre-consumption stages for gas account for between 15% and 40% of the fuel's full lifecycle emissions.[18] A significant portion of the emissions from oil and gas therefore comes from the consumption of those fuels for transportation, industrial, residential, and commercial purposes.

Swift and deep emissions cuts are needed to limit future warming

Global and national climate assessments along with thousands of individual scientific studies point to an even more dire future if we fail to rein in our heat-trapping emissions.

Drawing on the best available science, the global community—including the United States—pledged in the 2015 Paris Agreement to "*holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels*" to help limit the risks and impacts of climate change.[19] To cap global warming at any specific level, whether that is 1.5°C, 2°C, or any other target, we must reach net-zero emissions, meaning that any remaining emissions of heat-trapping gases are balanced by removals of in the same amount.[20] And to stay at or below a

[10] https://www.bbc.com/news/world-asia-china-57483492
[11] https://www.ucsusa.org/resources/each-countrys-share-co2-emissions
[12] http://energyatlas.iea.org/#!/tellmap/1378539487/4
[13] https://www.eia.gov/energyexplained/energy-and-the-environment/where-greenhouse-gases-come-from.php
[14] https://www.doi.gov/sites/doi.gov/files/report-on-the-federal-oil-and-gas-leasing-program-doi-eo-14008.pdf
[15] https://www.boem.gov/regions/gulf-mexico-ocs-region/oil-and-gas-gulf-mexico
[16] http://energyatlas.iea.org/#!/tellmap/1378539487/4
[17] https://www.iea.org/reports/world-energy-outlook-2018/o il-and-gas-innovation
[18] https://www.osti.gov/servlets/purl/1485127
[19] https://unfccc.int/sites/default/files/english_paris_agreement.pdf
[20] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf

specific temperature target, we must stay within a specific carbon budget. In other words, we can only emit so much more carbon before we exceed dangerous thresholds of warming.

On our current trajectory and with the current pledges from nations party to the Paris Agreement, the planet is on track to warm by at least 4.3°F (2.4°C) by the end of the century.[21] As just one example among myriad examples of what that warming implies for the US, the number of dangerously hot days across the country is projected to double between now and midcentury if we are slow to act to reduce global heat-trapping emissions.[22]

The relationship between our cumulative global emissions of CO_2 and global temperature is roughly linear: increased emissions, resulting in higher concentrations of CO_2 in the atmosphere, translate directly to higher global temperatures.[23] This strong relationship allows us to estimate that to have a 50% chance of limiting future warming to 1.5°C above preindustrial temperatures, nations around the world can only collectively emit another 500 $GtCO_2$.[24] Giving ourselves an 85% chance of meeting that 1.5°C goal would mean emitting even less than that—just 300 $GtCO_2$.[25] Total global CO_2 emissions currently amount to roughly 36 $GtCO_2$ per year (Global Carbon Project via Carbon Brief), which means that we are in danger of reaching the 1.5°C mark within the next 10 to 20 years.[26]

Staying below the 1.5°C mark—that is, not overshooting it at any point—requires us to decrease emissions quickly. The best available science suggests that we must reduce global CO_2 emissions by about 45% below 2010 levels by 2030 and reach net-zero emissions around 2050.[27] Emissions of other heat-trapping gases, such as methane, will need to decline along similarly steep pathways. Achieving these emissions reductions will mean significantly curtailing our fossil fuel use as quickly as possible.

Scientific modeling has shown that in most scenarios in which we are able to limit warming to 1.5°C above preindustrial levels, use of all fossil fuels, including oil and gas, must decline significantly[28,29] To meet global energy demand, those declines must be coupled with a commensurate increase in energy efficiency and renewable energy, with renewables supplying 90% or more of our electricity in 2050.[30,31] And numerous studies show that these investments

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[21] https://climateactiontracker.org/press/Glasgows-one-degree-2030-credibility-gap-net-zeros-lip-service-to-climate-action/
[22] https://iopscience.iop.org/article/10.1088/2515-7620/ab27cf
[23] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf
[24] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf
[25] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf
[26] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf
[27] https://www.ipcc.ch/sr15/chapter/spm/
[28] https://www.iea.org/reports/world-energy-outlook-2021
[29] https://www.ipcc.ch/sr15/ (2.4.2)
[30] https://www.ipcc.ch/sr15/ (2.4.1, 2.4.2, 2.4.3)
[31] https://www.iea.org/news/pathway-to-critical-and-formidable-goal-of-net-zero-emissions-by-2050-is-narrow-but-brings-huge-benefits

in efficiency and clean energy will more than pay off, especially when evaluated against the prohibitive costs of runaway climate change and the steep public health burden of fossil fuels.

The energy investments we make now will have repercussions for decades to come. Research suggests that developing the energy-related technologies and infrastructure consistent with a 1.5°C pathway will require investment in clean energy technologies and energy efficiency to overtake fossil investments by around 2025.[32] Furthermore, the International Energy Agency—among the world's leading energy organizations—has found that reaching net-zero emissions by 2050 would require having ceased investment in new fossil fuel supply projects as of last year.[33]

The United States is committed to substantial and necessary emissions reductions

The Biden Administration has committed the US to a 50-52% reduction in national heat-trapping emissions below 2005 levels by 2030, and to putting the nation on a path to net-zero emissions by midcentury.[34] Such reductions mirror the global emissions cuts necessary for capping warming at 1.5°C above preindustrial levels and there is a case to be made that the US's outsized contribution to global emissions historically and per capita demands that we shoulder a larger share of the global emissions reductions.

Achieving a 50% reduction in national emissions by 2030 will require bold action, resolute vision, and an exacting attention to the consequences of every energy-related decision we make going forward. And so we must bring that exacting attention and the best available science to our understanding of the consequences of opening up new leases for oil and gas drilling on federal lands.

Research by energy and transportation experts at the Union of Concerned Scientists indicates that deep cuts in heat-trapping emissions are feasible, both within this decade and continuing through 2050, in line with rigorous climate targets.[35] To achieve these reductions, though, every sector of the economy must shift, including through widespread uptake of energy efficiency, end-use electrification, and carbon-free energy. With currently available technologies, a viable solution set to achieving the US's stated emissions-reduction commitments is within our grasp today. The system costs of this transition are comparatively modest—and easily outweighed when compared to the benefits of improved health and avoided climate impacts. However, delaying necessary near-term action, including emissions reductions that could be achieved by expedited passage by Congress of the Build Back Better

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[32] https://www.ipcc.ch/sr15/ (2.5.2)
[33] https://www.iea.org/news/pathway-to-critical-and-formidable-goal-of-net-zero-emissions-by-2050-is-narrow-but-brings-huge-benefits
[34] https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/
[35] https://www.ucsusa.org/sites/default/files/2021-08/A-Transformative-Climate-Action-Framework.pdf

package—or further entrenching ourselves in a fossil-fuel-based economy—is costly and risks stranding assets, foreclosing some solutions pathways, and probably falling short of climate goals.

The implications of additional oil and gas leases in the Gulf of Mexico

In November 2021, the US government opened up more than 80 million acres of offshore federal land—an area larger than the state of New Mexico—in the Gulf of Mexico for lease sales. Within days, fossil fuel corporations had bid a combined $192 million for drilling rights on nearly two million of those acres.[36] It is likely to be several years before these areas are producing oil or gas, which means that they'd be coming online late this decade when emissions from fossil fuels must be in a steep decline to meet the US's climate goals.

The Bureau of Ocean Energy Management (BOEM) estimates that the area recently opened for lease sales could produce up to 1.2 billion barrels of oil and 4.4 trillion cubic feet of natural gas over the next 50 years.[37] Using the Environmental Protection Agency's Greenhouse Gas Equivalency guidelines, the combustion of those products would release an estimated 0.76 $GtCO_2$ with 0.52 Gt CO_2 resulting from oil combustion and 0.24 Gt CO_2 resulting from gas combustion. In 2019, US fossil-fuel emissions totaled 4.7 $GtCO_2$.[38] With this rough estimate and assuming no other changes in US fossil fuel sourcing or use, the potential emissions from the areas recently opened to leasing therefore represent about 16% of the nation's fossil-fuel emissions for one year.

While the potential emissions from these Gulf of Mexico lease sales may seem limited,[39] viewing them in isolation fundamentally mischaracterizes the cumulative and collective action challenge of climate change. It will take joint efforts by all nations to address the scale of the climate challenge—each contributing their fair share, cutting emissions across every sector of their economies, so that together we can meet science-based emission reduction goals. It is the cumulative result of each energy-related decision that has been made by nations over the last century and half that we are now struggling to cope with our already-altered climate. In this warmer climate, heat waves claim the lives of the most vulnerable among us—those who harvest our food,[40] our elderly parents and grandparents,[41] people who have no home in which to cool off.[42] Wildfires cross the spine of the Sierra Nevada[43] and make the air we breathe toxic

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[36] https://www.pbs.org/newshour/amp/economy/days-after-climate-talks-u-s-to-hold-huge-crude-sale-in-the-gulf-of-mexico

[37] https://www.boem.gov/sites/default/files/documents/oil-gas-energy/GOM-LS-257.pdf

[38] https://www.ucsusa.org/resources/each-countrys-share-co2-emissions

[39] "Each 1,000 GtCO2 of cumulative CO2 emissions is assessed to likely cause a 0.27°C to 0.63°C increase in global surface temperature with a best estimate of 0.45°C" (IPCC AR6)

[40] https://www.opb.org/article/2021/07/03/oregon-heat-wave-deaths-farm-workers-sebastian-francisco-perez-vigil/

[41] https://www.kuow.org/stories/heat-wave-death-toll-in-washington-state-jumps-to-112-people

[42] https://www.koin.com/news/special-reports/new-data-shows-scope-of-heatwave-related-homeless-deaths/

[43] https://www.sfchronicle.com/bayarea/article/Giant-Dixie-Fire-first-ever-to-burn-its-way-clear-16396141.php

for thousands of miles downwind.[44] Hurricanes intensify at an unbelievable pace[45] before slamming into the coast claiming lives along a 1,000-mile path.[46] Deadly heatwaves follow on the heels of hurricanes,[47] wildfire smoke exacerbates a pandemic's ravages on our health,[48] and infrastructure built for the climate of our ancestors fails.[49] And this is only considering impacts in the US.

Spills from oil drilling equipment have profoundly affected marine environments and ecosystems repeatedly and tragically for decades. Ten years after the 2010 Deepwater Horizon Oil Spill in the Gulf of Mexico, researchers have found that there is still a substantial amount of oil in the sediment at the bottom of the gulf; that reproduction rates of fish and dolphins near the spill site remain low; and that fish in the gulf remain contaminated with oil-related toxins.[50] An estimated 600,000 to 800,000 birds died because of the spill.[51] People, too, have suffered in the wake of the spill. In addition to the 11 Deepwater Horizon workers[52] who lost their lives when the rig exploded and sank, Gulf Coast residents experienced the loss of their livelihoods as well as health problems—including headaches, shortness of breath, depression, and anxiety—for years after the spill.[53]

Human health also suffers as oil and gas are processed or refined and transported. Communities located near oil refineries and petrochemical facilities exhibit higher rates of a wide range of cancers, including brain and lung cancer.[54] They are also at risk of immune system suppression resulting from exposure to harmful chemicals.[55] Threats to health from fossil fuel facilities along the Gulf Coast rise acutely during and after hurricanes, when accidents, emergency shutdowns, and restarts lead to the release of toxic chemicals into the air and water.[56] These threats are particularly acute in communities of color[57] because centuries of systemic racism have led to a constriction of living options and resources[58] as well as the deliberate siting of industrial facilities in and around these neighborhoods.[59]

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[44] https://www.theguardian.com/us-news/2021/jul/21/new-york-air-quality-plunges-smoke-west-coast-wildfires
[45] https://www.washingtonpost.com/business/how-climate-rapid-intensification-revved-up-hurricane-ida/2021/08/31/cfb0b5be-0a63-11ec-a7c8-61bb7b3bf628_story.html
[46] https://www.cnn.com/us/live-news/ida-aftermath-09-02-21/index.html
[47] https://weather.com/news/news/2021-09-09-heat-hurricane-ida-new-orleans-louisiana-power-outages
[48] https://news.harvard.edu/gazette/story/2021/08/wildfire-smoke-linked-to-increase-in-covid-19-cases-and-deaths/
[49] https://www.texastribune.org/2021/12/14/winter-weather-texas-climate-change/
[50] https://digitalcommons.usf.edu/msc_facpub/877/
[51] https://usa.oceana.org/reports/time-action-six-years-after-deepwater-horizon/
[52] https://www.epa.gov/enforcement/deepwater-horizon-bp-gulf-mexico-oil-spill
[53] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5932154/
[54] https://www.sciencedirect.com/science/article/abs/pii/S0013935120303881
[55] https://www.tandfonline.com/doi/abs/10.1080/09603123.2019.1689232
[56] https://www.sciencedirect.com/science/article/abs/pii/S030438940701477X
[57] https://www.liebertpub.com/doi/full/10.1089/env.2020.0052
[58] https://dsl.richmond.edu/panorama/redlining/#loc=5/39.1/-94.58&text=intro
[59] https://news.umich.edu/targeting-minority-low-income-neighborhoods-for-hazardous-waste-sites/

The ramifications of failures in drilling infrastructure can be long lasting. Seventeen years after a mudslide triggered by Hurricane Ivan caused a Taylor Energy oil platform to sink, the undersea wells that had been broken open as a result were still seeping oil into the Gulf.[60] Given that climate change is expected to increase the intensity of hurricanes[61] and given the prevalence of hurricanes in the Gulf of Mexico,[62] siting additional drilling infrastructure within the Gulf poses long-term hazards to the region.

Sharply phasing down our use of fossil fuels and securing our climate goals is about much more than cutting carbon emissions. By looking beyond carbon to all the ways in which our fossil fuel-based economy affects people, ecosystems, and the environment in which we live, we can unlock new opportunities for progress.[63]

Conclusion

Human activity has warmed the Earth by about 1°C over the last century and people are already suffering in a multitude of ways as a result. The science is clear that the consequences of surpassing the 1.5°C temperature target would be disastrous, the consequences of surpassing the 2°C temperature target almost unimaginable. Science has also shown us that those temperature targets translate into specific carbon budgets that, in turn, necessitate sharp reductions in fossil fuel use and systemic shifts in our energy system. Each of these pieces points to the urgent need to assess our energy investments holistically, not as one offs, to ensure the smoothest, best possible transition to cleaner forms of energy. With the stakes so high, there is no room for business-as-usual thinking when it comes to our energy-related decisions, including those regarding lease sales in the Gulf of Mexico. Continuing with lease sales without taking the time to fully interrogate whether or how the enabled extraction will fit with our nation's future is reckless and irresponsible.

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[60] https://www.nytimes.com/2021/12/22/climate/taylor-energy-oil-spill-gulf.html
[61] https://archive.ipcc.ch/report/srex/
[62] https://coast.noaa.gov/hurricanes/#map=2/60.49/-23.25&search=eyJzZWFyY2hTdHJpbmciOiJOb3J0aCBBdGxhbnRpYyBPY2VhbiBCYXNpbiIsInNlYXJjaFR5cGUiOiJiYXNpbiIsImNhdGVnb3JpZXMiOlsiSDUiLCJINCIsIkgzIiwiSDIiLCJIMSIsIlRTIiwiVEQiLCJFVCJdLCJ5ZWFycyI6W10sIm1vbnRocyI6W10sImVuc28iOltdLCJwcmVzc3VyZSI6eyJyYW5nZSI6WzAsMTE1MF0sImluY2x1ZGVVbmtub3duUHJlc3N1cmUiOnRydWV9LCJidWZmZXJVbml0IjpbIk1pbGVzIl0sInNvcnRTZWxlY3Rpb24iOnsidmFsdWUiOiJ5ZWFyc19uZXdlc3QiLCJsYWJlbCI6IlllYXIgKE5ld2VzdCkifSwiYXBwbHlUb0FPSSI6ZmFsc2UsImlzU3Rvcm1MYWJlbHNWaXNpYmxlIjp0cnVlfQ==
[63] https://www.ucsusa.org/sites/default/files/2021-08/A-Transformative-Climate-Action-Framework.pdf