United States House of Representatives
Select Committee on the Climate Crisis

Hearing on July 28, 2020
"Solving the Climate Crisis:
Building a Vibrant and Just Clean Energy Economy"

Questions for the Record

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The Honorable Garret Graves

1. **At the hearing, you were accused of "making stuff up" and not having expertise on climate and energy policy. Unfortunately, you were not given the opportunity to respond to those attacks. For the record, would you like to respond to those accusations and to any others that were lodged against you during the hearing?**

Shortly after giving expert testimony to the committee, I had the startling experience of being attacked by Representatives Sean Casten of Illinois and Jared Huffman of California who used the whole of their allotted time to claim that I am not a real environmentalist, that I am not a qualified expert, and that I am motivated by money.

Had I been given a chance to respond, I would have noted that I have been a climate activist for 20 years and an energy expert for 15 years. In the early 2000s I co-created and advocated for the predecessor to the Green New Deal, the New Apollo Project, which President Barack Obama implemented as his $90 billion green stimulus.

My new book, *Apocalypse Never*, has received strong praise from leading environmental scientists and scholars, including the father of modern climate science, Tom Wigley, who said, "This may be the most important book on the environment ever written." And in early 2020, the United Nations Intergovernmental Panel on Climate Change invited me to serve as an expert reviewer.

Finally, I would have noted, I have always been financially independent of industry interests and disclose my donors on my organization's web site.

But I wasn't given the chance to say any of that. After Casten and Huffman lied about me, Rep. Garret Graves asked the committee's chairperson, Rep. Kathy Castor of Florida, to let me respond. She refused and abruptly ended the hearing.

2. **Ms. Beth Soholt, Executive Director of the Clean Grid Alliance, disagreed with your testimony on the competitiveness of wind and solar energy. Specifically, she claimed that unsubsidized wind and solar are the cheapest and most reliable forms of energy. Would you like to respond?**

Renewable energy advocates propose spending hundreds of billions of public and ratepayer money on renewable energy, new transmission lines, energy efficiency, mass transit, electric vehicles, carbon capture and storage, and advanced nuclear energy. They argue that these federal investments will result in millions of good jobs with high pay, and also pay for themselves through higher economic growth.[1]

But similar programs over the last decade did not result in the benefits being promised. During the first decade of this century I advocated a suite of policies nearly identical to the ones currently being proposed and watched them fail to create a new manufacturing capacity, good jobs with high pay, or higher economic growth.

Rather, they resulted in low-wage service sector jobs, greater dependence on imported Chinese technologies, and higher energy costs. And they resulted in higher electricity prices and the net transfer of wealth from lower to upper income citizens.

A former Obama administration economist at the University of Chicago found last year that consumers in states with renewable energy mandates paid $125 billion more for electricity in the seven years after passage than they would have otherwise.[2]

Renewables contributed to electricity prices rising six times more in California than in the rest of the US since 2011, the state's "take-off" year for rapid growth in wind and solar, a price rise that occurred despite the state's reliance during the same years on persistently-low-priced natural gas.[3]

Renewables have the same impact everywhere in the world. They have caused electricity prices to rise 50 percent in Germany since 2007, the first year it got more than 10 percent of its power from subsidized wind, solar, and biomass. By 2019, German household electricity prices were 45 percent higher than the European average.[4]

Despite investing nearly a half-trillion dollars, Germany still generated just 42 percent of its electricity from non-hydro renewables last year, as compared to the 72 percent France generated from nuclear. [5]

If Germany didn't count emissions-producing and land-intensive fuels like biomass and biofuels as renewable, which most environmental groups, even Greenpeace, believe it shouldn't, the share of its electricity from non-emitting, non-hydro renewables is just 34 percent.[6]

Solar and wind make electricity more expensive because they are unreliable, requiring 100 percent backup, and energy-dilute, requiring extensive land, transmission lines, and mining. Solar and wind developers do not pay for the costs they create but rather pass them on to electricity consumers and other producers.[7]

Interest in massively subsidizing renewables comes at a time when industrial renewable energy projects are being blocked around the world, as even their boosters now admit. "Biden plots $2tn green revolution but faces wind and solar backlash," read a recent Guardian headline. "New York's bold green plans hit opposition,' reported *Financial Times* on September 1, 2020.

Ask yourself why, if renewables are cheaper than existing grid electricity, do solar and wind developers require $2 trillion from American taxpayers in the form of subsidies?
And why, if renewables are so cheap, do they make electricity so expensive?

Clean Grid Alliance, for the record, is an industrial wind-energy funded organization with a direct financial interest in promoting the continued subsidization of wind energy.

3. **Many of the policies contained in the Biden proposal and the majority staff report of the committee closely mirror the approach in California – both in targets and in scope.**

   Can you tell us a little bit about your experience in California about the impacts of the state's climate policies on jobs, access to jobs, housing cost and costs – particularly on those who can least afford it- and communities of color?

Renewable energy advocates are basing their climate agenda on what California, my home state, did, but our electricity rates since 2011 rose six times more than they did in the rest of the US, thanks mainly to the deployment of renewables and the infrastructure they require, such as transmission lines. And now, California's big bet on renewables, and shunning of natural gas and nuclear, is directly responsible for the state's electricity shortages.

The immediate cause of California's blackouts is a mismatch between electricity supply and demand. Higher temperatures have led to greater demand for air conditioning. And California has less electricity, including from wind energy, available.

The underlying reason blackouts are occurring is because California lacks reliable, in-state supply. And the reason for that is California has been closing both natural gas and nuclear power plants.

"People wonder how we made it through the heat wave of 2006," said California's electricity grid manager, Caliso's Steven Berberich. "The answer is that there was a lot more generating capacity in 2006 than in 2020.... We had San Onofre [nuclear plant] of 2,200 MW, and a number of other plants, totalling thousands of MW not there today."[8]

Despite these capacity shortfalls, the state is moving ahead with plans to remove 2,200-MW of reliable electricity from the grid. That's the amount of power produced by Diablo Canyon nuclear power plant, which will be closed in stages in 2024 and 2025.

Renewables advocates have long pointed to batteries as the way to integrate unreliable renewables onto the grid. Yes, renewables are unreliable, they admit. But if we can store energy collected during periods of peak capacity, we can parcel it out during periods of peak demand.

However, batteries are simply not up to the task. One of the largest lithium battery storage centers in the world is in Escondido, California. It can only store enough power to service 24,000 of California's 13,000,000 households.

And it can only do so for four hours. If demand surges for the better part of a day, the system will fail. Indeed, for renewables to work, batteries would need to be able to store the power for weeks and perhaps even months.

"Batteries don't generate any power," said Berberich. "And during extended cloud cover over solar fields, we will be in load shedding. We have told the Commissioners again and that solar will need to be overbuilt to serve load and charge batteries at same time."

People don't sit idly by when electrical systems fail or when reliability flags. Instead, businesses and individuals reach for tried and true methods of powering their day-to-day lives.

4. **Last month Mary Nichols, the head of the California agency tasked with climate policies tweeted out:**

   "I can't breathe" speaks to police violence, but it also applies to the struggle for clean air. Environmental racism is just one form of racism. It's all toxic. Government needs to clean it up in words and deed. We who do climate and environmental policy can and must do more"

   She quickly deleted that text, but The Two Hundred tweeted in response:

   "She wants to cry out "environmental racism" when the Enviro ideas SHE pushes as President of (CARB) leave the most marginalized communities in California to foot the bill AND pushes low-income families out of their neighborhoods" They go on to say "that is why we filed a lawsuit against her racist policies."

What do you think will be the impact of nationalizing California climate policies on jobs throughout the country, particularly the impact on low income folks and communities of color?

Poor people and people of color are disproportionately impacted by climate policies that restrict energy consumption.

In May, a California civil rights coalition filed a lawsuit against the state to prevent implementation of climate law aimed at reducing driving. The coalition calculates that the proposed law will increase the cost of a home by anywhere from $40,000 to $400,000.

"Latino, African American, and Asian American families," the coalition wrote in a letter to the governor, "are disproportionately victimized by the confluence of massively destructive state, regional and local housing policy choices."[9]

Consider what happened after California closed the San Onofre nuclear plant in 2013. Both carbon emissions and air pollution spiked. And air pollution disproportionately harms poor people. This is especially true in Los Angeles, where poor people of color have borne the brunt of increased pollution.

From 2011 to 2018, California's industrial electricity prices rose 32 percent, while the average price in the other 49 states fell one percent. The good manufacturing jobs in renewables are mostly in China, which makes most of the world's solar panels, including America's, while the US is stuck with temporary low-wage service jobs installing solar panels and wind turbines, and doing energy efficiency retrofits.

Now, faced with the electricity supply crisis, Gov. Newsom has suspended air-pollution regulations, which may increase the use of diesel generators, and worsen air pollution in the inner-city.

Advocates for renewables claim that solar and wind projects were somehow part of the battle for environmental justice. In reality, solar and wind projects are imposed on poorer communities and successfully resisted by wealthier ones.

In fact, a major new report found nearly 200 cases of human rights violations when renewable energy projects were imposed on poor communities. In Hawaii and Nebraska, indigenous leaders are resisting wind energy projects that threaten native bird species, including the nene and whooping crane, whose number one cause of mortality is transmission lines.

5. **You're an activist for civil nuclear power – not only because of its air quality and greenhouse gas emissions benefits, but because of the national security benefits to the United States of having a robust fleet of reactors.**

Do you believe that the nuclear-related package in the majority staff would help or harm the U.S. civil nuclear program? And in general, what would be the impact on greenhouse gas emissions?

The Green New Deal proposed by Rep. Alexandria Ocasio-Cortez and others last year called for the closure of US nuclear power plants. The written statement distributed by the office of Rep. Ocasio-Cortez said, "the plan is to transition off of nuclear."[10]

And yet study after study finds that closing nuclear plants increases air pollution and harms public health.

A 2017 study in *Nature Energy* found that the temporary closure of two nuclear plants led directly to lower birth weights, a key indicator of poor health outcomes later in life.[11] The study found that reduction in birth weight as small as 5.4 percent can result in a lower intelligence quotient and lower income, as well as higher rates of illness, stunted growth, and neurodevelopmental problems.[12]

In response to the Fukushima nuclear accident, the Japanese government shut down its nuclear plants and replaced them with fossil fuels. As a result, the cost of electricity went up, resulting in the deaths of a minimum of 1,280 people from the cold between 2011 and 2014.[13] In addition, scientists estimate that Japan's nuclear plant closures resulted in more than four thousand (avoidable) air pollution deaths per year.[14]

Unreliable electricity from solar and wind energies has been unable to compensate for the loss of reliable, near-zero pollution nuclear energy. A 2016 study found that the electricity lost from the closure of the San Onofre nuclear plant was mostly replaced by burning natural gas, which increased air pollution in southern California and raised the costs of generating electricity from natural gas by $350 million.[15]

In 2005, Vermont legislators promised to reduce emissions 25 percent below 1990 levels by 2012, but instead the state's emissions rose 16.3 percent, over twice as much as national emissions rose during the same period, in part due to the closure of the state's sole nuclear plant under pressure from climate activists, and in part due to the inability of unreliable solar and wind to replace lost nuclear energy electrical generation.[16]

New York State is in the process of closing Indian Point nuclear power plant and replacing it with fossil fuels. Under pressure from elected leaders, Indian Point's operator closed one of its two reactors in April of this year, and intends to close the other one in April 2021. In May, a few weeks after calling for a phase-out of nuclear energy, Rep. Ocasio-Cortez said she wanted to leave "the door open on nuclear,"[17] but five months later called for closing Indian Point nuclear plant.[18] Environmental and climate justice advocates are protesting its closure.[19] They point to a Harvard University study, which found that higher air pollution results in higher coronavirus death rates.[20]

The US could lose half to two-thirds of its nuclear energy over the next decade. By 2025, the US will close twelve reactors, which constitute 10.5 gigawatts of low-carbon power.[21] This should be extremely troubling for anyone who cares about air pollution and climate change. Deep decarbonization of US energy supply will require receiving 100 percent of electricity from zero-emissions sources as well as replacing all natural gas and petroleum used in transportation, cooking, and heating, which constitute roughly two-thirds of total primary energy. The cheapest and fastest way to achieve this decarbonization is to add nuclear reactors at existing nuclear power plants. Closing those plants will foreclose that future option.

Recently, in a major blow to the US nuclear-energy industry, China is reportedly helping Saudi Arabia create a facility to produce uranium "yellowcake" from uranium ore. The deal is further evidence that America's anti-nuclear energy policies are pushing US allies into the arms of our illiberal and undemocratic rivals.

Nations that partner with Russia or China to build nuclear plants are effectively absorbed into their sphere of influence. The line between soft power and hard power runs through nuclear energy. On the one side is cheap and clean electricity. On the other, a stepping stone to a weapons program.

Some nuclear-industry officials hope that the US will, in the future, "leapfrog" over China and Russia with smaller "modular" reactor designs, micro-reactors, and radical new reactor-coolant combinations such as those being pursued by Bill Gates. But China and Russia are already far ahead on building and selling small, modular and radical designs, as well as the standard water-cooled ones most nations have chosen since the 1950s.

The China-Saudi deal should serve as a wake-up call to Congress and the national-security and nonproliferation community. It's time for the United States to realign its policies with the NPT and take action to compete with the Chinese and Russians.

Nations looking to build nuclear plants will choose partners with experience building them. To compete, the US must make global nuclear-energy superiority a national security goal. This starts with either designating a new "national champion" nuclear building firm or creating a state-owned nuclear company capable of competing with Russian and Chinese firms.

As part of this effort, Congress should make sure all of today's reactors, including recently shuttered ones, stay open for at least 80 years. It should also consider amending the Atomic Energy Act to let the US help nations develop uranium-enrichment facilities, just as China and Russia do now.

Nuclear power plants, which can operate for 80 years or longer, *require* high-wage, high-skilled, and permanent jobs for multiple generations, and yet Democratic policymakers are seeking to shut down nuclear power plants in the U.S.

Congress and the White House must act thoughtfully and deliberately — but also decisively — before it's too late.

6. Why do you think many climate activists oppose fossil fuel technology innovation when it comes to solving the problem of climate change?

It is sometimes claimed that environmental or climate policies are required for lower pollution, but recent events show that not to be the case. US electricity sector emissions decreased 34 percent from 2005 to 2019, including an astonishing 10 percent in 2019, which is the largest year-on-year decline in history.[22] By contrast, the Obama administration's proposed carbon regulation of the power sector, the "Clean Power Plan," proposed emissions reductions of 32 percent — by 2030.[23] Thanks in large measure to natural gas replacing coal, the International Energy Agency (IEA) forecasts carbon emissions in 2040 to be lower than in almost all of the IPCC scenarios.[24]

Carbon emissions are thus following the same trajectory as other air pollutants. As a result of cleaner-burning coal, the transition to natural gas, cleaner vehicles, and other technological changes, developed nations have seen major improvements in air quality. Between 1980 and 2018, US carbon monoxide levels decreased by 83 percent, lead by 99 percent, nitrogen dioxide by 61 percent, ozone by 31 percent, and sulfur dioxide by 91 percent. While death rates from air pollution can rise with industrialization, they decline with higher incomes, better access to health care, and reductions in air pollution.[25]

The dominant form of climate policy in international bodies and among nations around the world emerged from 1960s-era environmental policies aimed at constraining food and energy supplies. These policies are correctly referred to as Malthusian in that they stem from the fears, first articulated by the British economist Thomas Malthus in 1798, that humans are at constant risk of running out of food.

Real world experience has repeatedly disproven Malthusianism. If it hadn't, there wouldn't be nearly eight billion of us. Worse, Malthusian ideas have been used to justify unethical policies that worsen socioeconomic inequality by making food and energy more expensive, including closing down nuclear plants.[26]

Policymakers should explicitly reject policies that significantly raise food and energy prices, directly or indirectly. Republicans and Democrats alike should affirm their commitment to human flourishing and prosperity, both of which depend on cheap food and energy, which depend on the rising productivity of inputs to agriculture and electricity generation, including labor, land, and capital.

The large reductions in air pollution, including carbon emissions, in recent decades came overwhelmingly from making natural gas cheap, not from making fossil fuels more expensive.

Short-term and focused subsidies and mandates may help accelerate technological innovation. But the main focus must be on making the new energy source affordable.

7. **In the past, you've talked about the success of the United States in reducing emissions. In absolute terms since 2005, we've reduced emissions more than the next twelve reducing emissions countries combined. You credit the vast amount of emissions reduced to our use of nuclear and natural gas. In fact, you've said that natural gas reduced emissions 11 times more than solar energy and 50 percent more than wind energy in the United States.**

   Do you think the current thinking in the Democratic party and their opposition to fracking make sense as an economics job and a global climate mitigation strategy?

For nearly a decade, climate activists have claimed that natural gas is worse for the climate than coal,[27] And yet, on virtually every metric, natural gas is cleaner than coal. Natural gas emits 17 to 40 times less sulfur dioxide, a fraction of the nitrous oxide that coal emits, and almost no mercury.[28] Natural gas is one-eighth as deadly as coal, counting both accidents and air pollution.[29] And burning gas rather than coal for electricity requires 25 to 50 percent less water.[30]

The technological revolution allowing for firms to extract far more natural gas from shale and the ocean floor is the main reason that U.S. carbon emissions from energy declined 13 percent between 2005 and 2018, and a big part of the reason why global temperatures are unlikely to rise more than 3 degrees centigrade above pre-industrial levels.[31]

Anti-natural gas activists make their claims that coal is better than natural gas by using an inappropriately short timeframe for global warming of just twenty years. The United States government and most experts agree that the appropriate timeframe to use is one hundred years. Their timeframe thus exaggerates the impact of natural gas as a heat-trapping gas.[32]

Despite a nearly 40 percent increase in natural gas production since 1990, the EPA reported a 20 percent decrease in methane emissions in 2013, in part because of improved gaskets, monitoring, and maintenance.[33] No matter how much methane leaks, natural gas will still have half the impact of energy on global warming by 2100 as compared to if the same energy were coming from coal.[34]

Natural gas fracking resulted in the decline 62 percent decline in the mountaintop mining for coal between 2008 and 2014.[35] Where fracking for natural gas cracks shale below the Earth's surface, imposing very small impacts aboveground, coal mining devastates mountain ecosystems. More than 500 mountains, covering more than one million acres, have been destroyed in central and southern Appalachia by mountaintop removal.[36]

When mining companies demolish mountains with explosives to harvest coal, they dump millions of tons of crushed rock into nearby valleys, destroying forests and headway streams. Exposed rock leeches heavy metals and other toxins, which hurt wildlife, insects, and humans. Dust that blows into the air from such operations can harm miners and people who live in nearby communities.[37]

No energy transition occurs without human and environmental impacts. Fracking brings pipelines, rigs, and trucks, which can disrupt peaceful landscapes that people rightly care about. Frackers have created small earthquakes and improperly disposed of fracking wastewater. These problems are serious and should be addressed, but they are nowhere as bad as coal mining, which has in many ways become worse throughout the decades, not better, culminating in mountaintop removal and the destruction of river ecosystems.[38]

What explains the lower environmental impact of natural gas fracking as compared to coal mining is power density. A natural gas field in the Netherlands is three times more power-dense than the world's most productive coal mines.[39]

Today, many if not most scientists and environmentalists support natural gas as a substitute for coal. "People are placing too much emphasis on methane," climate scientist Raymond Pierrehumbert told *The Washington Post*. "People should prove that we can actually get the CO2 emissions down first, before worrying about whether we are doing enough to get methane emissions down."[40]

Pollution regulations helped make coal plants more expensive to build and operate. But what mattered most was the creation of a more power-dense, abundant, and cheaper alternative.

8. **An article published March 19, 2019, by the Institute for Energy Research (https://www.instituteforenergyresearch.org/the-grid/wind-generation-fails-in-midwest-due-to-weather-events-polar-vortex-and-el-nino/) analyzed the performance of wind generation during acute weather events and included the following statement,**

> ***"During the polar vortex, wind turbines shut off when temperatures dipped below minus 20 degrees Fahrenheit. There has been little focus on developing wind turbines to operate below minus 20 degrees Fahrenheit because at these temperatures, there is not much wind blowing. The economics of producing wind energy in such extreme conditions would not justify the additional cost, according to wind experts."***

How did renewables perform (what percent of capacity was dispatched) during the polar vortex of 2014 and the polar vortex of 2019 in the regions impacted by each polar vortex?

When people's health and safety depended on power during the polar vortex, what were the best performing sources of energy?

The consulting firm Wood Mackenzie evaluated the polar vortex that occurred between January 27 to February 2, 2019 and concluded that, even with solar and wind scaled-up to produce the *total* equivalent quantity of electricity as the grid produces now, millions of people would have remained without power for several in freezing temperatures. "Any mix of wind and solar to serve load would require long-duration storage or optimization of multiple 'stages' of shorter duration," it found.[41]

By contrast, nuclear power plants performed exceedingly well during the polar vortexes. Wood Mackenzie found that "existing nuclear reduces the magnitude of hourly generation imbalances." During the polar vortex, nuclear plants ran with very high "up-time," with just one re-fueling outage.

It is notable that nuclear plants out-perform renewables in situations of high-heat as well. For example, Washington State's Columbia Generating station, a nuclear plant, is under a "no-touch" order to generate power during the West's current heat wave.[42]

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