

**Subcommittee on Environment and Climate Change**  
**Hearing on**  
**“Lessons from Across the Nation: State and Local Action to Combat Climate Change”**  
**April 2, 2019**

**Mayor James Brainard**  
**The City of Carmel, Indiana**

**The Honorable John Shimkus (R-IL)**

1. *In 2007, the U.S. Conference of Mayors announced a “Mayors Climate Protection Agreement” wherein more than 800 mayors committed to “strive to meet or beat the Kyoto Protocol targets in their own communities.” The cities of Columbia and Carmel both signed that agreement.*

- a. *Were your city’s able to meet their Kyoto pledges? How did you track them?*

**RESPONSE:** By joining the Mayors’ Climate Protection Agreement, mayors pledged to cut greenhouse gas emissions to 7% below the 1990 benchmark by 2012, in accordance with the targets established by the Kyoto Protocol. Mayors did so recognizing that local efforts would only carry their cities partway toward these goals, since Kyoto was about nations – directing their resources and considerable constitutional authorities and powers – to reduce emissions. As such, a nation not only has more tools but can benefit from the array of communities, sources and geography of emissions. In my City of Carmel, our population was 71,000 in 2007 when we signed onto the agreement. In 1990, our population was only 26,756 residents. Today, we are approaching 92,500 residents. Given available technologies and less than engaged partners at the state and federal levels, our population growth made achieving the Kyoto targets an impossibility. Certain that we would not achieve the overall goal, we nonetheless embarked on a course to do what we could to lower our carbon footprint in various sectors within our jurisdiction, today and in future years.

We understand that the largest source of greenhouse gas emissions from human activities in the United States is either the transportation or building sector, depending on the city. For our part, we developed policies to influence how and where new buildings were built, promoting multi-family and denser development nearby our new city center, and we worked to reduce emissions from the transportation sector, among other actions. In making infrastructure improvements, we invested in more efficient congestion management to yield emission reductions in our transportation sector.

One example is our work on roundabouts. In the late 1990s, the City of Carmel began installing its first traffic roundabouts to eliminate vehicular idling, reduce carbon emissions, and promote better air quality. Following the Kyoto pledge in 2007, I further prioritized these types of infrastructure investments in our local transportation system. To date, Carmel has now constructed 122 roundabouts, more than any other U.S. city. These improvements result in less gas being burned into the atmosphere and a better fuel economy for drivers. Gas savings average 24,000 gallons per year per roundabout, based on 10 study sites with traffic counts ranging from 14,000 to 47,000 AADT, according to our Engineering Department.

According to estimates from the U.S. Environmental Protection Agency (EPA) [gas equivalencies calculator](#), the sum of the greenhouse gas emissions is equivalent to 213 metric tons of Carbon Dioxide Equivalent per roundabout. These gas savings per roundabout are equal to 233,172 pounds of coal burned; 1.2 railcars' worth of coal burned; 2.8 tanker trucks' worth of gasoline; 494 barrels of oil consumed; 25.5 homes' energy use for one year; or 37.2 homes' electricity use for one year. Greenhouse gas emissions are avoided by 74.4 tons of waste recycled instead of landfilled; 10.6 garbage trucks of waste recycled instead of landfilled; or 9,306 trash bags of waste recycled instead of landfilled. These savings are equal to greenhouse gas emissions from 45.3 passenger vehicles driven for one year or 521,487 miles driven by an average passenger vehicle. The carbon sequestered at each roundabout annually is equal to 3,527 tree seedlings grown for 10 years; 251 acres of U.S. forests in one year; or 1.7 acres of U.S. forests preserved from conversion to cropland in one year.

Citywide, the construction of our 122 roundabouts will result in 2.928 million gallons of gas savings per year, based on the traffic data available from those 10 study sites. The sum of these total greenhouse gas emissions reductions is approximately 26,021 metric tons of Carbon Dioxide Equivalent. The EPA equivalency results are 5,525 passenger vehicles driven for one year or 63,621,359 miles driven by an average passenger vehicle. It is equivalent to any of the following figures: 28,446,981 pounds of coal burned; 142 railcars' worth of coal burned; 60,244 barrels of oil consumed; 2,556,104 gallons of diesel consumed; 344 tanker trucks' worth of gasoline; 3,116 homes' energy use for one year; 4,538 homes' electricity use for one year; or 1.06 million propane cylinders used for home barbecues. It is equivalent to greenhouse gas emissions avoided by: 9,076 tons of waste recycled instead of landfilled; 1,297 garbage trucks of waste recycled instead of landfilled; 1.135 million trash bags of waste recycled instead of landfilled; 5.5 wind turbines running for a year; or 988,382 incandescent lamps switched to LEDs. It is equivalent to the amount of carbon that would be requested by any of the following: 430,265 tree seedlings grown for 10 years; 30,625 acres of U.S. forests in one year; or 211 acres of U.S. forests preserved from conversion to cropland in one year.

In the City of Carmel, we are building a downtown where people can live, work, and play without having to drive anywhere. We are using city design principles to build a more walkable city, which improves our community's quality of life through the health benefits of more exercise

as well as the reduction of harmful emissions. We installed more than 200 miles of trails and paths that allow people to safely walk or bicycle to their destinations to further reduce emissions.

We understand that electricity production generates the second largest share of greenhouse gas emissions, so the City of Carmel has replaced almost all of its street lights with LEDs. This resulted in a 48 percent reduction in energy consumption to power those streetlights. In 2009, we used more than \$633,000 in federal assistance the City received from the Energy Efficiency and Conservation Block Grant (EECBG) administered by the U.S. Department of Energy to replace about 800 street lights with LED lights. This investment saves the city approximately 22 percent on electricity annually. The estimated savings will be \$70,000 a year in electricity costs and roughly 1.4 million pounds of carbon dioxide every year.

Commercial and residential buildings are another major source of greenhouse gas emissions. We strongly encourage developers to build environmentally sensitive buildings, such as LEED (Leadership in Energy and Environmental Design) guidelines or similar programs.

Our current and future plans for continued progress in emissions reductions are outlined in the second question below.

*b. If you did not meet your pledges, why did your efforts fall short with respect to Kyoto? What is different with your current pledges?*

**RESPONSE:** Our rapid population growth – 212 percent during the compliance period versus 26 percent nationally – made achieving these goals impossible, as our city’s population grew eight times faster than national population growth. It can be said that federal and state inaction on supportive policies to help us certainly hurt my city more than others which have been growing closer or below the national average for the period.

In 2017, the Carmel City Council passed a resolution in support of climate resilience and recovery, becoming the first municipality in the State of Indiana to do so. The City of Carmel will strive to reduce its carbon emissions from 2016 levels in a manner that is prudent, properly funded, well documented, and approved by the Carmel Common Council. In order to establish a plan to achieve the objectives of that resolution, the City is working to create a climate action plan. This plan includes obtaining a baseline measurement of citywide emissions across all sectors within our jurisdiction, establishing proper measures to ensure the plan is being implemented, and incorporating energy efficiency and renewable energy standards where possible.

2. *As you know, the Obama Administration's Paris commitment was to impose economy-wide GHG reductions. This means major reductions from not only the power sector—which are happening—but also transportation—cars, trucks, airports, and more, as well as manufacturing, industry, and commercial and residential sources.*

- a. *What are you planning to achieve reductions in these areas?*

**RESPONSE:** In accordance with the resolution passed in 2017, the City of Carmel will create a climate action plan to obtain baseline measurements of citywide emissions and appoint a commission of business, faith, youth and community leaders to consult with elected officials and monitor our collective progress toward the goals. We will seek to use of alternate sources of energy such as active solar, geothermal, and wind whenever feasible. By increasing the efficiency of our buildings, vehicles, and electricity, Carmel will reduce emissions and pollution, conserve energy, reduce waste, save money, and promote jobs in the clean energy sector.

In the City of Carmel, we are building a downtown where people can live, work, and play without having to drive anywhere. We are using city design principles to build a more walkable city, which improves our community's quality of life through the health benefits of more exercise as well as the reduction of harmful emissions. We installed more than 200 miles of trails and paths that allow people to safely walk or bicycle to their destinations to further reduce emissions. We are working to develop a bicycle network to better enable our residents to take non-vehicular trips by encouraging small-scale employment nodes and requiring large-scale employment nodes to install covered and secure bicycle parking, and shower and changing facilities for cycling commuters. Concurrently, we work to ensure that adequate bicycling facilities exist to allow safe and efficient bicycle commuting.

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Commercial and residential buildings are another major source of greenhouse gas emissions. We strongly encourage developers to build environmentally sensitive buildings, such as LEED (Leadership in Energy and Environmental Design) guidelines or similar programs. These "green" buildings conserve energy resources, provide more healthful inside environments, last longer, utilize products made from recycled material, and use products that can be safely disposed of or

recycled when the building is eventually dismantled. Green buildings also strive to use local material to reduce the transportation impact. For instance, importing marble from overseas has an enormous environmental impact compared to delivering Indiana limestone from southern counties.

We encourage the use of durable materials and construction methods that prolong the life of commercial and residential buildings. A paradigm shift is necessary to change the current 30-year life expectancy of commercial buildings and some production homes to a more substantial life expectancy. Carmel has already had some success in encouraging 100-year buildings. For instance, that standard is currently being applied to several buildings in the City Center and the Old Town Arts and Design District. The Monon Community Center was built with energy efficiency in mind. For example, 50 percent of the building is glass so natural sunlight reduces the need for as much electricity for lights and heat.

The City strives to encourage the use of water-saving devices, and we request that our citizens reduce water consumption by proper “smart” lawn sprinkling and exploring alternative landscapes which require less water. We encourage rainwater recycling to reduce potable water consumption. Our wastewater plant incorporates the bio-pasture system, which turns waste into fertilizer. The city re-uses methane gas that is a natural byproduct of the wastewater treatment process to heat the boilers used in the biosolids process as well as heat a maintenance building thereby reducing their energy consumption. Storm Water Management requires a pollution prevention plan for projects during and after construction.

As our climate warms and heat wave intensity and frequency increases, we must anticipate projected changes to residential and commercial energy demands and reduce our local needs through policies and investments that will reduce the urban heat island effect. We are working to establish precedent for environmental protection or re-vegetation when developing municipal facilities like parks, fire stations, and maintenance facilities. The City seeks to reduce unnecessary removal of trees on lots, encourage preservation of mature trees, and require replacement of trees that have to be removed for development. The preservation of our urban forest helps to reduce the heat island effect. We also encourage the use surfaces that retard the absorption of heat.

As discussed above in the previous question, infrastructure improvements that result in more efficient congestion management can yield significant emissions reductions in our transportation sector locally and nationally. Carmel is installing traffic roundabouts to eliminate vehicular idling, reduce carbon emissions, and promote better air quality. Carmel has constructed 122 roundabouts, more than any other U.S. city. These infrastructure improvements result in less gas being burned into the atmosphere and a better fuel economy for drivers. Gas savings average 24,000 gallons per year per roundabout, based on 10 study sites with traffic counts ranging from 14,000 to 47,000 AADT.

According to estimates from the U.S. Environmental Protection Agency (EPA) [gas equivalencies calculator](#), the sum of the greenhouse gas emissions is equivalent to 213 metric tons of Carbon Dioxide Equivalent per roundabout. These gas savings per roundabout are equal to 233,172 pounds of coal burned; 1.2 railcars' worth of coal burned; 2.8 tanker trucks' worth of gasoline; 494 barrels of oil consumed; 25.5 homes' energy use for one year; or 37.2 homes' electricity use for one year. Greenhouse gas emissions are avoided by 74.4 tons of waste recycled instead of landfilled; 10.6 garbage trucks of waste recycled instead of landfilled; or 9,306 trash bags of waste recycled instead of landfilled. These savings are equal to greenhouse gas emissions from 45.3 passenger vehicles driven for one year or 521,487 miles driven by an average passenger vehicle. The carbon sequestered at each roundabout annually is equal to 3,527 tree seedlings grown for 10 years; 251 acres of U.S. forests in one year; or 1.7 acres of U.S. forests preserved from conversion to cropland in one year.

Citywide, the construction of our 122 roundabouts would result in 2.928 million gallons of gas savings per year based on data from those 10 study sites. The sum of these total greenhouse gas emissions reductions is approximately 26,021 metric tons of Carbon Dioxide Equivalent. The EPA equivalency results are 5,525 passenger vehicles driven for one year or 63,621,359 miles driven by an average passenger vehicle. It is equivalent to any of the following figures: 28,446,981 pounds of coal burned; 142 railcars' worth of coal burned; 60,244 barrels of oil consumed; 2,556,104 gallons of diesel consumed; 344 tanker trucks' worth of gasoline; 3,116 homes' energy use for one year; 4,538 homes' electricity use for one year; or 1.06 million propane cylinders used for home barbecues. It is equivalent to greenhouse gas emissions avoided by: 9,076 tons of waste recycled instead of landfilled; 1,297 garbage trucks of waste recycled instead of landfilled; 1.135 million trash bags of waste recycled instead of landfilled; 5.5 wind turbines running for a year; or 988,382 incandescent lamps switched to LEDs. It is equivalent to the amount of carbon that would be requested by any of the following: 430,265 tree seedlings grown for 10 years; 30,625 acres of U.S. forests in one year; or 211 acres of U.S. forests preserved from conversion to cropland in one year.

In 2005, I signed an Executive Order that requires that alternative fuel vehicles are purchased by city departments when available. This month, our police department began switching its entire fleet of patrol cars from gasoline-powered vehicles to hybrids. This move will save the City of Carmel about \$400,000 once the entire 130-car fleet is replaced. With the introduction of hybrid vehicles, the City now has a viable and visible means for improving the environment through energy conservation.

Carmel is working with local entrepreneurs to install hydrogen engines on some city trucks. This public-private partnership promotes local entrepreneurship, research and development activities, and emissions reductions from vehicles. Our Public Works Department tested a hydrogen

powered pickup truck outfitted with a snow plow last winter following severe weather. The hydrogen vehicles operate without any harmful emissions.

These local activities supporting carbon emissions reductions are necessary to help mitigate climate-related risks to Hoosiers that can adversely impact our human health, infrastructure, and agriculture. We must enhance our resiliency as the region experiences increased heat wave intensity and frequency, more extreme droughts, increased heavy rain events and flooding, decreasing agricultural yield, and degraded air and water quality. In 2008, 82 of Indiana’s 92 counties were declared Presidential disaster areas due to winter weather, severe storms, and flooding. The State of Indiana incurred over \$1.9 billion in damage to public infrastructure, housing, and agriculture. Averting the worst impacts of climate change will require reducing carbon emissions by at least 80% by 2050 through our collective actions locally and nationally. Our forthcoming local individualized climate plan will allow Carmel to continue to show leadership in improving the quality of life for its citizens.

<b>Greenhouse gas emissions are avoided by:</b>		
	<b>Per Roundabout</b>	<b>Per 122 Roundabouts Citywide</b>
	233,172 pounds of coal burned	28,446,981 pounds of coal burned;
	1.2 railcars’ worth of coal burned;	142 railcars’ worth of coal burned;
	2.8 tanker trucks' worth of gasoline	344 tanker trucks’ worth of gasoline;
	494 barrels of oil consumed	60,244 barrels of oil consumed;
		2,556,104 gallons of diesel consumed;
	25.5 homes' energy use for one year	3,116 homes' energy use for one year;
	37.2 homes’ electricity use for one year	4,538 homes' electricity use for one year;
		1.06 million propane cylinders used for home barbecues.
	74.4 tons of waste recycled instead of landfilled	9,076 tons of waste recycled instead of landfilled;
	10.6 garbage trucks of waste recycled instead of landfilled	1,297 garbage trucks of waste recycled instead of landfilled;
	9,306 trash bags of waste recycled instead of landfilled.	1.135 million trash bags of waste recycled instead of landfilled;

		5.5 wind turbines running for a year; or
		988,382 incandescent lamps switched to LEDs.
<b>These savings are equal to greenhouse gas emissions from:</b>		
	45.3 passenger vehicles driven for one year	5,525 passenger vehicles driven for one year
	521,487 miles driven by an average passenger vehicle.	63,621,359 miles driven by an average passenger vehicle
<b>The carbon sequestered annually is equal to:</b>		
	3,527 tree seedlings grown for 10 years	430,265 tree seedlings grown for 10 years;
	251 acres of U.S. forests in one year	30,625 acres of U.S. forests in one year
	1.7 acres of U.S. forests preserved from conversion to cropland in one year.	211 acres of U.S. forests preserved from conversion to cropland in one year.

b. *And in the absence of specific plans, how do you actually expect to meet your commitments?*

**RESPONSE:** Our specific local plans are outlined in my response to the question above.

3. *We entered into the hearing record a letter from Mayor William Wescott of the City of Rock Falls, Illinois. The city owns and operates its own electrical utility, and participates in the Illinois Municipal Electric Agency, a collection of non-profit public power municipalities within the state. Mayor Westcott outlines the clean energy investments his city has made but he also talks about the critical investments in baseload power in state-of-the art coal fired generation facilities. (the 1.6 GW Prairie State Energy Campus). He warns that if federal or state policies that force premature closure of the coal-fired units, his city would still have to purchase energy but would also be burdened to make payments on the closed facilities.*

a. *Should policies be designed to ensure cities and ratepayers are not burdened with the stranded costs? What is your solution?*



**RESPONSE:** The federal government must lead in supporting our transition to clean, renewable energy, while ensuring that local governments and their citizens that are overly reliant on coal and fossil fuels are not unfairly burdened by the costs of stranded assets as the process gradually moves forward across the country. Legislators and regulators should promote policies that anticipate changing customer demands and declining costs of renewable energy and storage facilities.

Indiana is one of several states with anticipated coal-plant closures in the years ahead. Nearly 75 percent of electricity in the state comes from coal powered sources. According to a [report](#) entitled “Climate Change and Indiana’s Energy Sector: A Report from the Indiana Climate Change Impacts Assessment” published by Purdue University, only 5 percent of our energy is generated by renewable sources statewide. The college reports that the “energy mix makes the Hoosier State the eighth-largest emitter of climate-changing gases, at 183 million metric tons of carbon dioxide (CO<sub>2</sub>) emitted per year.” We must all accept the fact that the future of coal-fired generation assets is limited.

The U.S. Conference of Mayors recently adopted a policy of transition to 100% renewable energy and the use of clean fuels including natural gas are encouraged during the transition. The most critical question is where should the next investment dollar go – to coal fired power plants or to renewable fuel generating capacity?

One approach to making these decisions is to perform a net present value of a coal versus a renewable energy facility. The evaluation should include accounting for carbon emissions as an externality in the coal fired facility. Additionally, the steadily decreasing cost per Btu of renewable energy should be included in the evaluation.

A recent Indiana Public Services denial of permits for new natural gas units that would replace coal units slated for decommissioning was based on the assumption that consumer trends for renewable energy would likely make the proposed natural gas units a stranded asset.

Congress should make major federal investments in support of a gradual transition to clean energy, reducing our dependence on fossil fuels nationwide; concurrently, lawmakers should explore policies that support communities like Rock Falls that rely on coal and fossil fuels, minimize potential risk to cities and ratepayers, possibly offer financial assistance to reduce burdens, and establish national guidelines for future energy infrastructure investments.

- 4. It is well known that the “Keep It in the Ground” movement and its political allies have successfully blocked the ability to transport American energy from the Marcellus shale to markets where it is in demand. New York’s blocking of pipelines is probably the most prominent example, and it has indirectly led to cities such as Boston being cut off from clean, affordable U.S. natural gas. In fact, the Northeast has been forced to burn old,*

*dirty oil plants for electricity during cold snaps, and they have even been importing Russian Gas into Boston harbor on occasion.*

- a. Do you support expanding energy infrastructure to allow natural gas from Pennsylvania to be delivered to nearby markets in the mid-Atlantic, Northeast, and Southeast?*

**RESPONSE:** As leaders of our nation's cities, mayors oppose efforts by the federal or state government that would preempt local government and limit our ability to protect our communities from potential harm from fracking or any other proposed energy infrastructure projects. All U.S. communities should have the right to decide whether or not an energy infrastructure project is a safe and viable option, if the project is located within its boundaries or affecting the quality of life and environmental protection of the residents within its boundaries.