

ANSWERING THE CALL IN THE  
WAKE OF GULF'S FUEL DEPOT  
EXPLOSION IN PUERTO RICO

**HON. CHARLES B. RANGEL**

OF NEW YORK

IN THE HOUSE OF REPRESENTATIVES

*Tuesday, October 27, 2009*

Mr. RANGEL. Madam Speaker, I rise to thank President Barack Obama for his steadfastness in dealing with the state of emergency in my beloved Puerto Rico. An explosion at the fuel storage complex in Cataño ignited a fire on Friday, October 23rd, that burned for two days, spewing thick, toxic smoke across the Caribbean region and forcing hundreds of people on the island to evacuate their homes. The fire affected 21 of the fuel depot's 40 tanks. The damages are now estimated at \$6.4 million.

In a press statement issued by the office of the President's Press Secretary, President Obama swiftly declared that an emergency exists in the Commonwealth of Puerto Rico. Furthermore, the President ordered federal aid to supplement Governor Fortuno's funds and other local response efforts in the area struck by explosions and fire.

The President's action authorizes the Department of Homeland Security's Federal Emergency Management Agency to coordinate all disaster relief efforts. The purpose of this swift action is to alleviate the hardship and suffering caused by the emergency on the locals, and to provide appropriate assistance for required emergency measures, authorized under Title V of the Stafford Act. This will save lives, protect property and public health and safety, and lessen or avert the threat of a catastrophe in the municipalities of Bayamón, Cataño, Guaynabo, San Juan, and Toa Baja.

Although it's true that we can't personally drive those fire engines and we can't personally distribute aid, there are still lots of other ways in which we can all help. I, and my fellow colleagues here in Congress, can make sure that our government does not stray from its initial commitments and that bureaucratic red tape does not impede any relief efforts to the affected area. We can also appeal to constituents in our own home districts to give to the local charities that are involved in this effort, like the Red Cross or Catholic Charities.

We must never forget that our country's strength lies not just in the size of our military, but also in the depth of our compassion. Any effort will go a long way in relieving the suffering that continues to be felt by our fellow citizens and Commonwealth neighbors to the south.

PUTTING THE PRICE OF GOING  
GREEN IN CONTEXT

**HON. ED WHITFIELD**

OF KENTUCKY

IN THE HOUSE OF REPRESENTATIVES

*Tuesday, October 27, 2009*

Mr. WHITFIELD. Madam Speaker, I rise today to highlight an article by Dr. Kurt House entitled, "Putting the Price of Going Green in Context." The following column was coauthored by Benjamin Urquhart, a research associate at Harvard University's Center for the Environment, and Mark Winkler, a Ph.D. stu-

dent at Harvard's School of Engineering and Applied Sciences.

Over time, the global energy infrastructure must change because the continued combustion of fossil fuels is altering Earth's climate in potentially dangerous ways and because the large wealth transfer from mostly democratic oil-importing countries to mostly autocratic oil-exporting countries is propelling up repressive regimes worldwide. So, we know that the world's energy infrastructure must change. But, the interesting questions are: how big an investment are we willing to make to bring about that change and how fast are we willing to make that investment?

Many groups have tried to answer these questions. In the last year alone former Vice President Al Gore, Google, oilman T. Boone Pickens, Greenpeace, and the International Energy Agency all have published hypothetical scenarios for how the United States could transform its energy infrastructure over the next two decades. Gore's "Repower America" calls for generating 100-percent renewable electricity by 2020. Google's "Clean Energy 2030" would eliminate coal- and oil-burning power plants by 2030, while retaining natural gas power plants to maintain grid stability. Greenpeace is strongly anti-nuclear, while Pickens promotes wind power and natural gas as alternatives to foreign oil.

The quantity of new electricity-generating capacity proposed in the Gore and Google plans has led to criticism that they are unrealistically expensive. We try to place such commentary in a more quantitative context by comparing the industrial and financial commitments necessary to achieve the Google and Gore plans to two large-scale, government-led efforts from the twentieth century—the industrial buildup that accompanied World War II and the construction of the Interstate Highway System. These massive projects serve as tangible benchmarks for the magnitude of financial commitment and public support that will be required to rebuild the U.S. power sector.

Let's start with a bit of history: The U.S. industrial commitment to World War II was staggering. At its peak, the war occupied almost 40 percent of the nation's total economic capacity, and it required massive quantities of raw materials—at least 100 megatons of steel to build among other things more than 80,000 tanks, 250,000 planes and helicopters, and 15 million tons of munitions. The inflation adjusted annual cost of the war effort averaged close to \$700 billion between 1943 and 1945, while the total cost of the war effort topped \$2.5 trillion (in 2006 dollars).

In comparison, constructing the Interstate Highway System demanded a less intensive effort—but one of far longer duration. With the majority of its 47,000 miles covered by 11 inch-thick concrete—and weighing an impressive 700 megatons—it remains the largest public works project in U.S. history. During its peak years of construction, from 1970 to 1980, 17 megatons of concrete were used annually to create 1,100 miles of roadway a year, at a real annual expense of almost \$11 billion, or about 0.3 percent of the nation's annual economic output over that time. The project—from its start in 1956 until its symbolic completion in 1995—cost the nation close to \$350 billion (again, in 2006 dollars).

How do current energy transformation plans compare to these massive governmental efforts?

To determine the answer, we calculated the overnight capital cost—the cost of a project without interest payments, as if it were finished in one night—as well as the requirements in steel and concrete for the Gore and Google plans. We also calculated

expenditures for the U.S. Energy Information Agency's (EIA) Annual Energy Outlook, the traditional policy-neutral, business-as-usual scenario. We then compared the total and annual expenditures of capital, steel, and concrete using World War II as a baseline for capital and steel consumption, and the highway project as a baseline for concrete consumption. (Note: Although the cost of steel and concrete also are included in the total capital numbers, we wanted straight comparisons for the total mass of steel and concrete to complement the more traditional capital comparisons.)

The results are summarized in two charts we have generated. The first chart shows that achieving Gore's vision of removing fossil fuels from electricity production by 2020 will require 50 percent of the capital and 60 percent of the steel required to wage World War II as well as 25 percent of the concrete that was used to construct the Interstate Highway System. (Google's requirements are a bit higher because its forecast assumes a higher U.S. growth rate for electricity consumption.) The other chart shows that the annual expenditures required to achieve the Gore and Google plans would require 60 and 90 percent, respectively, of the concrete used annually for the highway system and about 20 percent of the steel consumed annually during the peak of war spending.

Take a moment to consider these numbers. Achieving either plan would require both an annual investment of concrete equal to the amount used to build the Interstate Highway System and an annual steel investment equal to one-quarter of that required to defeat the Axis powers. This is a massive industrial investment! Furthermore, these are only the steel and concrete requirements; the quantity of photovoltaic panels, for example, required to achieve the Gore or Google plan would be 28 and 74 times current global production, respectively.

The material requirements to achieve the Gore plan are significantly lower than those required to achieve the Google plan primarily due to their radically different estimates for the growth in electricity production. Google estimates that U.S. electricity production will grow by 4 percent to roughly 1,024 gigawatts by 2020, which essentially matches the EIA's forecast. The Gore plan, on the other hand, assumes that U.S. electricity production will decrease by a staggering 27 percent! That decrease—Gore claims—will result from huge increases in energy efficiency, but the EIA forecast already includes significant efficiency improvements.

We should note that the energy plans would last longer than World War II, making the annual rate of spending about 15 percent of the peak annual war expenses (\$100 billion—\$124 billion versus \$800 billion per year). Also, because the U.S. economy is about six times larger today than it was in the 1940s, these costs represent a much smaller fraction of the country's total economic output (about 1 percent of gross domestic product). Put another way, the economic demands of the war effort were equivalent to diverting two days of every worker's five-day work week, the energy plans—over their lifespans—would demand only about 24 minutes from every worker's week.

Although each plan has other aspects that merit critical analysis (e.g., estimated capacity factors, load growth rates, and balance of peak and base-load power) our analysis yields an interesting conclusion regarding the required financial and industrial investments. Specifically, we have identified two precedents for large-scale, governmental projects with industrial and financial investments that exceed the total requirements of both the Gore and Google plans. When measured against historical extremes, the cost