Statement of Charles D. McConnell

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Committee on Science, Space, and Technology

Subcommittee on Environment

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Written Testimony

Thank you, Mr. Chairman and members of the House Space, Science, and Technology Subcommittee on Environment, for the opportunity to testify on the EPA's Clean Power Plan (CPP). The implications and ramifications of this regulation are surely critical issues. I will discuss the non-impact of this rule on the environment and then discuss its real impact to what I will call energy sustainability, which is large and disturbing. The CPP has been falsely sold as environmental regulation, when it is really an attempt by our primary federal environmental regulator to take over federal and State regulation of energy.

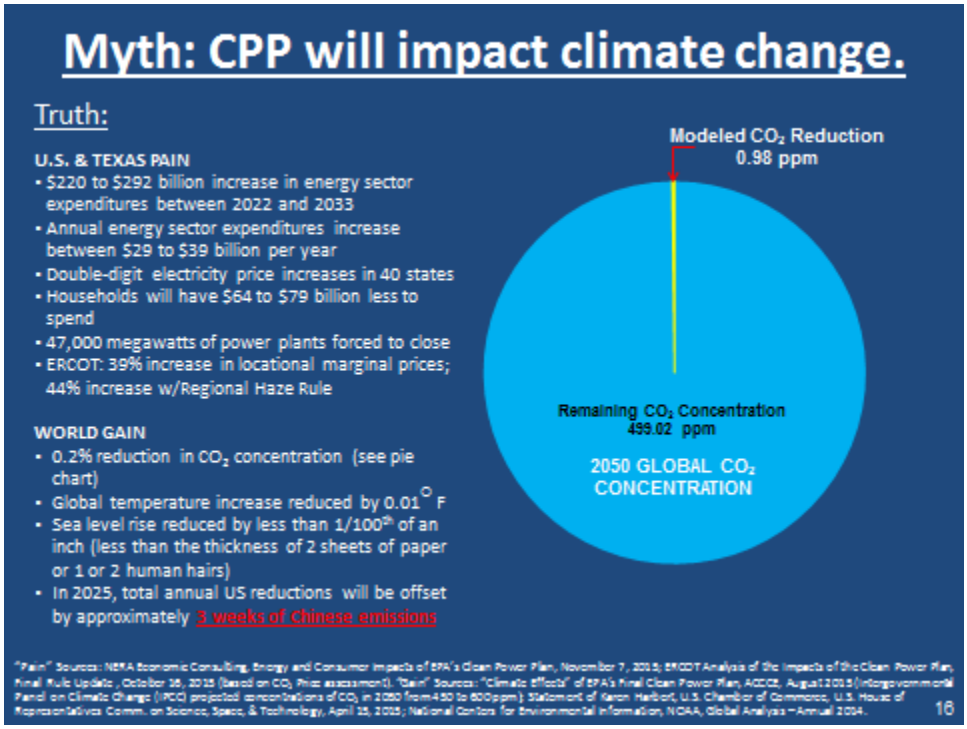
Let me be very clear. First, I believe that the climate is changing. I am not in denial. Second, CO_2 is a contributor or "forcing function" for climate change – certainly not the exclusive forcing function, but a major contributor – and it does require an energy strategy in this country and globally to address the long term implications. These two facts, I believe, are scientifically and technically documented and we have an obligation to address them as a society.

With that said - what is also clear both scientifically and technically is that the EPA's CPP is not a plan that will significantly impact global CO_2 emissions. It's not an environmental regulation,

it is energy regulation. If the definition of "clean" were the reduction of atmospheric CO_2 levels – and that is a naively narrow, incorrect perspective, but if it were – then this CPP is not really clean, because it is neither relevant nor impactful to the environment.

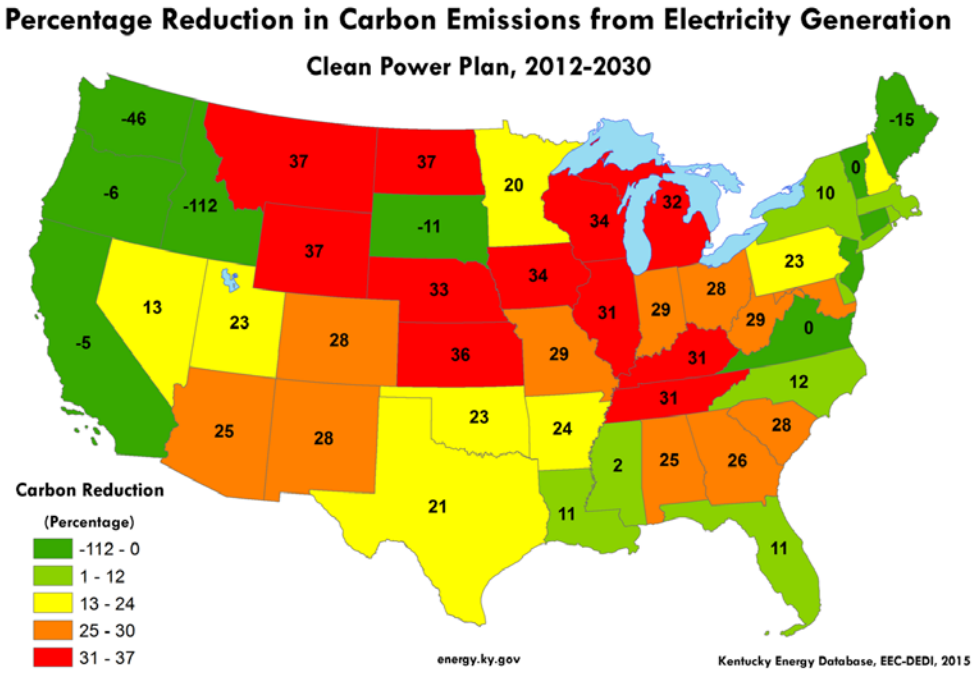
I have testified previously that the CPP reduces the amount of anthropogenic CO_2 globally by 0.2% (modeled to be less than 1 ppm), that the global temperature increase from the reduced CO_2 would be decrease average global temperature by 0.01°F, and that the resulting sea level rise reduction would be 1/100th of an inch (which equates to the width of two human hairs). These are facts, and facts are stubborn things. To get some perspective on how irrelevant EPA's plan is, after exacting tremendous pain on the U.S. economy and ratepayers, a full year's worth of annual reductions in 2025 would be offset by Chinese emission in just three weeks.

The following chart illustrates these stark "all pain, no gain" facts about EPA's plan:



Is this impactful climate regulation? A committee dedicated to science and technology surely cannot, and should not, recognize this as effective climate regulation. I certainly won't sit here and recognize it as such.

The next chart illustrates the states that must bear the burdens of implementation, regardless of existing efforts to deploy renewables and reconfigure markets to supply reliable and affordable power.



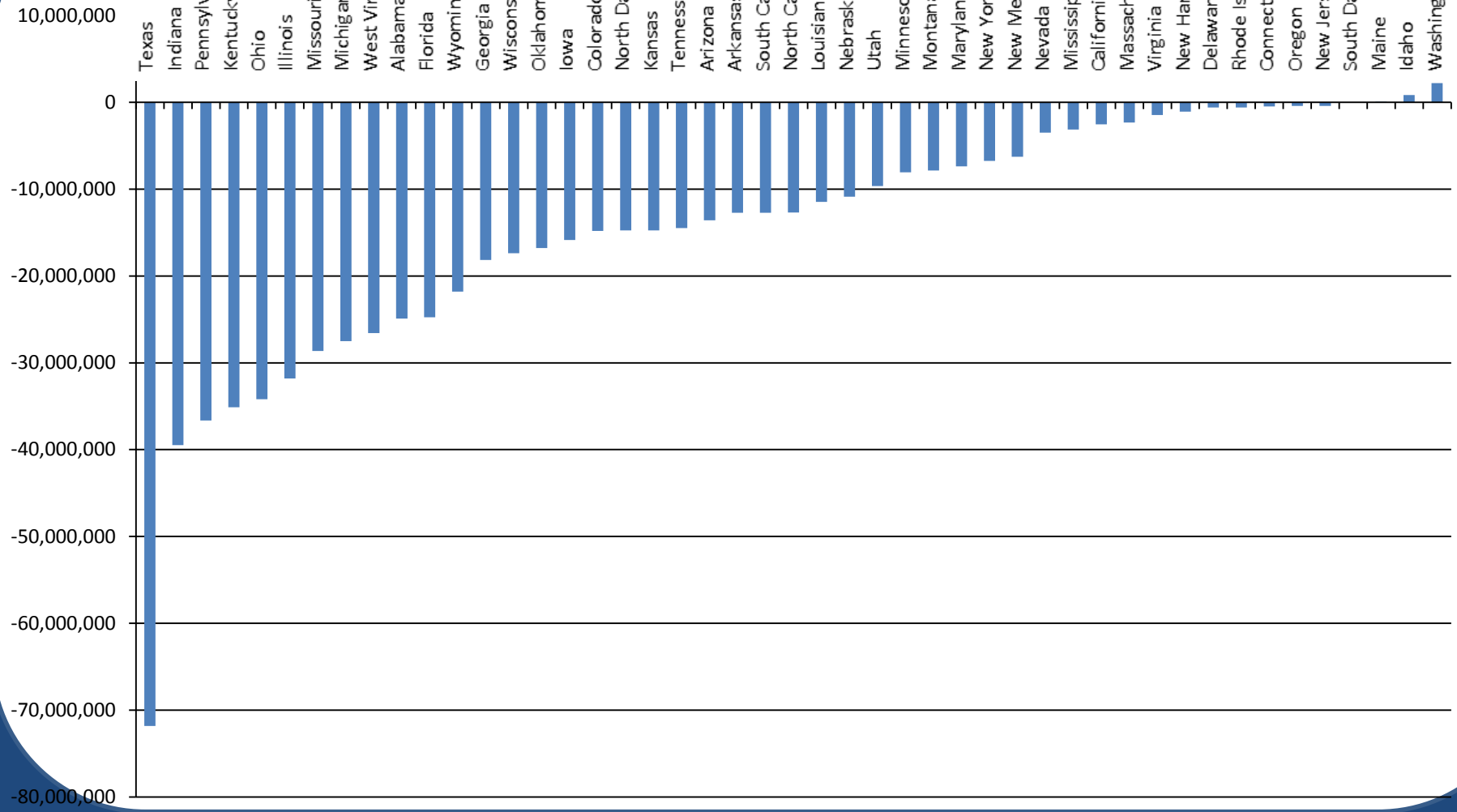
- Slide Courtesy of Len Peters, Secretary of Energy and Environment, Commonwealth of Kentucky

Percentage reduction is important, especially to smaller states, because it captures how drastic a change is being driven by EPA. However, because we all know that scale matters in energy, it is

also important to look at not just the percentage of reduction, but the amount of total tons of reduction that must be delivered by each state. This is significant because it helps define the scale of the burden on states in terms that are significant in the real world like how many plants must be retired, employees laid off, and stranded costs recovered, in addition to many acres will need to be covered with windmills, solar panels, and the transmission lines necessary to link those resources to where the people are. The following chart shows the scale of reductions in terms of tons of reduction that would be required in a rate-based state program.

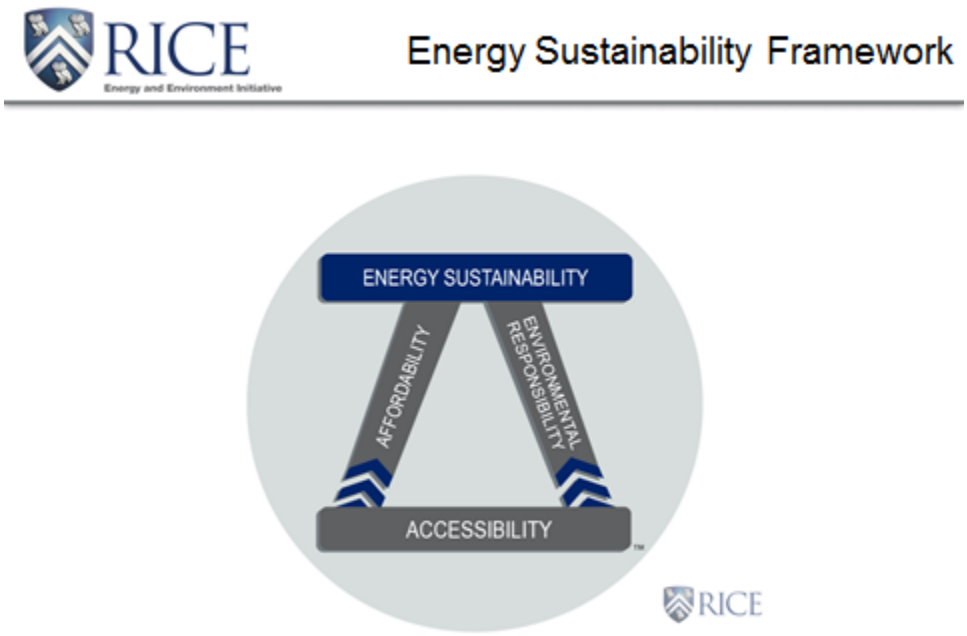
State CO_2 Reduction Burdens

RATE-Based Reductions (in Tons CO_2)



Rate-based reductions converted to tons. Source: Emission Performance Rate and Goal Computation, Goal Computation Appendix 1-5.

What I will recognize is that the CPP will cause double digit electricity price increases in over half of our states, not to mention the hidden costs of this regulation, not just in the generation of the electricity but in cost of transmission upgrades and redundant expenditures for reliability back-up generation. Renewables are not reliable in fact in Texas they are providing less than 15% of their installed capacity MWHs to the grid.



What we need to be working on is sustainable energy. "Sustainable" means it is accessible – meaning not only that we have steady access to the energy source to make it, but that it can produce consistently available, "always on" power; affordable, which means we are not jacking up consumers costs by using it; and environmentally responsible, and I submit to you that every major source of energy we have today can be used in an environmentally responsible manner. There are plenty of so-called environmentalists that won't admit that or don't even understand it. They are in denial about solutions.

The CPP is in effect a mandated federal renewable portfolio standard, which steps on your power as elected legislators. Congress refused to enact a renewable energy standard, half the States have declined to adopt one, but now we have an unelected federal agency, not responsible for energy, imposing one. This led renowned legal scholar Laurence Tribe, President Obama's Constitutional Law professor at Harvard, to testify last year before the Energy & Commerce Committee that "Burning the Constitution should not become part of our national energy policy."

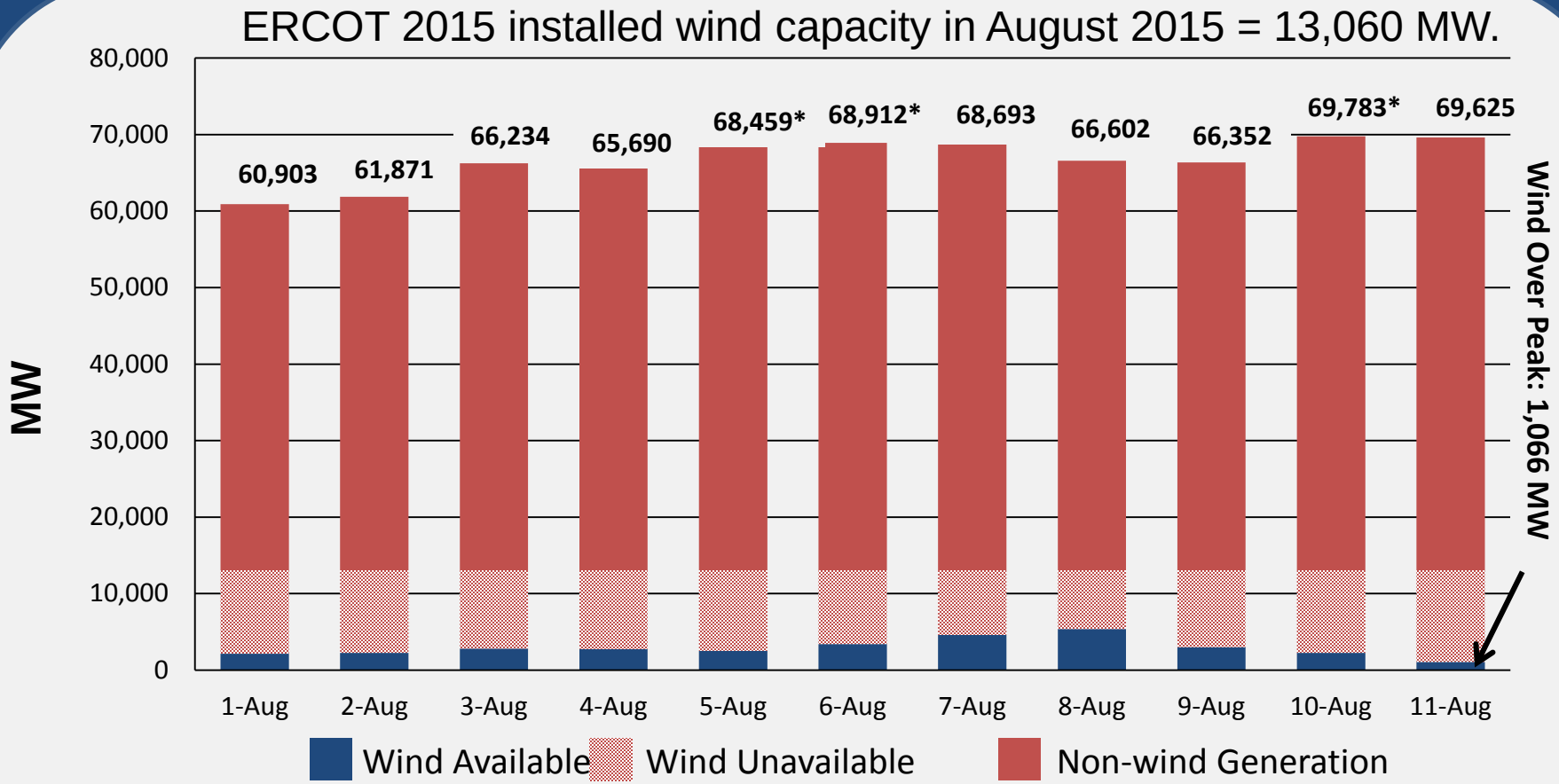
To meet CO_2 emission reduction targets that no clean fossil technology has yet been demonstrated to meet, States will have to substitute renewable energy for fossil fuels. At least it would be procedurally defensible if Congress made that choice, after weighing costs, need for transmission upgrades, and stranded costs from diminished use of generation assets, reliability impacts, and job impacts. But it still would not be impactful environmental policy. Understand that today, renewables must be backed up by a fast-ramping, reliable, "always on" power source, which today means natural gas. That subjects ratepayers to the assumption that natural gas costs will remain constant, an increasingly high risk proposition with the EPA aggressively attacking fracking technology.

When the EPA was hatching the CPP, I was witness to the EPA asking the Office of Fossil Energy, which I ran at the Department of Energy, to comment only on an EPA-defined concept of resource adequacy – not reliability! Why? Inconvenient truths! For those wondering what "resource adequacy" means, it means there is more capacity to generate power than predicted demand. But the real measure we are concerned with is reliability – whether that power is

available where it's needed, when it's needed, and available on a constant basis. This is the kind of linguistic mumbo jumbo often offered by that agency, meant to sound like a thoughtful theoretical capacity analysis, that if deployed, could meet demands. It's theoretical, but it is surely not useful!

Reliability means reliability. Available power means available power, not theoretically available. When wind can only be expected to be available about 10-15% of the time – in reality – then cloaking reliability considerations under a phrase like "resource adequacy" as a required term that the EPA presented to the DoE to comment on in through the stilted "interagency collaboration" charade I was witness to devalues the truth, only to disingenuously be able to claim there has been interagency consultation. It was not in my view legitimate interagency consultation because it was deliberately structured to avoid input that would highlight the rule's potential damage to electric reliability. One need look no farther than my current home state of Texas to see a case study in the difference between real world reliability and theoretical resource adequacy. This chart illustrates how our nation's largest renewable fleet functions when the state of Texas needs it most.

Wind Availability During Peak Power Demand (Case Study – First Week of August 2015)



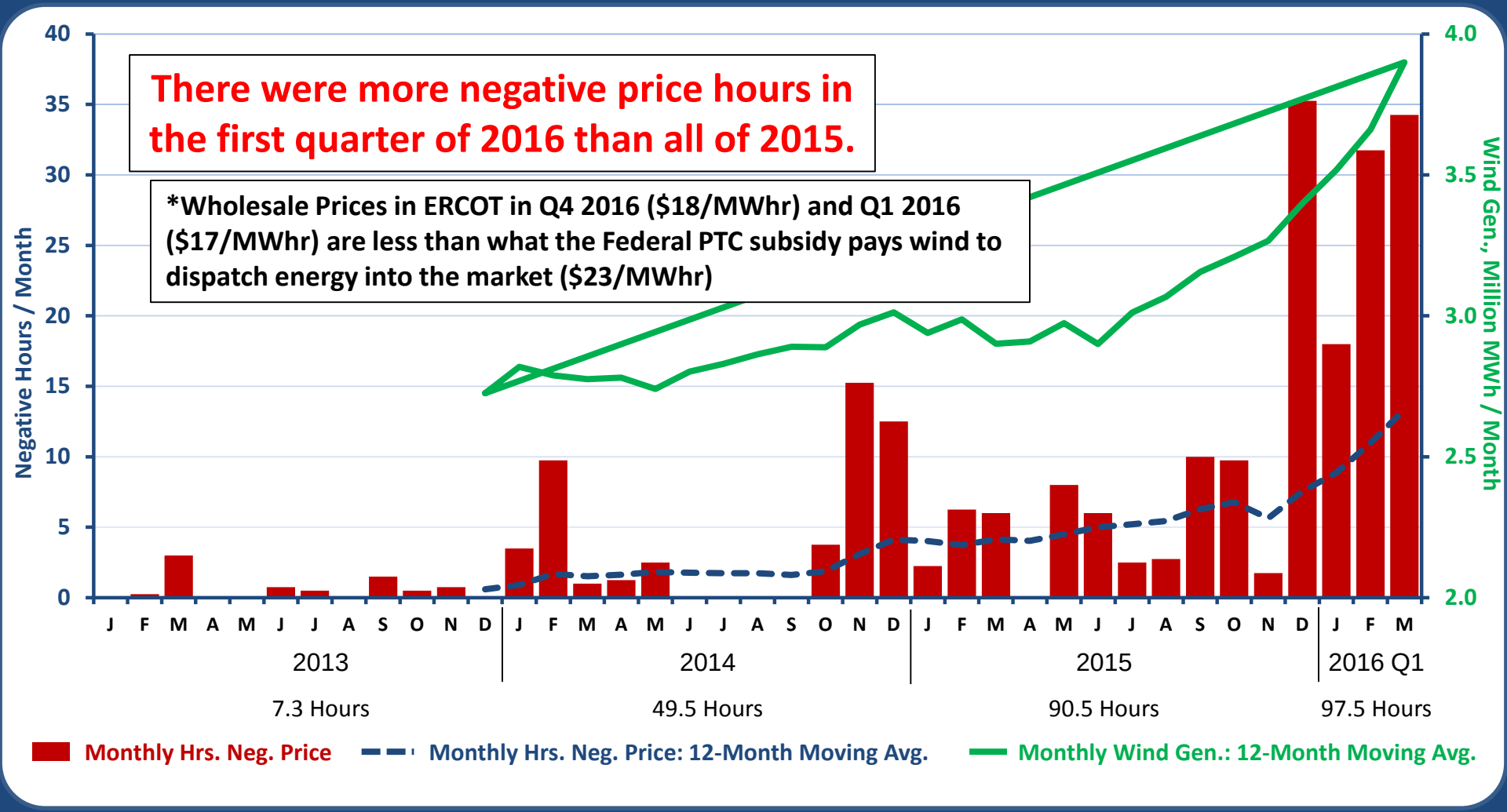
*New Peak Records: Aug. 5 – 68,459 (Wind Over Peak 2,501); August 6 – 68,912 (Wind Over Peak 3,418); August 10 – 69,783 (Wind Over Peak 2,242).

Sources: ERCOT, Daily Wind Integration Reports; ERCOT, Item 4.1: CEO Update.

In addition to proving the obvious – that when it is hot, the wind is not blowing, the chart identifies fundamental, real world, renewable integration that should have been the focal point of EPA and DoE discussions BEFORE the CPP was proposed that start with a recognition that wind will not be available when markets need it most and ends with a discussion of how markets will pay for other participants to sit around all year and spring to action when wind does not show up on the grid when it is needed most (for example, when almost 12 GW of wind no-showed the Texas market).

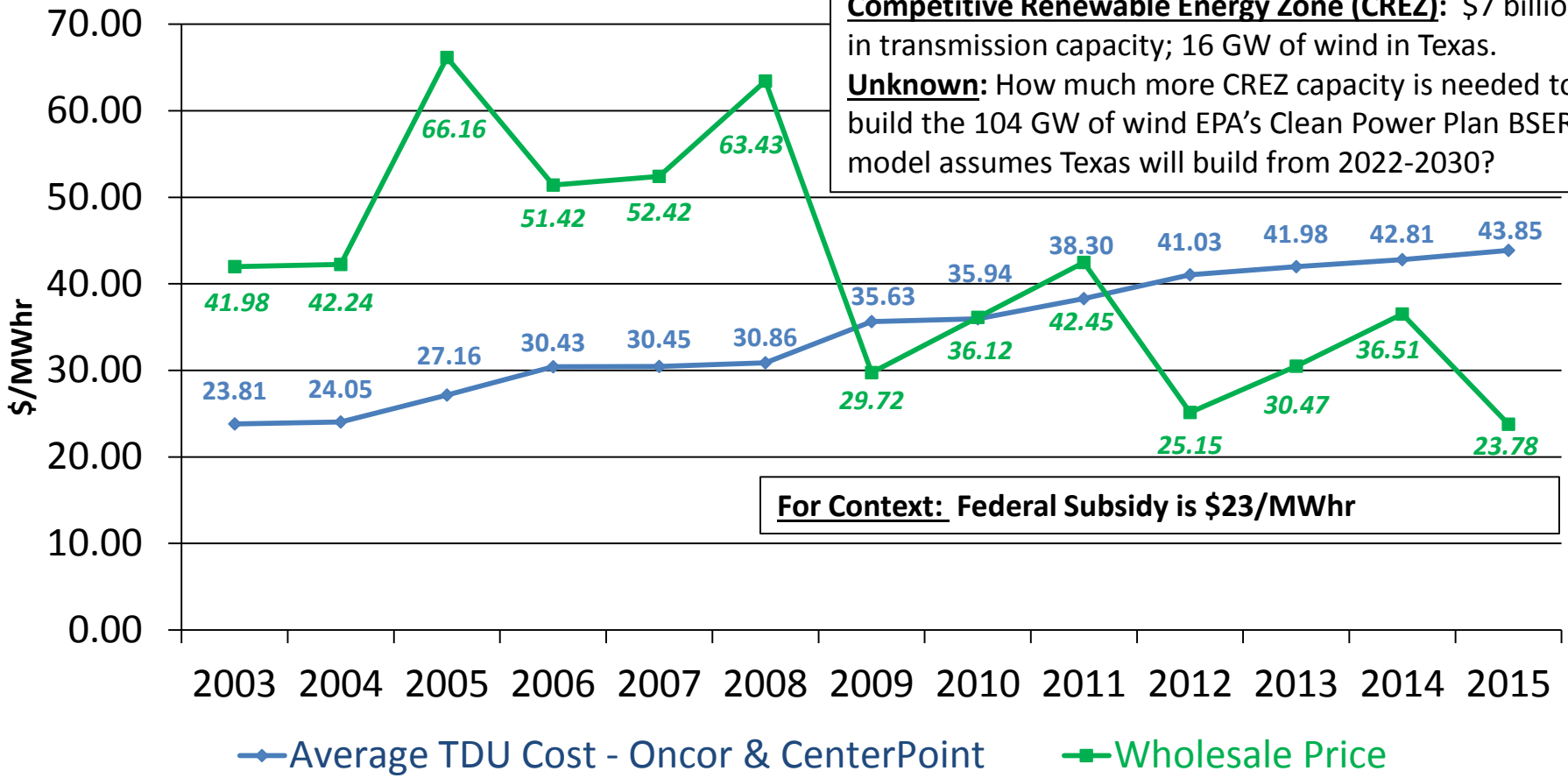
For additional perspective on how costly large-scale renewable integration can be, consider again the Texas example where the following two charts spell out the unprecedented market disruption and transmission/distribution costs associated with the integration of 16 GWs of wind - just one sixth of the wind that EPA estimates Texas will have to build to meet the CPP (in half the time, mind you). Note how historically low natural gas prices which set wholesale prices in the Texas ERCOT market are masking the significant increase in transmission costs. Just imagine what will happen when (I contend, not "if") natural gas prices climb.

Market Distortion from $23/MWhr Subsidy
(Negative Pricing Increases as Wind Penetrates)



Note: Instances of negative pricing are based on occurrences in the ERCOT North Zone, a leading indicator of market-wide conditions.
Sources: ERCOT 15-Minute Settlement Data, North Zone, 2011-2016, sum of intervals in the month with negative settlement prices; 2011 – Mar. 2016 ERCOT Energy and Demand Reports; *ERCOT real time settlement data, north zone, 2015-2016

Transmission/Distribution Costs Rise as Renewables Grow (*masked by low gas/power prices*)



Competitive Renewable Energy Zone (CREZ): $7 billion in transmission capacity; 16 GW of wind in Texas.
Unknown: How much more CREZ capacity is needed to build the 104 GW of wind EPA's Clean Power Plan BSER model assumes Texas will build from 2022-2030?

For Context: Federal Subsidy is $23/MWhr

* Oncor and CenterPoint are Texas' two largest electric delivery companies (83% of Texas load).

Note: Not all of Texas' renewable generation is connected to the grid via the CREZ system.
Source: Annual average of monthly averages of 15-Minute Settlement Data, ERCOT North Zone; Public Utility Commission of Texas, Archived TDU Rates Summaries; Business Council for Sustainable Energy, 2016 Factbook; ERCOT Quick Facts, March 2016; EPA's Best System of Emissions Reduction (BSER) model assumptions can be found in EPA, Clean Power Plan, Greenhouse Gas Mitigation Measures TSD.

Another very important point to add about the CPP is that it will frustrate the lower carbon future it claims to promote. Anyone paying attention knows the world will not meet its CO_2 reduction targets without development and commercial deployment of carbon capture, utilization, and storage technology, or CCUS. You can build all the windmills and solar panels you want, but by 2035 the world is going to have another 1.6 billion people on it. That's five times the population of the United States. Primary energy consumption is going to rise by 37% between 2013 and 2035. Fossil fuels are still going to supply the vast majority of energy across the globe, and almost all of that growth is going to come from non-OECD countries. So to get at those emissions, we have to have CCUS. But what this rule will do – or more accurately, the accompanying rule that was part of the same EPA effort but applies to new power plants rather than existing ones – is stifle investment in that technology. Fewer people will invest in CCUS if, when new reliable power is needed that needs to be on all the time, their choices are an immature technology with no performance history and a burdensome regulatory structure, or an off-the-shelf technology – natural gas – that has a well-known risk profile and less regulation. DoE has spent years working to help industry develop CCUS for power plants, but EPA decided for its own reasons that the technology was ready enough to require people to do it. Plenty of people told the EPA that regulation would stifle CCUS investment, but they did not listen.

Now, as to the legality of the rule. I'm no lawyer, but I am a citizen. It is a threat to democracy that an agency would take the plain enacted words of Congress, "best system of emission reduction . . . adequately demonstrated," and attempt to claim *not only* that it no longer means what the agency and regulated companies have always relied on it meaning – a cleanup technology installed and proven to work at their type of industrial facility – but that "system"

now means something the elected First Branch of government that enacted it never conceived: that a federal environmental regulator has carte blanche authority over whose power plants are allowed to run in the United States. EPA's legal insurrection allowed it to set an emission reduction level no cleanup technology has yet been demonstrated to meet. And again, it will not even have a significant environmental impact.

Science and technology requires real understanding and real analysis. The CPP is not worthy of that as it simply does not meet the test of impactful environmental regulation, which makes its high costs, its likely degradation of electric reliability, and EPA's unauthorized expedition into energy policy all the more disturbing.

Charles D. McConnell

Charles D. McConnell is Executive Director of Rice University's Energy and Environment Initiative, a university-wide integration of science, engineering, economic analysis, policy and social sciences to address the diverse issues and challenges associated with energy security, affordability and environmental sustainability. The effort is designed to partner with industry and external stakeholders and position Rice as an impartial broker that combines technology and policy to create a sustainable energy platform for excellence in resource utilization and environmental stewardship.

A 35-year veteran of the energy industry, McConnell joined Rice in August 2013 after serving two years as the Assistant Secretary of Energy at the U.S. Department of Energy.
At DOE, McConnell was responsible for the strategic policy leadership, budgets, project management, and research and development of the department's coal, oil and gas, and advanced technologies programs, as well as for the operations and management of the U.S. Strategic Petroleum Reserve and the National Energy Technologies Laboratories.

Prior to joining DOE, McConnell served as Vice President of Carbon Management at Battelle Energy Technology in Columbus, Ohio, where he was responsible for business and technology management, including leadership of the Midwest Regional Carbon Sequestration Partnership.

McConnell also spent 31 years with Praxair, Inc., providing business leadership and strategic planning to the global hydrogen business, refining and chemicals markets, enhanced oil recovery, carbon dioxide management and the full range of energy technology R&D activities.

McConnell has held a number of board positions including chairmanships of the Gasification Technologies Council and the Clean Carbon Technology Foundation of Texas. McConnell holds a bachelor's degree in chemical engineering from Carnegie-Mellon University (1977) and an MBA in finance from Cleveland State University (1984).