

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Grid Reliability and Resilience Pricing;
Proposed Rule

Docket No. RM18-1-000

October 13, 2017

COMMENTS OF
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ASSISTANT SECRETARY OF ENERGY FOR FOSSIL ENERGY (2011-2013)

As a concerned citizen, and a former Assistant Secretary in the Department of Energy (“DOE”), I was encouraged by DOE’s recent study on electricity grid reliability. Such robust analysis by the federal government of the reliability and resiliency of our electricity grid, focusing particularly on the loss of baseload power plants with on-site fuels such as coal and nuclear, was long overdue. DOE’s Grid Reliability and Resiliency Pricing Notice of Proposed Rulemaking (“NOPR”) represents sound action building on this thorough foundation of analysis. I encourage the Federal Energy Regulatory Commission (“Commission”) to reverse the too-long trend of policies undermining electricity reliability and finalize the NOPR.

Coal and nuclear generation plants provide grid resiliency through on-site and secure fuel supplies that cannot be matched by any other major generation sources. Notwithstanding the essential nature of this reliability feature, coal and nuclear plants have been retiring prematurely at an alarming rate. There are many factors underlying this trend, including regulations designed to make it more difficult for coal plants to operate, the uncertainty of additional regulations, subsidies and mandates for renewables and other market distortions, and extraordinarily low natural gas prices that have materialized recently. But especially concerning are the market designs that assume continued abundance from the investments made in the past to assure electricity supply for the public good. Resiliency must be examined on a system-wide basis and strategically supported to assure it will be recognized as a first-order need. All of these concerns have brought us to our current crisis point where action is required.

I can speak directly to the impacts of Federal and State policies and regulations, and their interaction with allegedly “competitive” markets, on the electric grid’s resilience. Reliability (that is, real reliability and not politically-fabricated terms such as “resource adequacy”) was purposely disregarded by federal agencies during my tenure at DOE. The ability of the electric grid to continue to provide reliable service and to anticipate, prepare for, adapt to, and recover from potential future disruptions were not part of discussions deemed politically proper as the previous Administration formulated and promulgated energy policies largely through EPA. The same was true for State policies that have pushed stable, cost-effective baseload electric generation with on-site fuel supplies – particularly coal, but also nuclear – out of the generation mix.

I was witness as the previous Administration’s EPA strategically minimized its interagency collaboration on such issues. They purposely avoided creating a record and bringing to light any scientific and commercial facts as to how their rules would result in a less reliable and resilient electric grid. This intentional neglect has caused thousands of megawatts of resilient power to disappear while policy makers turned a blind eye, and the situation continues to deteriorate – leading us to the current circumstance. Rules such as the Mercury and Air Toxics Standards (“MATS”) and others would have been deemed as shortsighted and weakening grid resilience had the EPA truly collaborated and informed itself through discussions with interagency energy experts. I have testified in Washington, D.C. on numerous occasions of my first-hand experience of such experts within DOE being ignored. The public record indicates that Commission staff had similar experiences.

When EPA first proposed MATS in May 2011, it claimed that it had “worked with FERC since we began developing these standards to ensure we [are] assessing any impacts they would have on electric reliability and affordability.”¹ Yet, then-Chairman Wellinghoff stated in August 2011 that “[t]he Commission has not participated in any interagency task force or other working group to address the impact of EPA’s proposed power sector rules.”²

Not that Commission staff did not try to work with EPA, EPA at that time simply was not interested in listening. In an October 2010 interagency meeting,³ the Commission’s Office of Electricity Reliability presented detailed modeling projecting that 81 GW of coal-fired generation was likely to close due to EPA regulations.⁴ Rather than seriously review these findings, EPA dismissed them, asking Commission staff to rerun their analysis using EPA’s conclusions.⁵ The White House even requested that the Commission begin work to evaluate a best case scenario.⁶

Commission staff were eventually forced to concede that their concerns regarding EPA’s assumptions in MATS were falling on deaf ears. After reviewing EPA’s responses to the Commission’s comments on the proposed MATS, a senior Commission economist stated in an e-mail that “I don’t think there is any value in continuing to engage EPA on the issues.”⁷ While

¹ 76 Fed. Reg. 24976, 25054 (May 3, 2011).

² Letter from Jon Wellinghoff, Chairman, Fed. Energy Regulatory Comm’n to Sen. Lisa Murkowski 5 (Aug. 1, 2011).

³ *Id.* at 2.

⁴ FED. ELEC. REGULATORY COMM’N. OFFICE OF ELEC. RELIABILITY, POTENTIAL RETIREMENTS OF COAL FIRED GENERATION AND ITS EFFECT ON SYSTEM RELIABILITY (PRELIMINARY RESULTS) 13 (“FERC MATS Analysis”).

⁵ Letter from Jon Wellinghoff at 12 (noting that at the conclusion of the meeting, EPA Clean Air Division (“CAD”) staff “expressed a desire for FERC staff to produce system production cost runs and reliability metric studies using the generation retirement lists created by the EPA CAD model.”

⁶ *Id.* (“The [White House Council on Environmental Quality] representative also expressed a desire for FERC staff to complete sensitivity studies regarding the major risk factors and begin evaluation of a best case scenario.”) (emphasis added).

⁷ E-mail from Dr. David Kathan, Senior Economist, Policy Div., Office of Energy Mkts. and Reliability, Fed. Energy Regulatory Comm’n to Julie Simon and Mason Emmett (Mar. 15, 2011, 13:25 EST).

concerned about EPA's flawed assumptions in MATS, the staffer resigned that "EPA has indicated these are their assumptions and have made it clear that [their assumptions] are not changed [by] anything on reliability or gas availability . . . EPA continues to make a lot of assumptions and does not directly answer anything associated with local reliability."⁸

Despite credible evidence from the Commission to the contrary, EPA projected that just 9.9 GW would retire due to the proposed MATS when it issued the proposal.⁹ Yet, numerous independent institutions reviewed EPA's proposed rules and projected potential coal plant retirements ranging from 30 GW - 70 GW.¹⁰ Indeed, the North American Electric Reliability Corporation ("NERC") found in November 2011 that EPA regulations could reduce U.S. generating capacity by 60 GW in 2018.¹¹ On a regional level, PJM Interconnection warned EPA that retirements in its operating region could be "well more than 10 times the amount of capacity that the EPA has estimated . . ."¹² PJM instead forecasted that approximately 11 GW of coal capacity in its region was at "high risk" for retirement due to EPA regulations, with another 14 GW of capacity "at some risk."¹³ The Midwest Independent Transmission System Operator identified nearly 13 GW of units at risk for retirement in its region due to EPA regulations.¹⁴

Astonishingly, EPA responded to these assessments by cutting its projections in half to 4.7 GW when finalizing MATS,¹⁵ no longer saying that the coal-fired plants would "retire"¹⁶ but would instead be "withdrawn as uneconomic" due to MATS.¹⁷ At that time, EPA dismissed higher retirement projections as "industry and NERC studies" having "a number of serious flaws in common that call their conclusions into question."¹⁸ Instead, EPA relied upon analyses such as DOE's "Resource Adequacy Report"¹⁹ – commissioned not by the Department's specific subject matter experts, but instead by DOE's Office of Policy, and using models so altered that they were effectively disavowed by DOE's respected Energy Information Administration ("EIA")²⁰ –

⁸ *Id.*

⁹ 76 Fed. Reg. at 25073.

¹⁰ See Metin Celebi, *Potential Coal Plant Retirements and Retrofits Under Emerging Environmental Regulations* 17, BRATTLE GROUP (Aug. 10, 2011) (listing investment company retirement projections, including Brattle (50-60 GW), Credit Suisse (60 GW) and FBR Capital (30-70 GW)).

¹¹ 2011 LONG-TERM RELIABILITY ASSESSMENT 18 fig. 55 (November, 2011).

¹² CORRECTED COMMENTS OF PJM INTERCONNECTION L.L.C. 19, Docket No. EPA-HQ-OAR-2009-0234-18441, Aug. 4, 2011.

¹³ COAL CAPACITY AT RISK FOR RETIREMENT IN PJM v, Aug. 26, 2011.

¹⁴ EPA IMPACTS ANALYSIS 5, Oct. 2011.

¹⁵ 77 Fed. Reg. 9304, 9307 (Feb. 16, 2012).

¹⁶ EPA, REGULATORY IMPACT ANALYSIS OF THE PROPOSED TOXICS RULE 8-17, Mar. 2011.

¹⁷ 77 Fed. Reg. at 9307.

¹⁸ EPA, REGULATORY IMPACT ANALYSIS FOR THE FINAL MERCURY AND AIR TOXICS STANDARDS 3-17, Dec. 2011 ("MATS RIA").

¹⁹ 77 Fed. Reg. at 9408.

²⁰ RESOURCE ADEQUACY IMPLICATIONS OF FORTHCOMING EPA AIR QUALITY REGULATIONS 2 n.2, Dec. 2011 ("Since this analysis was commissioned by DOE's Office of Policy and International Affairs (PI) and uses a version of NEMS that differs from the one used by the U.S. Energy Information Administration (EIA), the model is

to conclude that impacts would be far lower than Commission staff's 81 GW projection.²¹

Ultimately, EIA found that nearly 60 GW of coal-fired generation retired by the MATS 2016 compliance deadline.²² Just this past spring, DOE had to issue two emergency orders to keep open four reliability-critical coal-fired units that were otherwise slated for closure due to MATS. History proved that it was EPA's analysis, and not that of Commission staff and other outside experts, that had a number of serious flaws calling its conclusions into question.

Energy experts across the previous Administration, including those within the Commission, once again found themselves sidelined by EPA three years later with the Clean Power Plan. EPA claimed in that proposal that it had "met on several occasions with staff and managers from the Department of Energy and the Federal Energy Regulatory Commission to discuss our approach to the rule and its potential impact on the power system."²³ Yet the Commission later indicated to Congress that it had just six meetings with EPA regarding the Clean Power Plan before it was proposed, with most being general in nature.²⁴ Commission staff were given just one opportunity in those meeting to see a draft of the proposal, and were strictly forbidden from even taking notes when reviewing the document.²⁵ The Commission nonetheless noted a number of concerns with the proposal to EPA.²⁶ However, former Commissioner Tony Clark told Congress, "I am not aware of the extent to which FERC staffs suggestions were taken into account by the EPA before the [Clean Power Plan] proposal was released."²⁷

I mention this background not to rehash old fights. Rather this past experience provides important context to the Commission's current consideration of DOE's NOPR.

First, despite claims by some that the current state of coal-fired generation is only a matter of economics, environmental regulations have in fact played a substantial role in – to use the previous EPA's terminology – "withdrawing as uneconomic" coal-fired generation from markets. EPA's MATS retirement projections were so far off from that of Commission staff and other experts, and ultimately reality, because EPA substantially underestimated the cost of MATS compliance. For example, EPA assumed that coal-fired plants would heavily utilize low-cost Dry Sorbent Injection ("DSI") to comply with MATS,²⁸ even though experts questioned

referred throughout the document as PI-NEMS. The results described in this report do not necessarily represent the views of EIA.").

²¹ See 77 Fed. Reg. at 9408.

²² *AEO2014 projects more coal-fired power plant retirements by 2016 than have been scheduled*, Feb. 14, 2014, <https://www.eia.gov/todayinenergy/detail.php?id=15031#>.

²³ 79 Fed. Reg. 34830, 34899 (June 18, 2014)

²⁴ Letter from FERC Chairman LaFleur, Fed. Energy Regulatory Comm'n, to Sen. Murkowski (Dec. 3, 2014) at Attachment A.

²⁵ *Id.*

²⁶ *Id.*

²⁷ Letter from Fed. Energy Regulatory Comm'n Comm'r Clark to Sen. Lisa Murkowski, Rep. Fred Upton, and Rep. Ed Whitfield (Jan. 15, 2014) at 2.

²⁸ MATS RIA at 3-15 fig 3-6.

whether these controls could be deployed in such a manner. Yet detailed analysis indicates that few, if any facilities, ended up relying on DSI alone to comply with MATS. Instead, many coal-fired plants simply retired. Those that did not had to utilize expensive MATS compliance methods – costs that now hamper the ability of coal-fired plants to compete in electricity markets, notwithstanding their critical reliability and resiliency attributes. The last Administration’s environmental regulations had an immediate impact on the electricity grid – one that continues today. These effects are very relevant as the Commission considers the NOPR.

Second, the grid reliability and resilience concerns addressed by the NOPR are not novel to the Commission, nor are they issues to be considered by the Commission just in the coming days and weeks. Rather the Commission has been analyzing, but was sidelined on, many of these issues for at least seven years.

Third, the prescience of the Commission’s past analysis remains relevant to the present discussion. When foreseeing in 2010 that EPA regulations would result in substantial coal-fired generation retirements, Commission staff noted that “a non-diverse portfolio puts reliability at risk.”²⁹ While retired generation could be replaced by natural gas facilities, that analysis warned of “[g]as availability and concerns with pipelines and high cost of firm gas”³⁰ – concerns now being echoed by reliability experts such as NERC.³¹

The Commission is once again at a junction where policy choices will have a significant and irreparable impact on grid reliability and resilience. Yet rather than being effectively ignored, this time it is the Commission at the center of these decisions. The Commission should take this opportunity to act on the analysis ignored by EPA in the past. Incentives that distort markets for long-term detriment should not be allowed to undermine infrastructure critical to the grid. Markets must value resiliency immediately and the total costs and impacts to consumers large and small must be transparent and policies made rational. Over-reliance on a single fuel should – I could argue must – be avoided, and grid resilience must be maintained. As the Commission staff noted in 2010, a non-diverse portfolio puts reliability at risk.

I lead the Energy and Environment Initiative at Rice University and we embrace the need for three key elements to achieve real Energy Sustainability. It is our triangle of Accessibility, Affordability and Environmental Responsibility. Implicit in the term Accessibility is reliability and resilience – which is a first order requirement to minimize the risk and consequence of disruptions and to maximize the ability to plan for, and adapt to, them should they occur. It is not simply having the technology to develop energy generation and transmission systems and hardware, but the ability to utilize it fully to be secure. That is critical to enabling access. Resilience also is implicit in Affordability, as is diversity of fuel choices. Anyone with experience in the energy industry is keenly aware of the need for a portfolio of choices and the

²⁹ FERC MATS Analysis at 24.

³⁰ *Id.*

³¹ SHORT-TERM SPECIAL ASSESSMENT: OPERATIONAL RISK ASSESSMENT WITH HIGH PENETRATION OF NATURAL GAS-FIRED GENERATION vi (May 2016) (“Common-mode, single contingency-type disruptions to fuel supply and deliverability in areas with a high penetration of natural gas-fired generation are reducing resource adequacy and potentially introducing localized risks to reliability.”)

negative impacts of being over-weighted in any fuel choice. And finally, Environmental Responsibility is an important fundamental to pursue and achieve, but it can never be the sole lens to view real Sustainability. All three elements must be in balance and harmony, both in the short- and long-term and be strategically aligned to meet the public and private needs of our country. Such a portfolio is not only sound commercially, but essential to the delivery of electricity that is defined by, and always has been defined by, for the “public good.”

By balancing these critical inputs, one can strive to achieve real reliability, resiliency, and affordability. But the process must be methodical, well-timed and staged for implementation, and, most importantly, fact-driven. And on top of that, the framework in which power plants operate has to support investments and improvements to existing facilities and infrastructure that are accretive to all of these targets, as well as to improve environmental performance through efficiency and plant upgrades and continued technological innovation that is enabled by policy – not stifled by policies. So what do we face and how can we get to where we must go?

The impact of the utilization of natural gas for power generation has been undeniable in the U.S. over the past several years. Generators, transmission operators, and end users are all seeing the positive effects of natural gas, as well as of renewables both at the small distributed scale as well as the larger utility commercial scale. Gas has some great benefits for electric generation, such as fast ramping to meet changes in load and cost has been competitive over the past few years.

All of this, however, is a great example of how we tend to have short memories and to oversimplify. An abundance of natural gas does not support an assumption that electric generation will be just as secure and resilient as the country switches from coal and nuclear to gas. Switching to gas has been viewed, along with the implementation of wind and solar programs largely on the back of tax credits and incentives, as a vehicle to eliminate coal from our mix. That view is shortsighted and rife with assumptions and inaccuracies that do not reflect the physics of our electrical grid. This also masks a number of key issues with renewables:

- 1) The direct costs of renewable subsidies are hidden in our tax bills and not in our utility bills.
- 2) Indirect subsidies for renewables are also hidden as ancillary costs (intermittency that requires a backup source, need for transmission, balancing power, reliability risks, etc.), and the root of such costs is not transparent to taxpayers.
- 3) Land use increasingly is impacted by an over-reliance on renewables. Before conclusions about the need to favor and invest in not-yet-invested, much less reliable, renewable sources, the land, infrastructure, and integration impacts to the grid must be made transparent.

Challenges presented by over-reliance on natural gas – including weather disruptions to gas supply in the U.S., the vast differences in pipeline supply options that affect delivery or even the ability to deliver, the variability of cost and supply of gas as a commodity versus coal – also cannot be overlooked, nor can current low costs be assumed to continue forever. A perfect example is right here in Texas with ERCOT over the past year with the impact to grid stability, and cost from a mere \$0.40/MMBtu increase in natural gas costs and the effect to consumers big

and small (graphs attached). The assumption of abundant and affordable gas forever where it is currently supplied is dangerous enough, but to assume that natural gas can be provided cheaply and reliably all the time to all areas that would retire coal-fired power plants is uninformed and foolish.

Lessons learned in the Texas ERCOT grid are particularly pertinent to this discussion. Despite overwhelmingly positive press coverage, there is extraordinary market distortion of the Texas wholesale market occurring as a direct result of subsidies that exceed the wholesale price of power. “Negative pricing” is driven by renewables which, due to not accounting for their indirect costs, are essentially “riding free” into the deregulated market at the expense of the valuable baseload resources that have made significant long-term investments into the Texas grid.

Furthermore, while we have a great natural gas pipeline network in the U.S., it cannot provide for security and resiliency in the same way as having fuel on-site. People tend to build power plants near gas trunk lines to minimize the need to site and build new pipelines. There are many situations that could disrupt gas supply to a power plant – equipment repairs, leaks that require remediation (even small leaks under EPA rules may put equipment out of service until remedied), problems with gas storage (as we have seen in California with the Aliso Canyon gas leak), gas processing disruptions, natural causes, or unpredictable human causes. The more we rely on natural gas for its great benefits at the expense of maintaining power sources with fuel on-site, the more vulnerable we are of losing both gas service and electric supply, especially with multiple power plants along the same line.

A 500 MW power plant generates enough electricity to serve about 350,000 homes. Lose a gas line for a period of time that serves three, four, five such plants and would the electric grid be able to adapt? The more power plants that single line serves, the more likely that disruption of its supply causes a power outage, the effects of which can cascade across a broad area.

I have been watching for some time now as the country has been veering toward increased risk of disaster – subordinating the priority of reliable, resilient electric service, which is critical to the public health and welfare, to an anti-industry environmental agenda. We are at a crisis point. We can’t predict when a sudden circumstance will test our ability to adapt, but we can act now to strengthen the ability of the electric grid to adapt and recover rapidly in such an event. The public health depends on it. I encourage the Commission to finalize the NOPR.

Sincerely,

The Honorable Charles D. McConnell
Assistant Secretary of Energy (2011-13) Fossil Energy
Executive Director, EEI, Rice University
315A Allen Center
6100 Main Street MS 603
Houston, TX 77005

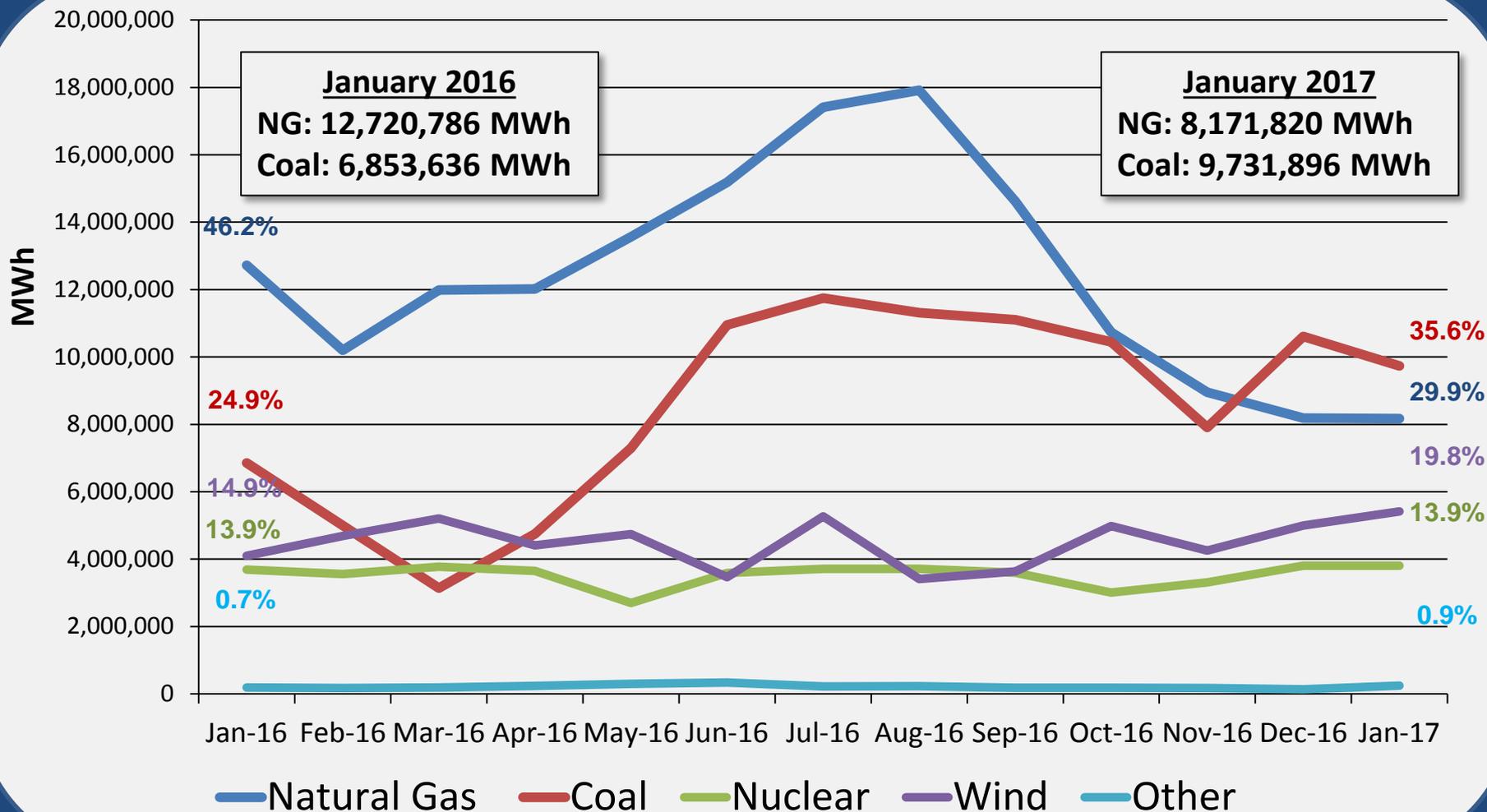
Attachments:

- 1) Energy Sustainability Triangle
- 2) Coal is Still Competitive: Texas Case Study (January 2016 – January 2017)
- 3) Energy Transparency Facts
- 4) Energy Transparency Facts # 1: Direct Subsidy Costs are Hidden
- 5) Energy Transparency Facts # 2: Renewables are Subsidized
- 6) Energy Transparency Facts # 3: Indirect Costs of Renewables
- 7) Energy Transparency Facts # 3: Case Study – Texas Wind Subsidies and Distortion
- 8) Energy Transparency Facts # 3: ERCOT Data (August 2015 – October 2016)



Coal is Still Competitive:

TX Case Study: Small Rise Gas Prices = Dispatch Back to Coal



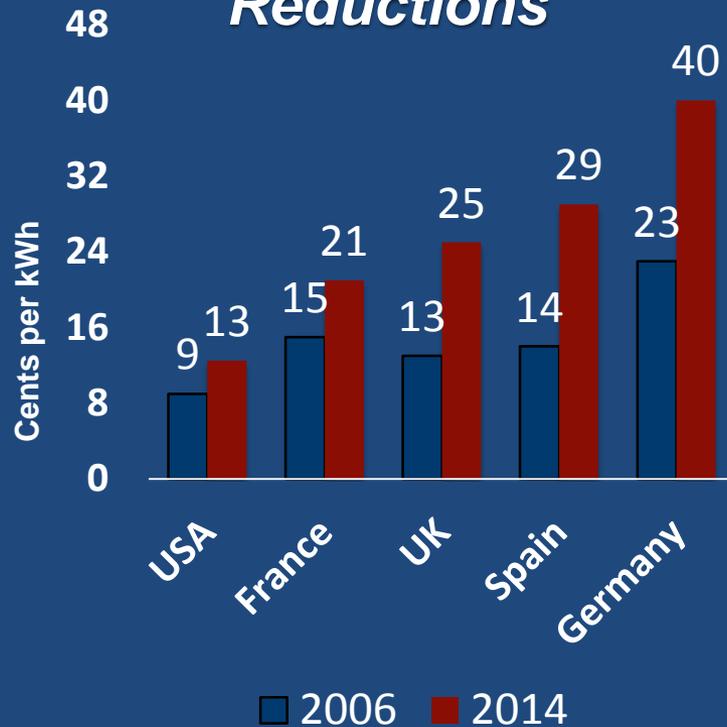
Source: ERCOT, 2016 and 2017 Demand and Energy Reports. "Other" includes Solar, Water, and Other generation sources, but excludes Net DC/BLT; percentages are rounded.

Energy Transparency Facts:

1. The direct costs of renewable subsidies are hidden in our tax bills - they are not yet fully seen in our utility bills.
2. Although all fuels receive a form of subsidy, there is no comparison between the return on investment we receive from fossil and nuclear power and what renewables deliver per \$ of subsidy.
3. Indirect costs of renewables (transmission / ancillary services / negative pricing) are masked by market designs and low gas prices.
4. Basic realities of physics and energy density hinder energy storage and renewable sources and greatly increase their need for vast amounts of land (for panels, mirrors, wind turbines, transmission lines, and rare earth mineral mining for battery storage).

Energy Transparency Fact #1: Direct subsidy costs of renewables are hidden in our tax bills.

The Price of Carbon Reductions



Source: Robert Bryce, "Maintaining the Advantage: Why the U.S. Should Not Follow the EU's Energy Policies", February 2014; U.S. Energy Information Administration, Electric Power Monthly March 2005 and February 2015; Eurostat data.

- The more wind and solar power Germany and other EU Countries deploy, the more coal and wood they have to burn as back-up power (gas not favored due to geopolitics of Russian supply).
- Germany is a cautionary tale, not an example that should be emulated.

Energy Transparency Fact #2

Renewables are subsidized exponentially more than other sources of energy (with far less return on investment).

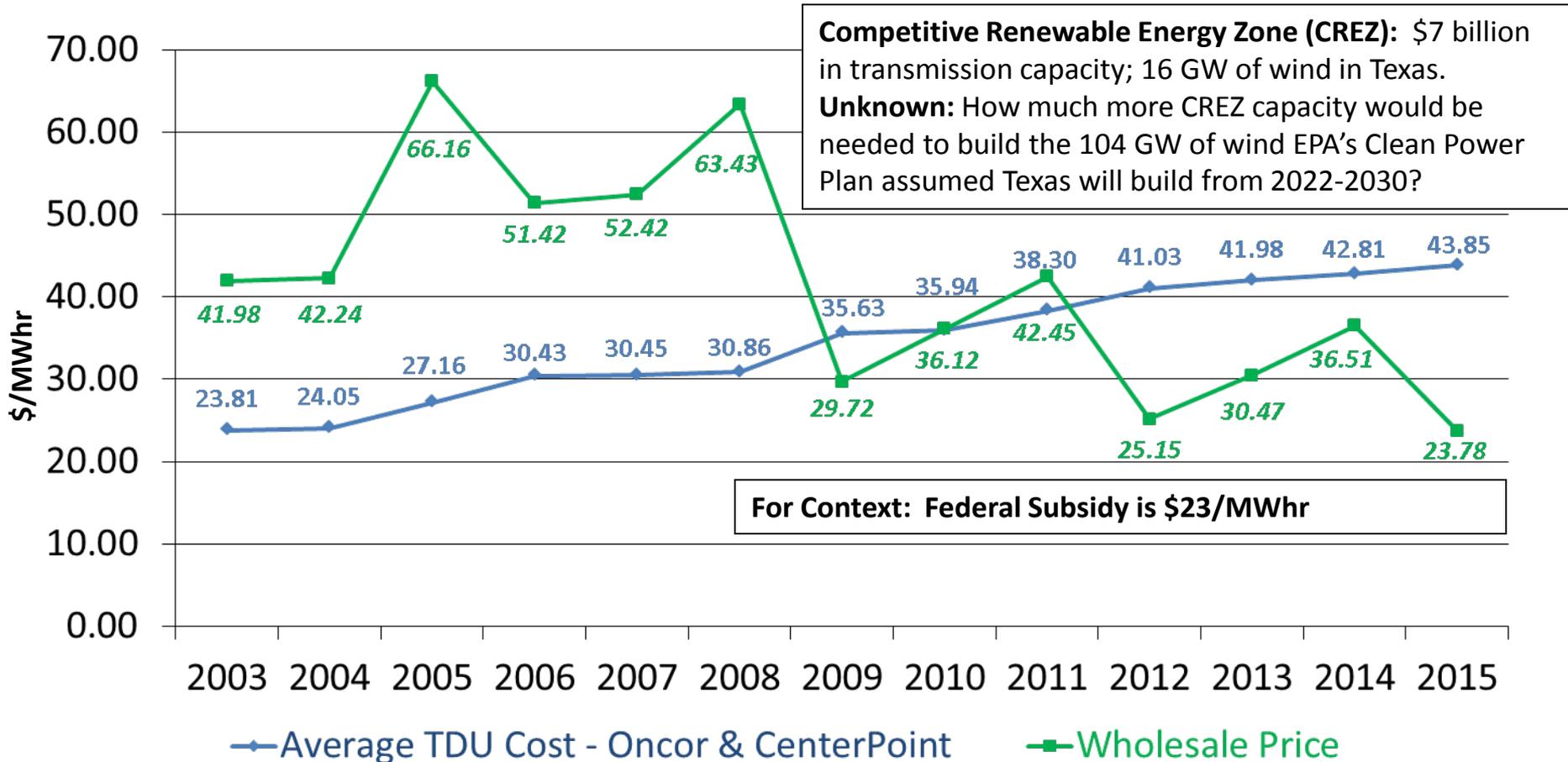
| Fuel Source | U.S. Subsidies (\$bln / year) | Quads Produced | \$/MMBtu Produced |
|-------------|-------------------------------|----------------|-------------------|
| Coal | \$1.08 | 20 | \$0.05 |
| Petro/NG | \$2.35 | 44.1 | \$0.05 |
| Nuclear | \$1.66 | 8.2 | \$0.20 |
| Solar | \$5.30 | 0.305 | \$17.38 |
| Wind | \$5.90 | 1.6 | \$3.69 |

Source: Forbes; December 2015 (Lynch)

Energy Transparency Fact #3:

Indirect Cost of Renewables – TRANSMISSION:

Case Study: Texas CREZ has doubled the transmission component of rates.



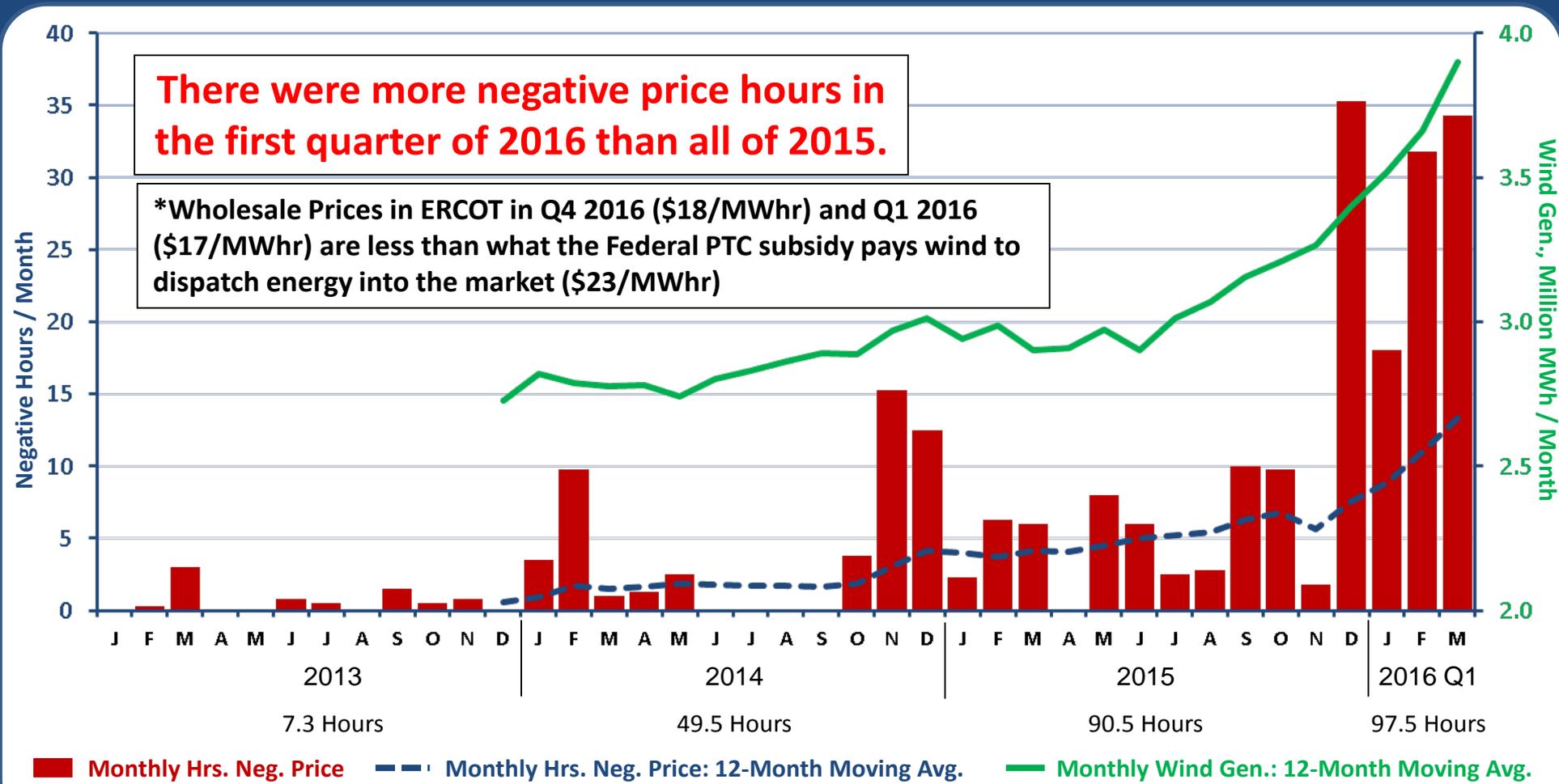
* Oncor and CenterPoint are Texas' two largest electric delivery companies (83% of Texas load).

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.

Energy Transparency Fact #3 (cont.): Case Study –TX: Wind subsidies are distorting markets & eroding base load.

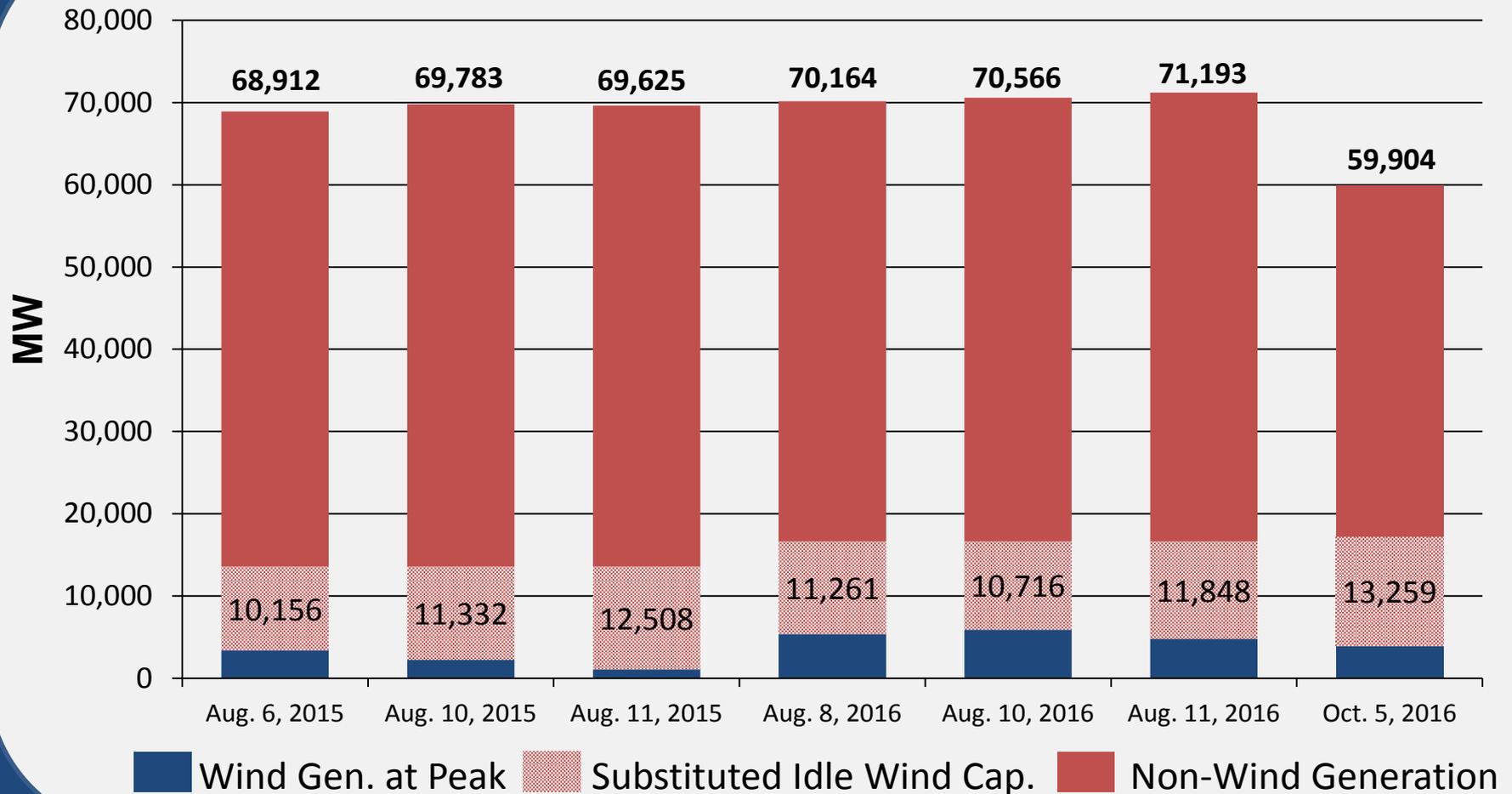
Study –TX: Wind subsidies are distorting markets & eroding base load.



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

Energy Transparency Fact #3 (cont...): To preserve reliability, markets are forced to “balance” renewable energy without cost to renewables and at great cost to other market participants.



Document Content(s)

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