Rep30

From: Bill Siderewicz <bills@perpower.com>
Sent: Saturday, March 18, 2017 6:16 PM
To: Rep30
Subject: My Response to FE's Sr VP

Dear Bill,

Just to let you know that we will not be "bullied" by First Energy or any other party who can't be truthful or capable of presenting true facts.

There is too much at risk for all citizens in Ohio, particularly the ones who don't have the financial resources to lobby the hallways of the Legislature and fend off the "Bailout Kings" . . . .the traditional "little guy" . .the residential customer is the at risk party here. My late parents, who happen to also be "blue collar" types like much of northern Ohioans, remind me of how the average citizen can be steam rolled by the likes of Ohio's electric utilities, when they collectively have no facts to work from.

The Ohio poll data speak LOUD and CLEAR of what the public thinks about utility BAILOUTS. . . . just like AEP says of the NUKE Bailouts . . . .. NO THANK YOU !!

Best regards,

Bill S.

From: Bill Siderewicz
Sent: Saturday, March 18, 2017 5:41 PM
To: Borchers, Dylan; Slagle, Christopher; Tunnell, Kurtis
Cc: 'Arno Hill'; MBeazley@ci.oregon.oh.us; Stewart, Jackie
Subject: My Response to FE's Sr VP

From: Bill Siderewicz
Sent: Saturday, March 18, 2017 5:29 PM
To: Dowling, Michael J.
Subject: AEP's CEO Runs Away from FirstE's ZEC (nuke) Bailout

Dear Mike,

Any information we present to the Legislature is supported by facts and if we had to present the same in any legal setting including cross examination our information would withstand any test !!

Conversely, to date First Energy has yet to provide one element of fact or basis for any critical information needed for decision making !! To date just utility "hand waving".

If you have any ligitimate facts, everyone would certainly like to see them.

You may recall that on Thursday you said W Lorain Peaker
is not gas fired and of less value in a sale. **Of course the facts are quite the opposite**. Seems kind of clear to those outside FE that simple facts are not known within FE's own four walls.

Bill S.

From: Dowling, Michael J. <dowlingm@firstenergycorp.com>
Sent: Saturday, March 18, 2017 2:08:07 PM
To: Bill Siderewicz
Subject: Fwd: *EXTERNAL* FW: AEP's CEO Runs Away from FirstE's ZEC (nuke) Bailout

Bill - I was disappointed to see your description of our proposed ZEN legislation. It goes without saying that I disagree with your descriptions. A lot of what you're communicating is not factual and is exaggerated (at best) rhetoric that I've come to expect in the work we do in various state capitals.

Michael J. Dowling
Senior VP, External Affairs
FirstEnergy
330-384-5761 office
330-283-1180 mobile

Begin forwarded message:

> **From:** "Pine, Ty" <tpine@firstenergycorp.com>
> **To:** "Dowling, Michael J." <dowlingm@firstenergycorp.com>, "Bailey, Joel D." <baileyj@firstenergycorp.com>, "Mendenhall, Kelley E" <mendenhallk@firstenergycorp.com>
> **Subject: FW: *EXTERNAL* FW: AEP's CEO Runs Away from FirstE's ZEC (nuke) Bailout**
>
> Please feel free to share with others.
>
> ---
>
> **From:** Rep30@ohiohouse.gov [mailto:Rep30@ohiohouse.gov]
> **Sent:** Wednesday, March 15, 2017 11:44 AM
> **To:** Pine, Ty <tpine@firstenergycorp.com>
> **Subject:** *EXTERNAL* FW: AEP's CEO Runs Away from FirstE's ZEC (nuke) Bailout
>
> FYI
>
> ---
>
> **From:** Bill Siderewicz [mailto:bills@perpower.com]
> **Sent:** Monday, March 13, 2017 1:17 PM
> **To:** Rep30 <Rep30@ohiohouse.gov>
> **Cc:** Rep50@ohiohouse.com; Rep97@ohiohouse.com; Smith, Ryan <Ryan.Smith@ohiohouse.gov>; Rob McColley_CLE <rmccolley@gmail.com>; Haavisto, Elizabeth <Elizabeth.Haavisto@ohiohouse.gov>; Klaber, Gretchen <Gretchen.Klaber@ohiohouse.gov>; Rep93 <Rep93@ohiohouse.gov>; Rep81 <Rep81@ohiohouse.gov>; Snider, Grace <Grace.Snider@ohiohouse.gov>; Osborne, Markee <Markee.Osborne@ohiohouse.gov>; JTimken@ohioGOP.org
> **Subject:** AEP's CEO Runs Away from FirstE's ZEC (nuke) Bailout

Good Afternoon Bill,

From the attached article (attachment : AEP) AEP's CEO explains that he wants no part of First Energy's nuclear Bailout if any bailout payment obligations are in AEP's territory !! Why you ask . . . . . because it's bad policy and burdensome economic news. He doesn't want his customers stuck with an economic "ball and chain" around their ankles, **in perpetuity**. If DP&L were asked the same question, the same response would result.

For this very reason every Legislator in Columbus should also be running in the opposite direction of First Energy's ZEC Bailout Plan, just like AEP has done !!!!

Not only is the suggested $ 300 million/year bailout an outlandish and arbitrary bailout request, but First Energy has stated on their recent analyst call that . . .First Energy will either **close** (de-commission) or **sell** the 2 nuclear plants **in 2018**. (attachment : FE Dumping Nukes in '18) With this latest news the request for a nuclear Bailout is even more ridiculous.. . .and should be summarily rejected. With these facts now known, northern Ohioans are being asked to now bailout **three parties** (instead of two) while getting no benefits and putting the northern portion of Ohio at a competitive disadvantage to the remainder of the State :

Bailout beneficiaries are now : (1) senior management of First Energy
(2) Wall St. (FE's stock and bond holders)
(3) the new Buyer (in '18) of FE's two nukes

If there were actual State-wide benefits due to fewer emissions or fuel diversity, AEP and DP&L would embrace such a ZEC plan .. . . .but there aren't such benefits and both remaining utilities are properly treating FE's ZEC Bailout like an economic plague, which is exactly what it is. These 2 nukes are notorious for their poor safety records (attached : Safety). Also, with nuclear waste now being stock piled at each site, which Legislator would honestly recommend that their children or grandchildren live in a home across the street from either facility ??

Violation of Free Market Choice : In addition to ZEC being an economic millstone around everyone's neck in northern Ohio, it is also a blatant violation of a person's/company's right to access and use a free and open electricity generation/purchase market. By implementing ZEC, such a law change would be violating the very premise imbedded in "**Customer Choice**" and free market purchasing policy. In today's open competitive electricity market, "**Customer Choice**" can provide residents with an electricity generation purchase cost of 4.0 to 4.1 cents/kwh. Of course T+D costs are additive to this amount. A $ 300,000,000 /year ZEC Bailout when spread across all kWh sales in FE 's territory (53 million MWh/yr) will add a cost of at least 0.56 cents/kwh, or a near 15 % increase in the market based generation cost for residential electricity. Since commercial and industrial baseline electricity prices are far lower than residential (cent/kwh) rates, the same ZEC adder will increase non-residential power rates by even higher %'s. Such a ridiculous increase will no doubt be met with severe objection by organizations like OMA.

When a new law like ZEC violates one's rights to benefit from a free and open-electricity market (that only applies to 1/3 of Ohio, no less) by creating an involuntary electricity price adder, how does this action not open a door for endless litigation, the day after any such ZEC becomes law ?

Fatal Flaw in FirstE Logic : It should also be mentioned that the very premise for justification of a ZEC payment is **fatally flawed** !!!! FE incorrectly assumes that a REC (renewable energy credit) is the same as a ZEC (zero emission credit). REC payments have been made in the past because wind and solar have no air emissions, nor any other measurable environmental impacts. Anyone who knows nuke, wind and solar impacts knows that **nukes are not** in any way shape or form the same as wind and solar and therefore do not earn a similar credit payment.

	Nuclear ZEC	**is not** =	to RECs (wind/solar)
Emissions :	No reactor emissions **but**, SOx, NOx, TSP stack **emissions** exist from back up **diesel**-fired boiler to make power		No emissions
Water :	Nukes use 300% more water that same sized gas-fired plants		No water use
Solid Waste :	On-site storage of nuclear waste		No solid waste

From the comparative table above it's obvious why nuclear is NOT in the same environmental category as wind/solar and thus does not warrant an environmental credit payment, as might apply for solar/wind.

The electorate that the Legislature represents have spoken LOUD and CLEAR via poll data (attachment : Polls) about utility Bailouts . . . . and thus want no part of ZEC by over 5:1 !!!

Are there solutions for First Energy . . .**w/o the need** for a ratepayer **bailout** . . . . YES !!!

1. **Sell the Nukes** : Since the two Ohio plants are underwater by $ 400 mm ($ 1.3 B in debt v. $ 900 mm market value) , they can't be sold as is. Instead FE should bundle : the 2 nukes, the Blue Creek wind project , W. Loraine gas peaker and maybe Sammis 5-7 Coal . . . . and sell all plants. The non-nukes might be enough to attract a legitimate bidder, like Exelon, Dominion, Southern Co., Entergy, et al. AEP just used this technique (bundle gas with coal) to sell the un-economical 2,600 MW Gavin Coal plant in SE Ohio.

2. **Decommission the Nukes** : There are $ 100's of millions of NRC -required funds set into trust to decommission these nukes (attachment : Funds). If the units can't be sold, then now is the time to decommission both un-economical plants. This shut down will take multiple years to complete. In doing so, it will also provide years of funds for employment and local community payments, while everyone re-adjusts to the nukes not being operational.

The factual information surrounding the ZEC Bailout is overwhelming in favor of **complete and outright rejection**, of such an "ask". As pointed out in the March 9 th article (attached : AEP) **you correctly state** that . . ." the extra costs would be borne by consumers and could affect market revenues for gas generators". As a non-utility gas-fired generator we agree with you 100% ; not only could such a ZEC impact the free market, but it WILL NEGATIVELY IMPACT the open Ohio electricity market. Subsidizing 2,170 MW of nuke generation will send a false pricing signal into an otherwise balanced and free PJM marketplace for electricity. Such an action will wrongfully distort both the PJM annual capacity price market and the daily day-ahead energy market. . . . and their prices. Creating turmoil in Ohio's free market system for electricity via ZEC also has a 2nd negative impact . . .. it keeps 2 large-scale gas-fired projects from being built in Ohio (and each new gas projects adds $ 14 Billion of new economic activity to Ohio). This market turmoil effect from ZEC is also documented by PJM via the attached article by PJM's Independent Market Monitor (IMM). .. . (attached : IMM).

We appreciate the opportunity to express the private sector, non-utility entity view on current day electric utility matters. If we can provide any other data/facts that you believe might be helpful, please let us know. We're here to serve you and the electricity consumers of all of Ohio.

Sincerely,

Bill S.

William Siderewicz, P.E.
President
Clean Energy Future, LLC

Rep30

From: Bill Siderewicz <bills@perpower.com>
Sent: Sunday, March 19, 2017 9:21 AM
To: Rep30
Cc: Arno Hill
Subject: First E. : Bundle Nukes + W. Lorain, to Sell all 3 assets
Attachments: Q's for FirstE.pdf; W. Lorain Peaker.pdf

Good Morning Bill,

Just to put the issue of knowing the **FACTS** in perspective (noted in my e-mail to you Sat. 6:16 PM), I have included below what I sent to FE yesterday morning.

The appropriate analogy here is, a reporter asks you . . " Mr. Seitz, do you know if your car is fueled by diesel or gasoline ?" It's safe to say most people can answer this question correctly.

When Mayor Hill and me met with Sr. VP Mike Dowling on Thurs. 3/16, who speaks for FE and manages ALL LOBBYISTS including **Ty Pine.** I purposely asked him **" What is the fuel for the W. Lorain Peaker power plant, near Cleveland ?"** He explicitly said " We have no gas there, it's fired on oil, therefore has little or no value in a "bundled" sale of assets including 2 nukes." Mayor Hill can witness the same !!!!

At the time, I took him for his word and did not pursue that line of questioning. The next day I looked of the **facts**, and found them to be 100% opposite what Mike said. I can only conclude two things here :

(a) a Sr. VP in FE truly has no idea what fuel is used in a major power plant and that is posted on FE's web site ? and/or

(b) he has no desire to speak truthfully about common known **facts**, that can lead to helpful problem solving or dilutes a primary

Chuck Jones objective to obtain a $ 300 mm/yr customer BAILOUT

You can draw your own conclusions. But now, at least you have the **truthful** background !!

Best regards,

Bill S.

From: Bill Siderewicz
Sent: Saturday, March 18, 2017 9:38 AM
To: 'DowlingM@firstenergycorp.com' <DowlingM@firstenergycorp.com>
Cc: 'Arno Hill' <arnoahill@aol.com>; 'MikkelsenE@firstenergycorp.com' <MikkelsenE@firstenergycorp.com>; 'KellyP@firtsenergy.com' <KellyP@firtsenergy.com>; 'BaileyJ@firstenergy.com' <BaileyJ@firstenergy.com>
Subject: Bundle Nukes + W. Lorain, to Sell all 3 assets

Mike,

When we met on Thurs. afternoon, I asked Q No. 12 (attached) . ..there is a $ 400 mm gap between market value and debt, for the 2 nukes. I asked. . ." is it possible for the W. Loraine Peaker to be bundled with the 2 nukes because a 545 MW Peaker could possibly fetch $400 mm ($ 735/kw) in a market where CCGT are at $ 1,150/kw." The peaker could remain stand alone or be converted to CCGT by the new buyer. In this way FE is relieved of all 3 units : Davis-B, Perry and W Lorain. .. .via a sale.

In my opening comments I mentioned that we built CCGT in Lordstown and not along Lake Erie because gas piping is either not available or too small in carrying capacity.

When you answered Q No. 12, you said that bundling W Lorain with the 2 nukes would not make sense because there is **NO GAS at W. Lorain** (just as CEF has observed) and that the peaking unit **gas turbines actually RUN ON OIL** !!! This being the case the W Lorain Peakers may not be worth much, so the idea of "bundling" may not make sense using W. Lorain.

I have attached "W Lorain Peaker" from the FirstE web site. Of course the information mentioned on the web site is **100 % OPPOSITE** of what you described. In fact there is a 30" dia. gas lateral to the peakers !!!

I can check the on-line OhioEPA web site, if you like, for the peaker's air permit, which will describe the fuel used.

It seems that either someone might want to change the web site if it's incorrect ? Or, if Chuck Jones also believes W Lorain is oil-only he may be overlooking an asset sale opportunity that can be a magnet for selling BOTH D-B and Perry !

Best regards,

Bill S.

From: Bill Siderewicz
Sent: Tuesday, March 14, 2017 6:48 AM
To: 'DowlingM@firstenergycorp.com' <DowlingM@firstenergycorp.com>
Cc: 'KHousley@firstenergycorp.com' <KHousley@firstenergycorp.com>; 'Arno Hill' <arnoahill@aol.com>
Subject: Q's for Visit on Thurs.

Mike,

We're likely to get blasted with 14-20 in. of new snow this am, so I wanted to get the attached Q's out to you early, for Thurs.' meeting at FE.

No one can dispute the fact that when D-B and Perry are making nuclear-based electricity that no CO2 is being produced. In this day when "climate change" is a topic of discussion, I can certainly see the nuke benefit. I am hopeful that with a little education from FE, we'll be on the same page regarding your plan. We look forward to our getting together !!

Best regards,

Bill S.

From: Bill Siderewicz
Sent: Monday, March 13, 2017 5:32 PM
To: 'DowlingM@firstenergycorp.com' <DowlingM@firstenergycorp.com>
Cc: 'KHousley@firstenergycorp.com' <KHousley@firstenergycorp.com>; Arno Hill <arnoahill@aol.com>
Subject: Visit Thurs.

Dear Mike,

I know that Mayor Hill enjoyed having you in Lordstown last week . . . . for a very informative visit.

We certainly look forward to a get together at FE this week. We would like to be supporters of what FE is proposing in the electricity space, but because of so few details available, we could use some help with answers to specific questions that can enlighten us of the FE merits.

I'll send over such a list on Tues. am.

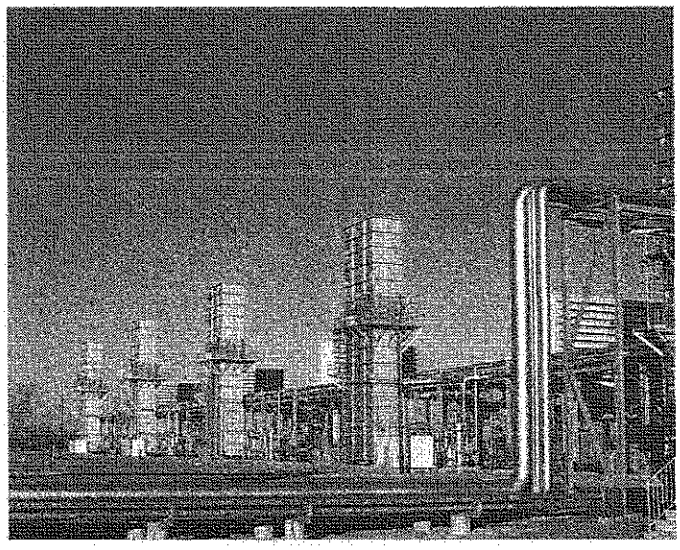
Thank you in advance for your generosity and hospitality in hosting a Thurs. mtg. in Akron.

Best regards,

Bill S.

William Siderewicz
Clean Energy Future, LLC

West Lorain Plant



The West Lorain Plant is located on more than 500 acres in Lorain, Ohio.

Facts At A Glance

West Lorain has the capacity to generate 545 megawatts (MW) of electricity, enough to power more than 400,000 homes.

- Employs eight people
- Plant pays more than $3 million in property taxes

Environmental Measures

In 2001, five 85-MW combustion turbine units were installed, increasing the plant's output by 425 MW. These new units can be fired by oil or natural gas.

The new units are equipped with low-NOx burners and other systems to reduce NOx emissions.

All power produced for customers at West Lorain in 2008 was generated with natural gas.

Natural gas arrives at the plant via a 10-mile-long, 30-inch-wide pipeline.

The plant burned nearly 240 million cubic feet of natural gas in 2008.

Rep30

From: Bill Siderewicz <bills@perpower.com>
Sent: Monday, March 20, 2017 8:29 AM
To: Rep30
Cc: Arno Hill; Rep97@ohiohouse.com; Rep50@ohiohouse.com; Smith, Ryan; Rob McColley_CLE; Haavisto, Elizabeth; Klaber, Gretchen; Rep93; Rep81; Snider, Grace; Osborne, Markee; Jane Timken
Subject: Rational First Energy Nuclear Plant Solutions
Attachments: FE Value.pdf

Dear Bill,

In case First Energy ever wanted to consider serious solutions to troubled nuclear plants, there are many solutions. . . . that **don't** require BAILOUTS by the public.

Bill S.

From: Bill Siderewicz
Sent: Monday, March 20, 2017 8:19 AM
To: 'DowlingM@firstenergycorp.com' <DowlingM@firstenergycorp.com>
Subject: Rational First Energy Nuclear Plant Solutions

Dear Mike,

To the extent FirstE might consider an external view, there seems to be some realistic options here for FE :

Option 1 : "Bundle" and Sell : AEP could NOT possibly sell Gavin Coal (2,600 MW) as a stand alone asset, when the plant's power production costs are nearly 100% higher than costs of a modern gas-fired power plant. So, AEP "bundled" other positive value generation assets with Gavin and successfully sold the "bundle" to ArcLight Capital (Boston) and Blackstone(NYC).

Now that you know that the W. Lorain peaker plant has gas firing capability (not just oil) it has value as a peaker, or could possibly be upgraded to combined cycle by a new owner. As long as your 100 MW wind PPA is "in the money" someone will pay FE for your wind PPA. Maybe Sammis 5-7 coal units can be tossed into the mix, if they are cash positive ?

Based on recent news articles, the 2 nukes have a FMV of $ 900 mm and debt of $ 1.3 Billion. A skilled financial advisor can quickly tell you if the W. Lorain Peaker, wind PPA and 2 nukes will yield a positive Purchase Price, if sold as a package deal. Companies like : Exelon, Dominion, Southern Co. and Entergy can/would certainly buy/run nukes. Under this plan, current jobs and local business activity would stay in place.

Option 2 : Chap 11 Process : The attached chart (attachment : FE Value) shows how current FE paper is now worth about 40 cents on the $ 1.00. It would seem that with an organized Chapter 11 process, the debt on the nukes would be "written down" to some practical level such that capacity, energy and ancillary service revenues from PJM to FE would offset all nuke costs . . .. and the plants would simply keep running as is.

As part of this process, maybe the local community pitches in as well and supports a reduction in : property, local salary and/or local income taxes. After all, they are now benefiting on all **THREE financial fronts**, via the nuke plants. This scenario, of Chap. 11 is better for them than plant shut downs !!

Option 3 : De-Commissioning : The Federal NRC has guided FE into setting aside multiple $ 100's of millions knowing that de-commissioning is a natural reality for nuke plants. Given that there is nearly $ 1 Billion is in the bank now .. . a choice to start de-commissioning in 2017/18 is not out of bounds. This process is a multi-year project that will result in local employment and tax payments for years to come, as everyone re-adjusts to the new reality of de-commissioning.

By now, you have no doubt have seen the voters' poll data that **NO ONE is in favor** of utility BAILOUTS, like FE's $ 6 + Billion ZEC/ZEN plan .. . just as AEP's CEO (Nick Akins) wants no part of such a payment obligation to FE, paid by his ratepayers !!! When true and total negative consequences of nuclear power are compared to benign wind/solar, even a 5 th grader can see that (renewable energy credits) REC's **do not** = ZEC/ZEN . . .making the very ZEC/ZEN premise fatally flawed !! It is clear to everyone that there is no free-willed SUPPORTER of such a FirstE "ask". The **only** supporters are those receiving the funds (FE, host communities and union operators).

The only possible support here might be a party who has/is obtained some of FE's $ millions/year in political contributions (that are documented in the public record- and that we monitor continually). The ZEN/ZEC "ask" is so outrageous that if I were a Legislator it would be personally insulted to even consider such an ask" , let alone sponsor and/or support such a FE proposal. I would instead feel quite an obligation to those people in Ohio who elected me to office and have spoken up so clearly, and I would feel that their : (i) financial interests, (ii) rights to "Customer Choice" w/o a FE financial over-burden and (iii) expressed desires far outweigh correcting corp. mis-steps.

If FE were truly interested in having a positive image in Ohio, vs. the equivalent of a "handout" or "welfare" image, that serious consideration be given to the 3 Options noted above. It goes without saying, Options 1-3 do not place undue and un-wanted financial burden on FE's ratepayers nor Ohio's fragile economy (as does ZEC/ZEN).

Sincerely,

Bill S.

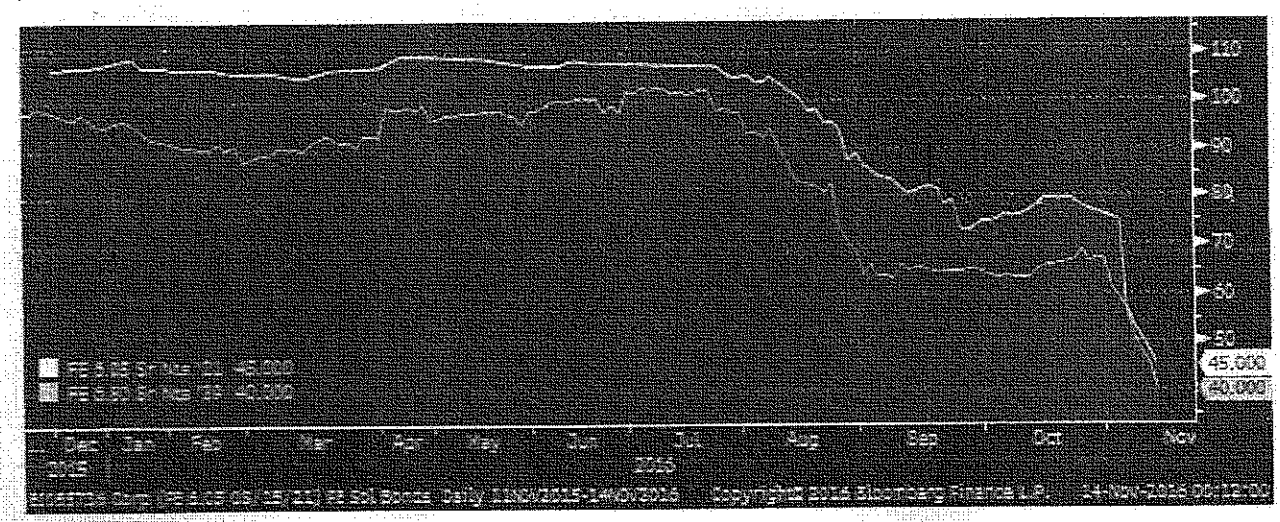
William Siderewicz, P.E.
President
Clean Energy Future, LLC

FirstEnergy Solutions Debt - Swan Dive Or Bungee Jump...?

Nov.14.16 | About: FirstEnergy Corp (FE)

Summary

- FirstEnergy Corp announced plans to exit its merchant power business within 12-18 months.
- Sale, closure, and bankruptcy are all possible exit paths.
- Merchant power-related unsecured notes plunged into the mid 40s after the exit announcement.
- Certain FirstEnergy Solutions notes are worth consideration at their repriced levels.



Source : Bruder Capital, LLC (New York, NY)

Rep30

From: Rep30
Sent: Tuesday, March 21, 2017 7:51 AM
To: Rep89
Cc: Bizjak, Joe
Subject: FW: Meeting w/ First E. in Akron
Attachments: First E..pdf; Chamber.pdf; Q's for FirstE.pdf; ZEC.pdf

The gas plant financiers continue to whack away at the ZEN plan with ever-increasingly inflammatory rhetoric, see enclosed.

From: Bill Siderewicz [mailto:bills@perpower.com]
Sent: Friday, March 17, 2017 10:06 AM
To: Rep30 <Rep30@ohiohouse.gov>
Cc: Arno Hill <arnoahill@aol.com>; Rep50@ohiohouse.com; Rep97@ohiohouse.com; Smith, Ryan <Ryan.Smith@ohiohouse.gov>; Rob McColley_CLE <rmccolley@gmail.com>; Haavisto, Elizabeth <Elizabeth.Haavisto@ohiohouse.gov>; Klaber, Gretchen <Gretchen.Klaber@ohiohouse.gov>; Rep93 <Rep93@ohiohouse.gov>; Rep81 <Rep81@ohiohouse.gov>; Snider, Grace <Grace.Snider@ohiohouse.gov>; Osborne, Markee <Markee.Osborne@ohiohouse.gov>; Jane Timken <jtimken@ohiogop.org>
Subject: Meeting w/ First E. in Akron

Dear Bill,

Mayor Hill (Lordstown, OH) and me meet with First E. (attached : First E.) from 3-5 pm on March 16 th, following the Youngstown Annual Chamber Meeting (attached : Chamber).. . . to celebrate the positive results that occur when the free-market, private sector and local communities work together for a common good . . .$ 1. 8 Billion of new gas-fired investment in the greater Youngstown "Valley".

Yesterday's First E mtg. is a result of a mid-Dec. '16 letter from Mayor Hill to Chuck Jones and a mid-Jan letter from C. Jones to the Mayor. Following a recent power plant visit in Lordstown, by FE, it was decided that a "discussion on related topics (ZEC)" might be helpful.

On Tues. March 14 th (6:48 AM) a list of 22 questions (attached : Q's for FirstE) were e-mailed to M. Dowling in anticipation of a meeting 3 days later. The expectation was that with enough advance time, thoughtful responses would add to facts surrounding the discussion of ZEC.

We'd like to share with you and you colleagues what we learned :

1. **NO written Responses** : One would think that a simple way to add facts to the debate would be to provide a written response to the assoc. Q's. We were quite surprise that First E did not offer a single written word.

2. **NO Verbal Response Initiative** : As the host of the 2 hr meeting, one would have thought that FE would simply walk through the agenda of questions and provide a verbal response to each question ? That did not happen.

3. **"Pulling Teeth"** : After listening to an overview of how FE will pursue ZEC and AEP will separately pursue guaranteed rate-of-return change in law for "Ohio Renewables" construction, it was clear that FE was offering nothing to the ZEC debate. After 15 min. we could have simply got up and left, and FE would not have offered more than a glass of water. A meaningful, thoughtful and helpful discussion on ZEC can't possibly happen without FACTS, which to date FE has yet to offer. Rather that walk away, we were the ones who created the dialogue and asked FE to answer each of the questions one by one. This was the equivalent to "pulling teeth

" !!! They did not have anyone with nuclear expertise in attendance so most of the nuclear Q's were unanswered. However, we were able to gain some useful insight from this process. I will prepare a written summary of the answers we did hear, and provide them to you.

It was painfully obvious to me (having been in the non-utility power gen business for 37 yr.) that FE's knowledge level on gas and gas-fired generation is at a de minimis level. On top of that, their 100 MW wind project and W. Loraine projects cannot be bundled with the 2 "under water" nukes in an effort to attract a Buyer via a sale . . .as was the case when AEP recently sold the low-value Gavin coal plant by throwing in assets (gas plants) with at least some value. With no assets to add to the mix, no Buyer will buy nukes with negative cash flow. Without a Customer Bailout (via ZEC) the next best option appears to be Chap. 11 for FE Solutions. . .. . the debt is written down to a correct new level, and then the operations continue. Short of this, it is de-commissioning time for both units. . . . continued local employment for at least 5 + years.

With no real facts to offer on ZEC, it is quite clear that ZEC "is what it is" a pure un-adulterated BAILOUT (as a substitute for Chap.11 or de-commissioning). The simplest way for anyone to think about ZEC is summarized in a simple 1-page explanation (attached : ZEC). How an outside investor group or Board of Directors has not taken corrective action with FE, as of now, is beyond words.

Best regards,

Bill S.

William Siderewicz, P.E.
President
Clean Energy Future, LLC

Rep30

From: Rep30
Sent: Tuesday, March 21, 2017 7:52 AM
To: Lehman, Ryan
Subject: FW: Meeting w/ First E. in Akron
Attachments: First E..pdf; Chamber.pdf; Q's for FirstE.pdf; ZEC.pdf

The gas plant financiers continue to whack away at the ZEN plan with ever-increasingly inflammatory rhetoric, see enclosed.

From: Bill Siderewicz [mailto:bills@perpower.com]
Sent: Friday, March 17, 2017 10:06 AM
To: Rep30 <Rep30@ohiohouse.gov>
Cc: Arno Hill <arnoahill@aol.com>; Rep50@ohiohouse.com; Rep97@ohiohouse.com; Smith, Ryan <Ryan.Smith@ohiohouse.gov>; Rob McColley_CLE <rmccolley@gmail.com>; Haavisto, Elizabeth <Elizabeth.Haavisto@ohiohouse.gov>; Klaber, Gretchen <Gretchen.Klaber@ohiohouse.gov>; Rep93 <Rep93@ohiohouse.gov>; Rep81 <Rep81@ohiohouse.gov>; Snider, Grace <Grace.Snider@ohiohouse.gov>; Osborne, Markee <Markee.Osborne@ohiohouse.gov>; Jane Timken <jtimken@ohiogop.org>
Subject: Meeting w/ First E. in Akron

Dear Bill,

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Best regards,

Bill S.

William Siderewicz, P.E.
President
Clean Energy Future, LLC

Rep30

From: Rep30
Sent: Tuesday, March 21, 2017 7:52 AM
To: 'Ty Pine (tpine@firstenergycorp.com)'
Subject: FW: Meeting w/ First E. in Akron
Attachments: First E..pdf; Chamber.pdf; Q's for FirstE.pdf; ZEC.pdf

The gas plant financiers continue to whack away at the ZEN plan with ever-increasingly inflammatory rhetoric, see enclosed.

From: Bill Siderewicz [mailto:bills@perpower.com]
Sent: Friday, March 17, 2017 10:06 AM
To: Rep30 <Rep30@ohiohouse.gov>
Cc: Arno Hill <arnoahill@aol.com>; Rep50@ohiohouse.com; Rep97@ohiohouse.com; Smith, Ryan <Ryan.Smith@ohiohouse.gov>; Rob McColley_CLE <rmccolley@gmail.com>; Haavisto, Elizabeth <Elizabeth.Haavisto@ohiohouse.gov>; Klaber, Gretchen <Gretchen.Klaber@ohiohouse.gov>; Rep93 <Rep93@ohiohouse.gov>; Rep81 <Rep81@ohiohouse.gov>; Snider, Grace <Grace.Snider@ohiohouse.gov>; Osborne, Markee <Markee.Osborne@ohiohouse.gov>; Jane Timken <jtimken@ohiogop.org>
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Rep30

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To: Rep72
Cc: Gray, Bryan
Subject: FW: Meeting w/ First E. in Akron
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Rep30

From: Rep30
Sent: Tuesday, March 21, 2017 8:53 AM
To: 'Ty Pine (tpine@firstenergycorp.com)'
Subject: FW: First E. : Bundle Nukes + W. Lorain, to Sell all 3 assets
Attachments: Q's for FirstE.pdf; W. Lorain Peaker.pdf

FYI

From: Bill Siderewicz [mailto:bills@perpower.com]
Sent: Sunday, March 19, 2017 9:21 AM
To: Rep30 <Rep30@ohiohouse.gov>
Cc: Arno Hill <arnoahill@aol.com>
Subject: First E. : Bundle Nukes + W. Lorain, to Sell all 3 assets

Good Morning Bill,

Just to put the issue of knowing the **FACTS** in perspective (noted in my e-mail to you Sat. 6:16 PM), I have included below what I sent to FE yesterday morning.

The appropriate analogy here is, a reporter asks you . . " Mr. Seitz, do you know if your car is fueled by diesel or gasoline ?" It's safe to say most people can answer this question correctly.

When Mayor Hill and me met with Sr. VP Mike Dowling on Thurs. 3/16, who speaks for FE and manages ALL LOBBYISTS including **Ty Pine.** I purposely asked him **" What is the fuel for the W. Lorain Peaker power plant, near Cleveland ?"** He explicitly said " We have no gas there, it's fired on oil, therefore has little or no value in a "bundled" sale of assets including 2 nukes." Mayor Hill can witness the same !!!!

At the time, I took him for his word and did not pursue that line of questioning. The next day I looked of the **facts**, and found them to be 100% opposite what Mike said. I can only conclude two things here :

(a) a Sr. VP in FE truly has no idea what fuel is used in a major power plant and that is posted on FE's web site ? and/or

(b) he has no desire to speak truthfully about common known **facts**, that can lead to helpful problem solving or dilutes a primary

Chuck Jones objective to obtain a $ 300 mm/yr customer BAILOUT

You can draw your own conclusions. But now, at least you have the **truthful** background !!

Best regards,

Bill S.

From: Bill Siderewicz
Sent: Saturday, March 18, 2017 9:38 AM
To: 'DowlingM@firstenergycorp.com' <DowlingM@firstenergycorp.com>
Cc: 'Arno Hill' <arnoahill@aol.com>; 'MikkelsenE@firstenergycorp.com' <MikkelsenE@firstenergycorp.com>; 'KellyP@firtsenergy.com' <KellyP@firtsenergy.com>; 'BaileyJ@firstenergy.com' <BaileyJ@firstenergy.com>
Subject: Bundle Nukes + W. Lorain, to Sell all 3 assets

Mike,

When we met on Thurs. afternoon, I asked Q No. 12 (attached) . ..there is a $ 400 mm gap between market value and debt, for the 2 nukes. I asked. . ." is it possible for the W. Loraine Peaker to be bundled with the 2 nukes because a 545 MW Peaker could possibly fetch $400 mm ($ 735/kw) in a market where CCGT are at $ 1,150/kw." The peaker could remain stand alone or be converted to CCGT by the new buyer. In this way FE is relieved of all 3 units : Davis-B, Perry and W Lorain. .. .via a sale.

In my opening comments I mentioned that we built CCGT in Lordstown and not along Lake Erie because gas piping is either not available or too small in carrying capacity.

When you answered Q No. 12, you said that bundling W Lorain with the 2 nukes would not make sense because there is **NO GAS at W. Lorain** (just as CEF has observed) and that the peaking unit **gas turbines actually RUN ON OIL** !!! This being the case the W Lorain Peakers may not be worth much, so the idea of "bundling" may not make sense using W. Lorain.

I have attached "W Lorain Peaker" from the FirstE web site. Of course the information mentioned on the web site is **100 % OPPOSITE** of what you described. In fact there is a 30" dia. gas lateral to the peakers !!!

I can check the on-line OhioEPA web site, if you like, for the peaker's air permit, which will describe the fuel used.

It seems that either someone might want to change the web site if it's incorrect ? Or, if Chuck Jones also believes W Lorain is oil-only he may be overlooking an asset sale opportunity that can be a magnet for selling BOTH D-B and Perry !

Best regards,

Bill S.

From: Bill Siderewicz
Sent: Tuesday, March 14, 2017 6:48 AM
To: 'DowlingM@firstenergycorp.com' <DowlingM@firstenergycorp.com>
Cc: 'KHousley@firstenergycorp.com' <KHousley@firstenergycorp.com>; 'Arno Hill' <arnoahill@aol.com>
Subject: Q's for Visit on Thurs.

Mike,

We're likely to get blasted with 14-20 in. of new snow this am, so I wanted to get the attached Q's out to you early, for Thurs.' meeting at FE.

No one can dispute the fact that when D-B and Perry are making nuclear-based electricity that no CO2 is being produced. In this day when "climate change" is a topic of discussion, I can certainly see the nuke benefit. I am hopeful that with a little education from FE, we'll be on the same page regarding your plan. We look forward to our getting together !!

Best regards,

Bill S.

From: Bill Siderewicz
Sent: Monday, March 13, 2017 5:32 PM
To: 'DowlingM@firstenergycorp.com' <DowlingM@firstenergycorp.com>

Cc: 'KHousley@firstenergycorp.com' <KHousley@firstenergycorp.com>; Arno Hill <arnoahill@aol.com>
Subject: Visit Thurs.

Dear Mike,

I know that Mayor Hill enjoyed having you in Lordstown last week . . . . for a very informative visit.

We certainly look forward to a get together at FE this week. We would like to be supporters of what FE is proposing in the electricity space, but because of so few details available, we could use some help with answers to specific questions that can enlighten us of the FE merits.

I'll send over such a list on Tues. am.

Thank you in advance for your generosity and hospitality in hosting a Thurs. mtg. in Akron.

Best regards,

Bill S.

William Siderewicz
Clean Energy Future, LLC

Rep30

From: Lehman, Ryan
Sent: Tuesday, March 21, 2017 10:14 AM
To: Rep30
Subject: RE: Meeting w/ First E. in Akron

Yeah – I agree this is a bit petty. I probably wouldn't answer those questions either if were FE.

Ryan J. Lehman
Majority Policy Advisor
Office of Speaker Clifford A. Rosenberger
Ohio House of Representatives
ryan.lehman@ohiohouse.gov
(614) 466-6505

From: Rep30
Sent: Tuesday, March 21, 2017 7:52 AM
To: Lehman, Ryan <Ryan.Lehman@ohiohouse.gov>
Subject: FW: Meeting w/ First E. in Akron

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Rep30

From: Rep30
Sent: Tuesday, March 21, 2017 11:20 AM
To: 'Ty Pine (tpine@firstenergycorp.com)'
Subject: ZEN
Attachments: I_132_0723-2.pdf

Please find attached the latest draft of the ZEN bill.

Reviewed As To Form By
Legislative Service Commission

I_132_0723-2

132nd General Assembly
Regular Session
2017-2018

. B. No.

A BILL

To amend section 4928.02 and to enact sections 4928.75, 4928.751, 4928.752, 4928.753, 4928.754, 4928.755, 4928.756, 4928.757, 4928.7511, 4928.7513, 4928.7514, 4928.7515, 4928.7520, 4928.7521, 4928.7522, 4928.7523, 4928.7524, 4928.7525, 4928.7526, 4928.7527, 4928.7530, 4928.7532, 4928.7533, 4928.7534, and 4928.7540 of the Revised Code regarding the zero-emissions nuclear resource program.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF OHIO:

Section 1. That section 4928.02 be amended and sections 4928.75, 4928.751, 4928.752, 4928.753, 4928.754, 4928.755, 4928.756, 4928.757, 4928.7511, 4928.7513, 4928.7514, 4928.7515, 4928.7520, 4928.7521, 4928.7522, 4928.7523, 4928.7524, 4928.7525, 4928.7526, 4928.7527, 4928.7530, 4928.7532, 4928.7533, 4928.7534, and 4928.7540 of the Revised Code be enacted to read as follows:

Sec. 4928.02. It is the policy of this state to do the

following throughout this state:

(A) Ensure the availability to consumers of adequate, reliable, safe, efficient, nondiscriminatory, and reasonably priced retail electric service;

(B) Ensure the availability of unbundled and comparable retail electric service that provides consumers with the supplier, price, terms, conditions, and quality options they elect to meet their respective needs;

(C) Ensure diversity of ~~electricity~~ the following:

(1) Electricity supplies and suppliers, by giving consumers effective choices over the selection of those supplies and suppliers and by encouraging the development of distributed and small generation facilities;

(2) Resources, including zero-emissions nuclear resources as defined in section 4928.75 of the Revised Code, that provide fuel diversity and environmental and other benefits.

(D) Encourage innovation and market access for cost-effective supply- and demand-side retail electric service including, but not limited to, demand-side management, time-differentiated pricing, waste energy recovery systems, smart grid programs, and implementation of advanced metering infrastructure;

(E) Encourage cost-effective and efficient access to information regarding the operation of the transmission and distribution systems of electric utilities in order to promote both effective customer choice of retail electric service and the development of performance standards and targets for service quality for all consumers, including annual achievement reports written in plain language;

(F) Ensure that an electric utility's transmission and distribution systems are available to a customer-generator or owner of distributed generation, so that the customer-generator or owner can market and deliver the electricity it produces;

(G) Recognize the continuing emergence of competitive electricity markets through the development and implementation of flexible regulatory treatment, while simultaneously recognizing the need for nuclear energy resources, as defined in section 4928.75 of the Revised Code, and resources that provide fuel diversity and environmental and other benefits;

(H) Ensure effective competition in the provision of retail electric service by avoiding anticompetitive subsidies flowing from a noncompetitive retail electric service to a competitive retail electric service or to a product or service other than retail electric service, and vice versa, including by prohibiting the recovery of any generation-related costs through distribution or transmission rates;

(I) Ensure retail electric service consumers protection against unreasonable sales practices, market deficiencies, and market power;

(J) Provide coherent, transparent means of giving appropriate incentives to technologies that can adapt successfully to potential environmental mandates;

(K) Encourage implementation of distributed generation across customer classes through regular review and updating of administrative rules governing critical issues such as, but not limited to, interconnection standards, standby charges, and net metering;

(L) Protect at-risk populations, including, but not

limited to, when considering the implementation of any new advanced energy or renewable energy resource;

(M) Encourage the education of small business owners in this state regarding the use of, and encourage the use of, energy efficiency programs and alternative energy resources in their businesses;

(N) Facilitate the state's effectiveness in the global economy.

In carrying out this policy, the commission shall consider rules as they apply to the costs of electric distribution infrastructure, including, but not limited to, line extensions, for the purpose of development in this state.

Sec. 4928.75. As used in sections 4928.75 to 4928.7540 of the Revised Code:

(A) "Nuclear energy resource" means an electric generation unit fueled, in whole or in part, by nuclear power and licensed by the nuclear regulatory commission.

(B) "PJM" means the PJM Interconnection, L.L.C., or its successor.

(C) "Zero-emissions nuclear credit" means the attributes associated with one megawatt hour of electricity generated by a zero-emissions nuclear resource.

(D) "Zero-emissions nuclear resource" means a nuclear energy resource that meets the criteria of section 4928.754 of the Revised Code.

Sec. 4928.751. There is hereby created a zero-emissions nuclear resource program to enable the state to meet its policy goals and requirements under which zero-emissions nuclear

credits are purchased by electric distribution utilities to provide long-term energy security and environmental and other benefits to the region and to retail electric service customers in the state. An electric distribution utility in this state that has a zero-emissions nuclear resource located within its certified territory shall participate in the program. All electric distribution utilities in the same holding company system shall participate jointly and shall allocate costs across all classes of each participating utility's customers.

Sec. 4928.752. The zero-emissions nuclear resource program shall operate for successive two-year program periods beginning with the initial program period commencing on the effective date of this section and terminating on the last day of the eighth program period.

Sec. 4928.753. To provide zero-emissions nuclear credits under the zero-emissions nuclear program, an entity that owns or operates a nuclear energy resource shall file with the public utilities commission a written notice verifying that the resource meets the criteria under section 4928.754 of the Revised Code. The entity shall file the written notice not later than ninety days after the commencement of the initial program period.

Sec. 4928.754. A nuclear energy resource that satisfies all of the following criteria is a zero-emissions nuclear resource for purposes of zero-emissions nuclear credits:

(A) The resource is interconnected within the transmission system of PJM.

(B) PJM has determined the resource is transmission deliverable under the metrics by which PJM calculates

deliverability for purposes of capacity planning on a round-the-clock baseload basis into the transmission zone or zones of electric distribution utilities participating in the zero-emissions nuclear resource program under sections 4928.75 to 4928.7540 of the Revised Code.

(C)(1) For in-state nuclear energy resources:

(a) The resource has benefited the air quality profile of the state more than the predominant electric generation source with similar capacity and baseload characteristics as the resource as of the time the resource commenced operation.

(b) All of the following could occur if the resource ceased operation and its capacity were replaced at the same location by the then predominant electric generation source with similar capacity and baseload characteristics as the resource:

(i) The ability of the state, or region of the state, to maintain or decrease existing intensity of fine particulate matter or to comply with one or more state or federal air pollution control programs, standards, or goals is reduced.

(ii) The carbon dioxide emissions intensity of the state is negatively impacted.

(iii) The ability of the state to maintain or decrease existing intensity of carbon monoxide, lead, ground-level ozone, particulate matter, nitrogen oxide, or sulfur dioxide is negatively impacted.

(2) For all other nuclear energy resources, each such resource is shown to provide no less than the same level of environmental benefits to the state as nuclear energy resources located within the state, pursuant to the requirements in division (C)(1) of this section.

(D) The resource, on or after January 1, 2017:

(1) Did not receive from another state tax exemptions, deferrals, exclusions, allowances, payments, credits, deductions, or reimbursements calculated in whole or in part using a metric that provides value for emissions not produced by the resource;

(2) Is not wholly owned by a municipal or cooperative corporation or a group, association, or consortium of those corporations; or

(3) Did not, during a program period described in section 4928.752 of the Revised Code, recover some or all of the capital or operating costs of the resource through rates regulated by a state.

Sec. 4928.755. With respect to a written notice filed under section 4928.753 of the Revised Code relating to a nuclear energy resource located in this state, any interested person may file comments with the public utilities commission not later than twenty days after the written notice was filed.

Sec. 4928.756. An entity that owns or operates a nuclear energy resource may file with the public utilities commission a response to any comment made under section 4928.755 of the Revised Code, not later than ten days after the comment was filed.

Sec. 4928.757. Not later than fifty days after the filing of a written notice under section 4928.753 of the Revised Code relating to a nuclear energy resource located in this state, the public utilities commission shall designate a resource that satisfies the criteria in section 4928.754 of the Revised Code as a zero-emissions nuclear resource and issue an order

consistent with that designation. If the commission does not issue an order in the time required by this section, the resource shall be deemed to be a zero-emissions nuclear resource.

Sec. 4928.7511. The public utilities commission, under a procedure it adopts, shall determine and issue the appropriate order regarding whether a nuclear energy resource described in division (C)(2) of section 4928.754 of the Revised Code satisfies the criteria in section 4928.754 of the Revised Code as a zero-emissions nuclear resource. The nuclear energy resource shall submit an environmental study showing that the resource meets the criteria under section 4928.754 of the Revised Code. At minimum, the adopted procedure shall provide the opportunity for comment and response similar to the opportunities described under sections 4928.755 and 4928.756 of the Revised Code.

Sec. 4928.7513. A nuclear energy resource determined under section 4928.757 or 4928.7511 of the Revised Code to be a zero-emissions nuclear resource shall continue to be considered such a resource for all successive program periods as long as the resource continues to meet the criteria of divisions (A), (B), and (D) of section 4928.754 of the Revised Code. The provisions of sections 4928.75 to 4928.7540 of the Revised Code shall apply to any person to which zero-emissions nuclear resources are sold, assigned, transferred, or conveyed.

Sec. 4928.7514. Zero-emission nuclear resources shall provide zero-emissions nuclear credits for the zero-emissions nuclear resource program. Not later than thirty days before a program period commences, each zero-emissions nuclear resource shall confirm with the public utilities commission its intent to

continue to commit its credits under the program.

Sec. 4928.7515. All financial statements, financial data, and trade secrets submitted to or received by the public utilities commission for purposes of satisfying the criteria as a zero-emissions nuclear resource and any information taken for any purpose from the statements, data, or trade secrets are not public records under section 149.43 of the Revised Code.

Sec. 4928.7520. Not later than sixty days after the initial program period commences and not later than thirty days before a subsequent program period commences, the public utilities commission shall set the price for zero-emissions nuclear credits applicable for the period. For the initial program period the price shall be seventeen dollars per credit. For each subsequent program period, that price shall be adjusted for inflation using the gross domestic product implicit price deflator as published by the United States department of commerce, bureau of economic analysis, index numbers 2007=100.

Sec. 4928.7521. At the same time the public utilities commission sets the price for zero-emissions nuclear credits, the commission shall determine the maximum number of credits to be purchased by electric distribution utilities during the program period. The amount the commission sets shall equal one-third of the total "Total End User Consumption" in megawatt-hours over the previous two calendar years as shown on PUCO Form D1 of each participating electric distribution utility's most recently filed long-term forecast report.

Sec. 4928.7522. Not later than seven days following the close of each quarter of a program period, each zero-emissions nuclear resource shall transfer all of its zero-emissions nuclear credits generated that quarter to the public utilities

commission, which shall hold the credits for the sole purpose of administering the program.

Sec. 4928.7523. Not later than seven days after the zero-emissions nuclear resource transfers its credits, the public utilities commission shall notify each participating electric distribution utility of the total amount of zero-emissions nuclear credits received from zero-emissions nuclear resources.

Sec. 4928.7524. (A) Except as provided in division (B) of this section, all participating electric distribution utilities shall purchase all zero-emissions nuclear credits transferred to the public utilities commission up to the maximum number of credits determined under section 4928.7521 of the Revised Code. The commission shall allocate the amounts to be purchased by each participating utility based on the total "Total End User Consumption" in megawatt-hours over the previous two calendar years as shown on PUCO Form D1 of each participating electric distribution utility's most recently filed long-term forecast report. Each participating electric distribution utility shall pay the credit price for each credit purchased.

(B) If the owner, as of December 31, 2016, of a zero-emissions nuclear resource sells or transfers the zero-emissions nuclear resource, the commission shall reduce the number of zero-emissions nuclear credits to be purchased from that resource during the program period and, if necessary, successive program periods, to reflect an adjustment equal to one-half of the dollar amount of any net proceeds available after the payment or provision for the seller's known obligations, but in no instance shall this adjustment apply to a sale or transfer under the United States Bankruptcy Code, including, but not limited to, sections 363 and 1123, 11 U.S.C. sections 363 and

1123.

Sec. 4928.7525. The public utilities commission shall deposit all payments for credits into the zero-emissions nuclear resources fund created under section 4928.7532 of the Revised Code.

Sec. 4928.7526. Not later than seven days after receipt of utility payment, the public utilities commission shall pay to each zero-emissions nuclear resource the amount paid for each of the resource's zero-emissions nuclear credits purchased from the zero-emissions nuclear resources fund.

Sec. 4928.7527. Credits purchased by participating electric distribution utilities may not be transferred, sold, or assigned to any other entity.

Sec. 4928.7530. Each participating electric distribution utility shall recover any and all direct and indirect costs for the purchase of zero-emissions nuclear credits through a nonbypassable rider charged to all of its retail electric service customers, which rider shall be established not later than sixty days after the effective date of this section. The nonbypassable charge shall be designed such that no retail electric service customer shall have an increase resulting from the nonbypassable rider in the customer's total retail electric service bill of more than five per cent as compared to June 2015. The participating electric distribution utility shall defer as a regulatory asset an amount equal to the revenue reduction resulting from the five per cent limit on customer bill increases and recover the deferral plus carrying charges through a nonbypassable charge assessed over a twelve-month period.

Sec. 4928.7532. There is hereby created the zero-emissions nuclear resources fund that shall be in the custody of the treasurer of state but shall not be part of the state treasury. The fund shall consist of all money collected by the public utilities commission from purchases of zero-emissions nuclear credits. The amounts deposited into the fund shall be used to pay the credit purchase price to the resources that generated the credits. All investment earnings from the fund shall be transferred by the treasurer to the general revenue fund in the state treasury.

Sec. 4928.7533. During each program period in which a zero-emissions nuclear resource receives payment for credits under section 4928.7526 of the Revised Code, an entity that owns or operates that zero-emissions nuclear resource and that has its corporate headquarters located in this state shall continue to maintain its corporate headquarters in this state.

Sec. 4928.7534. During the sixth and eleventh years of the zero-emissions nuclear resource program, the public utilities commission shall evaluate the zero-emissions nuclear credit price established under section 4928.7520 of the Revised Code for the purpose of discerning whether the program is achieving the policy goals in section 4928.751 of the Revised Code and whether those policy goals are being met through other federal environmental laws, programs, rules or regulations, or through amendments to the federal tax code. Upon the conclusion of its evaluation, the commission shall report the results of its evaluation to the standing committees of both houses of the general assembly that have primary jurisdiction regarding public utility legislation. In no case shall the zero-emissions nuclear resource program terminate earlier than the last day of the second program period.

Sec. 4928.7540. (A) For purposes of this section:

(1) "Employment levels" means the number of full-time employees regularly providing services at the location of a zero-emissions nuclear resource.

(2) "Full-time employee" means an individual who is employed for consideration for at least thirty-five hours per week, or who renders any other standard of service generally accepted by custom or specified by contract as full-time employment.

(B) During each program period in which a zero-emissions nuclear resource receives payment for zero-emissions nuclear credits under section 4928.7526 of the Revised Code, the employment levels at that zero-emissions nuclear resource shall continue to be similar to that of nuclear energy resources constructed prior to 1990 in the United States with the same reactor type, similar nameplate capacity, and single-unit location.

Section 2. That existing section 4928.02 of the Revised Code is hereby repealed.

Rep30

From: Cassell, Elizabeth <Elizabeth.Cassell@ohiosenate.gov>
Sent: Tuesday, March 21, 2017 3:41 PM
To: Wolf, Jimmy
Subject: RE: ZEN

Jimmy – I assume that this draft has all those ZEN amendments included. And do you think you will drop this next week???

Elizabeth M. Cassell
Senior Legislative Aide
Senator John Eklund
Ohio Senate
Phone (614) 644-7718
ecassell@ohiosenate.gov

From: Jimmy.Wolf@ohiohouse.gov [mailto:Jimmy.Wolf@ohiohouse.gov]
Sent: Tuesday, March 21, 2017 1:55 PM
To: Cassell, Elizabeth
Subject: ZEN

Liz,

Please find enclosed a copy of the latest ZEN draft for Senator Eklund.

Jimmy Wolf
Legislative Aide to Representative Bill Seitz
30th House District
614.466.8258
Jimmy.wolf@ohiohouse.gov

Rep30

From: Rep30
Sent: Wednesday, March 22, 2017 8:32 AM
To: 'Ty Pine (tpine@firstenergycorp.com)'
Subject: FW: Rational First Energy Nuclear Plant Solutions
Attachments: FE Value.pdf

FYI

From: Bill Siderewicz [mailto:bills@perpower.com]
Sent: Monday, March 20, 2017 8:29 AM
To: Rep30 <Rep30@ohiohouse.gov>
Cc: Arno Hill <arnoahill@aol.com>; Rep97@ohiohouse.com; Rep50@ohiohouse.com; Smith, Ryan <Ryan.Smith@ohiohouse.gov>; Rob McColley_CLE <rmccolley@gmail.com>; Haavisto, Elizabeth <Elizabeth.Haavisto@ohiohouse.gov>; Klaber, Gretchen <Gretchen.Klaber@ohiohouse.gov>; Rep93 <Rep93@ohiohouse.gov>; Rep81 <Rep81@ohiohouse.gov>; Snider, Grace <Grace.Snider@ohiohouse.gov>; Osborne, Markee <Markee.Osborne@ohiohouse.gov>; Jane Timken <jtimken@ohiogop.org>
Subject: Rational First Energy Nuclear Plant Solutions

Dear Bill,

In case First Energy ever wanted to consider serious solutions to troubled nuclear plants, there are many solutions. . . . that **don't** require BAILOUTS by the public.

Bill S.

From: Bill Siderewicz
Sent: Monday, March 20, 2017 8:19 AM
To: 'DowlingM@firstenergycorp.com' <DowlingM@firstenergycorp.com>
Subject: Rational First Energy Nuclear Plant Solutions

Dear Mike,

To the extent FirstE might consider an external view, there seems to be some realistic options here for FE :

Option 1 : "Bundle" and Sell : AEP could NOT possibly sell Gavin Coal (2,600 MW) as a stand alone asset, when the plant's power production costs are nearly 100% higher than costs of a modern gas-fired power plant. So, AEP "bundled" other positive value generation assets with Gavin and successfully sold the "bundle" to ArcLight Capital (Boston) and Blackstone(NYC).

Now that you know that the W. Lorain peaker plant has gas firing capability (not just oil) it has value as a peaker, or could possibly be upgraded to combined cycle by a new owner. As long as your 100 MW wind PPA is "in the money" someone will pay FE for your wind PPA. Maybe Sammis 5-7 coal units can be tossed into the mix, if they are cash positive ?

Based on recent news articles, the 2 nukes have a FMV of $ 900 mm and debt of $ 1.3 Billion. A skilled financial advisor can quickly tell you if the W. Lorain Peaker, wind PPA and 2 nukes will yield a positive Purchase Price, if sold as a package deal. Companies like : Exelon, Dominion, Southern Co. and Entergy

can/would certainly buy/run nukes. Under this plan, current jobs and local business activity would stay in place.

Option 2 : Chap 11 Process : The attached chart (attachment : FE Value) shows how current FE paper is now worth about 40 cents on the $ 1.00. It would seem that with an organized Chapter 11 process, the debt on the nukes would be "written down" to some practical level such that capacity, energy and ancillary service revenues from PJM to FE would offset all nuke costs . . .. and the plants would simply keep running as is.

As part of this process, maybe the local community pitches in as well and supports a reduction in : property, local salary and/or local income taxes. After all, they are now benefiting on all **THREE financial fronts**, via the nuke plants. This scenario, of Chap. 11 is better for them than plant shut downs !!

Option 3 : De-Commissioning : The Federal NRC has guided FE into setting aside multiple $ 100's of millions knowing that de-commissioning is a natural reality for nuke plants. Given that there is nearly $ 1 Billion is in the bank now .. . a choice to start de-commissioning in 2017/18 is not out of bounds. This process is a multi-year project that will result in local employment and tax payments for years to come, as everyone re-adjusts to the new reality of de-commissioning.

By now, you have no doubt have seen the voters' poll data that **NO ONE is in favor** of utility BAILOUTS, like FE's $ 6 + Billion ZEC/ZEN plan .. . just as AEP's CEO (Nick Akins) wants no part of such a payment obligation to FE, paid by his ratepayers !!! When true and total negative consequences of nuclear power are compared to benign wind/solar, even a 5 th grader can see that (renewable energy credits) REC's **do not** = ZEC/ZEN . . .making the very ZEC/ZEN premise fatally flawed !! It is clear to everyone that there is no free-willed SUPPORTER of such a FirstE "ask". The **only** supporters are those receiving the funds (FE, host communities and union operators).

The only possible support here might be a party who has/is obtained some of FE's $ millions/year in political contributions (that are documented in the public record- and that we monitor continually). The ZEN/ZEC "ask" is so outrageous that if I were a Legislator it would be personally insulted to even consider such an ask" , let alone sponsor and/or support such a FE proposal. I would instead feel quite an obligation to those people in Ohio who elected me to office and have spoken up so clearly, and I would feel that their : (i) financial interests, (ii) rights to "Customer Choice" w/o a FE financial over-burden and (iii) expressed desires far outweigh correcting corp. mis-steps.

If FE were truly interested in having a positive image in Ohio, vs. the equivalent of a "handout" or "welfare" image, that serious consideration be given to the 3 Options noted above. It goes without saying, Options 1-3 do not place undue and un-wanted financial burden on FE's ratepayers nor Ohio's fragile economy (as does ZEC/ZEN).

Sincerely,

Bill S.

William Siderewicz, P.E.
President
Clean Energy Future, LLC

Rep30

From: Pine, Ty <tpine@firstenergycorp.com>
Sent: Thursday, March 23, 2017 4:27 AM
To: Rep30
Cc: Rep89; Kasych, Shawn; Lehman, Ryan; John Eklund (DST); Bizjak, Joe; Elizabeth Cassell
Subject: Re: *EXTERNAL* FW: PJM watchdog joins lawsuit against nuclear subsidies

I agree - Ohio's ZEN proposal nails their coffin shut.

As you know, Chairman Seitz, the Ohio proposal specifically avoids the tether to market that Bowring opposes. Further, the US Supreme Court (Hughes case) specifically affords states the opportunity to value attributes outside of the market construct. So unless Me. Bowring or PJM can override the US Supreme Court Ohio stands on solid footing.

Sent from my iPhone

On Mar 22, 2017, at 3:16 PM, "Rep30@ohiohouse.gov" <Rep30@ohiohouse.gov> wrote:

> One more nail in the coffin.
>
> ---
>
> **From:** Bill Siderewicz [mailto:bills@perpower.com]
> **Sent:** Wednesday, March 22, 2017 12:14 PM
> **To:** Rep30 <Rep30@ohiohouse.gov>
> **Subject:** PJM watchdog joins lawsuit against nuclear subsidies
>
> As would be the case in Ohio !!!
>
> As we noted in our info. on First Energy nuke Bailout!!
>
> Bill
>
> ---
>
> **From:** Stewart, Jackie <Jackie.Stewart@fticonsulting.com>
> **Sent:** Wednesday, March 22, 2017 10:04:28 AM
> **To:** Bill Siderewicz
> **Cc:** Borchers, Dylan; Slagle, Christopher; Tunnell, Kurtis
> **Subject:** PJM watchdog joins lawsuit against nuclear subsidies
>
> http://www.eenews.net/energywire/2017/03/22/stories/1060051867
>
> ## ILLINOIS
>
> ## PJM watchdog joins lawsuit against nuclear subsidies
>
> Rod Kuckro, E&E News reporter
>
> Published: Wednesday, March 22, 2017

The independent monitor for the nation's largest electricity market, PJM Interconnection, is wading into the legal battle in Illinois over a law that subsidizes two nuclear plants using zero-emission credits.

The lawsuit was filed in February by independent power producers (IPPs) including Dynegy Inc., Calpine Corp. and NRG Energy Inc., which operate power plants that compete with Exelon Corp.'s nuclear plants in the state.

Joseph Bowring is president of Monitoring Analytics LLC, the independent monitor responsible for promoting a competitive, robust and nondiscriminatory electric power market in the PJM region, which encompasses all or parts of 13 states and the District of Columbia.

In Bowring's filing to intervene with the U.S. District Court for the Northern District of Illinois, Bowring said the subsidy program enacted by Illinois is "incompatible with the PJM market design, threatens the foundations of the PJM market and interferes with the federal regulatory scheme."

He said that his company would have to "expend significant resources to attempt to mitigate the harm on the PJM market design" if the subsidies are allowed to stand.

In his recent report on how PJM's market fared in 2016, Bowring railed against states like Illinois that subsidize nuclear plants, many of which are having trouble making a profit at a time when wholesale power prices have been pushed down by inexpensive natural gas-fired generation and renewables such as wind, where there is no fuel cost.

PJM, the grid operator, has not joined the suit, but "this is under active consideration," said spokeswoman Paula DuPont. "We have not decided yet."

An official with the Electric Power Supply Association, which represents IPPs, said there is no schedule yet for when the suit might be argued, as a judge was just assigned to the case.

The push to prop up nuclear plants is moving to other states.

In Connecticut, lawmakers are considering a bill, S.B. 106, that would treat Dominion Resources Inc.'s Millstone Nuclear Power Station as a renewable resource.

The bill would allow Dominion to bypass the wholesale electricity market operated by ISO New England and sell energy and capacity directly to utilities under five-year contracts.

"The ISO has taken no position on the proposed legislation and is monitoring it," said spokeswoman Marcia Blomberg.

And in New Jersey, on Monday the state Senate Environment and Energy Committee pulled from its agenda a bill, S. 3061, that would have directed the Board of Public Utilities to conduct a study on subsidizing the state's nuclear power plants through the use of zero-emission credits. It will be rescheduled for May.

Federal electricity regulators plan a two-day conference May 1-2 to tackle the tangled relationships between the Eastern electricity markets and states such as Illinois, New York and Connecticut that are pursuing policies that favor certain generating resources over others (*Energywire*, March 7).

Jackie Stewart
Senior Director
Energy & Natural Resources | Strategic Communications

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Canfield, Ohio 44406
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Rep30

From: Bill Siderewicz <bills@perpower.com>
Sent: Tuesday, March 28, 2017 1:26 PM
To: Rep30
Cc: Arno Hill; Rep97@ohiohouse.com; Rep50@ohiohouse.com; Smith, Ryan; Rob McColley_CLE; Haavisto, Elizabeth; Klaber, Gretchen; Rep81; Snider, Grace; Osborne, Markee; Jane Timken; MBeazley@ci.oregon.oh.us
Subject: Poisoning Ohio's School Kids : First E's ZEN (ZEC) Plan

Dear Bill,

I'm guessing that when you (and your Legislature colleagues) were in grade school, you were not trained in :

- Radiation Pills : how and when to take anti-radiation pills
- Nuclear Evacuation : How to escape a nuclear radiation event

I recall in those years, that our teachers might have had training in the issuance of "baby aspirin" or fire drills, but nothing that compares to what occurs now in Ottawa and Lake counties where Davis-Besse and Perry nuclear plants are located.

Content (below) of a recent article (March 26, '17) AP News by John Seewer reminded me of the perils, that First Energy would never dare mention to you . . .but this news article will remind all of us of the hidden dangers, that exist at the shores of Lake Erie :

" Then there are the stockpiles of radiation pills and emergency drills for students in case of a (nuclear accident) disaster."

Throughout this $ 300 million/year nuclear Bailout discussion there has been a total lack of facts by First E, relative to nuclear plants. Their claims of zero emissions and zero environmental impact (as is the case for wind/solar) is totally outrageous and quite frankly embarrassing.

Nuclear Impacts : One has to only Google 2 stories to see the potential that exists along Lake Erie with nuclear power production and on-site storage of nuclear waste. The 2 stories to Google are : (i) Fukushima Nuclear Accident - March 2011 and (ii) Chancellor Merkel Closing all (17) German Nuclear Plants – May 2011. A simple outage of a back up generator caused meltdown of both the reactor and the waste being stored on site. If Ohio were to have such an event not only would Cleveland and Lake Erie be devastated, but so would everyone down stream : Buffalo, Toronto, Rochester, Lake Ontario, Montreal, etc.

Ohio EPA : The State has on file the air emission permit for both Davis Besse and Perry. They are allowed to emit 40,000 lbs/ year of each combustion emission pollutant (TSP, NOx, SOx etc.)from their stacks, at each site. To claim that nuclear plants have zero emissions is absolute nonsense. To suggest the FE's nukes have no environmental impacts, just like renewables is simply not true. In addition to the potential of nuclear radiation is the fact that nukes use **300% more water** than a modern day gas-fired plant (of the same MW output size).

People in Lucas Co., Sandusky Co., Trumbull Co., and Mahoning Co. often will ask me "How is it that you are familiar with these topics ?" The answer is quite simple, I have a MS in environmental/civil engr. (Cornell Univ. – fellowship) and a BS in environmental/civil engr. (Merrimack College-cum laude) and have studied and researched all of these current energy topics, and cannot be fooled by First E propaganda. If ZEN (ZEC) were a medical related topic, the information being put forward by First E would be equivalent to information being offered by a tribal witch doctor, instead of by an OSU trained physician.

The AP Press article reminds all of us of what's at stake here.

In the end, ZEN (ZEC) is nothing more than a $ 300 million/yr Bailout to allow FE to **SELL ITS NUKES** in 2018 (vs. simply closing/de-commissioning them in '18).

Best regards,

Bill S.

William Siderewicz, P.E.
President
Clean Energy Future, LLC

Rep30

From: Brady, Chynna
Sent: Wednesday, March 29, 2017 1:32 PM
To: Wolf, Jimmy
Subject: Zen Credit Legislation

Hello Jimmy,

Representative DeVitis was hoping you could send him a copy of the latest draft of the Zen Credit bill.

Thank you,
Chynna Brady
Legislative Aide
Representative Anthony DeVitis | District 36
614.466.1790

Rep30

From: Pine, Ty <tpine@firstenergycorp.com>
Sent: Thursday, March 30, 2017 9:36 AM
To: Rep30
Subject: ZEN
Attachments: FE Edits to LSC ZEN Draft 3.30.docx

Chairman Seitz,

Per you request, attached is the language that set the credit price at "up to $17". You can find the new language in line 234.

Thanks.

Reviewed As To Form By
Legislative Service Commission

I_132_0723-2

132nd General Assembly
Regular Session
2017-2018

. B. No.

A B I L L

To amend section 4928.02 and to enact sections 4928.75, 4928.751, 4928.752, 4928.753, 4928.754, 4928.755, 4928.756, 4928.757, 4928.7511, 4928.7513, 4928.7514, 4928.7515, 4928.7520, 4928.7521, 4928.7522, 4928.7523, 4928.7524, 4928.7525, 4928.7526, 4928.7527, 4928.7530, 4928.7532, 4928.7533, 4928.7534, and 4928.7540 of the Revised Code regarding the zero-emissions nuclear resource program.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF OHIO:

Section 1. That section 4928.02 be amended and sections 4928.75, 4928.751, 4928.752, 4928.753, 4928.754, 4928.755, 4928.756, 4928.757, 4928.7511, 4928.7513, 4928.7514, 4928.7515, 4928.7520, 4928.7521, 4928.7522, 4928.7523, 4928.7524, 4928.7525, 4928.7526, 4928.7527, 4928.7530, 4928.7532, 4928.7533, 4928.7534, and 4928.7540 of the Revised Code be enacted to read as follows:

Sec. 4928.02. It is the policy of this state to do the

following throughout this state:

(A) Ensure the availability to consumers of adequate, reliable, safe, efficient, nondiscriminatory, and reasonably priced retail electric service;

(B) Ensure the availability of unbundled and comparable retail electric service that provides consumers with the supplier, price, terms, conditions, and quality options they elect to meet their respective needs;

(C) Ensure diversity of ~~electricity~~ the following:

(1) Electricity supplies and suppliers, by giving consumers effective choices over the selection of those supplies and suppliers and by encouraging the development of distributed and small generation facilities;

(2) Resources, including zero-emissions nuclear resources as defined in section 4928.75 of the Revised Code, that provide fuel diversity and environmental and other benefits.

(D) Encourage innovation and market access for cost-effective supply- and demand-side retail electric service including, but not limited to, demand-side management, time-differentiated pricing, waste energy recovery systems, smart grid programs, and implementation of advanced metering infrastructure;

(E) Encourage cost-effective and efficient access to information regarding the operation of the transmission and distribution systems of electric utilities in order to promote both effective customer choice of retail electric service and the development of performance standards and targets for service quality for all consumers, including annual achievement reports written in plain language;

(F) Ensure that an electric utility's transmission and distribution systems are available to a customer-generator or owner of distributed generation, so that the customer-generator or owner can market and deliver the electricity it produces;

(G) Recognize the continuing emergence of competitive electricity markets through the development and implementation of flexible regulatory treatment, while simultaneously recognizing the need for nuclear energy resources, as defined in section 4928.75 of the Revised Code, and resources that provide fuel diversity and environmental and other benefits;

(H) Ensure effective competition in the provision of retail electric service by avoiding anticompetitive subsidies flowing from a noncompetitive retail electric service to a competitive retail electric service or to a product or service other than retail electric service, and vice versa, including by prohibiting the recovery of any generation-related costs through distribution or transmission rates;

(I) Ensure retail electric service consumers protection against unreasonable sales practices, market deficiencies, and market power;

(J) Provide coherent, transparent means of giving appropriate incentives to technologies that can adapt successfully to potential environmental mandates;

(K) Encourage implementation of distributed generation across customer classes through regular review and updating of administrative rules governing critical issues such as, but not limited to, interconnection standards, standby charges, and net metering;

(L) Protect at-risk populations, including, but not

limited to, when considering the implementation of any new advanced energy or renewable energy resource;

(M) Encourage the education of small business owners in this state regarding the use of, and encourage the use of, energy efficiency programs and alternative energy resources in their businesses;

(N) Facilitate the state's effectiveness in the global economy.

In carrying out this policy, the commission shall consider rules as they apply to the costs of electric distribution infrastructure, including, but not limited to, line extensions, for the purpose of development in this state.

Sec. 4928.75. As used in sections 4928.75 to 4928.7540 of the Revised Code:

(A) "Nuclear energy resource" means an electric generation unit fueled, in whole or in part, by nuclear power and licensed by the nuclear regulatory commission.

(B) "PJM" means the PJM Interconnection, L.L.C., or its successor.

(C) "Zero-emissions nuclear credit" means the attributes associated with one megawatt hour of electricity generated by a zero-emissions nuclear resource.

(D) "Zero-emissions nuclear resource" means a nuclear energy resource that meets the criteria of section 4928.754 of the Revised Code.

Sec. 4928.751. There is hereby created a zero-emissions nuclear resource program to enable the state to meet its policy goals and requirements under which zero-emissions nuclear

credits are purchased by electric distribution utilities to provide long-term energy security and environmental and other benefits to the region and to retail electric service customers in the state. An electric distribution utility in this state that has a zero-emissions nuclear resource located within its certified territory shall participate in the program. All electric distribution utilities in the same holding company system shall participate jointly and shall allocate costs across all classes of each participating utility's customers.

Sec. 4928.752. The zero-emissions nuclear resource program shall operate for successive two-year program periods beginning with the initial program period commencing on the effective date of this section and terminating on the last day of the eighth program period.

Sec. 4928.753. To provide zero-emissions nuclear credits under the zero-emissions nuclear program, an entity that owns or operates a nuclear energy resource shall file with the public utilities commission a written notice verifying that the resource meets the criteria under section 4928.754 of the Revised Code. The entity shall file the written notice not later than ninety days after the commencement of the initial program period.

Sec. 4928.754. A nuclear energy resource that satisfies all of the following criteria is a zero-emissions nuclear resource for purposes of zero-emissions nuclear credits:

(A) The resource is interconnected within the transmission system of PJM.

(B) PJM has determined the resource is transmission deliverable under the metrics by which PJM calculates

deliverability for purposes of capacity planning on a round-the-clock baseload basis into the transmission zone or zones of electric distribution utilities participating in the zero-emissions nuclear resource program under sections 4928.75 to 4928.7540 of the Revised Code.

(C)(1) For in-state nuclear energy resources:

(a) The resource has benefited the air quality profile of the state more than the predominant electric generation source with similar capacity and baseload characteristics as the resource as of the time the resource commenced operation.

(b) All of the following could occur if the resource ceased operation and its capacity were replaced at the same location by the then predominant electric generation source with similar capacity and baseload characteristics as the resource:

(i) The ability of the state, or region of the state, to maintain or decrease existing levels~~intensity~~ of volatile organic compounds~~fine particulate matter~~ or to comply with one or more state or federal air pollution control programs, standards, or goals is reduced.

(ii) The carbon dioxide emissions intensity of the state is negatively impacted.

(iii) The ability of the state to maintain or decrease existing levels~~intensity~~ of carbon monoxide, lead, ground-level ozone, particulate matter, nitrogen oxide, or sulfur dioxide is negatively impacted.

(2) For all other nuclear energy resources, each such resource is shown to provide no less than the same level of environmental benefits to the state as nuclear energy resources located within the state, pursuant to the requirements in division (C)(1) of this section.

(D) The resource, on or after January 1, 2017:

(1) Did not receive from another state tax exemptions, deferrals, exclusions, allowances, payments, credits, deductions, or reimbursements calculated in whole or in part using a metric that provides value for emissions not produced by the resource;

(2) Is not wholly owned by a municipal or cooperative corporation or a group, association, or consortium of those corporations; or

(3) Did not, during a program period described in section 4928.752 of the Revised Code, recover some or all of the capital or operating costs of the resource through rates regulated by a state.

Sec. 4928.755. With respect to a written notice filed under section 4928.753 of the Revised Code relating to a nuclear energy resource located in this state, any interested person may file comments with the public utilities commission not later than twenty days after the written notice was filed.

Sec. 4928.756. An entity that owns or operates a nuclear energy resource may file with the public utilities commission a response to any comment made under section 4928.755 of the Revised Code, not later than ten days after the comment was filed.

Sec. 4928.757. Not later than fifty days after the filing of a written notice under section 4928.753 of the Revised Code relating to a nuclear energy resource located in this state, the public utilities commission shall designate a resource that satisfies the criteria in section 4928.754 of the Revised Code as a zero-emissions nuclear resource and issue an order

consistent with that designation. If the commission does not issue an order in the time required by this section, the resource shall be deemed to be a zero-emissions nuclear resource.

Sec. 4928.7511. The public utilities commission, under a procedure it adopts, shall determine and issue the appropriate order regarding whether a nuclear energy resource described in division (C)(2) of section 4928.754 of the Revised Code satisfies the criteria in section 4928.754 of the Revised Code as a zero-emissions nuclear resource. The nuclear energy resource shall submit an environmental study showing that the resource meets the criteria under section 4928.754 of the Revised Code. At minimum, the adopted procedure shall provide the opportunity for comment and response similar to the opportunities described under sections 4928.755 and 4928.756 of the Revised Code.

Sec. 4928.7513. A nuclear energy resource determined under section 4928.757 or 4928.7511 of the Revised Code to be a zero-emissions nuclear resource shall continue to be considered such a resource for all successive program periods as long as the resource continues to meet the criteria of divisions (A), (B), and (D) of section 4928.754 of the Revised Code. The provisions of sections 4928.75 to 4928.7540 of the Revised Code shall apply to any person to which zero-emissions nuclear resources are sold, assigned, transferred, or conveyed.

Sec. 4928.7514. Zero-emission nuclear resources shall provide zero-emissions nuclear credits for the zero-emissions nuclear resource program. Not later than thirty days before a program period commences, each zero-emissions nuclear resource shall confirm with the public utilities commission its intent to

continue to commit its credits under the program.

Sec. 4928.7515. All financial statements, financial data, and trade secrets submitted to or received by the public utilities commission for purposes of satisfying the criteria as a zero-emissions nuclear resource and any information taken for any purpose from the statements, data, or trade secrets are not public records under section 149.43 of the Revised Code.

Sec. 4928.7520. Not later than sixty days after the initial program period commences and not later than thirty days before a subsequent program period commences, the public utilities commission shall set the price for zero-emissions nuclear credits applicable for the period. For the initial program period the price shall be up to seventeen dollars per credit. For each subsequent program period, that price shall be adjusted for inflation using the gross domestic product implicit price deflator as published by the United States department of commerce, bureau of economic analysis, index numbers 2007=100.

Sec. 4928.7521. At the same time the public utilities commission sets the price for zero-emissions nuclear credits, the commission shall determine the maximum number of credits to be purchased by electric distribution utilities during the program period. The amount the commission sets shall equal one-third of the total "Total End User Consumption" in megawatt-hours over the previous two calendar years as shown on PUCO Form D1 of each participating electric distribution utility's most recently filed long-term forecast report.

Sec. 4928.7522. Not later than seven days following the close of each quarter of a program period, each zero-emissions nuclear resource shall transfer all of its zero-emissions nuclear credits generated that quarter to the public utilities

commission, which shall hold the credits for the sole purpose of administering the program.

Sec. 4928.7523. Not later than seven days after the zero-emissions nuclear resource transfers its credits, the public utilities commission shall notify each participating electric distribution utility of the total amount of zero-emissions nuclear credits received from zero-emissions nuclear resources.

Sec. 4928.7524. (A) Except as provided in division (B) of this section, all participating electric distribution utilities shall purchase all zero-emissions nuclear credits transferred to the public utilities commission up to the maximum number of credits determined under section 4928.7521 of the Revised Code. The commission shall allocate the amounts to be purchased by each participating utility based on the total "Total End User Consumption" in megawatt-hours over the previous two calendar years as shown on PUCO Form D1 of each participating electric distribution utility's most recently filed long-term forecast report. Each participating electric distribution utility shall pay the credit price for each credit purchased.

(B) If the owner, as of December 31, 2016, of a zero-emissions nuclear resource sells or transfers the zero-emissions nuclear resource, the commission shall reduce the number of zero-emissions nuclear credits to be purchased from that resource during the program period and, if necessary, successive program periods, to reflect an adjustment equal to one-half of the dollar amount of any net proceeds available after the payment or provision for the seller's known obligations, but in no instance shall this adjustment apply to a sale or transfer under the United States Bankruptcy Code, including, but not limited to, sections 363 and 1123, 11 U.S.C. sections 363 and

1123.

Sec. 4928.7525. The public utilities commission shall deposit all payments for credits into the zero-emissions nuclear resources fund created under section 4928.7532 of the Revised Code.

Sec. 4928.7526. Not later than seven days after receipt of utility payment, the public utilities commission shall pay to each zero-emissions nuclear resource the amount paid for each of the resource's zero-emissions nuclear credits purchased from the zero-emissions nuclear resources fund.

Sec. 4928.7527. Credits purchased by participating electric distribution utilities may not be transferred, sold, or assigned to any other entity.

Sec. 4928.7530. Each participating electric distribution utility shall recover any and all direct and indirect costs for the purchase of zero-emissions nuclear credits through a nonbypassable rider charged to all of its retail electric service customers, which rider shall be established not later than sixty days after the effective date of this section. The nonbypassable charge shall be designed such that no retail electric service customer shall have an increase resulting from the nonbypassable rider in the customer's total retail electric service bill of more than five percent~~per cent~~ as compared to June 2015. The participating electric distribution utility shall defer as a regulatory asset an amount equal to the revenue reduction resulting from the five percent~~per cent~~ limit on customer bill increases and recover the deferral plus carrying charges through a nonbypassable charge assessed over a twelve-month period.

Sec. 4928.7532. There is hereby created the zero-emissions nuclear resources fund that shall be in the custody of the treasurer of state but shall not be part of the state treasury. The fund shall consist of all money collected by the public utilities commission from purchases of zero-emissions nuclear credits. The amounts deposited into the fund shall be used to pay the credit purchase price to the resources that generated the credits. All investment earnings from the fund shall be transferred by the treasurer to the general revenue fund in the state treasury.

Sec. 4928.7533. During each program period in which a zero-emissions nuclear resource receives payment for credits under section 4928.7526 of the Revised Code, an entity that owns or operates that zero-emissions nuclear resource and that has its corporate headquarters located in this state shall continue to maintain its corporate headquarters in this state.

Sec. 4928.7534. During the sixth and eleventh years of the zero-emissions nuclear resource program, the public utilities commission shall evaluate the zero-emissions nuclear credit price established under section 4928.7520 of the Revised Code for the purpose of discerning whether the program is achieving the policy goals in section 4928.751 of the Revised Code and whether those policy goals are being met through other federal environmental laws, programs, rules or regulations, or through amendments to the federal tax code. Upon the conclusion of its evaluation, the commission shall report the results of its evaluation to the standing committees of both houses of the general assembly that have primary jurisdiction regarding public utility legislation. In no case shall the zero-emissions nuclear resource program terminate earlier than the last day of the second program period.

Sec. 4928.7540. (A) For purposes of this section:

(1) "Employment levels" means the number of full-time employees regularly providing services at the location of a zero-emissions nuclear resource.

(2) "Full-time employee" means an individual who is employed for consideration for at least thirty-five hours per week, or who renders any other standard of service generally accepted by custom or specified by contract as full-time employment.

(B) During each program period in which a zero-emissions nuclear resource receives payment for zero-emissions nuclear credits under section 4928.7526 of the Revised Code, the employment levels at that zero-emissions nuclear resource shall continue to be similar to that of nuclear energy resources constructed prior to 1990 in the United States with the same reactor type, similar nameplate capacity, and single-unit location.

Section 2. That existing section 4928.02 of the Revised Code is hereby repealed.

Rep30

From: Rep30
Sent: Thursday, March 30, 2017 10:12 AM
To: Shawn Kasych (shawn.kasych@ohiohouse.gov); Rep36
Cc: Brady, Chynna
Subject: FW: ZEN
Attachments: FE Edits to LSC ZEN Draft 3.30.docx

FYI

From: Pine, Ty [mailto:tpine@firstenergycorp.com]
Sent: Thursday, March 30, 2017 9:36 AM
To: Rep30 <Rep30@ohiohouse.gov>
Subject: ZEN

Chairman Seitz,

Per you request, attached is the language that set the credit price at "up to $17". You can find the new language in line 234.

Thanks.

Reviewed As To Form By
Legislative Service Commission

I_132_0723-2

132nd General Assembly
Regular Session
2017-2018

. B. No.

A B I L L

To amend section 4928.02 and to enact sections 4928.75, 4928.751, 4928.752, 4928.753, 4928.754, 4928.755, 4928.756, 4928.757, 4928.7511, 4928.7513, 4928.7514, 4928.7515, 4928.7520, 4928.7521, 4928.7522, 4928.7523, 4928.7524, 4928.7525, 4928.7526, 4928.7527, 4928.7530, 4928.7532, 4928.7533, 4928.7534, and 4928.7540 of the Revised Code regarding the zero-emissions nuclear resource program.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF OHIO:

Section 1. That section 4928.02 be amended and sections 4928.75, 4928.751, 4928.752, 4928.753, 4928.754, 4928.755, 4928.756, 4928.757, 4928.7511, 4928.7513, 4928.7514, 4928.7515, 4928.7520, 4928.7521, 4928.7522, 4928.7523, 4928.7524, 4928.7525, 4928.7526, 4928.7527, 4928.7530, 4928.7532, 4928.7533, 4928.7534, and 4928.7540 of the Revised Code be enacted to read as follows:

Sec. 4928.02. It is the policy of this state to do the

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following throughout this state:

(A) Ensure the availability to consumers of adequate, reliable, safe, efficient, nondiscriminatory, and reasonably priced retail electric service;

(B) Ensure the availability of unbundled and comparable retail electric service that provides consumers with the supplier, price, terms, conditions, and quality options they elect to meet their respective needs;

(C) Ensure diversity of ~~electricity~~ the following:

(1) Electricity supplies and suppliers, by giving consumers effective choices over the selection of those supplies and suppliers and by encouraging the development of distributed and small generation facilities;

(2) Resources, including zero-emissions nuclear resources as defined in section 4928.75 of the Revised Code, that provide fuel diversity and environmental and other benefits.

(D) Encourage innovation and market access for cost-effective supply- and demand-side retail electric service including, but not limited to, demand-side management, time-differentiated pricing, waste energy recovery systems, smart grid programs, and implementation of advanced metering infrastructure;

(E) Encourage cost-effective and efficient access to information regarding the operation of the transmission and distribution systems of electric utilities in order to promote both effective customer choice of retail electric service and the development of performance standards and targets for service quality for all consumers, including annual achievement reports written in plain language;

(F) Ensure that an electric utility's transmission and distribution systems are available to a customer-generator or owner of distributed generation, so that the customer-generator or owner can market and deliver the electricity it produces;

(G) Recognize the continuing emergence of competitive electricity markets through the development and implementation of flexible regulatory treatment, while simultaneously recognizing the need for nuclear energy resources, as defined in section 4928.75 of the Revised Code, and resources that provide fuel diversity and environmental and other benefits;

(H) Ensure effective competition in the provision of retail electric service by avoiding anticompetitive subsidies flowing from a noncompetitive retail electric service to a competitive retail electric service or to a product or service other than retail electric service, and vice versa, including by prohibiting the recovery of any generation-related costs through distribution or transmission rates;

(I) Ensure retail electric service consumers protection against unreasonable sales practices, market deficiencies, and market power;

(J) Provide coherent, transparent means of giving appropriate incentives to technologies that can adapt successfully to potential environmental mandates;

(K) Encourage implementation of distributed generation across customer classes through regular review and updating of administrative rules governing critical issues such as, but not limited to, interconnection standards, standby charges, and net metering;

(L) Protect at-risk populations, including, but not

limited to, when considering the implementation of any new advanced energy or renewable energy resource;

(M) Encourage the education of small business owners in this state regarding the use of, and encourage the use of, energy efficiency programs and alternative energy resources in their businesses;

(N) Facilitate the state's effectiveness in the global economy.

In carrying out this policy, the commission shall consider rules as they apply to the costs of electric distribution infrastructure, including, but not limited to, line extensions, for the purpose of development in this state.

Sec. 4928.75. As used in sections 4928.75 to 4928.7540 of the Revised Code:

(A) "Nuclear energy resource" means an electric generation unit fueled, in whole or in part, by nuclear power and licensed by the nuclear regulatory commission.

(B) "PJM" means the PJM Interconnection, L.L.C., or its successor.

(C) "Zero-emissions nuclear credit" means the attributes associated with one megawatt hour of electricity generated by a zero-emissions nuclear resource.

(D) "Zero-emissions nuclear resource" means a nuclear energy resource that meets the criteria of section 4928.754 of the Revised Code.

Sec. 4928.751. There is hereby created a zero-emissions nuclear resource program to enable the state to meet its policy goals and requirements under which zero-emissions nuclear

credits are purchased by electric distribution utilities to provide long-term energy security and environmental and other benefits to the region and to retail electric service customers in the state. An electric distribution utility in this state that has a zero-emissions nuclear resource located within its certified territory shall participate in the program. All electric distribution utilities in the same holding company system shall participate jointly and shall allocate costs across all classes of each participating utility's customers.

Sec. 4928.752. The zero-emissions nuclear resource program shall operate for successive two-year program periods beginning with the initial program period commencing on the effective date of this section and terminating on the last day of the eighth program period.

Sec. 4928.753. To provide zero-emissions nuclear credits under the zero-emissions nuclear program, an entity that owns or operates a nuclear energy resource shall file with the public utilities commission a written notice verifying that the resource meets the criteria under section 4928.754 of the Revised Code. The entity shall file the written notice not later than ninety days after the commencement of the initial program period.

Sec. 4928.754. A nuclear energy resource that satisfies all of the following criteria is a zero-emissions nuclear resource for purposes of zero-emissions nuclear credits:

(A) The resource is interconnected within the transmission system of PJM.

(B) PJM has determined the resource is transmission deliverable under the metrics by which PJM calculates

deliverability for purposes of capacity planning on a round-the-clock baseload basis into the transmission zone or zones of electric distribution utilities participating in the zero-emissions nuclear resource program under sections 4928.75 to 4928.7540 of the Revised Code.

(C)(1) For in-state nuclear energy resources:

(a) The resource has benefited the air quality profile of the state more than the predominant electric generation source with similar capacity and baseload characteristics as the resource as of the time the resource commenced operation.

(b) All of the following could occur if the resource ceased operation and its capacity were replaced at the same location by the then predominant electric generation source with similar capacity and baseload characteristics as the resource:

(i) The ability of the state, or region of the state, to maintain or decrease existing levels~~intensity~~ of volatile organic compounds~~fine particulate matter~~ or to comply with one or more state or federal air pollution control programs, standards, or goals is reduced.

(ii) The carbon dioxide emissions intensity of the state is negatively impacted.

(iii) The ability of the state to maintain or decrease existing levels~~intensity~~ of carbon monoxide, lead, ground-level ozone, particulate matter, nitrogen oxide, or sulfur dioxide is negatively impacted.

(2) For all other nuclear energy resources, each such resource is shown to provide no less than the same level of environmental benefits to the state as nuclear energy resources located within the state, pursuant to the requirements in division (C)(1) of this section.

(D) The resource, on or after January 1, 2017:

(1) Did not receive from another state tax exemptions, deferrals, exclusions, allowances, payments, credits, deductions, or reimbursements calculated in whole or in part using a metric that provides value for emissions not produced by the resource;

(2) Is not wholly owned by a municipal or cooperative corporation or a group, association, or consortium of those corporations; or

(3) Did not, during a program period described in section 4928.752 of the Revised Code, recover some or all of the capital or operating costs of the resource through rates regulated by a state.

Sec. 4928.755. With respect to a written notice filed under section 4928.753 of the Revised Code relating to a nuclear energy resource located in this state, any interested person may file comments with the public utilities commission not later than twenty days after the written notice was filed.

Sec. 4928.756. An entity that owns or operates a nuclear energy resource may file with the public utilities commission a response to any comment made under section 4928.755 of the Revised Code, not later than ten days after the comment was filed.

Sec. 4928.757. Not later than fifty days after the filing of a written notice under section 4928.753 of the Revised Code relating to a nuclear energy resource located in this state, the public utilities commission shall designate a resource that satisfies the criteria in section 4928.754 of the Revised Code as a zero-emissions nuclear resource and issue an order

consistent with that designation. If the commission does not issue an order in the time required by this section, the resource shall be deemed to be a zero-emissions nuclear resource.

Sec. 4928.7511. The public utilities commission, under a procedure it adopts, shall determine and issue the appropriate order regarding whether a nuclear energy resource described in division (C)(2) of section 4928.754 of the Revised Code satisfies the criteria in section 4928.754 of the Revised Code as a zero-emissions nuclear resource. The nuclear energy resource shall submit an environmental study showing that the resource meets the criteria under section 4928.754 of the Revised Code. At minimum, the adopted procedure shall provide the opportunity for comment and response similar to the opportunities described under sections 4928.755 and 4928.756 of the Revised Code.

Sec. 4928.7513. A nuclear energy resource determined under section 4928.757 or 4928.7511 of the Revised Code to be a zero-emissions nuclear resource shall continue to be considered such a resource for all successive program periods as long as the resource continues to meet the criteria of divisions (A), (B), and (D) of section 4928.754 of the Revised Code. The provisions of sections 4928.75 to 4928.7540 of the Revised Code shall apply to any person to which zero-emissions nuclear resources are sold, assigned, transferred, or conveyed.

Sec. 4928.7514. Zero-emission nuclear resources shall provide zero-emissions nuclear credits for the zero-emissions nuclear resource program. Not later than thirty days before a program period commences, each zero-emissions nuclear resource shall confirm with the public utilities commission its intent to

continue to commit its credits under the program.

Sec. 4928.7515. All financial statements, financial data, and trade secrets submitted to or received by the public utilities commission for purposes of satisfying the criteria as a zero-emissions nuclear resource and any information taken for any purpose from the statements, data, or trade secrets are not public records under section 149.43 of the Revised Code.

Sec. 4928.7520. Not later than sixty days after the initial program period commences and not later than thirty days before a subsequent program period commences, the public utilities commission shall set the price for zero-emissions nuclear credits applicable for the period. For the initial program period the price shall be up to seventeen dollars per credit. For each subsequent program period, that price shall be adjusted for inflation using the gross domestic product implicit price deflator as published by the United States department of commerce, bureau of economic analysis, index numbers 2007=100.

Sec. 4928.7521. At the same time the public utilities commission sets the price for zero-emissions nuclear credits, the commission shall determine the maximum number of credits to be purchased by electric distribution utilities during the program period. The amount the commission sets shall equal one-third of the total "Total End User Consumption" in megawatt-hours over the previous two calendar years as shown on PUCO Form D1 of each participating electric distribution utility's most recently filed long-term forecast report.

Sec. 4928.7522. Not later than seven days following the close of each quarter of a program period, each zero-emissions nuclear resource shall transfer all of its zero-emissions nuclear credits generated that quarter to the public utilities

commission, which shall hold the credits for the sole purpose of administering the program.

Sec. 4928.7523. Not later than seven days after the zero-emissions nuclear resource transfers its credits, the public utilities commission shall notify each participating electric distribution utility of the total amount of zero-emissions nuclear credits received from zero-emissions nuclear resources.

Sec. 4928.7524. (A) Except as provided in division (B) of this section, all participating electric distribution utilities shall purchase all zero-emissions nuclear credits transferred to the public utilities commission up to the maximum number of credits determined under section 4928.7521 of the Revised Code. The commission shall allocate the amounts to be purchased by each participating utility based on the total "Total End User Consumption" in megawatt-hours over the previous two calendar years as shown on PUCO Form D1 of each participating electric distribution utility's most recently filed long-term forecast report. Each participating electric distribution utility shall pay the credit price for each credit purchased.

(B) If the owner, as of December 31, 2016, of a zero-emissions nuclear resource sells or transfers the zero-emissions nuclear resource, the commission shall reduce the number of zero-emissions nuclear credits to be purchased from that resource during the program period and, if necessary, successive program periods, to reflect an adjustment equal to one-half of the dollar amount of any net proceeds available after the payment or provision for the seller's known obligations, but in no instance shall this adjustment apply to a sale or transfer under the United States Bankruptcy Code, including, but not limited to, sections 363 and 1123, 11 U.S.C. sections 363 and

1123.

Sec. 4928.7525. The public utilities commission shall deposit all payments for credits into the zero-emissions nuclear resources fund created under section 4928.7532 of the Revised Code.

Sec. 4928.7526. Not later than seven days after receipt of utility payment, the public utilities commission shall pay to each zero-emissions nuclear resource the amount paid for each of the resource's zero-emissions nuclear credits purchased from the zero-emissions nuclear resources fund.

Sec. 4928.7527. Credits purchased by participating electric distribution utilities may not be transferred, sold, or assigned to any other entity.

Sec. 4928.7530. Each participating electric distribution utility shall recover any and all direct and indirect costs for the purchase of zero-emissions nuclear credits through a nonbypassable rider charged to all of its retail electric service customers, which rider shall be established not later than sixty days after the effective date of this section. The nonbypassable charge shall be designed such that no retail electric service customer shall have an increase resulting from the nonbypassable rider in the customer's total retail electric service bill of more than five percent~~per cent~~ as compared to June 2015. The participating electric distribution utility shall defer as a regulatory asset an amount equal to the revenue reduction resulting from the five percent~~per cent~~ limit on customer bill increases and recover the deferral plus carrying charges through a nonbypassable charge assessed over a twelve-month period.

Sec. 4928.7532. There is hereby created the zero-emissions nuclear resources fund that shall be in the custody of the treasurer of state but shall not be part of the state treasury. The fund shall consist of all money collected by the public utilities commission from purchases of zero-emissions nuclear credits. The amounts deposited into the fund shall be used to pay the credit purchase price to the resources that generated the credits. All investment earnings from the fund shall be transferred by the treasurer to the general revenue fund in the state treasury.

Sec. 4928.7533. During each program period in which a zero-emissions nuclear resource receives payment for credits under section 4928.7526 of the Revised Code, an entity that owns or operates that zero-emissions nuclear resource and that has its corporate headquarters located in this state shall continue to maintain its corporate headquarters in this state.

Sec. 4928.7534. During the sixth and eleventh years of the zero-emissions nuclear resource program, the public utilities commission shall evaluate the zero-emissions nuclear credit price established under section 4928.7520 of the Revised Code for the purpose of discerning whether the program is achieving the policy goals in section 4928.751 of the Revised Code and whether those policy goals are being met through other federal environmental laws, programs, rules or regulations, or through amendments to the federal tax code. Upon the conclusion of its evaluation, the commission shall report the results of its evaluation to the standing committees of both houses of the general assembly that have primary jurisdiction regarding public utility legislation. In no case shall the zero-emissions nuclear resource program terminate earlier than the last day of the second program period.

Sec. 4928.7540. (A) For purposes of this section:

(1) "Employment levels" means the number of full-time employees regularly providing services at the location of a zero-emissions nuclear resource.

(2) "Full-time employee" means an individual who is employed for consideration for at least thirty-five hours per week, or who renders any other standard of service generally accepted by custom or specified by contract as full-time employment.

(B) During each program period in which a zero-emissions nuclear resource receives payment for zero-emissions nuclear credits under section 4928.7526 of the Revised Code, the employment levels at that zero-emissions nuclear resource shall continue to be similar to that of nuclear energy resources constructed prior to 1990 in the United States with the same reactor type, similar nameplate capacity, and single-unit location.

Section 2. That existing section 4928.02 of the Revised Code is hereby repealed.

Rep30

From: Rob Rains <rrains@washingtonanalysis.com>
Sent: Friday, March 31, 2017 10:03 AM
To: Shaffer, Andy
Subject: ZENs

Hi Andy,

I hope this email finds you well. My name is Rob Rains and I work for a DC-based research firm called Washington Analysis as a utilities analyst. Last month, I brought a group of clients to Columbus to meet with Rep. Seitz. We talked at length about the zero emissions nuclear credits proposal and I was curious if he has introduced that bill yet. Please let me know. Have a great weekend and I look forward to hearing from you soon.

All the best,

Rob

Robert Rains
Energy Analyst
Washington Analysis LLC
(202) 756-4431
rrains@washingtonanalysis.com

Rep30

From: Shaffer, Andy
Sent: Tuesday, April 04, 2017 12:49 PM
To: 'Rob Rains'
Subject: RE: ZENs

Rob,

Thank you for your email. Representative Seitz has not introduced the bill but he anticipates it will be introduced later this week by Rep. DeVitis (House) and Sen. Eklund (Senate).

Thank you,

Andy Shaffer
LSC Fellow for Representative Bill Seitz
Ohio House of Representatives | District 30
77 South High Street | Columbus, Ohio 43215
Andy.Shaffer@ohiohouse.gov | (o) (614) 466-8258

From: Rob Rains [mailto:rrains@washingtonanalysis.com]
Sent: Friday, March 31, 2017 10:03 AM
To: Shaffer, Andy
Subject: ZENs

Hi Andy,

I hope this email finds you well. My name is Rob Rains and I work for a DC-based research firm called Washington Analysis as a utilities analyst. Last month, I brought a group of clients to Columbus to meet with Rep. Seitz. We talked at length about the zero emissions nuclear credits proposal and I was curious if he has introduced that bill yet. Please let me know. Have a great weekend and I look forward to hearing from you soon.

All the best,

Rob

Robert Rains
Energy Analyst
Washington Analysis LLC
(202) 756-4431
rrains@washingtonanalysis.com

Rep30

From: Rob Rains <rrains@washingtonanalysis.com>
Sent: Wednesday, May 03, 2017 9:06 AM
To: Wolf, Jimmy
Subject: FW: FirstEnergy: Ohio Senate Public Utilities Committee Hearing about ZENs bill tomorrow, Updated States outlook

Fyi, chart might be the most useful.

From: Rob Rains (Washington Analysis) [mailto:rrains@washingtonanalysis.com]
Sent: Wednesday, May 03, 2017 9:01 AM
To: Rob Rains
Subject: FirstEnergy: Ohio Senate Public Utilities Committee Hearing about ZENs bill tomorrow, Updated States outlook

Good morning Rob,

I hope this email finds you well. Just writing with a quick update on **FirstEnergy's** (FE) efforts to secure zero emissions nuclear credits (ZENs) for its Ohio-based nuclear plants. In light of tomorrow morning's hearing before the Ohio Senate Public Utilities Committee for SB 128, which would assign a $17/mega-watt-hour value to both FirstEnergy Ohio plants for a period of 16 years, we reiterate our pessimism for its passage on the basis that the measure, as proposed, is still struggling to gain traction within the state legislature. Last week, we heard from a variety of stakeholders in the Ohio House Utilities Committee, including FirstEnergy CEO Chuck Jones. Today's hearing will only see testimony from the bill's sponsors, Republican Sens. John Eklund and Frank Larose.

Below is our updated chart concerning state proposals to value existing nuclear plants. Please take a look.

We will continue to watch this closely. Please let us know if you have any questions.

All the best,

Rob

State	Bill/Law	ZEC Price	Term	Bill Summary	
CT	SB 106 (on the Senate floor)	N/A	5 years (power purchasing agreement).	Orders Energy and Environment officials and the attorney general to request proposals from nuclear plants for a five year power purchasing agreement.	Voted out of the Senate March 21st. Passage exp
IL	SB 2814 (now Public Act 099-0906)	Adjusted social cost of carbon [$16.50/megawatt hour (MWh)]	10 years (May 31, 2027).	Directs the Illinois Power Agency to prepare a 10-year procurement plan for zero emissions credits based upon the floor price set by the social cost of carbon.	Was signed into law De June 1st. Currently litig district court. 1. *Electric Powe* Most recently, status in the pr 2. *Village of Old* recently, a stat

					FERC declined to subm Illinois ZECs last week unlikely to stop states fi ZECs to ultimately be u
NJ	S3061/A4698	N/A	N/A	Orders Board of Public Utilities to conduct a study within one year on the "feasibility and benefits" of adopting a ZEC program.	Hearing scheduled for M has been delayed again and Environment Comm not expect a ZECs prop conference held on May Richard Mroz spoke fav energy source.
NY	New York Clean Energy Standard (CES)	$17.48/MWh (adjusted after first 2 years)	12 years (March 31, 2029).	The state's energy research and development authority (NYSERDA) would enter into a 12-year overall agreement to purchase ZECs at a floor price of $17.48 per MWh beginning April 1, 2017, before gradually increasing to $29.15 per MWh through March 31, 2029.	Order issued by the Nev August 1st. Currently ch *Electricity et al v. Zibel* court. We expect dismi order by summer but al Court of Appeals. New but have little recourse.
OH	SB 128/HB 178	$17/MWh	16 years	Companies that "own or operate" a qualifying nuclear plant [**FirstEnergy** (FE)] would be compensated in two-year periods at $17/MWh for nuclear generation.	The House Utilities Co 25. Press reports indica according to Ohio Sena
PA	N/A	N/A	N/A	N/A	The Pennsylvania Nucl 22 but has indicated it i ZECs before proposing openly discussed the po existing nuclear fleet, a also have nuclear gener

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Rep30

From: Ned Ford <Ned.Ford@fuse.net>
Sent: Wednesday, May 03, 2017 11:14 AM
To: Shaffer, Andy
Subject: Re: MIT Study

FirstEnergy is asking for $265 million per year in the Zero Carbon Credits legislation. For $265 million per year Ohio can eliminate the need for Davis Besse in a couple of years with efficiency, or by incentivizing wind just a little for a few years (not for the foreseeable future like FE proposes). Utility scale solar is also cheaper than subsidizing the nuclear plants, but not as much.

Davis Besse would not be in such bad shape if FirstEnergy and its predecessor companies had not taken such poor care of it. It is one of the most dangerous nuclear plants in the United States today. Perry and Beaver Valley are in better shape, but they are aging too.

Of course the Oregon Ohio Natural Gas Combined Cycle plants under construction and due to be completed this year are larger than Davis Besse, and are only 20 miles away. They are supposed to be 1200 MW's while Davis Besse is only a little under 900 MW's.

Witness the collapse of Westinghouse. Nuclear power has run its course and it is time to move on.

Cheaper too.

Thanks for sending this.

- Ned Ford
513-600-4200

On 5/3/2017 9:19 AM, Andy.Shaffer@ohiohouse.gov wrote:

> Good morning,
> Please find enclosed the MIT study that was referenced in the House Public Utilities Committee meeting last Tuesday, April 25.
> Please do not hesitate to contact our office if you have any questions.
> Thank you,
> Andy Shaffer
> LSC Fellow for Representative Bill Seitz
> Ohio House of Representatives | District 30
> 77 South High Street | Columbus, Ohio 43215
> Andy.Shaffer@ohiohouse.gov | (o) (614) 466-8258

Rep30

From: Snitchler, Todd A <tasnitchler@vorysadvisors.com>
Sent: Wednesday, May 03, 2017 11:45 AM
To: Wolf, Jimmy
Subject: RE: Public Utilities Committee Meeting
Attachments: (4571)_(1)_R Street Analysis on Nuke Bailouts.PDF

Jimmy –

Per our discussion with Rep. Seitz attached is the R Street study on nuclear subsidies.

Also, appreciate the heads up, we'll get to work on getting people here.

TAS

VORYS | Advisors

Todd A. Snitchler
Principal
Vorys Advisors LLC
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From: Jimmy.Wolf@ohiohouse.gov [mailto:Jimmy.Wolf@ohiohouse.gov]
Sent: Wednesday, May 03, 2017 10:38 AM
To: Snitchler, Todd A
Subject: Public Utilities Committee Meeting

Todd,

Thanks for coming in. After talking with Chairman Seitz some more he is having me schedule committee next Tuesday, May, 9th at 3 PM for proponent/opponent testimony. Any hearings after next week will be all testimony. If you have any questions, please feel free to contact me.

Best,

Jimmy Wolf
Legislative Aide to Representative Bill Seitz
30th House District
614.466.8258
Jimmy.wolf@ohiohouse.gov

Free markets. Real solutions.

R STREET POLICY STUDY NO. 84
February 2017

DISCIPLINED POLICY RESPONSES TO NUCLEAR RETIREMENTS

Devin Hartman

CONTENTS

EXECUTIVE SUMMARY

A combination of market, policy and regulatory factors have converged to squeeze the finances of the U.S. nuclear generation fleet. Among a variety of organic and external factors, low-priced natural gas is the driving force of financial pressure.[1] A revolution in natural-gas extraction and generation technologies has dramatically shifted the competitive playing field.[2] External policy pressures—such as the Production Tax Credit (PTC) and Renewable Portfolio Standards (RPS) —also put downward pressure on nuclear revenues.

Increased cost pressure on nuclear plants largely stems from external regulatory factors, as the regulatory burden of the average nuclear plant now stands at $8.6 million annually.[3] Following the 2011 Fukushima Daiichi accident, increased safety-compliance costs have factored into the closure of several U.S. nuclear facilities.[4] However, it should be noted that, as post-Fukushima safety-related expenses decline, the nuclear industry expects capital expenditures to moderate from their 2014 peak back to levels last seen in 2007-2008.[5]

These forces have resulted in increased capital investment requirements, higher operating costs and reduced revenues in wholesale electricity markets for nuclear generators.[6] Cost and revenue pressures have rendered some nuclear plants unprofitable. Six reactors have closed in the past five years, while 19 others either have announced their intention to close or are "at-risk" of closure, as determined by ratings agencies and financial consultants.[7] Roughly 10 percent of the U.S. nuclear fleet has either already closed or is scheduled to close within the next 16 years.[8] Nuclear plants owned by independent power producers, or merchants, face greater risk of retirement given their exposure to market forces (i.e., they profit from market revenues, minus costs).

1 Rorke, 2016.

2 Hydraulic fracturing and horizontal drilling drove large production-cost decreases in natural-gas extraction, driving down the commodity price of natural gas. Meanwhile, natural gas, combined with cycle-generation technology, has witnessed marked advances that boosted plant efficiency. Combined with the low construction-cost risk of these plants and a very favorable financial environment (e.g., low interest rates and financial-engineering innovations), new market entrants using this technology add to market pressures on incumbents.

3 Batkins, 2016.

4 PJM Interconnection, "Resource Investment in Competitive Markets," May 5, 2016. http://www.pjm.com/-/media/documents/reports/20160505-resource-investment-in-competitive-markets-paper.ashx

5 Nuclear Energy Institute, "Nuclear Costs in Context," April 2016.

6 Coal generators have experienced similar effects.

7 Phillip Brown and Mark Holt, "Financial Challenges of Operating Nuclear Power Plants in the United States," Congressional Research Service, Dec. 14, 2016.

8 Rorke, 2016.

For this reason, announced or at-risk nuclear retirements tend to be concentrated in restructured electricity states, including Texas, Illinois, Ohio and most of the mid-Atlantic and Northeast. These states participate in organized, competitive wholesale electricity markets administered by regional transmission operators (RTOs) or independent system operators (ISOs). Plants owned by monopoly utilities are insulated from market forces to a large degree, as they pass wholesale market revenues and costs through to retail ratepayers. In 2015, *The Economist* correctly noted that "where markets are freer, it is harder for nuclear-power operators to make money, and too risky for them to build plants from scratch."[9]

Recent and anticipated nuclear retirements have prompted blowback from a variety of nuclear advocates. The reasons they argue against nuclear retirements include adverse effects on electric-system reliability, increased electricity costs, loss of fuel diversity, local economic impacts and increased air pollution, especially greenhouse-gas emissions. Claims of "incredibly detrimental" economic and environmental consequences have led to urgent calls for policies that prevent "premature" nuclear plant retirements.[10] Proponents have proposed or enacted various out-of-market, or "around market," policy interventions to support merchant nuclear plants.[11] These include subsidies, re-regulation and government takeover of private nuclear assets (i.e., nationalization).[12] Most notably, the New York Public Service Commission recently created a Zero Emissions Credits (ZECs) program that will subsidize three unprofitable nuclear plants for 12 years or more. This is part of a Clean Energy Standard to obtain half of New York's electricity from renewables, which will radically reshape its generation market.[13] Once the dust settles from legal challenges, ZEC may serve as a model for other states with unprofitable nuclear plants.[14] In December 2016, Exelon Corp. borrowed elements of the ZEC model in securing legislation that provides $235 million in annual subsidies for two unprofitable nuclear plants in Illinois.[15]

Nuclear retirements have not only invited interest in subsidies but spurred open discussions of re-regulation and against restructuring.[16] Discussions over vertical reintegration or re-regulation as a path to save unprofitable nuclear plants appear sincere and have staying power.[17] Ohio utilities openly discuss re-regulation and reintegration as part of a dispute over subsidies for unprofitable merchant coal and nuclear plants.[18] FirstEnergy Corp. announced plans to join American Electric Power Ohio (AEP) in lobbying the state Legislature to re-regulate generation assets.[19] In Michigan, utilities have cited Ohio's situation as a case against electricity competition and consumer choice, while pursuing legislation to eliminate it.[20] Like Ohio, Illinois policymakers have discussed re-regulation if nuclear subsidies fail.[21]

The market distortions posed by various interventions to preserve nuclear also have encouraged RTO/ISOs and their stakeholders to explore market-based alternatives. Nuclear subsidies in New York pushed the New York Independent System Operator (NYISO) and its stakeholders to be aggressive in exploring carbon pricing as an alternative.[22] A variety of disruptive state interventions to spur clean energy development and retention have encouraged ISO New England Inc. (ISO-NE) and its stakeholders also to examine carbon pricing, dedicated clean-energy markets or new market rules that accommodate state policy objectives.[23]

This report examines the merits of arguments to intervene to prevent nuclear retirements, as well as the consequences of doing so. It finds no justification for nuclear-specific interventions. The only legitimate concern that nuclear retirements are premature is that electricity markets do not fully account for the external "social cost" of pollution. Excluding

9 *The Economist*, "Half-death: The future of nuclear energy," Oct. 31, 2015. http://www.economist.com/news/international/21677243-nuclear-power-emits-no-greenhouse-gases-yet-it-struggling-rich-world-half-death

10 Donald R. Hoffman, "Presenting the Nuclear Narrative: Technical and Regulatory Issues Facing Nuclear Power Plants," ANS Special Committee on Nuclear in the State, June 2016. https://www.eiseverywhere.com/file_uploads/6dbdda911158b325ed6f7c550af95072_00-DonHoffman-PresentingtheNuclearNarrative_Revised.pdf

11 Raymond L. Gifford and Matthew S. Larson, "State Actions in Organized Markets: States Strive to 'Fix' Markets and Retain Base Load Generation," Wilkinson, Barker, Knauer LLP, September 2016. http://www.wbklaw.com/uploads/file/White%20Paper%20-%20Market%20Design%20Issues%20(September%202016).pdf

12 Energy Systems Strategic Assessment Institute, "Economic and Market Challenges Facing the U.S. Nuclear Commercial Fleet," Idaho National Laboratory, Center for Advanced Energy Studies, and Gateway for Accelerated Innovation in Nuclear, September 2016. https://gain.inl.gov/Shared%20Documents/Economics-Nuclear-Fleet.pdf

13 SNL Energy, "The New York Clean Energy Standard-A 360 View," Regulatory Research Associates, Aug. 23, 2016.

14 SNL Energy, 2016.

15 Peter Maloney, "Updated: Illinois Gov. Rauner signs Exelon nuclear legislation," Utility Dive, Dec. 7, 2016. http://www.utilitydive.com/news/updated-illinois-gov-rauner-signs-exelon-nuclear-legislation/431803/

16 Gifford and Larson, 2016.

17 Gifford and Larson, 2016.

18 Gifford and Larson, 2016.

19 Tom Knox, "FirstEnergy joining AEP push to pull back on open market in Ohio," *Dayton Business Journal*, Nov. 7, 2016. http://www.bizjournals.com/dayton/news/2016/11/07/firstenergy-joining-aep-push-to-pull-back-on-open.html?ana=RSS%26s=article_search

20 Andy Balaskovitz, "Michigan utility says Ohio 'bailouts' make case against deregulation," *Midwest Energy News*, April 12, 2016. http://midwestenergynews.com/2016/04/12/michigan-utility-says-ohio-bailouts-make-case-against-deregulation/

21 Based on personal conversations with elected Illinois officials in summer 2016.

22 E.g., see forthcoming Brattle Group white paper on CO_2 pricing in NYISO's energy market.

23 Mark Karl, "Initial ISO IMAPP Comments," ISO-NE, Sept. 14, 2016. https://www.iso-ne.com/static-assets/documents/2016/09/imapp_20160914_presentation_iso_initial_comments.pdf

external "social cost" considerations, nuclear retirements generally do not appear to be premature through a nominal economic lens.[24] Rather, they are consistent with the under-lying economics of baseload plants in the current market and regulatory environment.[25]

Electricity markets should not explicitly value fuel diversity (a proxy slogan for benefits already remunerated in markets) or local economic protection (transfer payments).[26] Rather, the core function of market design should remain to procure reliable electricity at the least cost. The RTO/ISO market constructs for reliability are imperfect, but do not appear specifically to disadvantage nuclear or other baseload assets.[27] To whatever extent market design fails to account for certain reliability attributes, that failure concerns reliability service procurement alone, not an inherent need to procure a certain type of fuel or technology. Any such failure should be corrected via market-design reforms, not out-of-market compensation. Furthermore, there is no evidence of an imminent threat to bulk reliability to justify interim subsidies.[28]

Some nuclear retirements—those that meet definitions of socially "premature" retirements—would not occur if markets fully internalized the social cost of pollution.[29] Nuclear retirements will generally increase conventional and greenhouse-gas emissions, except for emissions regulated under a binding emissions-trading program.[30] Socially premature nuclear retirements highlight the shortcomings of U.S. climate policy.[31] In the absence of consistent, market-based emissions-reduction policy, what has instead surfaced is ad hoc climate policy (e.g., sporadic subsidies for particular resources, including nuclear plants). This threatens to undermine competitive electricity markets severely and is generally inconsistent with sound economic policy. If an ad hoc system supersedes American capitalism's predictable rules-based system, the long-term economic damage will be grave.[32]

Nuclear subsidies, re-regulation or nationalization each represent industrial policy with, at best, temporary environmental co-benefits. Industrial policy is a high-cost, less-effective path to a cleaner energy future. Providing subsidies to clean energy is not equivalent to pricing externalities like air pollution. The underlying market failure is that pollution is underpriced, not that clean power is too expensive.[33] In theory, subsidies offer incentives to reduce emissions, but in practice, they often promote economically inefficient and environmentally unsound actions.[34] Counteracting subsidies for certain resources (e.g., renewables) with subsidies for others (e.g., nuclear) constitutes a policy race to the bottom. Introducing new subsidies deepens the political cycle of rent-seeking handouts. The future health of electricity markets depends on unwinding the existing subsidy regime.[35]

If subsidies are a foregone conclusion, they should be specific in purpose, minimal in duration and should be extended only where there is a valid market failure, all to reduce the likelihood of broader subsidy metastasis. Re-regulation and nationalization are economically damaging policy options that have no slimmer "diet" version to avoid severe market distortions. Electric industrial policy undermines market institutions during a politically vulnerable period and propels the uneconomical movement for government engineering of the electric fuel mix. Sacrificing policy quality for political expedience will come at high economic and political cost, with extensive long-term unintended consequences.[36]

24 "Premature," from an engineering perspective refers to where shutdown occurs with useful operating life remaining. This sense of the term is distinct from the relevant economic perspective. Retirements are economically premature if the costs of continued operation are less than the costs of replacement resources, assuming no change in demand.

25 The Brattle Group, "Response to U.S. Senators' Capacity Market Questions," open letter to the U.S. Government Accountability Office, May 5, 2016. http://www.brattle.com/system/publications/pdfs/000/005/283/original/Brattle_Open_Letter_to_GAO_-_Response_to_U.S._Senators%E2%80%99_Capacity_Market_Questions.pdf?1462477367

26 Mere transfer payments do not improve economic efficiency. Any policy intervention should occur to address legitimate market failures (e.g., barriers to labor retraining), if applicable.

27 No market-design flaws clearly discriminate against nuclear or other baseload resources in a manner that jeopardizes grid reliability. Investment trends in these markets indicate sufficient resources will exist to maintain reliability in light of nuclear retirements. The failure of some nuclear units to clear capacity markets indicates that reliability standards will be met more cost-effectively with replacement resources for unprofitable nuclear plants (largely new natural-gas generators).

28 Some cite MISO's projected generation shortfall as an imminent threat. However, MISO's limited tools to project resource adequacy multiple years in advance have led to false projections of resource shortages in the recent past. MISO's capacity market still must procure sufficient resources. A shortfall in resources would mean the supply offered into the market would have to be less than the procurement requirement. This has never occurred in any capacity market, because some market participants are always willing to provide capacity at some price.

29 The revenues obtained by nuclear plants would increase if electricity prices reflected the social cost of pollution. If these revenues were sufficient to keep some otherwise unprofitable plants financially solvent, then retiring these plants is socially premature.

30 Subsidizing a method of emissions reduction under a binding emissions-trading program simply shifts the means of emissions reductions (and distorts the emissions-allowance market) without reducing the total level of emissions.

31 Some nuclear-plant retirements are socially inefficient and would remain open under a robust price on carbon.

32 "How Donald Trump is changing the rules for American business," *The Economist*, Dec. 10, 2016. http://www.economist.com/news/leaders/21711314-president-elect-has-new-approach-dealing-corporate-america-it-not-all-good

33 Severin Borenstein, "The Private and Public Economics of Renewable Electricity Generation," Energy Institute at Haas, December 2011. https://ei.haas.berkeley.edu/research/papers/WP221.pdf

34 Robert N. Stavins, "Experience with Market-Based Environmental Policy Instruments," Resources for the Future, November 2001. http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-01-58.pdf

35 David Victor, "Energy and climate: Moving beyond symbolism," Brookings Institution, Oct. 18, 2016. https://www.brookings.edu/research/energy-and-climate-moving-beyond-symbolism/

36 For example, contentious, high-cost interventions intensify the political divide over climate policy.

Further sacrifices of market integrity will reverberate through the industry, chilling investment as costs escalate.[37]

The twin political motivations of economic growth and emissions mitigation should prompt policymakers to strengthen, not undermine, competitive electricity markets. Competitive electricity markets drive environmental improvements through improved fuel management, risk management, feedback effects of lowering emissions-reduction costs, facilitating organic growth in clean-energy demand and stimulating innovation. As such, out-of-market interventions that temporarily reduce emissions may compromise long-term emissions reductions by disrupting competitive market performance.[38]

Public policy should facilitate well-functioning marketplaces. Trimming regulatory costs could help the competitiveness of the nuclear industry.[39] Reforming wholesale electricity markets to improve price formation (prices do not currently reflect all costs) would enhance market performance. Reducing government engineering of the fuel mix similarly would bolster markets (e.g., reducing mandates and phasing-out deployment subsidies, which distort price signals). Such actions would increase market revenues for nuclear as a byproduct.

The most important message for policymakers is to stay disciplined. The notion that the economic and environmental consequences of nuclear retirements are "incredibly detrimental" is overblown. By contrast, the adverse consequences of out-of-market policies to prevent nuclear retirements are potentially severe. The economic case for government intervention remains limited to *efficient* correction of market failure. The unease of socially premature nuclear retirements should motivate political commitment for a market-based, long-term strategy that drives innovation, reduces emissions at least cost and bolsters reliability. This will benefit the U.S. economy the most and prove far more politically durable than ad hoc climate policy. It also would serve as a model the world is more likely to follow.

WHOLESALE ELECTRICITY MARKET DESIGN

Reliability and cost concerns of merchant nuclear retirements are necessarily questions of wholesale electricity market design. Extensive market failure in the electric industry necessitates the "visible hand" of market design to allow the "invisible hand" of the market to function. Market design sets the rules for how markets operate and participants interact. It provides incentives for competitive behavior and shapes the processes that guide market outcomes.

Some critics argue electricity markets have severe flaws that fail to recognize the unique value of nuclear – such as its dependability, price stability, environmental attributes and local economic development impacts (e.g., tax revenue, job creation and labor income).[40] This has led critics to levy broad assertions that structural problems in market design put well-operated nuclear plants at risk.[41] Others have made more specific charges that structural problems in wholesale electric energy and capacity markets pose a threat to grid reliability by insufficiently compensating baseload resources (i.e., resources with high year-round operational dependability).[42] Certain nuclear proponents have criticized specific RTO/ISOs, such as accusations of poor market design in NYISO.[43]

Evaluating market design begins with the central objective of achieving electric reliability at least cost. RTO/ISOs do not have an environmental mandate, but can reduce compliance costs with external environmental policies.[44] Fuel diversity and local economic development are not aims of market design, but questions have been raised questions about whether they warrant explicit market valuation.

Local economic development

Nuclear plants often are located in small towns, where they frequently comprise a large portion of the workforce and local tax base. An average nuclear plant creates 700 to 1,200 permanent jobs, $46 million in total labor income and $16-$20 million in state and local tax revenue.[45] Local economic disruption from a nuclear plant closure is not categorically different from the loss of any major employer, such as a large manufacturing facility. Out-of-market policies to keep unprofitable plants in operation reflect temporary transfer payments that suppress market prices.[46] This inhibits eco-

37 Such concerns prompted recent interest in enhanced emissions pricing in the Northeast as a more economical alternative.

38 Devin Hartman, "Environmental benefits of electricity policy reform," R Street Institute, January 2017. http://www.rstreet.org/policy-study/environmental-benefits-of-electricity-policy-reform/

39 Sam Batkins, "The Costs and Benefits of Nuclear Regulation," American Action Forum, Sept. 8, 2016. https://www.americanactionforum.org/research/costs-benefits-nuclear-regulation/

40 Hoffman, 2016.

41 Christine Todd Whitman, "Why Closing Nuclear Power Plants Is Short-Sighted," *Wall Street Journal*, Nov. 16, 2015. http://blogs.wsj.com/experts/2015/11/16/why-closing-nuclear-power-plants-is-short-sighted/

42 George David Banks, "Market Flaws and Distortions in Competitive Electricity Markets," *The American Consumer*, July 9, 2014. http://www.theamericanconsumer.org/2014/07/new-aci-consumergram-market-flaws-and-distortions-in-competitive-electricity-markets-preserving-grid-reliability-and-protecting-u-s-climate-goals/

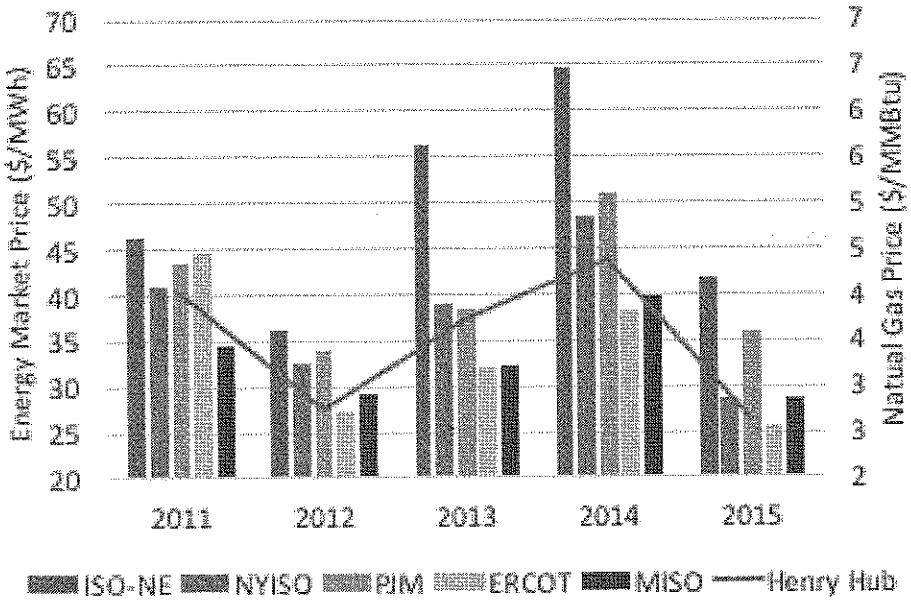
43 Nuclear Energy Institute, "Poor Market Design Propels Closure of another Plant-FitzPatrick," Nov. 5, 2015. http://www.nei.org/News-Media/News/News-Archives/Poor-Market-Design-Propels-Closure-of-Another-Plan

44 Devin Hartman "Wholesale Electricity Markets in the Technological Age," R Street Institute, August 2016. http://www.rstreet.org/wp-content/uploads/2016/08/67.pdf

45 Hoffman, 2016.

46 Brattle Group, "Response to U.S. Senators' Capacity Market Questions," 2016.

FIGURE I: WHOLESALE ELECTRICITY VERSUS NATURAL GAS PRICES



SOURCE: R Street chart derived from SNL Energy, NYMEX and CME Clearport data.

nomic dynamism, which depends on the unimpeded flow of capital and labor to facilitate their most productive uses. The "gale of creative destruction" relies on new firms leveraging an innovative process to replace incumbent firms within a specific industry.[47]

Structural unemployment from nuclear retirements does not warrant intervention to postpone retirements. Policy intervention, if necessary, should correct for labor-market failures (e.g., local illiquidity, information imperfections in capital markets that constrain access to job retraining) and perhaps to ease local economic shocks. This is not an economic justification for taxpayers or ratepayers to subsidize an expensive, temporary employment bridge, let alone to do so to the detriment of electricity-market performance.

Fuel diversity

Arguments for explicit valuation of fuel diversity tend to have two justifications: risk management and reliability. The first notes that fuel diversity has value as a hedge against volatility in electricity prices (i.e., risk management). Price volatility depends on the volatility of the physical output and input cost parameters of specific types of resources in specific locations. It does not correlate with a generic metric of fuel-mix diversity. For example, the comparatively high output variability of wind and solar and high fuel-price volatility of natural gas typically make generation portfolios with higher reliance on these fuel types experience more price volatility. The marginal cost of nuclear is comparatively very stable, thus nuclear generation in lieu of natural gas, wind or solar generation should reduce price volatility. This effect is very modest, however, as nuclear rarely sets the market-clearing price. Rather, natural gas is already the driving force of wholesale electricity prices. Thus, further reliance on natural gas in lieu of nuclear generation would have modest price hedging value, at best.

Some analysts argue that a diversified portfolio is the most cost-effective tool to manage inherent uncertainty in future fuel prices.[48] Merchant generation owners account for this in their portfolio holdings. Furthermore, merchants manage risk based on self-interest, resulting in better risk management than when risk is socialized (e.g., as with legislated resource mandates or under the monopoly utility model). Market failures under the competitive model will be seen only where there is a misalignment of private and social risk. This unsettled debate largely comes down to discrepancies in time horizons, as merchant owners use relatively high discount rates. This is a potential argument for time-adjustments to resource-adequacy constructs, but not for explicit valuation of resource diversity.

Wholesale electricity market participants employ hedging positions to protect against price volatility. Similarly, retail customers in restructured states can choose electric supply contracts that provide greater rate stability. Market partici-

47 Joseph Schumpeter, "Capitalism, Socialism and Democracy," Harper & Row, 1943.

48 IHS Energy, "The Value of US Power Supply Diversity," July 2014. http://www.energyxxi.org/sites/default/files/USPowerSupplyDiversityStudy.pdf

pants are best equipped to undertake hedges consistent with their individual cost-risk profiles, which vary substantially. Market design that explicitly seeks to reduce price volatility via fuel diversity would likely prove complex and require administrative judgment to substitute for that of heterogeneous market participants. This results in poor resource allocation.

The other argument for fuel diversity posits that a more diverse fuel mix is inherently more reliable, but this isn't necessarily the case.[49] As the market monitoring unit for PJM Interconnection LLC notes, "diversity is not a synonym for reliability."[50] Fuel diversity is often conflated with, and used as a proxy for, particular attributes that directly affect reliability. Attributes such as dependability, or specific capabilities like frequency response and operational flexibility (e.g., "ramp," or the ability to adjust generation output) are essential for reliability and often associated with particular fuel types to varying degrees. Markets must procure reliability attributes in the correct proportion, not necessarily a fuel type ratio, even if fuel type is associated with the attributes.[51] In this manner, well-designed markets achieve reliability without explicitly valuing fuel diversity.

The "fuel diversity as reliability" argument highlights a potential emerging hole in market design. Increased reliance on a shared fuel supply line at multiple power plants can lead to an amassing point of single failure, assuming no or limited alternative supply lines exist. For example, areas like New England—with few natural gas pipelines—are vulnerable to a single disruption in pipeline service that would affect multiple power plants. This can also apply to coal facilities, where railway delivery issues affect on-site coal inventories at multiple power plants on the same rail supply line.[52] Nuclear provides a reliability hedge against fuel-supply network constraints, but market design does not generally recognize this value. While the goal of market design should not be explicit valuation of fuel diversity, it should give consideration to the reliability attribute of shared fuel-delivery network effects.[53]

Attempts to achieve fuel diversity explicitly likely would result in inefficient and discriminatory practices inconsistent with the Federal Power Act. The reliable performance of power generators varies across and within fuel types and often changes with fluctuating conditions. This would render any attempt to value fuel diversity explicitly very complex and would require extensive administrative judgment. Ultimately, the central aim of market design should remain to procure specific reliability attributes at the least cost.

Least-cost reliability

Wholesale grid reliability relies on resource adequacy, which is the state of having sufficient resources to meet maximum demand. Resource adequacy is nonexcludable, causing "bare" markets to underprovide the service.[54] To counteract this, RTO/ISOs employ scarcity pricing in energy markets. Midcontinent Independent System Operator (MISO), NYISO, PJM and ISO-NE also use capacity markets. These mechanisms ensure resource owners receive sufficient revenue to sustain resource investment for the system to obtain adequate resources. As of summer 2016, these mechanisms have led to RTO/ISOs maintaining adequate installed resources to meet reliability targets.[55] However, this does not guarantee that resources will operate dependably as expected at times of system stress.

Energy markets use short-term supply and demand to form prices that reflect the location-based marginal value of bulk energy. This facilitates the least-cost use of resources to maintain operating grid reliability. Expectations of future energy-market prices drive investment behavior.

The Electric Reliability Council of Texas (ERCOT) relies exclusively on energy markets to achieve resource adequacy, which puts great weight on scarcity pricing. Scarcity pricing is a mechanism to send price signals that reflect real-time systemwide shortages in power reserves.[56] This approach relies exclusively on investor expectations of sufficient market revenue to maintain resource adequacy.

System shortages are rare, typically occurring when unusual weather drives exceptionally high demand or when generation availability is low. This results in infrequent scarcity pricing events where some resources are unprofitable in most years but gain sufficient revenue during high shortage years to remain profitable over a multiyear period. Analysis suggests that, in 2015, ERCOT markets did not provide sufficient revenues to support existing nuclear or coal units, as

49 For example, a "well-diversified" generation portfolio consisting of five fuel types may not perform as reliably as a portfolio with three fuel types if the latter relies more on resources with superior performance capabilities. In this case, certain fuel types may have attributes that cause performance advantages (e.g., on-site fuel supply mitigates fuel shortages), but the attributes of that advantage are what should be pursued in market design, not the associated fuel type or any measure of fuel diversity.

50 Monitoring Analytics LLC, "Post-hearing reply brief of the independent market monitor for PJM," Feb. 26, 2016. http://www.monitoringanalytics.com/reports/Reports/2016/IMM_Post_Hearing_Reply_Brief_Case_No_14-1297-EL-SSO_20160226.pdf

51 PJM, 2016.

52 Federal Energy Regulatory Commission, "Coal Delivery Issues or Electric Generation," Dec. 18, 2014. https://www.ferc.gov/media/headlines/2014/2014-4/A-3-presentation-staff.pdf

53 For example, contingency definitions for reliability planning may need to recognize the impact of fuel delivery disruptions on multiple power plants.

54 Hartman, 2016.

55 Federal Energy Regulatory Commission, "Summer 2016 Energy Market and Reliability Assessment," May 19, 2016. https://www.ferc.gov/market-oversight/reports-analyses/mkt-views/2016/05-19-16.pdf

56 Hartman, 2016.

well as any new entry from natural gas units.[57] ERCOT did not trigger scarcity in the summer of 2016, despite witnessing record peak demand, largely the result of high wind output. Loss of some coal and nuclear units could put ERCOT below its reliability target. However, new generation continues to come online in ERCOT, perhaps indicating that investors expect a rebound in future revenues.

In 2013, the Public Utilities Commission of Texas ordered ERCOT to implement scarcity-pricing reforms. The last step was implemented in June 2015. In 2015, the commission indicated an interest in reviewing the reforms.[58] It is difficult to evaluate whether further adjustments are warranted, given the brief duration of scarcity-pricing reforms.[59]

In contrast to reliance on a price instrument, which provides no guarantee of sufficient resource procurement, capacity markets procure a minimum quantity of capacity. This quantity is based on projected annual peak demand, plus a reserve margin. If a resource does not expect to receive enough revenues in the energy market to remain operational, it has the incentive to offer into the capacity market at a level that will provide it sufficient revenue to cover its costs. Resources whose offers are greater than the market price do not clear the market. The RTO/ISO relies on resources clearing the capacity market to perform when called upon. RTO/ISOs differ in the penalties for nonperformance. All three eastern RTO/ISOs (PJM, NYISO and ISO-NE) and MISO employ capacity markets to supplement energy markets.

MISO operates a short-term capacity market in a region where regulated monopoly utilities serve 96 percent of demand.[60] Resource procurement for regulated utilities occurs through state processes, not in response to capacity market signals.[61] As a result, utilities typically opt-out of MISO's capacity market or offer at zero. This leaves a small, residual capacity market to provide primarily for Illinois, the sole fully restructured state in MISO. Concerns over the lack of efficient and timely price signals in restructured areas has prompted MISO to propose major capacity-market design changes, which are currently under review by the Federal Energy Regulatory Commission (FERC).[62]

MISO's capacity market has multiple design flaws. One study concluded its current design is unlikely to support sufficient market-based investment to meet the needs of restructured areas.[63] Arguably the largest flaw is a single minimum-capacity requirement, effectively a vertical demand curve. This does not reflect the continuous value of incremental resource adequacy that a sloped demand curve would provide. As a result, price signals are volatile and difficult to predict, providing an inconsistent investment signal. At least some generation retirements and suspensions announced in 2016 in MISO can be attributed to inefficient capacity pricing.[64] This creates legitimate revenue concerns for all merchant generation in MISO, including its five remaining merchant nuclear plants. In addition to market-design concerns, deficiencies in utility procurement practices lead to undervaluation of merchant-owned resources, but enhanced "market tests" offer one option to better achieve this.[65]

NYISO also operates a short-term capacity market, but with a decidedly different design than MISO. According to NYISO's independent market monitor, the capacity market is fundamentally sound and has performed relatively well.[66] NYISO has always procured sufficient capacity to meet reliability requirements and retirement decisions generally have been efficient.[67] The primary incentive for generator performance rests with NYISO's real-time energy-market pricing. NYISO's energy market has provided sufficient performance incentive for the system to maintain reliability. For example, natural-gas fired generators conserved scarce natural gas by switching to fuel oil during 2014's "polar vortex."[68] Well-performing generators, such as nuclear, are rewarded for their dependability during such scarcity periods when prices spike.

ISO-NE and PJM recently enacted major overhauls of their long-term (three years forward) capacity markets to create robust capacity payments and penalties as the primary

57 Potomac Economics, "2015 State of the Market Report for the ERCOT Wholesale Electricity Markets," June 2016. https://www.potomaceconomics.com/uploads/ercot_documents/2015_ERCOT_State_of_the_Market_Report_-_FINAL_update_6.21_16_.pdf

58 Kenneth W. Anderson, Jr., "Commission Proceeding to Ensure Resource Adequacy in Texas," PUCT Docket No. 40000, Oct. 7, 2015.

59 Potomac Economics, 2016.

60 Midcontinent Independent System Operator, "Market Vision Stakeholder Feedback," 2014. https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/MSC/2014/20140401/20140401%20MSC%20Item%2005a%20Stakeholder%20Market%20Roadmap%20Feedback.pdf

61 Kathleen Spees, Samuel A. Newell and Roger Lueken, "Enhancing the Efficiency of Resource Adequacy Planning and Procurements in the Midcontinent ISO Footprint: Options for MISO, Utilities, and States," prepared for NRG, November 2015. http://www.brattle.com/system/publications/pdfs/000/005/221/original/Enhancing_the_Efficiency_of_Resource_Adequacy_Planning_and_Procurements_in_the_MISO_Footprint_Newell_Spees_1115.pdf?1448034421

62 Marcy Crane, "MISO proposes forward capacity auction for competitive retail areas," SNL Energy, Nov. 2, 2016. https://www.snl.com/web/client?auth=inherit#news/article?id=38235280&KeyProductLinkType=2

63 Spees, et al., 2015.

64 Potomac Economics, "2015 State of the Market Report for the MISO Electricity Markets," June 2016. https://www.potomaceconomics.com/uploads/midwest_reports/2015_SOM_Main_Body_Final_Rev.pdf

65 Spees, et al., 2015.

66 David B. Patton, "NYISO Capacity Markets: Function, Performance, and Future," Joint Technical Conference on New York Markets and Infrastructure, Docket No. AD14-18-000, Nov. 5, 2014.

67 Patton, 2014.

68 David B. Patton, Pallas Lee VanSchaick and Jie Chen, "2014 State of the Market Report for the New York ISO Markets," May 2015. http://www.nyiso.com/public/webdocs/markets_operations/documents/Studies_and_Reports/Reports/Market_Monitoring_Unit_Reports/2014/NYISO2014SOMReport_5-13-2015_Final.pdf

drivers of resource performance. These reforms, known as "capacity performance" in PJM and "pay-for-performance" in ISO-NE, came in the wake of the polar vortex weather events that led to high generation-outage rates, prompting calls to improve incentives for generator performance.[69] The markets now heavily advantage resources with year-round dependability, such as nuclear, coal and natural gas-fired generators with dependable fuel supply. At the same time, it further disadvantaged resources with seasonal fluctuations in performance, including renewables and demand response. The nuclear industry supported the reforms, concluding that nuclear plants would benefit from performance payments.[70]

Market design takeaways

The suggestion that certain resources should receive special compensation for dependable performance or fuel-diversity benefits lacks economic merit. Reliability benefits are remunerated through existing market structures. Quality market design ensures sufficient incentive for dependable resource investment and operation within an electricity market.[71]

The dependability of nuclear has advantaged its revenue stream in existing resource-adequacy constructs, namely with a high likelihood of capturing scarcity-pricing rents and/or receiving a high capacity rating in capacity markets.[72] With the exception of merchant nuclear in MISO, the entire merchant nuclear fleet appears to operate in markets that provide sufficient price signals for resource dependability. It remains too early to tell whether ERCOT's scarcity-pricing reforms provide adequate compensation to existing generation.[73] The PJM and ISO-NE capacity markets likely overcompensate dependability outside the summer season, causing inflated demand and revenues for resources like nuclear.

The market-design flaws in MISO, and any potential shortcomings in ERCOT, are not unique to nuclear. Corrective action should take the form of fixing these flaws, which are currently under evaluation. They do not present a case for nuclear-tailored out-of-market policy support. Furthermore, there is no evidence of an imminent threat to reliability that would justify interim subsidies.[74]

Various distortions artificially suppress prices in energy markets, where nuclear units obtain the majority of their revenues.[75] Certain policies, like the federal PTC and state RPS, distort price formation. Grid operators can suppress prices by manually intervening when they perceive energy markets have failed to procure resources to maintain system reliability.[76] The nuclear industry and other market participants have diagnosed structural problems that inhibit energy-market prices from reflecting all aspects of generators' marginal costs, thus depressing those prices.[77] FERC has an ongoing energy price formation initiative that seeks to remedy these issues.[78]

Even with depressed energy market prices, the increased financial pressure on nuclear and other existing units puts upward pressure on capacity-market prices.[79] With the exception of ERCOT, the combination of well-designed energy and capacity markets should create sufficient incentives to maintain resource adequacy, despite energy-market distortions. Still, advancing price-formation reforms should enhance competitive market performance in a manner that should boost nuclear revenues in energy markets.

Single point-of-failure analysis on shared fuel infrastructure is worth evaluating, especially in ISO-NE, which is highly dependent on a small number of natural-gas pipelines to fuel much of its generation fleet.[80] It is unclear whether or how market design may account for this, as resource adequacy mechanisms generally evaluate thermal generation (e.g., fossil and nuclear) resources individually, not in regard to coincident synergies with other system resources.[81] Any changes

69 Some evidence suggests energy-market prices alone were high enough to encourage sufficient performance-improving investments in generators.

70 Jonas Monast, Kate Konschnik, Ari Peskoe, Sarah Adair, Christina Reichert and David Hoppock, "Illuminating the Energy Policy Agenda: Electricity Sector Issues Facing the Next Administration," Duke University, 2016. http://nicholasinstitute.duke.edu/publications

71 Market prices should reflect the reliability value of resources when and where they are needed. Proper price formation will ensure sufficient revenue exists to cover costs to achieve resource adequacy.

72 Resources receive capacity-value ratings, where a certain percentage of their output qualifies to receive capacity compensation based on the resource's historical performance. Fossil and nuclear plants tend to have a high capacity-value rating, which denotes the dependability of baseload nuclear resources is already valued in capacity market design.

73 Mark Watson, "Consultant's warning of ERCOT blackout potential disputed," SNL Energy, Sept. 21, 2016. https://www.snl.com/InteractiveX/article.aspx?CDID=A-37786909-12063&KPLT=4

74 Some cite MISO's projected generation shortfall as an imminent threat. However, MISO's limited tools to project resource adequacy multiple years in advance has led to false projections of resource shortages in the past. Given the predominantly vertically integrated structure of MISO states, any shortfall likely would be limited to a fraction of the small proportion of MISO demand that is reliant exclusively on market signals.

75 Banks, 2014.

76 Hartman, 2016.

77 Edison Electric Institute, Electric Power Supply Association, Natural Gas Supply Association, Nuclear Energy Institute, and America's Natural Gas Alliance, Letter to FERC Chairman and Commissioners, March 6, 2015. http://www.ngsa.org/download/filings_testimony/2015_filings/FYI-Joint%20price%20formation%20principles%20NGSA%20EPSA%20EEI%20ANGA%20NEI.pdf

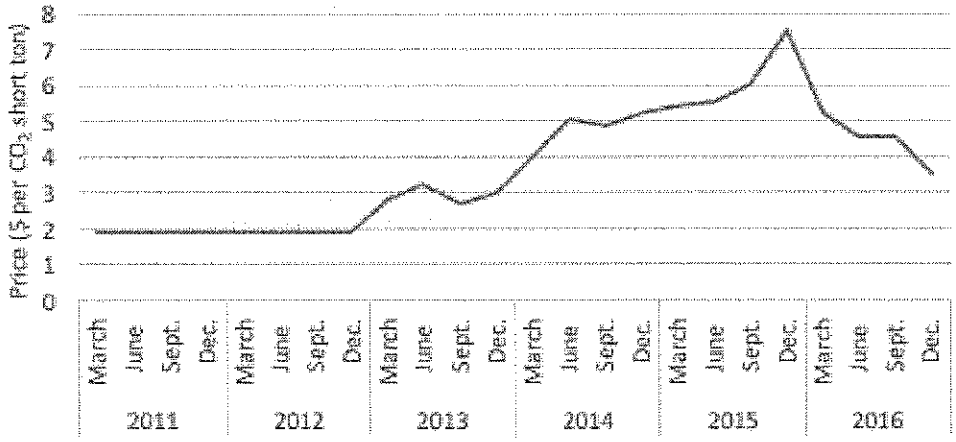
78 Federal Energy Regulatory Commission, https://www.ferc.gov/industries/electric/indus-act/rto/energy-priceformation.asp, accessed Nov. 2, 2016.

79 "Types of Organized Electricity Markets," R Street Institute, August 2016. http://www.rstreet.org/wp-content/uploads/2016/08/electricity5.pdf

80 Other RTO/ISOs examined here have at least fairly robust natural-gas pipeline networks.

81 Renewables capacity accreditation processes may offer analytical insights. Variances in wind and solar output at individual facilities have a correlation with output from in-kind resources as a result of a shared fuel source (i.e., solar radiation and wind).

FIGURE 2: RGGI AUCTION-CLEARING PRICES



SOURCE: R Street chart derived from data from the RGGI Inc.[1]

1. Regional Greenhouse Gas Initiative, Auction Results. https://www.rggi.org/market/co2_auctions/results

would likely advantage any resource that did not rely exclusively on a high dependency pipeline. This includes nuclear, dual fuel capability (on-site oil backup to natural gas), hydroelectric, coal, demand-side resources, wind, solar and others. This does not present an economically sound argument for out-of-market support for nuclear, in particular.

Nuclear unit retirements do not appear to result from faulty market design in the eastern RTO/ISOs. Rather, they are consistent with the underlying economics of baseload plants in the current market and regulatory environment.[82] Excluding external "social cost" considerations, nuclear retirements generally are not premature.[83]

CLIMATE POLICY

Domestic climate-change policy is in a state of flux, with nuclear caught in the middle. Nuclear retirements will have ripple effects on existing carbon markets and other initiatives to reduce emissions.[84] Concerns over increases in carbon emissions from nuclear replacements have spurred extensive calls from industry, environmental groups and public officials to save unprofitable nuclear plants. Others caution that such concerns are overblown, or that the medicine to save nuclear is harsher than the disease.

Premature retirements

Nuclear plant retirements are socially premature if they would remain profitable in a market that accurately reflected the social cost of pollution.[85] Policies to internalize the external cost of climate-altering emissions, including carbon dioxide, vary by region and state.[86] The most relevant for nuclear is the Regional Greenhouse Gas Initiative (RGGI), a mandatory emission-trading program to reduce greenhouse-gas emissions in Connecticut, Maine, Delaware, Maryland, Massachusetts, New Hampshire, Rhode Island, Vermont and New York.[87] This encompasses many merchant nuclear plants in ISO-NE, NYISO and PJM.

Under the new cap implemented in 2014, RGGI prices have fluctuated between $4 and $7.5 per short ton. This is well below the social cost of carbon estimates used by the U.S. Environmental Protection Agency (EPA). The optimal social cost determination is highly contentious and very sensitive to factors like discount rate, with EPA's 2015 estimate ranging from $11 to $56 per metric ton for a 5 percent and 2.5 percent rate, respectively.[88]

Nuclear plants vary in costs but most are low enough to make existing nuclear a relatively low-cost emissions-reduction option. For example, retaining existing nuclear in upstate

82 Brattle Group, "Response to U.S. Senators' Capacity Market Questions," 2016.

83 "Premature" from an engineering perspective, where shutdown occurs with useful operating life remaining, is distinct from the relevant economic perspective. Retirements are economically premature if the costs of continued operation are less than the costs of replacement, assuming no change in demand.

84 Gifford and Larson, 2016.

85 The revenues obtained by nuclear plants would increase if electricity prices reflected the social cost of pollution. If these revenues were sufficient to keep some otherwise unprofitable plants financially solvent, then retiring these plants is socially premature.

86 Greenhouse gases are the most common form of climate-forcing emissions but other substances—such as black carbon—also are noteworthy.

87 A new cap of 91 million short tons was implemented in 2014. This declines 2.5 percent each year from 2015 to 2020.

88 U.S. Environmental Protection Agency, "The Social Cost of Carbon: Estimating the Benefits of Reducing Greenhouse Gas Emissions," Dec. 22, 2016. https://www.epa.gov/climatechange/social-cost-carbon

New York would cost between $20 and $43 per ton.[89] Similarly, retaining a single-unit nuclear plant in ISO-NE costs about $20 per ton.[90] Depending on the value of the social cost of carbon, this suggests some nuclear retirements may be socially premature (i.e., if the social cost of carbon exceeds the carbon cost that would retain nuclear).

Socially premature nuclear retirements indicate that domestic environmental policies are not economically sound. In RGGI states, one option is to lower the emissions cap such that emissions prices better reflect prevailing estimates of the social cost of carbon. Outside RGGI, merchant nuclear plants face less-friendly prospects for emissions pricing.

Near-term emissions impacts

Existing nuclear plants provide more than 60 percent of domestic carbon-free power.[91] Some clean-energy advocates claim that renewables and energy efficiency can cost-effectively offset lost nuclear generation. Such an experiment—known as Energiewende, translated as "energy transition"—was initiated in Germany in 2010, focused on out-of-market renewable energy and energy-efficiency support. After the 2011 Fukushima accident, the German government decided to phase-out nuclear by 2022.[92] The result has been dramatic increases in energy costs and modest emissions increases, as the loss of nuclear has contributed to increased coal use.[93] Energiewende is unsustainable in its current form, with reforms needed to maintain the vitality of the German economy.[94]

In the absence of broad emissions-reduction policies, various parties have raised valid concerns that nuclear retirements will undermine short-term climate-emissions goals.[95] Economic modeling suggests that increased natural-gas generation will fill much of the nuclear void.[96] In regions with large coal capacity, nuclear retirements may cause coal generation to increase temporarily.[97] One recent study found that a 1,000 megawatt (MW) nuclear retirement (about the size of a typical nuclear reactor) would cause an increase in CO_2 emissions of 4.1 to 6.7 million tons per year, given the variances in regional electric-fuel mixes.[98]

Imposing new policies under a binding emissions-trading program would affect the market price of allowances without changing emissions levels.[99] Thus, policy intervention to retain nuclear will increase RGGI allowances and decrease market prices. This undercuts the signal to reduce emissions through other means, resulting in nuclear retention displacing emissions reductions elsewhere. Since many restructured states already participate in RGGI, this is what's likely to happen within ISO-NE, NYISO and some of PJM. One study concluded that New York's Clean Energy Standard will have a "barely discernible impact" on global emissions, with reductions possibly offset by an increase in emissions from other RGGI states.[100] Holding all else constant, nuclear retention will not reduce emissions in RGGI states if RGGI remains binding (i.e., reduces emissions below business-as-usual, setting a positive price on carbon allowances). Whether RGGI remains binding depends largely on adjustments to the RGGI cap, market dynamics and other carbon-reduction policies, namely the aggressive renewables and energy-efficiency policies in the Northeast.

Emissions pricing versus subsidies

Retaining many unprofitable nuclear plants is a relatively low-cost emissions-reduction method.[101] This frequently translates into the inaccurate conclusion that any form of policy intervention to retain nuclear comes at low cost. The full cost of nuclear retention depends on the underlying economics, as well as the method of intervention.

89 David B. Patton, Pallas Lee VanSchaick and Jie Chen, "2015 State of the Market Report for the New York ISO Markets," May 2016. http://www.nyiso.com/public/webdocs/markets_operations/documents/Studies_and_Reports/Reports/Market_Monitoring_Unit_Reports/2015/NYISO%202015%20SOM%20Report_5-23-2016-CORRECTED.pdf

90 David B. Patton, Pallas Lee VanSchaick and Jie Chen, "2015 Assessment of the ISO New England Electricity Markets," June 2016. https://www.isc-ne.com/static-assets/documents/2016/06/isone_2015_emm_report_final_6_14_16.pdf

91 Monast et al., 2016.

92 Phillip Brown, "European Union Wind and Solar Electricity Policies: Overview and Considerations," Congressional Research Service, Aug. 7, 2013. https://www.fas.org/sgp/crs/row/R43176.pdf

93 The sudden shutdown of nuclear units in Japan had a similar effect.

94 IHS Global, "A More Competitive Energiewende: Securing Germany's Global Competitiveness in a New Energy World," March 2014. https://www.vci.de/vci/downloads-vci/media-weitere-downloads/dokumente/2014-03-ihs-report-a-more-competitive-energiewende-english.pdf

95 E.g., see Samuel Brinton and Josh Freed, "When Nuclear Ends: How Nuclear Retirements Might Undermine Clean Power Plan Progress," Third Way, August 2015. http://www.thirdway.org/report/when-nuclear-ends-how-nuclear-retirements-might-undermineclean-power-plan-progress

96 Lucas Davis and Catherine Hausman, "Market Impacts of a Nuclear Plant Closure," Energy Institute at Haas, May 2015. https://ei.haas.berkeley.edu/research/papers/WP248.pdf

97 Jeffrey Tomich, "Do at-risk Exelon reactors matter for Ill. compliance?," ClimateWire, June 20, 2016; Illinois Commerce Commission, et al. "Potential Nuclear Power Plant Closings in Illinois: Impacts and Market-Based Solutions," Response to the Illinois General Assembly Concerning House Resolution 1146, 119, Jan. 5, 2015.

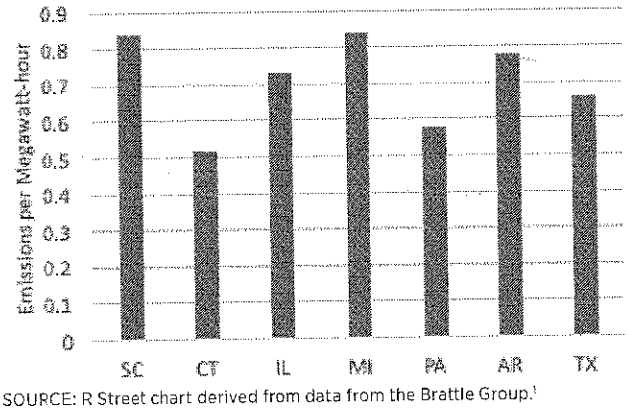
98 Metin Celebi, Marc Chupka, Frank Graves, Dean Murphy and Ioanna Karkatsouli, "Nuclear Retirement Effects on CO2 Emissions," The Brattle Group, December 2016. http://www.brattle.com/system/publications/pdfs/000/005/385/original/Brattle_Nuclear-Carbon_Whitepaper_-_Dec2016.pdf?1482159096

99 Carolyn Fischer, Richard G. Newell and Louis Preonas, "Environmental and Technology Policy Options in the Electricity Sector," Resources for the Future, December 2013. http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-13-20.pdf

100 Ken Girardin and Annette Brocks, "Green Overload: New York State's Ratepayer-Zapping Renewable Energy Mandate," Empire Center, 2016. http://www.empirecenter.org/wp-content/uploads/2016/09/GreenOverload.pdf

101 See e.g., Celebi et al., 2016.

FIGURE 3: CARBON DIOXIDE IMPACT OF 1,000 MW RETIREMENT IN SELECTED STATES



SOURCE: R Street chart derived from data from the Brattle Group.[1]

1. Celebi et al., 2016.

Pricing environmental externalities (e.g., air pollution) is the most economically efficient policy, but policymakers often find the approach politically impractical.[102] The focus then shifts to whether alternative policy interventions would provide more benefit than harm. Some parties consider production subsidies more politically palatable and a suitable alternative. For example, a U.S. Department of Energy task force recently concluded that electricity markets must recognize zero-carbon generation, based on the social cost of carbon emissions avoided, by either assessing an emission charge or, alternatively, extending a production payment of about $0.027 per kilowatt-hour on carbon-free generation.[103]

The portrayal of subsidies for clean energy as nearly equivalent to pricing pollution externalities is very problematic, as the underlying market failure is underpricing of pollution, not overpricing of clean energy.[104] In theory, subsidies, as a mirror image of taxes, can provide incentives to reduce emissions. In practice, they often promote economically inefficient and environmentally unsound actions.[105] Subsidies artificially depress power prices, leading to overconsumption and disincentives for energy efficiency.[106]

Production subsidies are also vulnerable to extensive government failure. This stems both from ulterior government motives and from honest faults in subsidy calculations that result from incomplete information.[107] For example, the ability of clean-energy sources to reduce emissions varies with time and location. Pollution pricing accounts for that variance but technology-specific subsidies do not.[108] The carbon emissions avoided by retaining nuclear varies markedly across and within RTO/ISOs, which handicaps the ability to determine a subsidy that reflects the dynamic value of zero-emissions resources.

Recent subsidies for three nuclear plants in New York and two in Illinois reveal major disparities between subsidies and emissions pricing. Policymakers used the federal government's social cost of carbon estimate to determine the subsidy value. This approach has economic advantages relative to an arbitrary method, but it will allocate resources less efficiently than emissions pricing applied at the same social-cost level. Subsidies result in at least five types of economic inefficiencies that emissions pricing avoids:

- Subsidies create a public financial burden. The DOE task force recommendation would cost $213 million for a 1,000 MW reactor,[109] which would easily reach billions of dollars in subsidies across the full at-risk nuclear fleet. By comparison, emissions pricing creates no such burden, with costs incurred in proportion to the social cost of emissions by responsible parties.
- Subsidies inaccurately compensate for low-emissions attributes. Subsidy revenue for low-emissions resources differs from increased market revenues that result from emissions pricing. Emissions pricing raises revenues consistent with the marginal emissions costs of the electric system. This value is very dynamic (grid conditions can change rapidly) and granular across time by location. The administrative estimates that determine subsidies fail to capture this dynamism.
- Subsidies encourage poor economic behavior by nuclear owners. Production subsidies lower the effective costs of operation, which provides incentive for owners to offer into electricity markets below their true marginal cost. This can artificially suppress market-clearing prices and distort market signals for resource investment.
- Government picks different winners than markets. Emissions pricing is technology-neutral and induces least-cost emissions reductions through a combination of actions that may differ from nuclear retention (e.g., replace coal with natural gas, replace fossil generators with renewables, energy efficiency). In NYISO, one estimate suggests the least-cost option

102 Borenstein, 2011.

103 Secretary of Energy Advisory Board, Task Force on the Future of Nuclear Power, Department of Energy, Draft Report, 2016. http://energy.gov/sites/prod/files/2016/09/f33/SEAB%20Nuclear%20Power%20Task%20Force%20Draft%20Report%20%28final%29.pdf

104 Borenstein, 2011.

105 Stavins, 2001.

106 Borenstein, 2011.

107 Hartman, 2016.

108 Borenstein, 2011.

109 Secretary of Energy Advisory Board, 2016.

to reduce emissions incrementally is to replace inefficient generation with a new combined-cycle natural-gas-fired generator on Long Island.[110] The independent market monitor for NYISO notes the result underscores the importance of using a technology-neutral approach to carbon reductions.[111] Nuclear subsidization merely selects one politically preferred method of emissions reductions, which misallocates resources and raises the cost of emissions reductions. In New York, the application of subsidies was not even consistent within the nuclear technology class; only three of four nuclear generators received subsidies.

- Subsidies elevate political risk for investors. Commitment to emissions pricing, and rejection of out-of-market interventions, contributes to a healthy, stable investment climate. Upholding market institutions belies investor confidence. Subsidies and other market-contradicting policies undermine investor confidence, which can lead to artificial increases in capital costs and inefficient capital expenditures (see next section).

Subsidies have an adverse economic and political interplay with emissions pricing. Clean-energy subsidies are unlikely to enhance social welfare when enacted alongside sufficient emissions pricing.[112] Aggregate emissions levels remain constant when applying subsidies under a binding emissions-trading scheme. Subsidization also creates an incentive for rent-maintenance behavior that could undermine any attempt to use nuclear subsidies as a transitional policy to efficient emissions pricing.

If the pursuit of subsidies is a foregone conclusion, policymakers should take care to pursue subsidies that achieve the most cost-effective emissions reductions with the least-adverse impacts on electricity markets. Recent economic analyses have explored various auction mechanisms to allocate subsidies for carbon-emissions reductions.[113] Conditional subsidies may also improve effectiveness, such as provisions to phase-out subsidies upon implementation of emissions-pricing policies, or ensuring additional emissions reductions in RGGI states (e.g., altering the cap to account for nuclear retention). Predicating subsidies on specific conditions may avoid broader subsidy pursuits, reduce investment risk and encourage substitution of superior policies.

For example, the New York Public Service Commission can modify or eliminate the ZEC if a national, NYISO or other program internalizes the value of zero-emission attributes.[114] This has contributed to NYISO and its stakeholders aggressively exploring carbon pricing as an alternative.[115]

Maintaining a long-term strategy

Effective climate policy is geared toward a stable decades-long strategy. This places exceptional importance on the quality of policies and institutions. The United States should serve as a policy model to follow and assist in driving down the costs of emissions abatement economically, which maximizes the likelihood of emissions reductions abroad. This requires technologies that are globally scalable and affordable.[116] Innovation plays a pivotal role, given the high cost of clean power generation.[117] In the long term, global climate progress is linked to the innovative performance of the electricity industry, which outperforms under a competitive model.

The rise of competitive electricity markets has had positive environmental implications and should serve as a domestic and global foundation to achieve a low-emissions future. Markets create pathways to low-cost emissions reductions. The competitive platform spurs innovation and facilitates transitions to breakthrough technologies far more effectively than the regulated-monopoly model.[118] These effects amplify when combined with emissions pricing, which is far more effective in competitive markets, where participants have incentives to follow price signals.[119]

The imperative to strengthen competitive electricity markets has run into political headwinds. Policymakers face great temptations to cave to ad hoc climate policy.[120] Sacrificing policy quality for political expedience will come at high economic and political cost, with extensive long-term unintended consequences.[121] Sporadic interventions may

110 David B. Patton, Pallas Lee VanSchaick and Jie Chen, "2015 State of the Market Report for the New York ISO Markets," May 2016.

111 Patton et al., May 2016.

112 Fischer, Newell and Preonas, 2013.

113 E.g., see Haoran He and Yefeng Chen, "Auction Mechanisms for Allocating Subsidies for Carbon Emissions Reduction," Environment for Development, March 2014. http://www.rff.org/files/sharepoint/WorkImages/Download/EfD-DP-14-06.pdf

114 Justin Gundlach and Romany Webb, "Carbon Pricing in New York ISO Markets," Columbia Public Law Research Paper, Nov. 28, 2016. https://ssrn.com/abstract=2876895

115 E.g., see forthcoming Brattle Group paper on CO_2 pricing in NYISO's energy market.

116 National Academies of Sciences, Engineering, and Medicine, "The Power of Change: Innovation for Development and Deployment of Increasingly Clean Electric Power Technologies," The National Academies Press, 2016.

117 National Academies of Sciences, Engineering, and Medicine, 2016.

118 Hartman, 2017.

119 Navigant Consulting, Inc., "Price Signals and Greenhouse Gas Reduction in the Electricity Sector," prepared for the COMPETE Coalition. http://www.competecoalition.com/files/Navigant%20Study%20FINAL.pdf

120 The patchwork of ad hoc sporadic subsidies for unprofitable technologies or artificial rejections of profitable ones.

121 Contentious, high-cost interventions intensify the political divide over climate policy.

temporarily reduce emissions but undermine competitive-market performance.[122] Nuclear bailouts are a prime example of such nearsighted thinking. In sacrificing the foundations of competitive markets, such interventions undercut long-term climate success.

IMPLICATIONS OF POLITICAL INTERVENTIONS

A fundamental assumption of competitive electricity markets is that market participants make operating and investment decisions based on market prices.[123] In particular, resource investments are driven by forward price expectations.[124] This makes the determinants of price formation critical to investor confidence and the efficiency of capital expenditures. When investors perceive political interference in price formation, it negatively impacts flows of capital to the sector.[125] Price distortions adversely affect market efficiency and sometimes reliability. The degree of impact depends on the structure, severity and duration of interventions. Once a state has abolished price regulation, interference in price formation breaches that state's commitment to reform the electricity sector on a free-market basis.[126]

Political interventions harm competitive relationships in at least two ways. First, the artificial retention of unprofitable power plants suppresses market prices, depressing revenues for competitors. Secondly, interventions inefficiently reallocate risk in the market by providing an income guarantee to one participant and shifting risk to the rest of the marketplace. The mere threat of intervention creates political risk that worsens creditworthiness and can inflate borrowing costs for competitors.[127]

Political interventions deter investment or require a significant risk premium for investment.[128] This mutes market signals for reliability. Reliability signals occur at the margin, where a relatively small change in quantity induces a large change in energy or capacity prices (i.e., the supply curve is very steep near the equilibrium point). Energy-only RTO/ISOs are especially vulnerable, as a large fraction of net revenues required to cover capital investments is produced in a very small number of hours each year.[129] This can create underinvestment by eliminating the financial viability of power investments, thus compromising resource adequacy. Capacity markets provide a reliability backstop for nominal (i.e., installed) capacity investment. However, suppressing energy market prices discourages investment that would otherwise improve resource performance (e.g., firming fuel supplies, weatherizing equipment). In this way, out-of-market policies deter reliability-enhancing behavior, even in RTO/ISOs with capacity markets.[130] While nominal capacity may remain the same, retaining capacity artificially will still oversupply the market, distorting capacity prices and investment decisions.

Subsidies

Subsidies are inconsistent with market principles, as they weaken price signals and create an uneven playing field among competitors.[131] Such payments for select resources oversupply the market and distort short- and long-term investment signals.[132] Even short- and medium-term interventions significantly affect the annual and long-term profitability of capacity investments.[133] For example, New York's ZEC program will profoundly disrupt NYISO electricity markets and result in a transfer of more than $600 million per year.[134] This has prompted a lawsuit from competitors, signifying the degree to which the program alters competitive relationships within NYISO.[135]

Some nuclear proponents argue that subsidies are necessary to counter subsidies for competing technologies that harm. The goal of market design is not to include counteracting existing subsidies via enhanced revenue to nonsubsidized sources.[136] As it is, designing and maintaining effective power

122 Ad hoc climate policy weakens competitive markets at a time they need strengthening to meet economic and environmental objectives. Caving to pressures for political expediency risks setting a legal and political precedent for expanded ad hoc climate policy.

123 William W. Hogan, "Electricity Market Design and Efficient Pricing: Applications for New England and Beyond," 2014. https://www.hks.harvard.edu/fs/whogan/Hogan_Pricing_062414r.pdf

124 Potomac Economics, "2015 State of the Market Report for the ERCOT Wholesale Electricity Markets," June 2016. https://www.potomaceconomics.com/uploads/ercot_documents/2015_ERCOT_State_of_the_Market_Report_-_FINAL_update_6.21_16_.pdf

125 Anatole Boute, "Challenging the Re-regulation of Liberalized Electricity Prices under Investment Arbitration," Energy Law Journal, Vol. 32, 2011. http://www.feli.org/sites/default/files/docs/eli322/14-497-boute.pdf

126 Boute, 2011.

127 For a discussion on the impact of credit ratings on electric company borrowing costs, see Lynne Holt, "U.S. Electric Utility Creditworthiness—Why the Regulatory Framework Matters," Feb. 9, 2016. http://warrington.ufl.edu/centers/purc/purcdocs/papers/1602_Holt_Electric_Utility_Creditworthiness.pdf

128 Peter Cramton and Axel Ockenfels, "Economics and design of capacity markets for the power sector," May 30, 2011. ftp://www.cramton.umd.edu/papers2010-2014/cramton-ockenfels-economics-and-design-of-capacity-markets.pdf

129 Paul L. Joskow, "Competitive Electricity Markets and Investment in New Generating Capacity," The New Energy Paradigm, 2007.

130 The increase in non-performance penalties in ISO-NE and PJM quells this somewhat.

131 PJM, 2016.

132 Johannes P. Pfeifenberger, Samuel A. Newell and Kathleen Spees, "Energy and Capacity Markets: Tradeoffs in Reliability, Costs, and Risks," Harvard Electricity Policy Group, Feb. 27, 2014. http://www.brattle.com/system/publications/pdfs/000/004/986/original/Energy_and_Capacity_Markets_Pfeifenberger_Newell_Spees_HEPG_Feb_27_2014.pdf?1393528054

133 Cramton and Ockenfels, 2011.

134 Coalition for Competitive Electricity, et al., v. Audrey Zibelman, U.S. District Court for the Southern District of New York, Oct. 19, 2016. http://www.epsa.org/forms/uploadFiles/3D17B00000014.filename.ZEC_Complaint_File_Stamped_101916.pdf

135 Ibid.

136 PJM, 2016.

markets is extremely difficult with layers of distorting and counterdistorting subsidies.[137] Indeed, the future health of electricity markets depends on unwinding the existing subsidy regime.[138]

RTO/ISOs have to introduce new rules, such as those requiring minimum offer prices, to prevent subsidies from degrading price signals and potentially undermining reliability.[139] Recent nuclear subsidies have potential to disrupt markets profoundly, given the size of the resources and their propensity to influence capacity prices at the margin. This has contributed to efforts in PJM to examine further market-rule adjustments to limit the market distortions of subsidies.[140] Even in the absence of emissions pricing, supporting subsidies as a next-best approach does not translate into sound policy for requiring RTO/ISOs to administer the subsidy regime.[141] The harm of subsidies is growing, as they create a toxic mix of imperfect competition and regulation that work at cross-purposes.[142]

Any subsidy proposal must be subjected to a robust cost-benefit analysis. Evaluations of nuclear subsidies have tended to examine only direct financing costs to ratepayers or taxpayers. This ignores such indirect costs as increased investor risk, resource misallocation from price distortion and the propensity for government failure. If the use of subsidies is a foregone conclusion, they should be minimal in duration and conditioned upon valid market failure to reduce the likelihood of broader subsidy metastasis. Subsidy design must account for the protection of investors' market-pricing expectations.

Re-regulation and nationalization

Re-regulation and nationalization of merchant nuclear assets would fundamentally undermine market institutions and may adversely affect the performance of the fleet. These actions remove the incentives provided under competitive conditions to increase power plant efficiency, cut costs and innovate. Competitive forces motivated merchant nuclear owners to reduce the frequency and duration of plant outages, contributing to a 10 percent increase in operating efficiency.[143]

Re-regulation would stymie the health of competitive markets. Merchants are reluctant to invest when they anticipate re-regulation, as it prevents them from recovering their costs and earning a reasonable rate of return.[144] If fully implemented, re-regulation would backtrack to the economically inferior paradigm of monopoly-utility regulation.

The profound deficiencies of re-regulation and nationalization simply reflect the advantages of restructuring. Competitive wholesale electricity markets provide clear, transparent market signals, enhance efficiency and promote innovation.[145] Even when competitive rates rose sharply with natural-gas prices in the mid-2000s, clear heads recognized that the superficial appeal of re-regulation carried substantial risk of being ineffective and costlier in the long term.[146] Even then, Standard & Poor's noted that "the introduction of competition into generation resulted in greater efficiencies, lower heat rates, greater reliability, lower nonfuel operating costs, and in general, more widely adopted best practices."[147]

Since 2008, natural-gas prices have plummeted, benefiting restructured states the most.[148] Overall, competition has outperformed the regulated monopoly model on the basis of weighted-average electricity prices.[149] This portends well for the future benefits of retaining restructuring and speaks to the adverse consequences of reverting to re-regulation or nationalization.

Political precedent

Where American capitalism has flourished thanks to predictable application of rules, if an ad hoc system that super-

137 David Victor, "Energy and climate: Moving beyond symbolism," Brookings Institution, Oct. 18, 2016. https://www.brookings.edu/research/energy-and-climate-moving-beyond-symbolism/

138 Victor, 2016.

139 PJM, 2016.

140 Stu Bresler, "Potential Alternative Approach to Expanding the Minimum Offer Price Rule to Existing Resources," PJM Interconnection, Aug. 11, 2016. http://www.pjm.com/-/media/committees-groups/stakeholder-meetings/grid-2020-focus-on-public-policy-market-efficiency/meeting-materials/20160816-potential-alt-solution-to-the-mir-offer-price-rule-for-existing-resources.ashx

141 William W. Hogan, "Electricity Markets and the Clean Power Plan," The Harvard Project on Climate Agreements October 2015. http://belfercenter.ksg.harvard.edu/files/dp79_hogan.pdf

142 John Moot, "Subsidies, Climate Change, Electric Markets and the FERC," *Energy Law Journal*, 35(2), 345-374, 2014. http://heinonlinebackup.com/hol-cgibin/get_pdf.cgi?handle=hein.journals/energy35&section=24

143 Lucas W. Davis and Catherine Wolfram, "Deregulation, Consolidation, and Efficiency: Evidence from U.S. Nuclear Power," National Bureau of Economic Research, August 2011. http://www.nber.org/papers/w17341.pdf

144 Boute, 2011.

145 Frank Huntowski, Aaron Patterson, and Michael Schnitzer, "Negative Electricity Prices and the Production Tax Credit," The NorthBridge Group, Sept. 14, 2012. https://www.hks.harvard.edu/hepg/Papers/2012/Negative_Electricity_Prices_and_the_Production_Tax_Credit_0912.pdf

146 J.P. Pfeifenberger, G.N. Basheda and A.C. Schumacher, "Restructuring Revisited: What we can learn from retail-rate increases in restructured and non-restructured states," Public Utilities Fortnightly, June 2007. http://www.brattle.com/system/publications/pdfs/000/003/999/original/RestructuringRevisited_Pfeif_PUF_2007.pdf?1378772091

147 Standard & Poor's "Re-Regulation of U.S. Electric Utilities: The Toothpaste Challenge," April 3, 2007.

148 Severin Borenstein and James Bushnell, "The U.S. Electricity Industry after 20 Years of Restructuring," Annu. Rev. Econ. 7 submitted, May 2015. https://ei.haas.berkeley.edu/research/papers/WP252.pdf

149 Philip R. O'Connor and Erin M. O'Connell-Diaz, "Evolution of the Revolution: The Sustained Success of Retail Electricity Competition," COMPETE Coalition, July 2015.

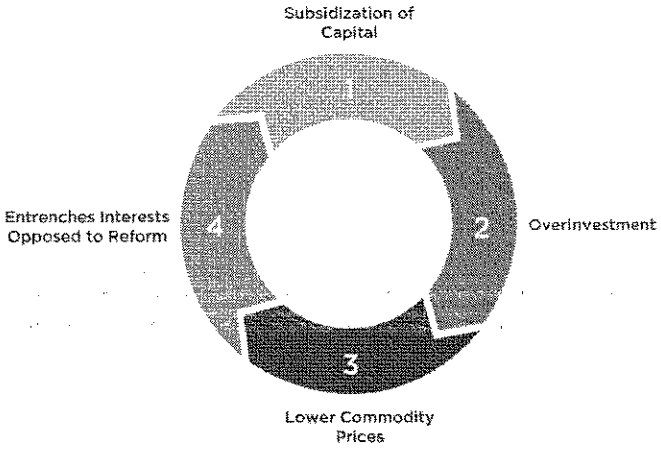
sedes this rules-based system, the long-term economic damage would be grave.[150] The legitimacy of electric investors' market-pricing expectations depends on the regulatory and contractual framework created by the state.[151] Ad hoc subsidies or, worse, re-regulation or nationalization, set a precedent that can fundamentally disrupt a stable investment framework. Limiting the grounds for price interference to cases of structural market malfunction (e.g., market power, imminent reliability threat) contains investment risk. But the unlimited right of public authorities to interfere in electricity markets fundamentally contradicts the principle underlying liberalization.[152] The rationales, conditions and policy instruments behind interventions therefore have a major impact on the degree of damage to investor confidence.

New York's rationale for nuclear subsidies goes beyond compensation for insufficient emissions pricing. The intervention revealed a clear intent for government to engineer the fuel mix. The New York Public Service Commission (PSC) stated that nuclear is needed in the short term and would ideally be replaced by renewable generation.[153] This fundamentally contradicts free-market principles and creates artificial investment risk in those resources that aren't politically preferred. The PSC also cited fuel diversity and fuel security as reasons to support nuclear subsidies.[154] The economic validity of these purported benefits is debatable, and the ability of central planners to achieve these aims efficiently via ad hoc interventions is exceptionally dubious. New York's ZEC framework has served as a model for other states with nuclear plants at risk of retirement, setting a precedent that extends far beyond out-of-market support for select nuclear plants.

Nuclear subsidization for the express purpose of preserving traditional baseload generation, fuel diversity or avoiding local economic disruption could politically justify subsidies for a variety of other retiring plants, especially coal. A subsidy spree expanded to coal would severely erode investor confidence and distort markets, while increasing emissions at the expense of taxpayers or ratepayers. In Ohio, for example, the PUCO-approved subsidies went to finance unprofitable coal and nuclear plants on the basis of perceived supply diversity and reliability benefits.[155] Such political slogans proved more convincing than the opinion of PJM's market monitor, which noted that "Ohio customers have nothing to gain from paying above market prices to preserve aging and obsolete assets."[156]

An examination of bailout policy history reveals that "early bailouts set a stage that makes subsequent requests for assistance more difficult to resist."[157] The low prices and overinvestment induced by subsidies may foster concentrated consumer and producer interests. Once entrenched, these interests naturally tend to resist having the subsidies removed, contributing to an ongoing cycle of subsidization.[158] Economists call this rent-maintenance behavior, where the benefiting industry seeks continued subsidization even after the initial subsidy rationale no longer exists. As evidence, the PTC was created more than 20 years ago to launch a nascent wind industry, yet this distortive subsidy still remains, even though the wind industry is now mature globally.[159]

FIGURE 4: ENTRENCHED CYCLE OF SUBSIDIZATION



SOURCE: PJM[1]

1. PJM, 2016.

The nuclear industry has lamented the PTC for wind resources, which drives down market revenues and undermines market performance. But countersubsidies for nuclear would merely exacerbate the effects on market performance and anchor a subsidy precedent, with damaging economic ramifications.

150 The Economist, 2016.

151 Boute, 2011.

152 Boute, 2011.

153 SNL Energy, "The New York Clean Energy Standard-A 360 View," Regulatory Research Associates, Aug. 23, 2016.

154 SNL Energy, 2016.

155 The Federal Energy Regulatory Commission rejected the decision, but PUCO approved a less substantial subsidy in October 2016.

156 Monitoring Analytics LLC, "Post-hearing reply brief of the independent market monitor for PJM," Feb. 26, 2016. http://www.monitoringanalytics.com/reports/Reports/2016/IMM_Post_Hearing_Reply_Brief_Case_No_14-1297-EL-SSO_20160226.pdf

157 Cheryl D. Block, "Overt and Covert Bailouts: Developing a Public Bailout Policy," Indiana Law Journal, Vol. 67, Fall 1992. http://www.repository.law.indiana.edu/cgi/viewcontent.cgi?article=1456&context=ilj

158 PJM Interconnection, "Resource Investment in Competitive Markets," May 5, 2016. http://www.pjm.com/-/media/documents/reports/20160505-resource-investment-in-competitive-markets-paper.ashx

159 Huntowski, Patterson and Schnitzer, 2012.

Given the planned phase-out of the PTC and investment tax credit, expanding subsidies to nuclear would torpedo a critical opportunity to reduce subsidies dramatically.

Surely, any broad momentum toward re-regulation and nationalization of generation assets would signify a profound risk to merchant investors. This, or the onset of widespread subsidization, could spur an investor-confidence contagion. Standard & Poor's notes that re-regulation "is a risky proposition that could threaten utility balance sheets, destroy value and impair credit ratings."[160] The ramifications would be dire for innovation and inflate producer and consumer costs. Artificially elevating project-finance costs would disrupt the entry of new resources—especially power plant-construction—keeping older and generally less-efficient resources operating longer. Such severe disruption to capital stock turnover would undermine economic and environmental objectives. Securing market integrity is imperative to the health of the electricity industry.

CONCLUSION

Organic market factors are the principle drivers of the financial challenges facing the U.S. merchant nuclear fleet. The swiftness and efficiency of merchant coal and nuclear retirements predominantly reflect that competitive wholesale electricity markets are performing as intended. That is, markets signal generation retirements and new resource entry when and where supply and demand indicate.[161] Nuclear-specific interventions to promote fuel diversity, local economic development and grid reliability lack economic merit.

Some nuclear retirements would not occur if markets fully internalized the social cost of pollution. However, the notion that the economic and environmental consequences of nuclear retirements are "incredibly detrimental" is overblown. By contrast, the adverse consequences of interventionist policies to prevent nuclear retirements are potentially severe. Such actions would undermine market institutions during a politically vulnerable period and propel the uneconomical movement for government engineering of the electric-fuel mix. Further sacrifice of market integrity will reverberate through the industry, chilling investment as costs escalate. In this case, the medicine of out-of-market interventions is worse than the underlying disease.

Romanticizing nuclear power for its historically affordable, reliable and emissions-free service has often found a receptive audience. But this tempting political narrative should not be mistakenly translated into misguided industrial policy.

Nuclear subsidies, re-regulation or nationalization constitute industrial policy with, at best, temporary environmental co-benefits. Industrial policy is a high-cost, less effective pathway to a cleaner energy future. If subsidies are a foregone conclusion, they should be specific in purpose, minimal in duration and should be extended only where there is a valid market failure, all to reduce the likelihood of broader subsidy metastasis. Re-regulation and nationalization are economically damaging policy options that have no slimmer "diet" version to avoid severe market distortions.

The twin political motivations of economic growth and emissions mitigation should prompt policymakers to strengthen competitive electricity markets. Electric competition drives environmental improvements through improved fuel management, risk management and, most importantly, innovation. The competitive electricity model has tremendous upside to usher in rapid technological change with profound economic and environmental benefits.[162]

Public policy should facilitate well-functioning marketplaces. Removing government engineering of the fuel mix is essential, and could largely benefit nuclear as a byproduct (e.g., reducing mandates and phasing out deployment subsidies for competing technologies). But counteracting subsidies for select resources with subsidies for others is a policy race to the bottom. Rather, bolstering competition by enhancing market rules that affect price formation may augment nuclear revenue streams.[163] Specific to nuclear, trimming regulatory costs could help the competitiveness of the nuclear industry.[164]

The most important message for policymakers is to stay disciplined. The economic case for government intervention remains limited to efficient correction of market failures. Failure to enact efficient emissions pricing does not warrant an abandonment of market principles. This was summarized appropriately by former Exelon Corp. Chairman and CEO John Rowe. Regarding three unprofitable Exelon Corp. nuclear plants in Illinois, Rowe stated: "in a world that's driven by unfriendly market prices and unfriendly public policy, you shut them down... it is the proper market-driven answer."[165]

160 Standard & Poor's "The Credit Implications of U.S. Electric Utility Re-Regulation," April 12, 2007.

161 For example, ISO-NE's markets have driven the retirement of 4,200 MW of oil, coal and nuclear generation capacity since 2013. They also have attracted 3,000 MW of new natural gas generation to high demand areas that will come online over 2017-2019.

162 Hartman, 2017.

163 Energy Systems Strategic Assessment Institute, 2016.

164 Batkins, 2016.

165 Jeffrey Tomich, "Former Exelon CEO Rowe: Shutting down struggling nukes is 'the proper market-driven answer'," EnergyWire, July 27, 2015. http://www.eenews.net/stories/1060022403

The unease of socially premature nuclear retirements should motivate political commitment for a market-based, long-term strategy that drives innovation, reduces emissions at least cost and bolsters reliability. This will benefit the American economy the most and prove far more politically durable than ad hoc policy. It will also serve as a model the world is more likely to follow.

ABOUT THE AUTHOR

Devin Hartman is electricity policy manager and senior fellow for the R Street Institute, where he researches and promotes competitive electricity markets, efficient energy R&D and environmental policies, and sensible rate designs.

Devin previously worked at the Federal Energy Regulatory Commission (FERC), where he conducted economic analysis of wholesale electricity markets. His specialties included renewables integration, environmental regulation, coordination of natural gas and electric industries, and capacity-market performance and design evaluation.

Before FERC, Devin worked at the Indiana Utility Regulatory Commission, where he spearheaded the initiative to modernize Indiana's electric-resource planning rule. He led research on risk and uncertainty management, as well as advanced technologies, including electric vehicles, carbon capture and storage, energy storage and distributed generation.

Rep30

From: Rep30
Sent: Wednesday, May 03, 2017 3:29 PM
To: 'Ty Pine (tpine@firstenergycorp.com)'
Subject: FW: MIT Study

FYI

From: Ned Ford [mailto:Ned.Ford@fuse.net]
Sent: Wednesday, May 03, 2017 11:14 AM
To: Shaffer, Andy <Andy.Shaffer@ohiohouse.gov>
Subject: Re: MIT Study

FirstEnergy is asking for $265 million per year in the Zero Carbon Credits legislation. For $265 million per year Ohio can eliminate the need for Davis Besse in a couple of years with efficiency, or by incentivizing wind just a little for a few years (not for the foreseeable future like FE proposes). Utility scale solar is also cheaper than subsidizing the nuclear plants, but not as much.

Davis Besse would not be in such bad shape if FirstEnergy and its predecessor companies had not taken such poor care of it. It is one of the most dangerous nuclear plants in the United States today. Perry and Beaver Valley are in better shape, but they are aging too.

Of course the Oregon Ohio Natural Gas Combined Cycle plants under construction and due to be completed this year are larger than Davis Besse, and are only 20 miles away. They are supposed to be 1200 MW's while Davis Besse is only a little under 900 MW's.

Witness the collapse of Westinghouse. Nuclear power has run its course and it is time to move on.

Cheaper too.

Thanks for sending this.

- Ned Ford
513-600-4200

On 5/3/2017 9:19 AM, Andy.Shaffer@ohiohouse.gov wrote:

> Good morning,
> Please find enclosed the MIT study that was referenced in the House Public Utilities Committee meeting last Tuesday, April 25.
> Please do not hesitate to contact our office if you have any questions.
> Thank you,
>
> Andy Shaffer
> LSC Fellow for Representative Bill Seitz
> Ohio House of Representatives | District 30
> 77 South High Street | Columbus, Ohio 43215
> Andy.Shaffer@ohiohouse.gov | (o) (614) 466-8258

Rep30

From: Stewart, Jackie <Jackie.Stewart@fticonsulting.com>
Sent: Thursday, May 04, 2017 8:21 AM
To: Wolf, Jimmy
Subject: FW: Coalition Opposing FirstEnergy Nuclear Bailout Announced

Good morning Jimmy,
I wanted to also pass on this news for Rep. Seitz. It's pretty clear that the bailout is not popular among anyone other than FirstEnergy!
Hope you are doing well and thanks again
Jackie

From: Coalition Against Nuclear Bailouts [mailto:nonuclearbailout=gmail.com@mail69.suw17.mcsv.net] **On Behalf Of** Coalition Against Nuclear Bailouts
Sent: Thursday, May 04, 2017 7:00 AM
Subject: Coalition Opposing FirstEnergy Nuclear Bailout Announced

For Immediate Release

Contacts:
Trey Addison, AARP, 937-470-1033
Lordstown Mayor Arno Hill, 330-824-3330
Jenn Klein, Ohio Chemistry Technology Council, 330-224-1730

Coalition Opposing the FirstEnergy Nuclear Bailout Announced

Over forty bipartisan Ohio elected, business, and community leaders and organizations announce today the formation of the Coalition Against Nuclear Bailouts. This rapidly growing coalition seeks to protect Ohio consumers, businesses, communities, and families from the proposed government bailout of FirstEnergy's Davis Besse and Perry nuclear power plants proposed in Senate Bill 128 and House Bill 178.

This up to $300 million a year bailout would pick winners and losers in the energy market and would prop-up increasingly uncompetitive plants on the backs of Ohio families and businesses, so that one company can make a larger profit. The coalition is concerned that if this bailout is approved, it could lead to higher electric bills for all Ohioans, drive away investment and business development in our state, kill thousands

of good-paying Ohio jobs, and threaten tax revenues for local governments and schools.

For more information and future updates about the coalition please visit our Facebook page.

The coalition offered the following statements:

"This proposed nuclear bailout will hurt current Ohio businesses and could stop new businesses from investing in Ohio," said Summitville Tiles, Inc. CEO David Johnson. "Senate Bill 128 and House Bill 178 will increase the cost of doing business in FirstEnergy's territory. And, because it interferes with the competitive energy generation market in Ohio, could lead to higher energy costs for businesses across the state. If the state passes this legislation, it will be sending the message that Ohio is willing to pick winners and losers and to favor one business to the detriment of thousands of others."

"I urge Ohio's General Assembly to reject Senate Bill 128 and House Bill 178" said Community Mobilization Coalition Chairman Reverend Simon. "This legislation would raise electric rates on thousands of Ohio families regardless of ability to pay. Families should not have to choose between keeping the lights on or eating dinner, so that another big company can get another big bailout. FirstEnergy was just recently given the authority to increase their customers' bills by $204 million a year, just to prop up the company's bottom-line. Now they are asking for more? It is time for our elected leaders to say no."

"The proposed FirstEnergy bailout would put at risk the jobs, investments, and much needed tax revenues for local government and schools provided by the construction of two natural-gas fired power plants here in Lordstown" said Lordstown Mayor Arno Hill. "At the same time, it would increase electric rates on our local families and businesses. This nuclear bailout could devastate Lordstown, and countless other Ohio communities if passed. And to what end? FirstEnergy has already announced it plans to sell the nuclear plants. Ohio families and communities should not have to suffer just so

FirstEnergy can make a larger profit."

"Ohio consumers should not be saddled with higher electric bills so that the state can prop up FirstEnergy's uncompetitive nuclear power plants," said AARP Ohio's Trey Addison. "This proposed bailout is another in a long line of subsidies that have increased consumers' electric bills by $14.7 billion since 2000. These subsidies are not necessary to provide clean, reliable and cost effective electric service to Ohio families. Ohio is part of a 13 state electric grid and PJM, the grid operator, notes that subsidies distort the wholesale power market to the detriment of consumers and grid reliability. We urge legislators to consider the cost to consumers, including those over 50 on fixed incomes, and reject this legislation."

"The FirstEnergy nuke bailout bill is the utility's latest move to try to prop up its financially troubled business on the backs of Ohio consumers," said Ohio Manufacturers' Association Vice President and Managing Director of Public Policy Services Ryan Augsburger. "Manufacturers support nuclear power as part of an 'all-of-the above' energy portfolio, but Senate Bill 128 is a wolf in sheep's clothing. The legislation would impose an unwarranted new multi-billion- dollar tax on Ohio businesses and families, stunt innovation and discourage investment in new generation assets in our state. We will actively work to oppose this misguided, anti-consumer bill."

"Ohio's leaders should support free market solutions to electric generation because they ensure the lowest cost energy for consumers," said Todd Snitchler, spokesman for Alliance for Energy Choice. "Subsidies, such as that proposed in Senate Bill 128 and House Bill 178, guarantee higher costs to customers. What is more, the proposed subsidy would hurt communities in Ohio where private investors have planned new, clean, highly efficient natural gas plants. Why would private energy producers choose to invest in Ohio if the state is in the business of picking winners and losers and preferring corporate bailouts over private investments? The proposed subsidy would reduce the overall number of construction, operations and maintenance jobs in communities around the state, and would simply shift the risk of closure to the more efficient Ohio power plants."

Members of the rapidly growing Coalition Against Nuclear Bailouts include:

AARP

Alliance for Energy Choice

American Petroleum Institute Ohio

Bowling Centers Association of Ohio

Clean Energy Future

Cleveland City Councilman Ken Johnson

Columbiana County Commissioner Mike Halleck

Columbiana Mayor Bryan Brakeman

Community Mobilization Coaltion

Cuyahoga County Councilman Anthony Harrison

Dan Crouse, Routh Hurlbert Real Estate

David Johnson, CEO, Summitville Tiles, Inc.

Energy Professionals of Ohio (EPO)

Harrison County Commissioner Dale Norris

Joe Knab, Green Township Board of Zoning Appeals

Landowners for Energy Access and Safe Exploration

Lordstown Mayor Arno Hill

Maumee City Councilman Dan Hazard

Mayfield Heights City Councilmember Donna R. Finney

Mike Baach, President & CEO, Philpott Solutions Group

Minister Jerry Primm of East Cleveland Concern Pastors

NARO Appalachia

National Association of Royalty Owners (NARO)

New Bethel Baptist Church Reverend Kenneth Simon

Newtown Falls Mayor Lyle Waddell

Nick Homrighausen, Executive Director of Community & Economic Development, Harrison County

Nita Thomas, Hamilton County Westside Community Action

Ohio Chemistry Technology Council

Ohio Coin Machine Association

Ohio Licensed Beverage Association

Ohio Manufacturers Association

Ohio Oil and Gas Association

Ohio State Grange

Oregon City Administrator Mike Beazley

Pastor Jimmy Gates of Kinsmen Pastors

Pastor Tony Minor of UNITED Pastors

Quality Water Systems

Regina Mitchell, President, Warren Fabricating and Machining Corporation

Stark County Black Caucus

Stark County Concerned Pastors

Trumbull County Commissioner Daniel Polivka

Trumbull County Commissioner Frank Fuda

Trumbull County Commissioner Mauro Cantalamessa

Warren Mayor Doug Franklin

We the People Ohio Valley

Wilmington Mayor John Stanforth

Youngstown Warren Black Caucus

Zanesville Patriots

###

This email was sent to Jackie.Stewart@fticonsulting.com

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Coalition Against Nuclear Bailouts · - · -, Ohio - · USA

Rep30

From: Snitchler, Todd A <tasnitchler@vorysadvisors.com>
Sent: Thursday, May 04, 2017 12:10 PM
To: Rep30
Subject: FYI - Carbon Pricing Reporting

http://www.utilitydive.com/news/the-carbon-consensus-generators-analysts-back-co2-price-at-ferc-technical/441862/

Does it count as federal interference if the generators are supportive of what they do? Selective opposition to federal actions perhaps?

TAS

VORYS | Advisors

Todd A. Snitchler
Principal
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www.vorysadvisors.com

Rep30

From: Rep30
Sent: Monday, May 08, 2017 9:44 AM
To: Wolf, Jimmy
Subject: FW: Follow Up ZEN Q&A from 4/25 Hearing
Attachments: House Public Utilities 4.25 Follow Up Q&A.pdf

Forward onto the entire committee? Entire interested party group?

From: Pine, Ty [mailto:tpine@firstenergycorp.com]
Sent: Monday, May 08, 2017 9:36 AM
To: Rep30 <Rep30@ohiohouse.gov>; Rep36 <Rep36@ohiohouse.gov>
Subject: Follow Up ZEN Q&A from 4/25 Hearing

Gentlemen,

Attached are the deliverables that were asked of FirstEnergy during the April 25th House Public Utilities committee question and answer period.

I hope this information is helpful.

Ty Pine

Q: How much do natural gas prices need to increase for Ohioans to pay $300 million more annually in the PJM energy market?

The ZEN legislation provides benefits to Ohioans regardless of any movement in the price of natural gas. The Davis-Besse and Perry nuclear power plants provide benefits including fuel diversity, environmental, and other benefits to the state.

Assuming gas sets the price as the marginal fuel at its current frequency (43.8% of the hours[1]), then the gas price would need to rise $0.59/MCF for all Ohioans to pay $300 million annually in additional energy charges. The most recent Henry Hub spot price for natural gas is $3.06/MCF, so the increased gas price would need to be $3.65/MCF, a spot price that was reached as recently as January 2, 2017[2].

Q: How much do natural gas prices need to increase for Davis-Besse and Perry to earn $300 million more annually from the PJM energy market?

The ZEN legislation provides benefits to Ohioans regardless of any movement in the price of natural gas. The Davis-Besse and Perry nuclear power plants provide benefits including fuel diversity, environmental, and other benefits to the state.

Gas prices are low and are projected to remain low for the near future. FirstEnergy continues to believe that earning an additional $300 million annually from the PJM electric market is not feasible for the foreseeable future. However, if you assume gas sets the price as the marginal fuel 100% of the time, the price would have to rise roughly $2.20/MCF. The most recently available Henry Hub spot price for natural gas is $3.06/MCF, so the increased rate would need to be $5.26/MCF, a price which hasn't been seen a single day since March 2014 (2nd Polar Vortex) and hasn't been consistently seen (one month straight) since January 2010.

If you assume gas sets the price as the marginal fuel at its current frequency (43.8% of the hours), then the price would have to rise $5.02/MCF to $8.08/MCF, a spot price that hasn't been consistently seen since August 2008.

Q: How much more would each household in Lake and Ottawa county have to pay to retain existing services should Perry and Davis-Besse close?

Assuming the plants closed, Lake County would lose $9.5 million in personal property taxes (and possibly more if there is a reduction in the $4.5 million in real estate taxes) and Ottawa County would lose $9 million in personal property taxes. If these values were spread over all the households in the respective counties, households[3] in Lake County would have to pay just over $100/year and those in Ottawa County would have to pay more than $510/year.

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[1] PJM Market Monitor 2016 State of the Market Report, Section 3
http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2016/2016-som-pjm-sec3.pdf
[2] EIA data, April 24, 2017 https://www.eia.gov/dnav/ng/hist/rngwhhdd.htm
[3] 2010 U.S. Census https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml#

Q: How do you reconcile the message that Perry and Davis Besse are not profitable with the alleged conclusion from the MIT study that Davis Besse is the 12th most profitable plant and Perry is the 14th most profitable?

While we don't agree with the profitability ranking of our nuclear plants for the reasons noted below we do agree with the conclusion of the study that reductions in nuclear generation will increase carbon emissions if replaced by gas-fired units or increase significantly the cost of subsidies annually if the generation is replaced with renewables. We further agree that supporting existing nuclear assets is a very cost effective means to lower carbon emissions while ensuring long-term security of supply.

However, the nuclear profitability ranking in the MIT study is flawed and the conclusions are inaccurate. The MIT study evaluated 61 nuclear plants for profitability by summing energy and capacity market revenues and legislative/regulatory support then subtracting expenses. After reviewing the report, it is clear that the SNL Financial Database used in the study is understating the average cost of generation compared to the Nuclear Energy Institute (NEI) each year, by as much as $5.6/MWh (see chart on page 5 of the report). The SNL Financial Database uses public information where available, and a proprietary model when the data is unknown. While it is not possible to speak to the specific cost numbers used in the study for Davis Besse and Perry since they are not identified, the study acknowledges that average costs used are lower than other industry sources.

It also is unclear how certain fixed costs (such as depreciation or interest) and how outage costs are factored into the analysis or how costs are unitized per production output, as the study concludes that Davis Besse ranks higher than Perry, which is simply wrong. In fact, based on proprietary data available on a confidential basis to nuclear owners, relative station cost rankings are inconsistent in several instances with the profitability rankings concluded in this study.

FirstEnergy suspects that the revenues may be overstated as well. Rather than performing analysis of future energy prices, the study uses an historical average to estimate future energy prices, where location assumptions are historic, unknown and may not be related to station location. Additionally, the report does not include sufficient detail on assumptions around capacity market prices; it states that actual auction results are used to forecast future capacity revenue. This is a flawed assumption. For example, in northern Ohio, the price for annual resources was higher than the Rest of RTO region for the 2015/16 delivery year, which was an unusual circumstance. This same zone did not separate in a material way in any other past or recent PJM auctions, resulting in significantly lower capacity revenues for these stations in other years. These flawed assumptions could help explain the inaccurate profitability conclusion for Davis-Besse and Perry.

Finally, the profitability rankings contradict known facts. For example, Indian Point in New York, which this study ranked among the best financially, has announced premature closure, due to lack of profitability. Strikingly, the top ranked plant is Millstone, which is currently the subject of legislation in Connecticut for financial support.

According to studies by NEI, single unit nuclear plants (both Davis-Besse and Perry are single-unit reactors) cost about $50/MWH to operate. For units in restructured states (like Ohio and more than a dozen other states who unbundled retail electric service and transferred the authority over dispatch and pricing of generation from state to federal regulators), where markets do not value the environmental, fuel diversity and other benefits of nuclear, revenues from markets are below $35/MWH. In all

restructured states where nuclear plants exist, a plant solution is approved or being discussed. As Chuck Jones indicated in November 2016, the options for FirstEnergy plants (including Davis Besse and Perry) are regulation-like, closure, or sale.

The projected 2017-2020 for Davis Besse and Perry nuclear power plants are negative cash flow. Even without debt costs and existing fuel contracts, the plants are breakeven at best. The financial gap to sustain the business is not on the horizon through the markets.

Rep30

From: Lehman, Ryan
Sent: Monday, May 08, 2017 2:32 PM
To: Wolf, Jimmy
Subject: RE: 4/25 ZEN Q&A

thanks

Ryan J. Lehman
Majority Policy Advisor
Office of Speaker Clifford A. Rosenberger
Ohio House of Representatives
ryan.lehman@ohiohouse.gov
(614) 466-6505

From: Wolf, Jimmy
Sent: Monday, May 08, 2017 12:42 PM
To: Kasych, Shawn ; Lehman, Ryan
Subject: FW: 4/25 ZEN Q&A

FYI from Chairman Seitz

From: Pine, Ty [mailto:tpine@firstenergycorp.com]
Sent: Monday, May 08, 2017 9:35 AM
To: Anthony DeVitis; Seitz, William; John Eklund - Calfee, Halter & Griswold LLP (JEklund@Calfee.com)
Subject: 4/25 ZEN Q&A

Gentlemen,

Attached are the deliverables that were asked of FirstEnergy during the House Public Utilities committee question and answer period.

I hope this information is helpful.

Ty Pine

Rep30

From: julia johnson <juliejohnson@ctcn.net>
Sent: Monday, May 08, 2017 5:52 PM
To: Rep30
Cc: sam@mwncmh.com; Lehman, Ryan
Subject: Gloves are off in fossil fuel fight against nuclear

Http://www.world-nuclear-news.org/V-Gloves-are-off-in-fossil-fuel-fight-against-nuclear-0205171.html

Gloves are off in fossil fuel fight against nuclear

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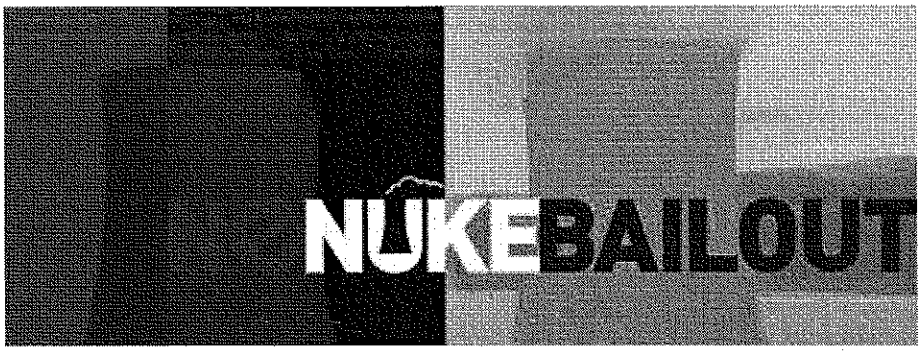
02 May 2017

The American Petroleum Institute (API) recently urged lawmakers in Ohio to "reject legislation that would subsidize nuclear power companies", launching an anti-nuclear campaign that marks a return to above board competition in energy markets, writes Rod Adams.

The Ohio division of the API called on "corporate supporters of the legislation to stop misleading Ohio consumers with false information on the economic and environmental consequences of shuttering nuclear power plants in the state". In question are bills before the Ohio House Public Utilities Committee and the state Senate which would grant Zero Emission Credits to FirstEnergy's Perry and Davis-Besse nuclear power plants to ensure their continued operation. Given the two nuclear plants represent 14% of the state's power, compared to coal at 59%, gas at 23% and renewables at only 4%. *The Wall Street Journal* and Environmental Progress have taken note of the API's activities in Ohio.



A banner from the anti-nuclear campaign supported by API

This is one more example of what might be an important trend in the long running conversation about energy supply and consumption. It appears that at least part of the oil and gas industry has decided it's time to openly battle nuclear energy so that it can capture additional energy market share.

The coal industry, never very skilled at public relations, invested resources throughout the 1960s in a lobby group called the National Coal Policy Council (NCPC). That group, an uneasy alignment that included coal mining companies, coal miner unions, railroad companies, coal mine equipment companies and coal burning utility companies, directly challenged the federal government's programs designed to make the peaceful atom an economically viable competitor.

Unsurprisingly, NCPC's efforts didn't work very well. It wasn't easy to convince Americans and their elected officials to stop investing in the new thing - atomic energy - to protect King Coal, the railroads that carried the coal and the unions that occasionally held the entire country hostage during strikes. By 1970, perhaps partly as a result of acquisitions of coal

companies by the more PR savvy oil and gas industry, investments in the NCPC fell off. The organisation was disbanded in 1971.

Though it's not easy to find meeting minutes or to point to a specific strategy document with clear talking points, it's reasonable to assume that there were numerous thoughtful discussions in the 1960s among skilled propagandists about the best way to respond to the rapidly growing threat from nuclear energy.

The results of those discussions can be discerned by looking at actions that are a matter of historical record.

Since the late 1960s and early 1970s, most of the voices associated with what I generally refer to as "fossil fuel interests" have been notably quiet about nuclear energy. If possible, they have avoided the subject entirely, neither voicing support nor opposition in public. Instead of actively engaging in the almost-expected business behaviour of criticising and opposing market competitors, they have followed a strategy of allowing surrogates to be the public faces of the opposition to nuclear energy.

As anti-nuclear surrogates successfully waged battles over safety, nuclear waste, siting, financing, regulations, radiation protection and exports constraints justified by carefully stoked fears of nuclear weapons proliferation, the fossil fuel industry took advantage of a slowing competitor. It gladly supplied replacement fuels and power plants whenever and wherever nuclear growth was stymied. It also enjoyed several periods of substantial market pricing power that stocked its coffers with enormous financial and political resources.

It also invested substantial resources in technological improvements that improved its ability to produce higher quality products in ever increasing quantity.

The nuclear industry, started by engineers, scientists and business developers used to working on government or monopoly utility projects, didn't recognise the competitive landscape. It was poorly equipped to fend off the accumulating burdens, partially because it was used to the customers picking up any additional costs imposed by changing rules and requirements.

During several periods of time, the nuclear industry accepted so many burdens that nearly all of its capital was expended in reacting to criticism by adding complex systems that were often designed to be idle nearly 100% of the time. Browns Ferry, Three Mile Island, 911 and Fukushima were all used to justify efforts that interfered with numerous improvement initiatives that would have lowered costs and increased production capacity.

More honest competition

Now that groups like API Ohio, the Pennsylvania Independent Oil and Gas Association and Marcellus Shale Coalition have decided to openly engage in opposition to nuclear energy, perhaps the industry will take the steps necessary to mature and prosper.

Here is a partial list of suggestions.

Recognise that energy is perhaps the world's largest and most competitive commodity enterprise.

Recognise that all energy sources compete against each other, sometimes through a degree of separation or two.

Understand that in commodity markets, cost is a key differentiator.

Even in commodity markets, quality and other characteristics vary. Suppliers have to invest resources in convincing customers differences exist and are worth higher prices.

Understand that hypothetical improvements in hypothetical damage frequency probabilities don't produce exciting sales literature.

Recognise that a positive vision of a future with almost unlimited quantities of affordable, clean energy can excite people enough to become a self-fulfilling prophecy.

Fight back against the deceptive tactics being employed even as the true competitors begin to come out of the shadows.

Abundant electricity

I understand what Alex Epstein calls 'the moral case for fossil fuels'. I am an unabashed and unashamed consumer who enjoys the good things that abundant availability of hydrocarbon power gives to society. Fossil fuels can be extracted, transported, refined, distributed and consumed in ways that harm the environment less than most non-nuclear alternatives for producing an equal amount of power.

Since our current world population has so many people who cannot access or afford the reliable energy that enables the kind of comfortable lifestyle taken for granted in the mid to upper echelons of developed countries, there is a lot more room for increased energy consumption than most current models predict.

If energy suppliers would invest more effort in growing the overall size of the pie they would have less reason to kneecap each other. Instead, they now fight over a slowly growing market that is full of customers that might be interested in buying more power to improve their lives and control their living conditions. Unfortunately, the energy industry has invested a big chunk of its communications resources convincing people to feel guilty about using its valuable and lifestyle enabling products.

Rod Adams

Comments? Please send them to editor@world-nuclear-news.org

Rod Adams is the publisher of Atomic Insights, a blog that has been covering the energy industry from the Atomic perspective since 1995. This article first appeared on his blog.

Rep30

From: Rep30
Sent: Tuesday, May 09, 2017 9:53 AM
To: 'brad.wieners@gmail.com'
Subject: FW: Pitting Wind and Solar Against Nuclear Power

FYI

From: julia johnson [mailto:juliejohnson@ctcn.net]
Sent: Friday, May 05, 2017 6:57 AM
To: Rep30 <Rep30@ohiohouse.gov>
Cc: sam@mwncmh.com; Frank Strigari <Frank.Strigari@ohiosenate.gov>; Lehman, Ryan <Ryan.Lehman@ohiohouse.gov>; Tom Stacy <tfstacy@gmail.com>
Subject: Pitting Wind and Solar Against Nuclear Power

http://www.theenergycollective.com/geoffrey-styles/2403683/pitting-wind-solar-nuclear-power

Pitting Wind and Solar Against Nuclear Power

May 4, 2017 by Geoffrey Styles 4 Comments

- ***With US electricity demand stalled, expanding wind and solar power is increasing the economic pressure on equally low-emission nuclear power.***
- ***New state incentives for nuclear plants are facing resistance from the beneficiaries of renewable energy subsidies, as both battle for market share.***

It's an old adage that a growth market has room for all participants, including new entrants. The US electricity market is now experiencing the converse of this, with increasing competition for static demand leading to headlines like the one I saw earlier this week: "Lifeline for Nuclear Plants Is Threatening Wind and Solar Power."

The idea behind that headline is ironic, considering that for more than a decade renewables have depended on government mandates and incentives to drive their impressive expansion. Along with recently cheap natural gas, they have made conditions increasingly difficult for established generating technologies like coal and nuclear power. In the case of coal, that was an entirely foreseeable and even intentional outcome, but for nuclear power it has come as a mostly unintended consequence.

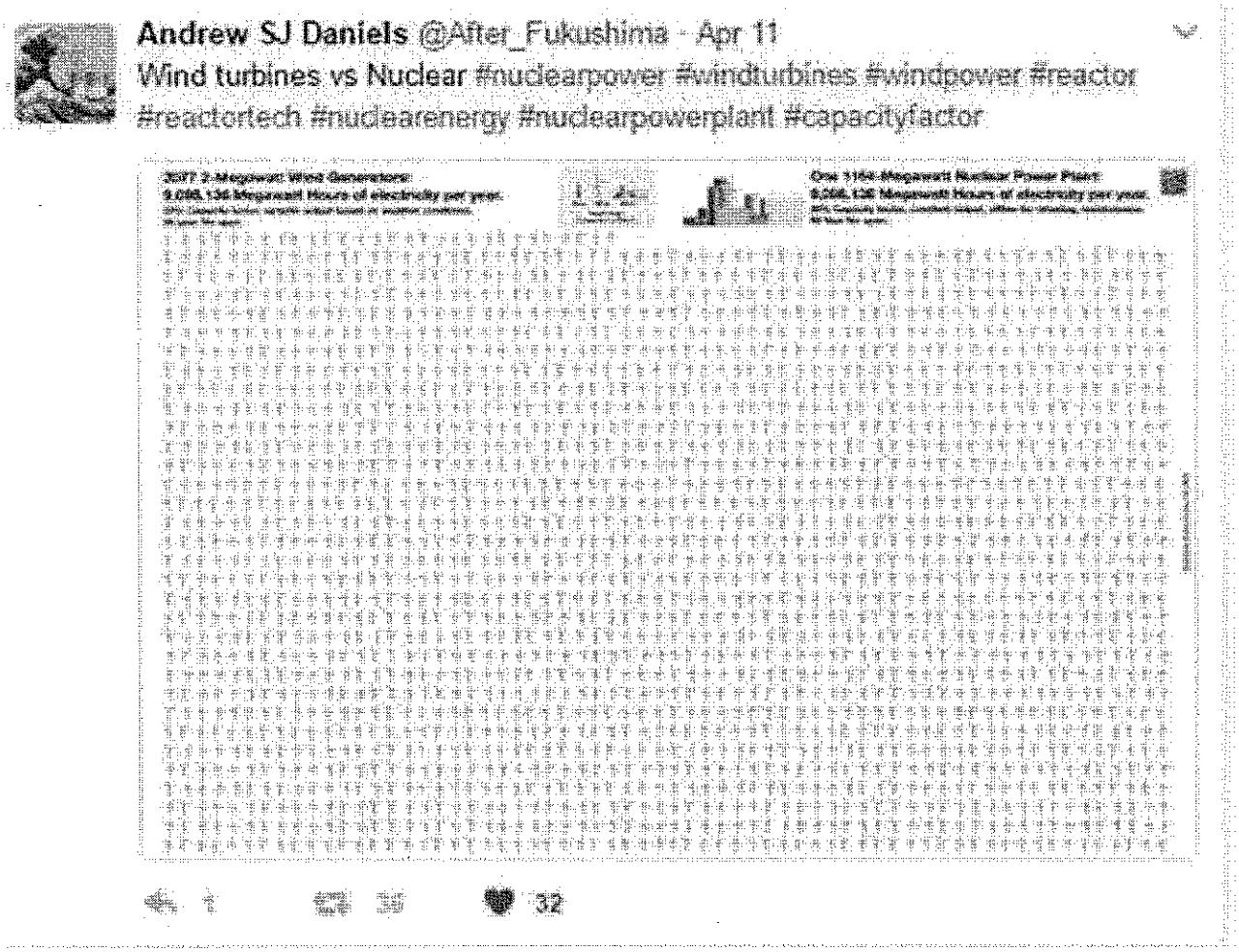
Much as the slowdown in gasoline demand brought on by the recession created a crisis for biofuel quotas, stagnant electricity demand has hastened and intensified the inevitable fight for market share and the resulting shakeout in generating capacity. US electricity consumption has been essentially flat since the financial crisis of 2008-9, thanks to a weak economy and aggressive investment in energy efficiency. More generation serving the same demand means lower prices for all producers, and fewer annual hours of operation for the least competitive of them.

At the same time abundant, low-priced natural gas from soaring shale production has made gas-fired turbines both a direct competitor in the 24/7 "baseload" segment that coal and nuclear power formerly dominated, and the go-to backup source for integrating more renewables onto the grid.

The US is essentially swimming in energy, at least when it comes to resources that can be turned into electricity. The only rationale left for the substantial subsidies that wind and power still receive–over $3 billion budgeted for wind alone in 2017–is environmental: mainly concerns about climate change and the emissions of CO2 and other greenhouse gases linked to it.

That's the same reason why some states have become alarmed enough by the recent wave of nuclear power plant retirements to consider providing some form of financial support for existing facilities. Nuclear power isn't just the third-largest source of electricity in the US; it is by far our largest producer of zero-emission power: 3.5 times the output of wind in 2016 and 22 times solar. A large drop in nuclear power is simply not compatible with the desire to continue cutting US emissions. Environmental groups like EDF are reaching similar conclusions.

Nuclear's scale is even more of a factor when it comes to considering what could replace it. For example, it takes the output of about 2,000 wind turbines of 2 megawatts (MW) each–roughly half of the 8,203 MW of new US wind installations last year–to equal the annual energy production of a single typical nuclear reactor. An infographic I saw on Twitter makes that easier to visualize:



I can appreciate why utilities and others that are investing heavily in wind and solar power might be convinced that providing incentives to keep nuclear power plants from retiring prematurely is "the wrong policy." After all, we have collectively pushed them to invest in these specific technologies, because it has been easier to reach a consensus at the federal and state levels to provide incentives for renewables, rather than for all low-emission energy.

As long as we are promoting renewables in this way, though, we should recognize that nuclear power is no less worthy. The biggest benefit of renewables is their low emissions (including non-greenhouse air pollutants,) an attribute shared with nuclear power. Yet because of their much lower energy densities, requiring much bigger footprints for the same output, and their lower reliability, incorporating a lot more renewables into the energy mix requires additional investments in electricity grid modernization and energy storage, along with new tools like "demand response." Nuclear power is compact, available about 90% of the time, and it works just fine with the existing grid.

By experience and philosophy, I'm a big fan of markets, so I would normally be more sympathetic to the view expressed by the American Petroleum Institute that states shouldn't tip the scales in favor of nuclear power over gas and other alternatives. However, we don't have anything resembling a level playing field for electricity generation, even in states with deregulated electricity markets. The existing federal incentives for wind and solar power, together with state Renewable Portfolio Standards, are already tipping the scales strongly in *their* favor. These subsidies will remain in place until at least 2022, consistent with the most recent extension by Congress. Why do renewables merit such subsidies more than nuclear power?

Wind and solar power are key parts of the emerging low-emission energy mix, and we will want more as their costs continue to fall, but not at the expense of much larger low-emission energy sources that are already in place. Less nuclear power doesn't just mean more renewables. It also means more gas or coal-fired power. That's the experience of Germany's "Energiewende", or energy transition.

As long as that is the case, and without corresponding incentives for equally low-emission nuclear plants, as well as for fossil-fuel plants that capture and sequester their CO2, we will end up with an energy mix in the next few years that is less diverse, less reliable, and emits more CO2 than necessary. I wouldn't consider that progress.

Rep30

From: Rep30
Sent: Tuesday, May 09, 2017 9:54 AM
To: Committee_PublicUtilities_List_ALL; Committee_PublicUtilities_List_DEM; Committee_PublicUtilities_List_GOP
Subject: FW: Pitting Wind and Solar Against Nuclear Power

I recommend this short read to gain a better understanding of the issues before us.

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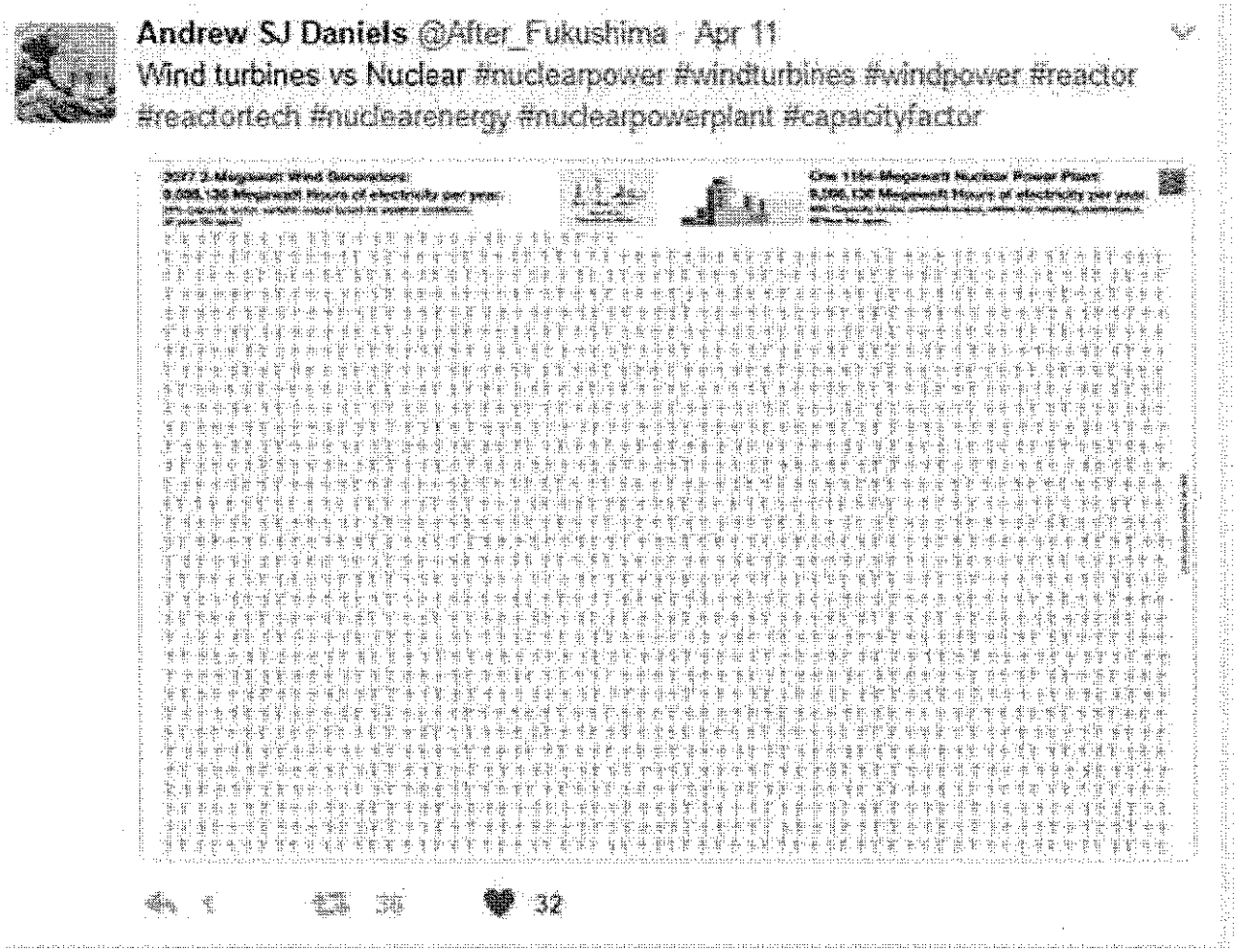

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Rep30

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To: 'Ty Pine (tpine@firstenergycorp.com)'
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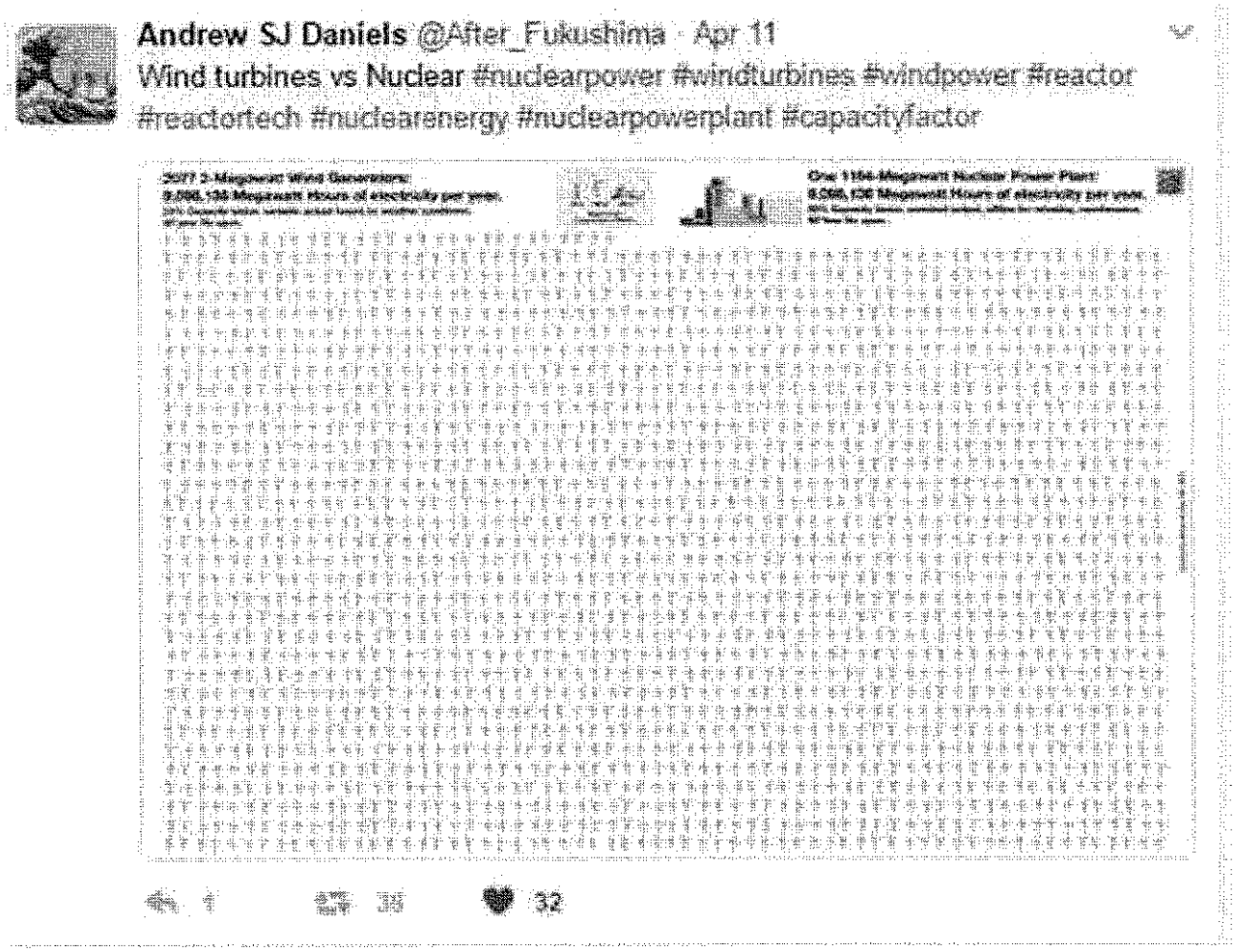

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Rep30

From: Rep30
Sent: Tuesday, May 09, 2017 9:55 AM
To: John Eklund (DST)
Cc: Elizabeth Cassell
Subject: FW: Pitting Wind and Solar Against Nuclear Power

I recommend this short read to gain a better understanding of the issues before us.

From: julia johnson [mailto:juliejohnson@ctcn.net]
Sent: Friday, May 05, 2017 6:57 AM
To: Rep30 <Rep30@ohiohouse.gov>
Cc: sam@mwncmh.com; Frank Strigari <Frank.Strigari@ohiosenate.gov>; Lehman, Ryan <Ryan.Lehman@ohiohouse.gov>; Tom Stacy <tfstacy@gmail.com>
Subject: Pitting Wind and Solar Against Nuclear Power

http://www.theenergycollective.com/geoffrey-styles/2403683/pitting-wind-solar-nuclear-power

Pitting Wind and Solar Against Nuclear Power

May 4, 2017 by Geoffrey Styles 4 Comments

- ***With US electricity demand stalled, expanding wind and solar power is increasing the economic pressure on equally low-emission nuclear power.***
- ***New state incentives for nuclear plants are facing resistance from the beneficiaries of renewable energy subsidies, as both battle for market share.***

It's an old adage that a growth market has room for all participants, including new entrants. The US electricity market is now experiencing the converse of this, with increasing competition for static demand leading to headlines like the one I saw earlier this week: "Lifeline for Nuclear Plants Is Threatening Wind and Solar Power."

The idea behind that headline is ironic, considering that for more than a decade renewables have depended on government mandates and incentives to drive their impressive expansion. Along with recently cheap natural gas, they have made conditions increasingly difficult for established generating technologies like coal and nuclear power. In the case of coal, that was an entirely foreseeable and even intentional outcome, but for nuclear power it has come as a mostly unintended consequence.

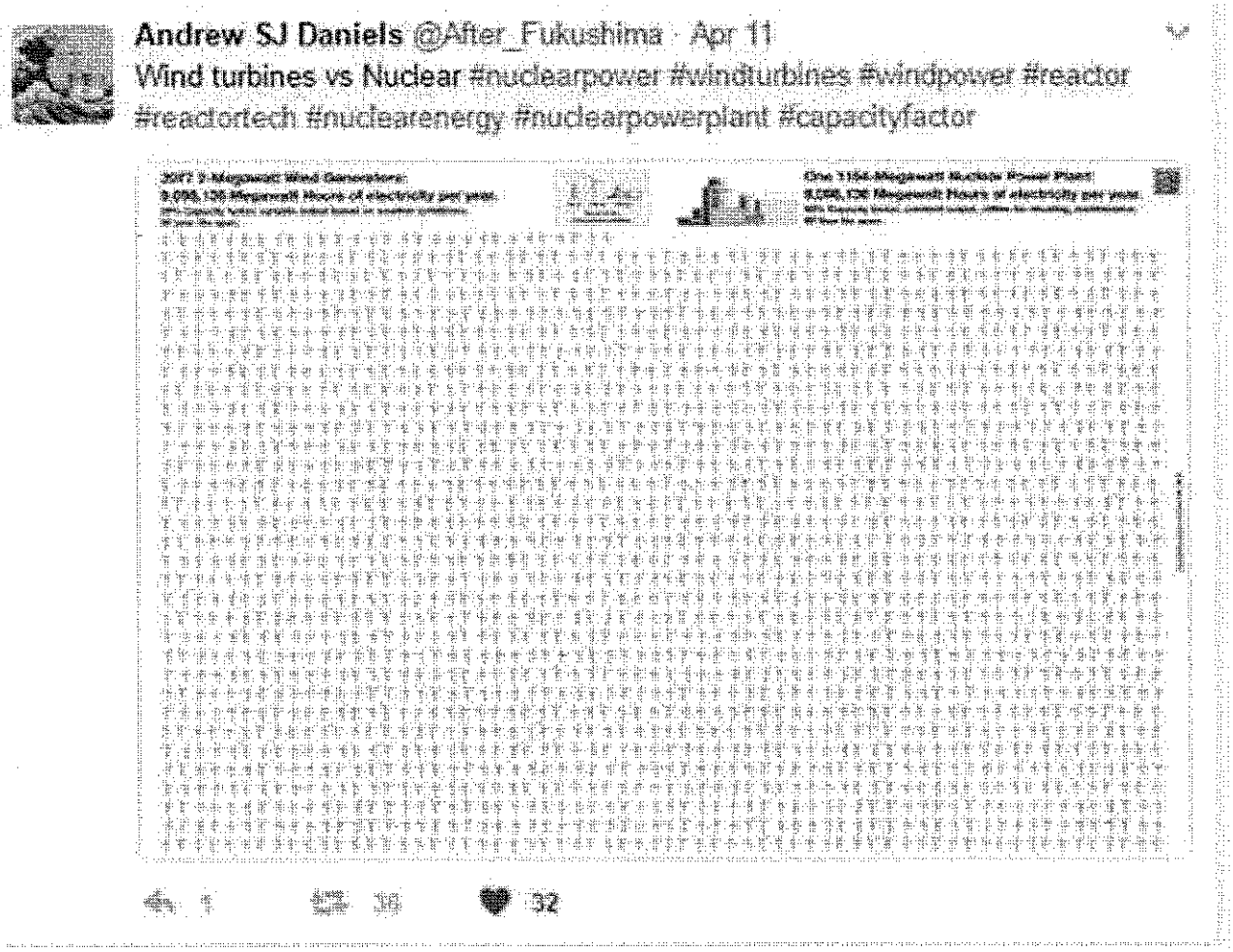
Much as the slowdown in gasoline demand brought on by the recession created a crisis for biofuel quotas, stagnant electricity demand has hastened and intensified the inevitable fight for market share and the resulting shakeout in generating capacity. US electricity consumption has been essentially flat since the financial crisis of 2008-9, thanks to a weak economy and aggressive investment in energy efficiency. More generation serving the same demand means lower prices for all producers, and fewer annual hours of operation for the least competitive of them.

At the same time abundant, low-priced natural gas from soaring shale production has made gas-fired turbines both a direct competitor in the 24/7 "baseload" segment that coal and nuclear power formerly dominated, and the go-to backup source for integrating more renewables onto the grid.

The US is essentially swimming in energy, at least when it comes to resources that can be turned into electricity. The only rationale left for the substantial subsidies that wind and power still receive–over $3 billion budgeted for wind alone in 2017–is environmental: mainly concerns about climate change and the emissions of CO2 and other greenhouse gases linked to it.

That's the same reason why some states have become alarmed enough by the recent wave of nuclear power plant retirements to consider providing some form of financial support for existing facilities. Nuclear power isn't just the third-largest source of electricity in the US; it is by far our largest producer of zero-emission power: 3.5 times the output of wind in 2016 and 22 times solar. A large drop in nuclear power is simply not compatible with the desire to continue cutting US emissions. Environmental groups like EDF are reaching similar conclusions.

Nuclear's scale is even more of a factor when it comes to considering what could replace it. For example, it takes the output of about 2,000 wind turbines of 2 megawatts (MW) each–roughly half of the 8,203 MW of new US wind installations last year–to equal the annual energy production of a single typical nuclear reactor. An infographic I saw on Twitter makes that easier to visualize:



I can appreciate why utilities and others that are investing heavily in wind and solar power might be convinced that providing incentives to keep nuclear power plants from retiring prematurely is "the wrong policy." After

all, we have collectively pushed them to invest in these specific technologies, because it has been easier to reach a consensus at the federal and state levels to provide incentives for renewables, rather than for all low-emission energy.

As long as we are promoting renewables in this way, though, we should recognize that nuclear power is no less worthy. The biggest benefit of renewables is their low emissions (including non-greenhouse air pollutants,) an attribute shared with nuclear power. Yet because of their much lower energy densities, requiring much bigger footprints for the same output, and their lower reliability, incorporating a lot more renewables into the energy mix requires additional investments in electricity grid modernization and energy storage, along with new tools like "demand response." Nuclear power is compact, available about 90% of the time, and it works just fine with the existing grid.

By experience and philosophy, I'm a big fan of markets, so I would normally be more sympathetic to the view expressed by the American Petroleum Institute that states shouldn't tip the scales in favor of nuclear power over gas and other alternatives. However, we don't have anything resembling a level playing field for electricity generation, even in states with deregulated electricity markets. The existing federal incentives for wind and solar power, together with state Renewable Portfolio Standards, are already tipping the scales strongly in *their* favor. These subsidies will remain in place until at least 2022, consistent with the most recent extension by Congress. Why do renewables merit such subsidies more than nuclear power?

Wind and solar power are key parts of the emerging low-emission energy mix, and we will want more as their costs continue to fall, but not at the expense of much larger low-emission energy sources that are already in place. Less nuclear power doesn't just mean more renewables. It also means more gas or coal-fired power. That's the experience of Germany's "Energiewende", or energy transition.

As long as that is the case, and without corresponding incentives for equally low-emission nuclear plants, as well as for fossil-fuel plants that capture and sequester their CO2, we will end up with an energy mix in the next few years that is less diverse, less reliable, and emits more CO2 than necessary. I wouldn't consider that progress.

Rep30

From: Rep30
Sent: Tuesday, May 09, 2017 10:44 AM
To: 'Ty Pine (tpine@firstenergycorp.com)'
Subject: FW: Coalition Opposing FirstEnergy Nuclear Bailout Announced

FYI

From: Stewart, Jackie [mailto:Jackie.Stewart@fticonsulting.com]
Sent: Thursday, May 04, 2017 8:21 AM
To: Wolf, Jimmy <Jimmy.Wolf@ohiohouse.gov>
Subject: FW: Coalition Opposing FirstEnergy Nuclear Bailout Announced

Good morning Jimmy,
I wanted to also pass on this news for Rep. Seitz. It's pretty clear that the bailout is not popular among anyone other than FirstEnergy!
Hope you are doing well and thanks again
Jackie

From: Coalition Against Nuclear Bailouts [mailto:nonuclearbailout=gmail.com@mail69.suw17.mcsv.net] **On Behalf Of** Coalition Against Nuclear Bailouts
Sent: Thursday, May 04, 2017 7:00 AM
Subject: Coalition Opposing FirstEnergy Nuclear Bailout Announced

For Immediate Release

Contacts:

Trey Addison, AARP, 937-470-1033

Lordstown Mayor Arno Hill, 330-824-3330

Jenn Klein, Ohio Chemistry Technology Council, 330-224-1730

Coalition Opposing the FirstEnergy Nuclear Bailout Announced

Over forty bipartisan Ohio elected, business, and community leaders and organizations announce today the formation of the Coalition Against Nuclear Bailouts. This rapidly growing coalition seeks to protect Ohio consumers, businesses, communities, and families from the proposed government bailout of FirstEnergy's Davis Besse and Perry nuclear power plants proposed in Senate Bill 128 and House Bill 178.

This up to $300 million a year bailout would pick winners and losers in the energy market and would prop-up increasingly uncompetitive plants on the backs of Ohio families and businesses, so that one company can make a larger profit. The coalition is concerned that if this bailout is approved, it could lead to higher electric bills for all Ohioans, drive away investment and business development in our state, kill thousands of good-paying Ohio jobs, and threaten tax revenues for local governments and schools.

For more information and future updates about the coalition please visit our Facebook page.

The coalition offered the following statements:

"This proposed nuclear bailout will hurt current Ohio businesses and could stop new businesses from investing in Ohio," said Summitville Tiles, Inc. CEO David Johnson. "Senate Bill 128 and House Bill 178 will increase the cost of doing business in FirstEnergy's territory. And, because it interferes with the competitive energy generation market in Ohio, could lead to higher energy costs for businesses across the state. If the state passes this legislation, it will be sending the message that Ohio is willing to pick winners and losers and to favor one business to the detriment of thousands of others."

"I urge Ohio's General Assembly to reject Senate Bill 128 and House Bill 178" said Community Mobilization Coalition Chairman Reverend Simon. "This legislation would raise electric rates on thousands of Ohio families regardless of ability to pay. Families should not have to choose between keeping the lights on or eating dinner, so that another big company can get another big bailout. FirstEnergy was just recently given the authority to increase their customers' bills by $204 million a year, just to prop up the company's bottom-line. Now they are asking for more? It is time for our elected leaders to say no."

"The proposed FirstEnergy bailout would put at risk the jobs, investments, and much needed tax revenues for local government and schools provided by the construction of

two natural-gas fired power plants here in Lordstown" said Lordstown Mayor Arno Hill. "At the same time, it would increase electric rates on our local families and businesses. This nuclear bailout could devastate Lordstown, and countless other Ohio communities if passed. And to what end? FirstEnergy has already announced it plans to sell the nuclear plants. Ohio families and communities should not have to suffer just so FirstEnergy can make a larger profit."

"Ohio consumers should not be saddled with higher electric bills so that the state can prop up FirstEnergy's uncompetitive nuclear power plants," said AARP Ohio's Trey Addison. "This proposed bailout is another in a long line of subsidies that have increased consumers' electric bills by $14.7 billion since 2000. These subsidies are not necessary to provide clean, reliable and cost effective electric service to Ohio families. Ohio is part of a 13 state electric grid and PJM, the grid operator, notes that subsidies distort the wholesale power market to the detriment of consumers and grid reliability. We urge legislators to consider the cost to consumers, including those over 50 on fixed incomes, and reject this legislation."

"The FirstEnergy nuke bailout bill is the utility's latest move to try to prop up its financially troubled business on the backs of Ohio consumers," said Ohio Manufacturers' Association Vice President and Managing Director of Public Policy Services Ryan Augsburger. "Manufacturers support nuclear power as part of an 'all-of-the above' energy portfolio, but Senate Bill 128 is a wolf in sheep's clothing. The legislation would impose an unwarranted new multi-billion- dollar tax on Ohio businesses and families, stunt innovation and discourage investment in new generation assets in our state. We will actively work to oppose this misguided, anti-consumer bill."

"Ohio's leaders should support free market solutions to electric generation because they ensure the lowest cost energy for consumers," said Todd Snitchler, spokesman for Alliance for Energy Choice. "Subsidies, such as that proposed in Senate Bill 128 and House Bill 178, guarantee higher costs to customers. What is more, the proposed subsidy would hurt communities in Ohio where private investors have planned new, clean, highly efficient natural gas plants. Why would private energy producers choose

to invest in Ohio if the state is in the business of picking winners and losers and preferring corporate bailouts over private investments? The proposed subsidy would reduce the overall number of construction, operations and maintenance jobs in communities around the state, and would simply shift the risk of closure to the more efficient Ohio power plants."

Members of the rapidly growing Coalition Against Nuclear Bailouts include:

AARP
Alliance for Energy Choice
American Petroleum Institute Ohio
Bowling Centers Association of Ohio
Clean Energy Future
Cleveland City Councilman Ken Johnson
Columbiana County Commissioner Mike Halleck
Columbiana Mayor Bryan Brakeman
Community Mobilization Coaltion
Cuyahoga County Councilman Anthony Harrison
Dan Crouse, Routh Hurlbert Real Estate
David Johnson, CEO, Summitville Tiles, Inc.
Energy Professionals of Ohio (EPO)
Harrison County Commissioner Dale Norris
Joe Knab, Green Township Board of Zoning Appeals
Landowners for Energy Access and Safe Exploration
Lordstown Mayor Arno Hill
Maumee City Councilman Dan Hazard
Mayfield Heights City Councilmember Donna R. Finney
Mike Baach, President & CEO, Philpott Solutions Group
Minister Jerry Primm of East Cleveland Concern Pastors
NARO Appalachia
National Association of Royalty Owners (NARO)
New Bethel Baptist Church Reverend Kenneth Simon

Newtown Falls Mayor Lyle Waddell

Nick Homrighausen, Executive Director of Community & Economic Development, Harrison County

Nita Thomas, Hamilton County Westside Community Action

Ohio Chemistry Technology Council

Ohio Coin Machine Association

Ohio Licensed Beverage Association

Ohio Manufacturers Association

Ohio Oil and Gas Association

Ohio State Grange

Oregon City Administrator Mike Beazley

Pastor Jimmy Gates of Kinsmen Pastors

Pastor Tony Minor of UNITED Pastors

Quality Water Systems

Regina Mitchell, President, Warren Fabricating and Machining Corporation

Stark County Black Caucus

Stark County Concerned Pastors

Trumbull County Commissioner Daniel Polivka

Trumbull County Commissioner Frank Fuda

Trumbull County Commissioner Mauro Cantalamessa

Warren Mayor Doug Franklin

We the People Ohio Valley

Wilmington Mayor John Stanforth

Youngstown Warren Black Caucus

Zanesville Patriots

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Rep30

From: McGAREY, Michael <mfm@nei.org>
Sent: Thursday, May 11, 2017 10:38 AM
To: Rep30
Subject: Good to see you at ALEC

Which industry benefits most from federal energy incentives? Oil and Natural Gas, followed by Renewables.

NUCLEAR ENERGY INSTITUTE

Dear Chairman Seitz:

I enjoyed our conversation last week and I appreciated your insights on our efforts to preserve reliable, zero-carbon baseload nuclear power in Ohio. I wanted to share some timely information that might be beneficial to you and your Ohio General Assembly colleagues. This puts into perspective the true costs to taxpayers of the lavish subsidies enjoyed by the oil and gas industry over the past 67 years (and by Renewables since 1994) versus the more modest course corrections being pursued by the nuclear industry to keep the non-emitting Davis-Besse and Perry plants in Ohio's diverse energy mix.

Management Information Services, at the behest of NEI, has updated its 2012 study on federal energy incentives. This study, "Two-Thirds of a Century and $1 Trillion+ U.S. Energy Incentives," revealed that although billions of dollars in incentives distributed to the energy industry came in various forms only 8 percent was spent on nuclear energy. The study covers all incentives, including tax breaks, regulation exemptions and technology transfer from government to industry, and breaks down the incentives by technology type.

For more information, read Management Information Services' news release and the new study. The study was released yesterday.

Please feel free to share this with your colleagues in the legislature, and do not hesitate to call me if I may be of assistance in any way.

Regards,

Mike

Michael F. McGarey
Nuclear Energy Institute
1201 F Street, NW, Suite 1100
Washington, DC 20004

P: 202-739-8118
M: 202-439-3698
E: mfm@nei.org
T: @N_E_I

Clean Air Energy

Rep30

From: Stewart, Jackie <Jackie.Stewart@fticonsulting.com>
Sent: Monday, May 15, 2017 10:06 AM
To: Wolf, Jimmy
Subject: FE's Regional War on Ratepayers

HI Jimmy,
Just wanted to pass on a few stories out of West Virginia for Rep. Seitz . As you can clearly see, FE is trying to bailout their nuclear plant in PA, and similar efforts are underway in WV too. This is in fact a regional issue. I thought you might be interested. Thanks!
Jackie
Pleasants, he said, "is a small piece of a much bigger effort, but it's the piece playing out in West Virginia."

More groups, businesses protest power plant purchase

The Dominion Post
By David Beard
May 13, 2017

Several groups and businesses that have opposed state approval of Mon Power's purchase of the Pleasants Power Station from a corporate sister are also opposing federal approval.
Mon Power and its FirstEnergy sister company, Potomac Edison, are seeking state Public Service Commission approval to buy the coal-fired Pleasants Power Station from another sister, Allegheny Energy Supply.
Mon Power also has a concurrent application for approval filed with the Federal Energy Regulatory Commission. The PSC has oversight of the transaction's effects on retail rates, while FERC examines its effects on wholesale power rates. One or both could block the transaction.
FERC has received protests from Longview Power LLC; jointly from the Electric Power Supply Association and the PJM Power Providers Group (EPSA/P3); and jointly from the Community Power Network, WVSUN and the West Virginia Citizens Action Group.
The PSC's consumer Advocate Division also filed with FERC comments in opposition to the transfer.

Longview Power Challenges Mon Power's Pleasants Deal

The State Journal
By Linda Harris
May 15, 2017

Longview Power is asking the Federal Energy Regulatory Commission to intercede in Mon Power's proposed $195 million acquisition of an aging coal-fired plant.
Mon Power wants to buy the nearly 40-year-old Pleasants power station at Willow Island from its sister company, Ohio-based Allegheny Energy Supply Co. Both companies are owned by FirstEnergy, which also is Ohio-based. The company says it needs the additional capacity to plug a 1,300 megawatt shortfall it anticipates over the next 10 years in Northern and North Central West Virginia.
FirstEnergy insists the deal would be a win for West Virginia: preserving coal-related jobs and providing other economic benefits. FirstEnergy says Pleasants "employs about 200 people, consumes more than 3.4 million tons of coal per year and pays millions of dollars in annual property taxes." It predicts the average residential bill will drop about $1 a month as a result of the transaction.
But Longview Power CEO Jeff Keefer sees the Pleasants deal as a thinly disguised bailout. He wants FERC to either schedule a hearing before an administrative law judge or request additional information from Mon Power.
The Maidsville-based utility's protest also asks FERC to delay acting on Mon Power's application "pending the conclusion of discovery in the ongoing proceedings before the (West Virginia Public Service Commission), which may give (us) an opportunity to obtain at least some of the missing information."
Keffer said the proposed sale would allow FirstEnergy to shift an under-performing asset out of its portfolio in Ohio, where the energy market is deregulated, into West Virginia's still-regulated market, so shareholders

would be guaranteed a return on their investment no matter how it performs. He believes FirstEnergy "grossly exaggerated" the need for additional capacity to justify the acquisition.

"But the much bigger issue is that FirstEnergy, throughout its service territory, wherever it has old, antiquated power plants, is trying desperately to either get them regulated or subsidized," he said. "Their unregulated plants are losing tremendous amounts of money and going broke, (without relief) they'll have to file bankruptcy and they're admitting that."

Pleasants, he said, "is a small piece of a much bigger effort, but it's the piece playing out in West Virginia."

Longview's 37-page protest suggests Mon Power issued a "flawed and biased" request for proposals in mid-December, with technical requirements designed to ensure only Pleasants could achieve 100-percent compliance.

The RFP gave sellers in Mon Power's current service area a competitive edge. It stipulated the energy source must be dispatchable — meaning it had to be able to generate power at any time, so proposals involving renewable energy wouldn't be entertained. It also required a three-day power supply be on site at all times, a stipulation that could exclude natural gas plants. The RFP also had a short turnaround, with preliminary expressions of interest due within a week of the Dec. 16 notice.

Keffer contends the utility's projected shortfall nearly doubled year-to-year: Documents the company filed with PSC in 2015 had identified a 100-megawatt capacity shortfall starting in 2016, projected to reach 700 megawatts by the year 2020 and 850 megawatts by 2027. This year, Mon Power predicted a 1,300-megawatt capacity need, plus up to 100 megawatts of demand-response resources, which are "temporary reductions of electrical usage," much of it sparked by growth in the oil and gas industry.

Keffer said FERC prefers "arms-length dealings between subsidiaries," and said there's "plenty of evidence here to suggest that's not been the case and FERC needs to look at it carefully."

"Should Mon Power be allowed to proceed with this there's a huge conflict of interest," he said, "because clearly, they're beholden to a holding company that has a different agenda and is not looking out for the interests of the ratepayers of Monongahela Power."

Keffer maintains the $195 million asking price is much too high for a 40-year-old plant FirstEnergy CEO Chuck Jones has said is a money loser in Ohio's competition-driven market. Pushing it into a regulated market like West Virginia means other consumers would face higher rates because of that and, in the long run, it would be a deterrent to new business development.

"If they're moved into a regulated base they'll continue to operate, but they'll be subsidized," he said. "They'll continue to sell electric even though they're selling at prices that don't (require them) to have to manage their business. Longview has to try every day and sell into the power grid and make sure our costs are lower than revenues — we compete. They will be in a position where they don't have to anymore."

Keffer said it's essential that competitive markets be allowed to actually compete, and not rely on subsidies to preserve money-losing power plants like Pleasants. "If they get to continue to operate when they shouldn't ... it causes serious problems for companies like Longview that are trying to play by the rules of the market," he said.

Mon Power had filed its proposal with the PSC in March. A spokesman, Todd Meyers, could not be reached for comment. However, he'd said previously "the RFP process is open and transparent." He said updated energy usage forecasts determined Mon Power would need additional capacity this year, "with a steadily increasing shortfall to reach about 1,400 megawatts by 2030." He also said Mon Power is doing its best to "help identify possible resources necessary to meet future generation supply obligations in a cost-effective, prudent and reliable manner."

Jackie Stewart
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Rep30

From: Melissa Clark <mclark@gallianet.net>
Sent: Monday, May 15, 2017 11:30 AM
To: Miller, Adam; Gonzales, Anne; DeVitis, Anthony; Seitz, Bill; Hill, Brian; Hagan, Christina; Craig, Hearcel; Boccieri, John; Rogers, John; Dever, Jonathan; Faber, Keith; Smith, Kent; Boggs, Kristin; Roegner, Kristina; Conditt, Margaret; Romanchuk, Mark; Sweeney, Martin; Ashford, Michael; Carfagna, Rick; Robert Cupp; Thomas Brinkman; Patton, Thomas; Timothy Ginter
Cc: Rep30; Rep68; Rep44; Rep59; Rep18; Rep27; Rep52; Rep26; rep4@ohiohouse.gov; Rep36; Rep28; Rep84; rep5@ohiohouse.gov; Rep19; Rep50; Rep97; Rep17; rep7@ohiohouse.gov; Rep37; Rep60; rep2@ohiohouse.gov; rep8@ohiohouse.gov; Rep14; Smith, Ryan; Peterson@ohiosenate.gov; Stepp, Taylor
Subject: House Bill 178 - Letter from Gallia County Commissioners
Attachments: House Bill 178 - Gallia County Commissioners.pdf

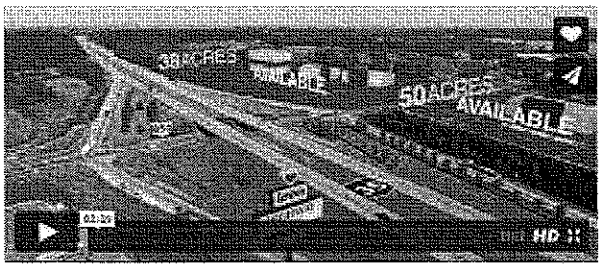
Good Afternoon,

Please find attached a letter from the Gallia County Board of Commissioners requesting opposition to House Bill 178.

Thank you for your consideration in regard to this important matter.

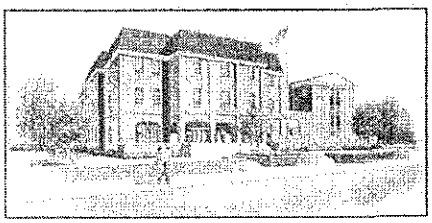
Thank you,
Melissa Clark

Melissa Clark
Director
Economic & Community Development
Gallia County
18 Locust Street – Rm 1268
Gallipolis, OH 45631
PH: 740-446-4612 ext. 271
FX: 740-446-4804
Email: mclark@gallianet.net
www.growgallia.com



Gallia County Commissioners

Gallia County Courthouse
18 Locust Street - Room 1292
Gallipolis, Ohio 45631
Ph: 740.446.4612, Ext 227
Fax: 740.446.4804
Email: gcboc@gallianet.net
Website: www.gallianet.net



May 15, 2017

House Public Utilities Committee
77 S. High Street
13th Floor
Columbus, OH 43215

Re: House Bill 178

Dear Chairman Bill Seitz, Vice Chairman Rick Carfagna, Ranking Member Michael Ashford, and Members of the House Public Utilities Committee:

The Gallia County Commissioners write in strong opposition to House Bill 178, which creates a Zero Emission Nuclear (ZEN) program that will unfairly subsidize the already unprofitable operation of nuclear power plants.

With our community's largest economic contributors being the coal fired power plants, Lightstone Generation Gavin Plant and the Ohio Valley Electric Kyger Creek Plant, Gallia County has a vested interest in the outcome of House Bill 178.

As coal continually competes to stay viable, it is already challenged against inexpensive and abundant natural gas, new environmental regulations, and environmental activists. The allowance of subsidies for nuclear power plants with HB 178, will leave other energy producing companies, including coal fired power plants, at an even further operating disadvantage.

Gallia County is a small rural county in Southeast Ohio with a population of 31,000. The Gavin Plant and the Kyger Creek Plant are not only among the top employers of the community, but the power plants compromise 70% of our county's tax base and 67% of the local school revenue. The continued operation of these power plants are essential to the ongoing economic stability of Gallia County.

Not only will HB 178 put other energy producing companies, including the Lightstone Generation Gavin Plant and the Ohio Valley Electric Corporation Kyger Creek Plant, at a clear disadvantage by operating without government subsidies, but the pending legislation causes potential interruption in the current energy market, and will hinder economic growth and new business attraction with the increase in electricity costs across the state of Ohio.

For the reasons listed above, the Gallia County Commissioners strongly urge you to oppose House Bill 178 and its unfair subsidies of nuclear power plants.

Thank you very much for your consideration of this important matter.

Sincerely,

Harold G. Montgomery
President
Gallia County Board of Commissioners.

cc: Ryan Smith, Representative, Ohio House of Representatives
Bob Peterson, Ohio State Senator

Rep30

From: Snitchler, Todd A <tasnitchler@vorysadvisors.com>
Sent: Tuesday, May 16, 2017 11:21 AM
To: Rep30
Subject: FYI

http://www.utilitydive.com/news/eia-natural-gas-renewables-squeeze-nuclear-capacity/442701/

VORYS | Advisors

Todd A. Snitchler
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www.vorysadvisors.com

Rep30

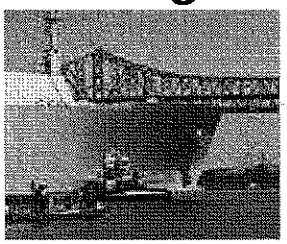
From: Rep30
Sent: Tuesday, May 16, 2017 1:29 PM
To: Committee_PublicUtilities_List_ALL; Committee_PublicUtilities_List_DEM; Committee_PublicUtilities_List_GOP; Lehman, Ryan; Ty Pine (tpine@firstenergycorp.com); 'Snitchler, Todd A'; 'bills@perpower.com'; zeiglerc@api.org
Subject: FW: New England in Precarious Position After EPA Shuts Down Coal

The enclosed article highlights the risk of over dependence on natural gas as an electricity feedstock. If one is inclined to support the ZEN nuclear credits bill, this article makes the case as eloquently as it can be made. If one opposes the ZEN bill, then a necessary corollary is that you must stand firm in favor of more pipeline construction and against localized efforts to block pipelines or fracking. As William F. Buckley used to say "he who says A must say B."

From: julia johnson [mailto:juliejohnson@ctcn.net]
Sent: Tuesday, May 16, 2017 11:44 AM
To: Rep30 <Rep30@ohiohouse.gov>
Cc: sam@mwncmh.com; Frank Strigari <Frank.Strigari@ohiosenate.gov>; Lehman, Ryan <Ryan.Lehman@ohiohouse.gov>; Kevon Martis <kevon@kevonmartis.com>; Tom Stacy <tfstacy@gmail.com>
Subject: New England in Precarious Position After EPA Shuts Down Coal

http://www.newsmax.com/TomBorelli/new-england-coal-power-plant-natural-gas/2017/05/15/id/790209/

New England in Precarious Position After EPA Shuts Down Coal



In this handout from the U.S. Coast Guard, a U.S. Coast Guard boat helps the Liquified Natural Gas container ship Berge Everett as it comes inbound May 8, 2006, in Boston, Massachusetts. (Kelly Turner/U.S. Coast Guard via Getty Images)
By Tom Borelli
Monday, 15 May 2017 01:00 PM

Former President Obama is reaping the financial benefits from his political life by getting huge speaking fees, but his failed policies will haunt Americans for years to come.

Obama is scheduled to make $400,000 for speaking at a health care conference in September and a whopping $3.2 million for his foundation from a climate change speech in Italy this week.

While Obama cashes in on his fame, millions of Americans are suffering the consequences of his biggest policy achievements: Obamacare and his climate change agenda.

President Trump is working to unwind these disastrous policies, but a significant amount of damage was done. Obamacare's financially unsustainable pre-existing condition insurance mandate is proving difficult to undo, and his climate change agenda fundamentally transformed our electricity generation infrastructure.

Obama's regulatory assault on coal forced utilities to close coal-fired power plants, resulting in a dangerous lack of energy diversity in regions such as New England. The closing of coal-fired and nuclear power plants, coupled with cheap natural gas, made New England highly dependent on natural gas for electricity production.

According to ISO New England (nonprofit corporation responsible for electricity pricing and supply), in 2016, almost 50 percent of electricity was derived from natural gas, followed by nuclear at 31 percent, renewable 9.7 percent, hydroelectric 7.1 percent, and coal 2.4 percent. On the surface, New England electricity generation energy sources appear diverse and climate-change-friendly, but what's not seen is a cause for concern.

The 2016 long-term reliability assessment by the North American Electric Reliability Corporation (NERC) — the regulatory authority for the electricity grid — warns New England about its energy diversity risk. The report concludes that New England is projected to have adequate power for the future, but it also stated the region's "increased reliance on natural gas ... indicate[s] a medium resource adequacy risk, particularly during the winter peak season."

The natural gas dependency risk, as outlined in the report, is due to limited pipeline and natural gas storage capacity, meaning the energy infrastructure is lagging behind demand for this fuel.

ISO New England provides more details about the risk posed by the region's dependency on natural gas. ISO notes the lack of pipeline infrastructure restricted the amount of natural gas needed for electricity production, and "its unavailability can pose a serious risk to the reliable supply of electricity, particularly when non-gas-fired resources are also unavailable."

The electricity diversity problem for New England is going to get much worse because nuclear, oil, and coal power plants — the non-gas-fired energy resources — are closing due to EPA regulations, making the region more dependent on natural gas.

The problems outlined by NERC are not just theoretical. During the 2014 polar vortex, the supply of natural gas struggled to keep up with demand for both home heating and electricity generation because of limited pipeline capacity. The resulting spike in natural gas prices caused havoc for residents and businesses.

Meanwhile, environmental activists are fighting new pipeline construction. This month, eighteen environmental activists were arrested in Massachusetts at a construction site for a natural gas pipeline at the Otis State Forest, and New England elected officials are also resisting the energy infrastructure projects. Massachusetts Democrat Senators Elizabeth Warren and Ed Markey want a pipeline construction project at the Otis State Forest halted to allow residents in the area a rehearing on the permit.

The convergence of closing the non-gas-fired energy resources and environmental activism choking new natural gas pipeline supply is a recipe for disaster. Wind and solar power, Obama's preferred sources of electricity, are not going to save the day. ISO New England analysis of renewable energy notes their growth but highlights their limitations including the projected capacity, transmission upgrade requirements, limited energy storage, and the problems posed by intermittent energy production.

Because renewable energy is intermittent, the electric grid needs backup power. ISO says, "New natural gas generators will likely fill this role, further exacerbating New England's fuel-security challenge."

The New England region had already been moving toward more natural gas usage before Obama's election. But Obama's climate change agenda heaped political and regulatory pressure on traditional energy sources in New England, resulting in a lack of energy diversity that will bring New England electricity shortages and high prices for years to come.

Meanwhile, Obama will enjoy the riches of his retirement.

This article originally appeared on ConservativeReview.com**.**

Wolf, Jimmy

From: Snitchler, Todd A <tasnitchler@vorysadvisors.com>
Sent: Monday, May 15, 2017 5:05 PM
To: Wolf, Jimmy
Cc: Hill, Ned
Subject: FW: HB 178 testimony
Attachments: FW HB 178 testimony

Wolf, Jimmy

From: Snitchler, Todd A <tasnitchler@vorysadvisors.com>
Sent: Monday, May 15, 2017 5:05 PM
To: Wolf, Jimmy
Cc: Hill, Ned
Subject: FW: HB 178 testimony
Attachments: osu-emailsig.png

Jimmy -

Please see Prof. Hill's email below. Can you confirm that this is still acceptable and he can testify tomorrow?

Thank you in advance.

TAS

Todd Snitchler
Vorys Advisors, LLC
614.464.6222

From: EDWARD HILL
Sent: Monday, May 15, 2017 5:01:18 PM
To: Snitchler, Todd A
Subject: Re: HB 178 testimony

I will submit tomorrow AM. I have to revise tonight—I lost a big chunk of the day.

Do you have an email address where I can send it?

Ned

[cid:BD1B9DCB-001C-4B42-AF3B-E42B2E2F4366@attlocal.net]

Edward [Ned] Hill
Professor of Public Administration and City & Regional Planning Faculty, Ohio Manufacturing Institute John Glenn College of Public Affairs 310P, Page Hall, 1810 College Rd, Columbus, OH 43210
614-247-4086 Office / 216-926-6719 Mobile hill.1973@osu.edu<mailto:hill.1973@osu.edu> or Edward.Ned.Hill@icloud.com<mailto:Edward.Ned.Hill@icloud.com>
Blog: http://nedhillonehandedeconomist.com
Twitter: https://twitter.com/AOneHandedEcon
Publications and Research: https://www.researchgate.net/profile/Edward_Hill4

On May 15, 2017, at 4:56 PM, Snitchler, Todd A <tasnitchler@vorysadvisors.com<mailto:tasnitchler@vorysadvisors.com>> wrote:

Ned -

The chairman's office is looking for your testimony for tomorrow.

TAS

Todd Snitchler
Vorys Advisors, LLC
614.464.6222

From: Jimmy.Wolf@ohiohouse.gov<mailto:Jimmy.Wolf@ohiohouse.gov>
Sent: Monday, May 15, 2017 4:49:14 PM
To: Snitchler, Todd A
Subject: RE: HB 178 testimony

Todd,

I still have not received Dr. Hill's testimony for tomorrow. Do you have an update on when he will get it to me?

Thanks,

Jimmy

-----Original Message-----
From: Snitchler, Todd A [mailto:tasnitchler@vorysadvisors.com]
Sent: Monday, May 15, 2017 8:27 AM
To: Wolf, Jimmy <Jimmy.Wolf@ohiohouse.gov<mailto:Jimmy.Wolf@ohiohouse.gov>>
Subject: HB 178 testimony

Good morning Jimmy -

I hope you had a great weekend, the weather finally cooperated.

I wanted to ask about testimony for HB 178. Dr. Ned Hill is able to testify this week (he will be submitting testimony today) but has to be in Solon at 6 pm. If it's at all possible Dr. Hill needs to testify and be done by 4:15-4:30 pm in order to get to Solon on time.

Can you confirm with Rep. Seitz if the committee could accommodate this request?

Thanks in advance for the consideration and I look forward to hearing from you.

Thanks again.

TAS

Todd Snitchler
Vorys Advisors, LLC

614.464.6222

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