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IN THE UNITED STATES COURT OF APPEALS  
FOR THE SEVENTH CIRCUIT

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VILLAGE OF OLD MILL CREEK, *et al.*,  
*Plaintiffs-Appellants*,

v.

ANTHONY STAR, in his official capacity as  
Director of the Illinois Power Agency,  
*Defendant-Appellee*,

And

EXELON GENERATION COMPANY, LLC,  
*Intervening Defendant-Appellee*.

ELECTRIC POWER SUPPLY ASSOCIATION, *et al.*,  
*Plaintiffs-Appellants*,

v.

ANTHONY STAR, in his official capacity as  
Director of the Illinois Power Agency, *et al.*,  
*Defendants-Appellees*,

And

EXELON GENERATION COMPANY, LLC,  
*Intervening Defendant-Appellee*.

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On Appeal from the United States District Court for the Northern District of  
Illinois, Nos. 1:17-cv-01163 & 1:17-cv-01164, Hon. Manish S. Shah, District Judge

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BRIEF OF INDEPENDENT ECONOMISTS AS *AMICI CURIAE*  
IN SUPPORT OF DEFENDANTS-APPELLEES

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Appellate Court No: 17-2433, 17-2445

Short Caption: Village of Old Mill Creek, et al. v. Anthony Star, et al.

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**INTEREST OF *AMICI CURIAE***

The undersigned *amici curiae* are economists who are expert in the field of energy and environmental economics. They teach and publish widely in this field, and several have served at the highest levels of government. An appendix to this brief details their credentials and affiliations. *Amici* economists have no financial interest in the outcome of this case and have received no compensation for their participation. The foregoing reflects their independent judgment regarding the important economic issues involved in this case and does not represent the views of any institutions with which they are affiliated. No counsel for any party authored this brief in whole or in part. No person made a monetary contribution to this brief's preparation or submission. Counsel is proceeding *pro bono publico*. All parties in these consolidated appeals have consented to the filing of this brief.

## SUMMARY OF THE ARGUMENT

Plaintiffs contend that Illinois' Zero Emissions Credit (ZEC) program “disrupts,” “manipulat[es],” and “intrudes” into wholesale power markets and – invoking the language of economics – that the program will “distort” prices there. Brief for Elec. Power Supply Assoc. et al. at 7, 11, 42 & 57 (EPSA Brief). In their telling, apart from the recent intrusion of ZECs, wholesale markets are free from the influence of state policies aimed at reducing the environmental impacts of electric power generation.

They are mistaken. State environmental policies have had pervasive economic impacts on the wholesale markets since their inception and without objection from FERC. Moreover, states have had good reason for pursuing these policies. Absent intervention, electric power markets do not yield economically efficient outcomes. That is so because the cost of pollution is borne by society at large rather than the entities doing the polluting. It is no coincidence, therefore, that the states that have led the way toward market competition in electricity (rather than centralized resource planning) have also led the way toward policies, like the ZEC program, that use economic incentives to achieve environmental objectives.

Prices in wholesale power markets assimilate a wide range of state policies aimed at mitigating environmental harms. These policies vary in their design, scope, and stringency. Some create economic incentives for cleaner generation or economic penalties for emitting pollution. Others impose emission standards or

technology requirements directly on polluters. No matter their design, all of these policies influence investment decisions and operational practices at power plants, and therefore also affect wholesale market prices. That the composition of resources in these markets, and the resulting prices, bear the influence of environmental policies does not mean these markets are less competitive. It means, simply, that the terms of competition include satisfying environmental performance objectives as well as other factors.

Illinois' Zero Emissions Credit (ZEC) program compensates power plants that generate electricity without emitting pollutants that harm public health and cause climate change. To be sure, the program will affect the wholesale markets. The ZEC program will incentivize the ZEC recipients to submit lower bids into energy and capacity markets, and will generally improve their competitive position. The program will, therefore, also indirectly affect other market participants. But, in these respects, the ZEC program is no different than other state (or federal) policies targeting the environmental consequences of electric power generation. Nor is it greater in magnitude. In fact, the ZEC price of \$16.50/MWh is lower than the benefits that have generally been received by other zero-carbon resources.

Putting a value on carbon-free electricity improves economic efficiency. A fundamental principle of economics is that markets do not operate efficiently when transactions within those markets cause harm to third parties. (The harm to third parties is referred to in economics as a "negative externality"). The classic example of this concept is pollution: if polluters need not pay for the harm they cause, they



will engage in market transactions that result in more pollution than is economically efficient. The ZEC program addresses that problem, if only in part, by compensating qualifying generators for the value of their carbon-free electricity. By doing so, the program ensures that the economic decisions made by the owners of these resources (including retirement decisions) take account of their environmental advantages over the fossil-fuel fired generators that dominate the market and that are not required to pay for the social cost of their carbon dioxide emissions.

## ARGUMENT

### I. **Prices in Wholesale Energy and Capacity Markets Reflect Policies Aimed at Environmental Objectives**

#### *a. Evolution of the competitive landscape*

FERC's approach to wholesale competition over the past two decades has been an exercise in cooperative federalism. *See, e.g., FERC v. Elec. Power Supply Ass'n*, 136 S. Ct. 760, 779-80 (2016). FERC has required that all generators have non-discriminatory access to the interstate transmission system. *See, generally, Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Servs. by Pub. Utils.*, FERC Order No. 888, 61 Fed. Reg. 21,540, 21,541 (May 10, 1996). But, in other ways FERC has accommodated divergent state preferences. With regard to market competition, FERC has urged utilities to join regional transmission organizations (RTOs), and promoted organized wholesale markets. *Regional Transmission Organizations*, FERC Order No. 2000, 65 Fed. Reg. 809 (Jan. 6, 2000). But, ultimately, FERC has let states decide whether their

utilities join RTOs. *Id.* FERC has also let states decide whether to maintain traditional regulatory structures based on cost-of-service regulation of vertically-integrated utilities.

Today, in large expanses of the country, mainly in the West and Southeast, there are no RTOs or organized wholesale markets. Even where wholesale markets do exist, many states have retained their roles as economic regulators over generation resources. For instance, in much of the Midwest and South, RTOs operate the transmission system and administer markets, but many of the generation units belong to vertically-integrated utilities and recover their cost of service plus a return on equity through state-regulated retail rates (an arrangement that would also presumably be invalid under Plaintiffs' theory). In MISO, most of the participating generation units located outside Illinois belong to vertically-integrated utilities and receive cost recovery under state law.<sup>1</sup> Within these vertically-integrated utilities, state officials exercise control over which new resources are built and which retire.

Another group of states – in the East and Midwest, along with California and Texas – embraced wholesale competition more completely. These states, like

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<sup>1</sup> MISO does not publish data on the fraction of generation resources within its footprint that are rate-regulated. A pleading filed at FERC a couple years ago by a group of companies that included parties on both sides of this case claimed that one-fourth of generating resources in MISO are “merchant” resources, and the remainder receive cost recovery under state regulation. *See Midwest Independent Transmission System Operator, Inc.*, 153 FERC ¶ 61,229 at PP 57 & 77 (2015). PJM also includes power plants that are part of vertically integrated utilities. We have not identified data on what percentage of PJM generation is regulated in this way, but we expect it to be a substantially lower percentage than in MISO.

Illinois, directed their investor-owned utilities to transfer control of their transmission facilities to RTOs, and for the most part broke up the vertically-integrated utility structures. These decisions took those states out of the role of economic regulator for power plants within their borders.

By relinquishing their role as economic regulators over power plants, these states in no way gave up their role as environmental regulators over power plants. To the contrary, many of the states that led the way to market competition, including California and the Eastern states, also pursued the most aggressive policies to shape the mix of resources that now prevail in their states. Indeed, it would be impossible to understand the wholesale markets as they exist today without attention to the role that state environmental policies have played over the past twenty years. Most notably, California and the Northeastern states have nearly eliminated the use of coal and have aggressively promoted renewable energy within their markets. These states have achieved rates of carbon dioxide emissions per unit of electricity that are less than half of those in the more polluting states.<sup>2</sup>

*b. The effect of State (and Federal) environmental policies on organized wholesale markets*

State and federal environmental policies have had pervasive effects on organized wholesale markets. These policies affect energy and capacity markets differently, so it is helpful to consider each separately.

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<sup>2</sup> See Environmental Protection Agency, Emissions & Generation Resource Integrated Database (eGRID) (eGRID2014 Data File v2 at ST14) at <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>.

“Energy,” as a term of art in organized wholesale markets, means the generation of electricity at a particular location on the system and for a specified period of time. Both PJM and MISO run day-ahead and real-time auctions for energy. Generators that clear in the auction receive the clearing price at their location. The unit in energy markets is the megawatt-hour (MWh). Because energy markets compensate generators per MWh, policies that affect the marginal cost or benefits of generating each incremental MWh impact bidding there. Some policies provide additional sources of revenue (or tax abatement) for generators and therefore encourage them to bid lower in energy markets than they otherwise would. These same policies also induce some generators into the market – many of which have no fuel cost – thereby increasing the quantity of generation bidding into those markets with low marginal cost.

The most prominent example of this type of state policy is the renewable portfolio standard (RPS). Nine states in PJM and eleven in MISO have RPS programs. RPS programs require utilities to procure a specified percentage of electricity from renewable sources. RPS programs typically allow the renewable attributes to be unbundled from the physical electricity and sold separately as renewable energy credits (RECs). For each MWh they generate, renewable resources earn one REC they can sell. The prospect of additional revenues from the sale of RECs will cause generators to bid lower than they otherwise would in wholesale energy markets and will cause some new resources to enter the market that otherwise would not have. In this way, RPS programs affect wholesale energy

prices. See Monitoring Analytics LLC, State of the Market Report for PJM, January through June (2017)<sup>3</sup> at 301 (“RECs clearly affect prices in the PJM wholesale power market.”). Some RPS programs place additional value on the promotion of particular technologies, such as solar energy, by carving out technology-specific targets. For example, complimenting the ZEC program, the Future Energy Jobs Act also substantially increased the targets in the Illinois RPS and created a separate REC procurement to incentivize renewable distributed generation, (i.e. small-scale generation). 20 ILCS 3855/1-75(c).

Federal tax credits – while not raising the preemption issue that is the subject of this case – directly reward generators for producing clean energy and so have similar wholesale market impacts to ZECs and RECs. Renewable resources may claim these tax credits in addition to RECs. The Production Tax Credit (PTC) provides wind, geothermal, biomass, and other generators with tax credits for the first ten years of operation. In 2017, the PTC is worth \$24 per MWh generated. See, Internal Revenue Service, *Credit for Renewable Electricity Production and Refined Coal Production, and Publication of Inflation Adjustment Factor and Reference Prices for Calendar Year 2017*, 82 Fed. Reg. 17,740 (April 12, 2017). The PTC will phase out for new wind projects and end entirely for projects that have yet to begin construction by 2020. 26 U.S.C. § 45(b)(5). Solar resources may claim the PTC or the Investment Tax Credit (ITC), which provides a tax credit equivalent to

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<sup>3</sup> Available at [http://www.monitoringanalytics.com/reports/PJM\\_State\\_of\\_the\\_Market/2017/2017q2-som-pjm-sec8.pdf](http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2017/2017q2-som-pjm-sec8.pdf) (hereafter PJM State of the Market Report).

30% of the capital cost of the resource. The ITC remains at 30% through 2019 then phases down to 10% by 2022. 26 U.S.C. § 48(a)(6).

Pulling in the opposite direction are policies that require generators to pay a cost for negative environmental outcomes that is proportional to the amount of energy they generate. These policies will tend to increase the price at which certain generators bid into energy markets and, therefore, to increase average clearing prices. For example, Illinois has set standards for NO<sub>x</sub>, SO<sub>2</sub>, and mercury from power plants that exceed federal requirements. *See* Ill. Admin. Code tit. 35 §§ 225.233, .295 & .298.

Several states have also imposed sector-wide caps on carbon dioxide emissions, requiring generators to purchase allowances for each ton of carbon dioxide they emit. Nine Northeastern and Mid-Atlantic states (including two in PJM, Maryland and Delaware) have formed the Regional Greenhouse Gas Initiative, a cap-and-trade program that sets a 2030 emissions cap that is 65% lower than 2009 levels.<sup>4</sup> Likewise, California has implemented a cap-and-trade program that includes the transportation and industrial sectors as well as the electric sector and that will require substantial emissions reductions through 2031. At the federal level, implementing the Clean Air Act, EPA has created markets for allowances to emit certain air pollutants. *See, e.g.*, Environmental Protection

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<sup>4</sup> *See*, Press Release, RGGI States Announce Proposed Program Changes: Additional 30% Emissions Cap Decline by 2030 (Aug. 23, 2017) at [http://rggi.org/docs/ProgramReview/2017/08-23-17/Announcement\\_Proposed\\_Program\\_Changes.pdf](http://rggi.org/docs/ProgramReview/2017/08-23-17/Announcement_Proposed_Program_Changes.pdf).

Agency, *Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS*, 81 Fed. Reg. 74,504 (Oct. 26, 2016). Generators that need allowances for compliance purposes would generally bid higher into wholesale markets than they would if they had no compliance obligation.

Environmental policies also affect capacity market prices. “Capacity” is a commitment by the generator to make a certain amount of generating capacity available at a specified time in the future. The purpose of capacity requirements is to ensure that there will be adequate resources in the market to meet peak demand. PJM capacity auctions require generators to commit to making their resources available three years in advance of the delivery year, with incremental auctions in the intervening years.<sup>5</sup> MISO’s capacity auctions occur two months prior to the delivery year and are voluntary in that load-serving entities can meet their capacity requirements outside the central auction. The unit of capacity is the megawatt (MW), but because capacity commitments extend over time, capacity market prices are articulated per MW-day.

Wholesale capacity markets require generators to commit to make their resources available at certain future dates. Generators, therefore, base capacity bids on the opportunity cost of remaining in the market. A generator that is profitable solely from its participation in the energy market, for example, might submit a low capacity bid because it knows it will stay in operation regardless of the

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<sup>5</sup> *Capacity Market (RPM)*, PJM, <http://learn.pjm.com/three-priorities/buying-and-selling-energy/capacity-markets.aspx> PJM also conducts incremental auctions 20, 10 and 3 months prior to the delivery year.

price at which the capacity market clears. A generator that does not make much in the energy market or has high fixed costs, by contrast, might submit a higher capacity market bid, because only a high clearing price in the capacity market would make staying in the market profitable. In this way, capacity market bidding is inextricably linked with generators' overall profitability and their decisions about retiring existing resources and bringing new ones into the market.

Because of the broad range of economic inputs that generators must consider in determining their opportunity costs of remaining in the market, an equally broad range of public policies affect those bids. The policies that affect energy market bidding described above (such as RECs, tax credits, etc.) also affect capacity market bidding because, by making each MWh more or less profitable, those policies also affect the willingness of existing generators to remain in the market and of new generators to enter the market.<sup>6</sup> Many other policies affect capacity market bidding as well. For example, state permitting requirements may constrain what types of resources are able to enter the market and submit capacity bids. State and federal rules requiring generators to install new equipment to meet air or water quality standards might cause those generators to increase their capacity market bids. *See* PJM State of the Market Report at 299 (“investments required for environmental compliance have resulted in higher offers in the Capacity Market”). Likewise, for nuclear generators, the cost of renewing their licenses with the Nuclear Regulatory

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<sup>6</sup> Note, however, that some capacity markets constrain the types of costs that may be used to formulate bids and/or impose minimum offer prices that generators may not bid below.



Commission (NRC) or complying with NRC safety rules might affect the profitability of remaining in operation, and therefore the capacity prices those generators would require to stay in the market.

## **II. Illinois' Zero Emission Credit program has similar market impacts to other state and federal policies**

The ZEC program is designed to achieve an environmental outcome. It is available only to resources that produce zero-emission electricity. It rewards those resources in an amount, \$16.50 /MWh, that equates to the social cost of each incremental ton of carbon dioxide emissions as measured by the Interagency Working Group on the Social Cost of Greenhouse Gases (IWG).<sup>7</sup> The IWG was an inter-disciplinary group of experts drawn from across the federal government and supported by analysis from the National Academy of Sciences, Engineering, and Medicine. To inform regulatory decisionmaking, the IWG developed the social cost of carbon, which is an estimate of the monetized damages of each incremental increase in carbon emissions. The social cost of carbon includes, among other impacts, changes in net agricultural productivity, human health, property damage from increased flood risk, and the value of ecosystem services due to climate change. The social cost of carbon (expressed as dollars per ton) may be multiplied by an emissions factor (expressed as tons of CO<sub>2</sub> per MWh) to calculate a value of carbon-

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<sup>7</sup> The Illinois Legislature used the social cost of carbon from the IWG's most recent analysis as of the date of enactment. Subsequently, the current Administration has disbanded the IWG and produced a social cost of carbon estimate that excludes harmful effects outside the United States and is, therefore, sharply lower.

free electricity in dollars per MWh. The Illinois Legislature in FEJA did not specify the emissions factor it used to arrive at the value of \$16.50 per MWh. But, reverse-engineering the math, it appears they used an emissions factor of roughly 800 pounds per MWh, or roughly the emissions from a new, efficient natural gas-fired power plant. Had the Illinois Legislature used an emissions factor based on the average emissions in the region (which includes coal as well as natural gas), it would have produced a substantially higher ZEC price.

In short, ZEC recipients receive no more than their contribution to reducing carbon dioxide emissions based on conservative assumptions and as valued by the best available science. The ZEC program does not guarantee that the ZEC recipients' bids will clear the market or that they will make a profit. It simply ensures that their decisions of how much to bid and whether to remain in operation are influenced by the social value of the pollution they displace.

Plaintiffs claim that that the ZEC program “intrudes” into and “distorts” the wholesale markets, as if to suggest that wholesale energy and capacity markets are free from the effect of policies aimed at environmental impacts. But as we explain above, many state and federal programs affect generator bidding behavior in energy and capacity markets. These policies have developed over decades without objection from FERC.<sup>8</sup> The ZEC program is fundamentally no different in the way it affects

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<sup>8</sup> For instance, FERC has considered “[c]ompensation for environmental externalities through RECs,” and concluded that “RECs are separate commodities from the capacity and energy produced . . . . If a state chooses to create these separate commodities, they are not compensation for capacity and energy.” *Cal. Pub. Util. Comm’n et al*, 133 FERC ¶ 61,059, P.31 n.62 (2010).

the wholesale market. Indeed, the ZEC value of \$16.50/MWh is lower than the out-of-market benefits paid to other zero-carbon resources that receive both federal tax credits and RECs.

Monitoring Analytics, LLC, which serves as the PJM Market Monitor, has filed an amicus brief declaring the ZEC program a “threat to PJM’s market design.” Brief of the Independent Market Monitor for PJM at 21. Their brief, however, does not attempt to distinguish the market impacts of ZECs from the market impacts of RECs or federal tax credits. In fact, in its most recent PJM State of the Market Report, the PJM Market Monitor, explains how similar those impacts are:

RECs, federal investment tax credits and federal production tax credits provide out of market payments to qualifying resources, primarily wind and solar, which create an incentive to generate MWh until the [local price] is equal to the marginal cost of producing power minus the credit received for each MWh. The same is true for nuclear power credits, ZECs (zero emissions credits). The credits provide an incentive to make negative energy offers and more generally provide an incentive to operate whenever possible. These subsidies affect the offer behavior and the operational behavior of these resources in PJM markets and in some cases the existence of these resources and thus the market prices and the mix of clearing resources.

PJM State of the Market Report at 301; *see also* Brief of PJM Interconnection LLC in Opp. to Mot. to Dismiss, Appellants’ Joint Appx. 92, 101.

Unable to distinguish the effect of ZECs from the effect of RECs and other policies, Plaintiffs make much of the Price Adjustment – the program feature that phases out the ZEC’s value when composite prices reach a certain level. It is clear, however, that the Price Adjustment does not “distort” wholesale markets. As compared to a hypothetical version of the ZEC program without it, the Price

Adjustment would tend to *reduce* the impact of the ZEC program on wholesale markets because it would lower the ZEC price and, under some circumstances, eliminate it entirely.

Plaintiffs also mischaracterize the Price Adjustment when they assert that it would “guarantee” a particular level of revenue to ZEC recipients. EPSA Brief at 8. As the District Court correctly observed, the adjustment to the ZEC value based on the market price index does not reflect the market prices that any individual ZEC recipient would see. *See Village of Old Mill Creek v. Star*, No. 17CV1163, 2017 WL 3008289 at 31 (N.D. Ill. July 14, 2017). Half of the market price index is calculated based on the PJM Northern Illinois Hub, 20 ILCS 3855/1-75(d-5)(1)(B)(iii), a reference price for which data is easily obtained, but that does not determine the price paid to any nuclear plants eligible for ZECs, which would be based on the pricing node closest to each plant. Twenty-five percent is calculated based on the average capacity price for Comed zone in PJM. The final 25% is the average capacity price in MISO Zone 4 (southern Illinois). To illustrate how the market price index may not correspond to prices received by an individual facility, consider the broad range of prices in the most recent capacity auctions in PJM and MISO. The most recent PJM capacity auction (for 2020/2021) yielded capacity prices of \$188.12 / MW-day for the Comed Zone.<sup>9</sup> The most recent capacity auction in MISO

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<sup>9</sup> <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/2020-2021-base-residual-auction-report.ashx>.

yielded a capacity price of \$1.50 / MW-day for Zone 4.<sup>10</sup> Therefore, if MISO prices stay where they are into 2020, the capacity price component of the market price index would be \$94.81 /MW-day (the average of \$188.12 / MW-day and \$1.50 / MW-day). That is far removed from what, for example, the Quad Cities plant would receive in the Comed Zone (had it cleared) at \$188.12 / MW-day and what the Clinton Power Station would receive in MISO Zone 4 at \$1.50 MW-day.

### **III. Putting a Value on Carbon-Free Electricity Improves Economic Efficiency**

Plaintiffs' assertion that the ZEC program will "distort" market prices ignores the important economic rationale underlying policies that put a monetary value on environmental attributes. In economics lingo, a necessary condition for markets to produce efficient outcomes is that the price of a good equals the marginal cost of producing it. Negative externalities are costs that result from an economic transaction and are borne by third parties. Absent intervention, negative externalities produce inefficient market outcomes because they result in transactions for which the true cost of producing a good (which includes both the producer's cost and the harm to third parties) exceeds the marginal consumer's willingness to pay for it.

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<sup>10</sup> 2017/2018 PLANNING RESOURCE AUCTION RESULTS (APRIL 14, 2017), MISO, <https://www.misoenergy.org/Library/Repository/Report/Resource%20Adequacy/Planning%20Year%2017-18/2017-2018%20Planning%20Resource%20Adequacy%20Results.pdf>.

Pollution is the paradigmatic negative externality. To illustrate, the IWG estimates the social cost of carbon dioxide emissions at \$42 per ton.<sup>11</sup> A typical coal-fired power plant emits roughly one ton of carbon dioxide per MWh. In an efficient market, the coal-fired generator would have to take account of both its private costs and the social cost of the pollution it emits. For instance, if a coal plant's marginal cost of generating is \$30/MWh, it would only be efficient for the coal plant to run when the price of electricity exceeds \$72/MWh – the sum of its private costs and the social costs.<sup>12</sup> But, absent intervention requiring the coal plant to “internalize” the cost of its pollution, the coal plant would be willing to run at prices between \$30/MWh and \$72/MWh. Running in that price range would reduce economic efficiency because the cost to society would be greater than the benefit to the marginal consumer.

Economists generally agree that the best way to address this negative externality would be to impose an economy-wide price on carbon dioxide emissions through a carbon tax or cap and trade program. In the absence of such a policy, the ZEC program begins to address the problem by ensuring that qualifying nuclear generators are compensated for the value of their carbon-free electricity, perhaps approximating the competitive benefit these resources would enjoy from a sector-wide price on carbon. Far from “distorting” the wholesale market, the ZEC program

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<sup>11</sup> This figure assumes a 3% discount rate, as did the Illinois Legislature in FEJA. 20 ILCS 3855/1-75(d-5)(1)(B)(i). The IWG produced figures for every five years; this is the figure for 2020.

<sup>12</sup> Note, this figure would be higher if it included the social cost of other pollutants – SO<sub>2</sub>, NO<sub>x</sub>, particulates, and mercury, which have been left out for simplicity.

is better thought of as a small step toward correcting the larger distortion that comes from the absence of a carbon price.

*Amici* energy economists attempt to raise doubt as to whether the ZEC program will improve efficiency and even whether the program is likely to reduce carbon emissions. They invoke the “theory of the second best,” which holds that, in the absence of an ideal solution to a problem, it is impossible to determine *a priori* whether second-best or partial solutions improve social welfare. Say, for example, that you are a legislator deciding whether the drinking age should be 18 or 21. Evidence demonstrating that alcohol harms the brain at that stage of development might immediately convince you that 21 is the better drinking age. But, the theory of the second best would prompt you first to look carefully at other imperfections in the policy arena in which you are legislating. For example, if drugs are available, might an older drinking age cause some young people to experiment with them? Or, recognizing that enforcement of the drinking age is imperfect, might the older drinking age cause more dangerous patterns of drinking outside adult supervision? In the end, the prudent legislator might nonetheless conclude that 21 is the better drinking age. But she could not make this decision *a priori*. She could do so only after reviewing the balance of the evidence and making real-world judgments about the likelihood of unintended consequences materializing.

*Amici* energy economists raise the theory of the second best to argue that the ZEC program *might* not improve social welfare and *might* not reduce carbon emissions, which is to say that the effects of the policy cannot be determined *a*

*priori*. Notably, they invoke the theory of the second best without saying what they believe the “first-best” policy to be. We presume they share the consensus view among economists that an economy-wide price on carbon is the first-best policy. They have not said so, however, because acknowledging that wholesale markets in PJM and MISO are skewed by the lack of a carbon price would undermine, fatally, their claim that the ZEC program “distorts” otherwise efficient market prices and patterns of investment.

*Amici* energy economists are not wrong to raise the theory of the second best. But they are wrong to suggest that it counsels for inaction here. Policymakers often must choose among second best options and make judgments about what outcomes are most likely. What is required is consideration of the broader context in which the policy is applied and whether there could be unintended consequences that would frustrate its objectives.

In this case, there were strong reasons for the Illinois legislature to conclude that awarding ZECs to nuclear generators would improve efficiency and lower emissions. PJM and MISO are currently dominated by fossil-fuel fired generators that are not required to pay the costs of their carbon emissions. Seventy-four percent of the installed generating capacity in PJM and 76% in MISO burns fossil fuels.<sup>13</sup> It is overwhelmingly likely that these units would see increased utilization

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<sup>13</sup> See PJM, <http://www.pjm.com/-/media/markets-ops/ops-analysis/capacity-by-fuel-type-2017.ashx?la=en>; MISO, <https://www.misoenergy.org/Library/Repository/Communication%20Material/Corporate/Corporate%20Fact%20Sheet.pdf>.



should any nuclear generators retire.<sup>14</sup> Illustrating the point, PJM publishes the emission rates of “marginal units.” These units set the real-time price and, therefore, are most sensitive to changes in price that might come from a nuclear plant retiring. PJM’s data stated that, for 2016, the marginal units (averaged across different regions and times of the day and year) were 44.9% coal-fired, 43.86% natural gas-fired, and 7.08% oil-fired. *See* PJM, 2012-2016 CO<sub>2</sub>, SO<sub>2</sub> and NO<sub>x</sub> Emissions Rates, at 4.<sup>15</sup> Not coincidentally, the average rate of carbon emissions per MWh for marginal units was 63% higher than the system average during on-peak times and 48% higher during off-peak times. *Id.* at 4. These facts demonstrate the likelihood that retiring nuclear generators would be immediately replaced by fossil-fuel fired generation, increasing emissions and lowering efficiency.

*Amici* energy economists raise the possibility that nuclear generators receiving ZECs might, over the long run, crowd out other sources of carbon-free energy that could more cost-effectively reduce emissions. We might share that concern if other sources of carbon-free energy received no support and nuclear generators were given a demonstrable advantage. But that is not the case. In a

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<sup>14</sup> Recent market developments provide further evidence. The price of capacity in PJM has dropped rapidly in each of the past two years. Likewise, the reserve margin – the percentage of cleared capacity that stands in reserve, i.e. excess to meet consumption – is the highest in recent memory and substantially greater than PJM’s target. *See* PJM 2020/2021 RPM Base Residual Auction Results at 6, at <http://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2020-2021-base-residual-auction-report.ashx?la=en>. These facts show that there is substantial overhang of existing capacity from natural gas and coal-fired generators.

<sup>15</sup> Available at <https://www.pjm.com/~media/library/reports-notice/special-reports/20170317-2016-emissions-report.ashx>.

complimentary fashion, the same legislation that created the ZEC program also expanded Illinois' RPS from 13 percent in 2017 to 25 percent in 2025 with incremental targets along the way. These provisions of the Future Energy Jobs Act direct the Illinois Power Agency to procure substantial quantities of RECs through 2030, split between wind and solar with additional carve outs for solar at the distributed scale. The Act also substantially expands energy efficiency programs within the state. 220 ILCS 5/8-103B.

### CONCLUSION

The ZEC program does not intrude into or distort wholesale energy and capacity markets. These markets already bear a deep influence of state (and federal) environmental policies. Moreover, state programs that value carbon-free electricity, such as the ZEC program, do not distort wholesale markets. Rather, they seek to address a market failure that inevitably arises when the producers of pollution are not required to take account of its cost to society.

The district court's decision granting defendants' motion to dismiss should be affirmed.

Dated: November 3, 2017

Respectfully submitted,

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**CERTIFICATE OF COMPLIANCE WITH FED. R. APP. P. 32(A)(7)**

1. This brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B) because this brief contains 5,775 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(f).

2. This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and Circuit Rule 32 and the type style requirements of Fed. R. App. P. 32(a)(6) because this brief has been prepared in a proportionally spaced typeface using Microsoft Office Word 2016 in 12 point Century Schoolbook font for the main text and 11 point Century Schoolbook font for footnotes.

Dated: November 3, 2017

/s/ Samuel T. Walsh  
Samuel T. Walsh

**APPENDIX**

List of *Amici Curiae*\*

**Dallas Burtraw** is the Darius Gaskins Senior Fellow at Resources for the Future. Mr. Burtraw previously served on the National Academy of Sciences Board on Environmental Studies and Toxicology and on the U.S. Environmental Protection Agency's Advisory Council on Clean Air Compliance Analysis. Mr. Burtraw received a Ph.D. in economics from the University of Michigan, an M.P.P. in public policy from the University of Michigan, and a B.S. from the University of California at Davis.

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**Susan Tierney** is a Senior Advisor at Analysis Group. She previously served as the Assistant Secretary for Policy at the U.S. Department of Energy, as Secretary of Environmental Affairs in Massachusetts, and as a commissioner of the Massachusetts Department of Public Utilities. Ms. Tierney received a Ph.D. and Masters degree in regional planning from Cornell University, and a B.A. from Scripps College.

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**CERTIFICATE OF SERVICE**

I, Samuel T. Walsh, an attorney, hereby certify that on November 3, 2017, I caused the foregoing Brief to be electronically filed with the Clerk of the Court for the United States Court of Appeals for the Seventh Circuit by using the CM/ECF system. I certify that all participants in this case are registered CM/ECF users and that service will be accomplished by the CM/ECF system.

/s/ Samuel T. Walsh  
**Samuel T. Walsh**