17-2654-cv

IN THE UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

COALITION FOR COMPETITIVE ELECTRICITY, DYNEGY INC., EASTERN GENERATION, LLC, ELECTRIC POWER SUPPLY ASSOCIATION, NRG ENERGY, INC., ROSETON GENERATING LLC, SELKIRK COGEN PARTNERS, L.P.,
Plaintiffs-Appellants,

v.

AUDREY ZIBELMAN, in her official capacity as Chair of the New York Public Service Commission, PATRICIA L. ACAMPORA, in her official capacity as Commissioner of the New York Public Service Commission, GREG C. SAYRE, in his official capacity as Commissioner of the New York Public Service Commission, DIANE X. BURMAN, in her official capacity as Commissioner of the New York Public Service Commission,
Defendants-Appellees,

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On Appeal from a Final Judgment of the United States District Court for the Southern District of New York, No. 16-cv-8164 (VEC)

BRIEF OF ENERGY ECONOMISTS AS *AMICI CURIAE*
IN SUPPORT OF PLAINTIFFS-APPELLANTS AND REVERSAL

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October 20, 2017

(caption continued from front cover)

and

EXELON CORP., R.E. GINNA NUCLEAR POWER PLANT LLC,
CONSTELLATION ENERGY NUCLEAR GROUP, LLC,
NINE MILE POINT NUCLEAR STATION LLC,
Intervenor-Defendants-Appellees.

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STATEMENT OF *AMICI CURIAE*

Amici curiae are leading economists and experts in the field of the markets for electric power. *Amici* also serve as professors and teachers of economics; write on economic issues; advise clients on the economic impact of legislation, regulations, and other policies; or previously were employed by an Independent System Operator ("ISO"). A summary of the qualifications and affiliations of *amici* is provided as an appendix to this brief. *Amici* file this brief as individuals and not on behalf of the institutions with which they are affiliated. None of *amici* are being compensated in connection with this brief.[1] All parties in this appeal have consented to the filing of this brief. *See* Fed. R. App. P. 29(a)(2).

Although *amici* do not always agree on economic issues presented by energy-market regulations, *amici* share the concern that New York's Zero Emissions Credit ("ZEC") program at issue in this case will have a deleterious effect on the federally regulated wholesale energy and capacity markets. *Amici* have dedicated substantial professional effort to helping to promote the efficient operation of wholesale electric markets, sharing a belief that efficient, competitive markets promote the efficient supply of electric power for the benefit of the public.

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[1] Counsel for *amici* drafted this brief in its entirety, and none of the parties or their counsel contributed money to fund the preparation or submission of this brief. Cogentrix Energy Power Management, LLC and Tenaska, Inc. contributed money to fund the brief.

This brief is intended to explain a number of relevant issues in this case: (1) how the district court misunderstood the functioning of ISO markets by finding that the ZEC program is tied to energy production and not energy sales; (2) how this particular subsidy will distort the Federal Energy Regulatory Commission ("FERC")-approved capacity and energy auctions and influence entry and exit decisions of other generators; and (3) why this subsidy may not fulfill the stated purpose of reducing greenhouse gas emissions.

BACKGROUND

1. In a series of orders, FERC restructured wholesale delivery of electric power throughout the nation to promote competition. *See*, *e.g.*, *Regional Transmission Organizations*, 89 FERC ¶ 61,285, 1999 WL 33505505, at *2 (1999) ("Competition in wholesale electricity markets is the best way to protect the public interest and ensure that electricity consumers pay the lowest price possible for reliable service."). As part of that move to competitive markets, FERC authorized ISOs and Regional Transmission Organizations ("RTOs") to manage the wholesale transmission of power from generators to buyers, generally referred to as "load-serving entities" ("LSEs"). In New York, wholesale electric energy is bought and sold through auctions administered by the New York Independent System Operator ("NYISO"), which operates pursuant to FERC-approved tariffs.

Under the NYISO tariff, rates paid by LSEs for capacity – their share of the costs of resources reserved or dedicated to the market necessary to meet anticipated maximum demand inclusive of reserve margins – and energy – the electric energy itself – are determined through auction-based markets. *See Hughes v. Talen Energy Mktg., LLC*, 136 S. Ct. 1288, 1291-92 (2016) ("FERC's regulatory scheme includes an auction-based market mechanism to ensure wholesale rates that are just and reasonable."). Energy auctions, for example, occur both the day before the operating day, to establish a preliminary schedule for power plant dispatch and operation to meet anticipated demand, and during the operating day, to match generation to actual demand. Suppliers are compensated for their sales in the day-ahead market, and receive additional compensation (or pay some of it back) based on deviations in real time from such obligations.

In general, all generators are obligated to submit offers to supply – the prices at which they are willing to offer capacity or to produce power – and all load-serving entities to submit bids to consume – price-based or non-price-based bids for the amount of power they require – for each auction interval, typically hourly. NYISO then runs central auctions that "stack" the generators' bids in order from lowest to highest price; select the amount of energy, in order of increasing bid prices, required to meet demand in each market interval; and set a price at each point of injection (supply) or withdrawal (demand) based on the highest price

needed to just meet demand – that is, to "clear the market." These results also reflect transmission limitations within the NYISO. This "market-clearing" price – the highest accepted bid – is "the price an efficient market would produce" and is paid to all generators. *FERC v. Electric Power Supply Ass'n*, 136 S. Ct. 760, 769 (2016). The auctions also allow for locational price deviations reflecting transmission limits.

Generators can bid $0 per megawatt-hour ("MWh") or even make negative offers (expressing a willingness to pay to have their power accepted), reflecting a desire to take whatever price the auction sets or to be assured of being among the last generators asked to reduce power production – to be "backed down." Generators may also "self-schedule" their power – that is, inject power into the grid and agree to accept whatever price (positive or negative) the market "clears" through the auction. (A generator may effectively self-schedule by making itself a price-taker in the relevant auction.) Such bidding behavior is typical of generators that are highly inflexible in terms of output, such as legacy nuclear plants, or that have high opportunity costs for rapidly changing output; and also of other units that receive a production-tied subsidy to offset any market price risk that would be forgone if they did not produce energy. In addition to prices, the auction mechanism establishes schedules that indicate the amount of production expected

from each generator and the amount of consumption expected by each load-serving entity.

2. In 2016, the New York State Public Service Commission ("PSC") adopted an "Order Adopting a Clean Energy Standard" (the "CES Order") which created the ZEC program. *See Coalition for Competitive Elec. v. Zibelman*, No. 16-CV-8164, slip op. at 4-5 (S.D.N.Y. July 25, 2017) ("Op.") (SPA1-47). The stated goal of the ZEC program is "to preserve existing zero-emissions nuclear generation resources as a bridge to the clean energy future." CES Order at 1 (A85). In particular, the ZEC program is targeted to address financial problems at three nuclear generation facilities in western New York State, which to date are the only nuclear facilities that have been found eligible to receive ZECs. *See* Op. 7 n.5. Other nuclear generators (with the same environmental properties) have either been excluded from the program or have accepted litigated settlements that require retirement of their units.

These nuclear generators receive ZECs for each MWh they generate. *See id.* at 7. LSEs such as local electric utilities must pay for all of the ZECs those nuclear generators receive, regardless of existing power purchase contracts or other supply preferences. *See id.* at 7 n.6. (This is typically referred to as a "non-bypassable surcharge.") These costs are passed on to electricity consumers, who of course

must pay them. ZEC prices are calculated using the federal estimate of the "social cost of carbon" and a forecast of wholesale electricity prices. *See id.* at 7.

For the first six years of the program, wholesale electricity prices are calculated based on a recent period average forecast of energy prices plus a forecast of capacity prices – $39 MWh. For the first two-year subsidy period, the ZEC program ensures that the nuclear generators receive an additional payment of $17.48 per MWh of actual production on top of what they earn in capacity and energy market revenues. *See* CES Order App. E, at 13 (A266). That base subsidy amount increases to $19.59/MWh for the following two-year "tranche," and $21.38 for the two-year period ending in March 2023. *See id.* The base subsidy amount is subject to downward adjustment (dollar-for-dollar) if the price forecasts for the subsequent two-year tranche exceed $39 per MWh. The $39-per-MWh amount is subject to adjustment just once, before the beginning of the fourth two-year tranche in 2023. The revenue for the units' output is thereby insulated on the "low" side from market results.

SUMMARY OF THE ARGUMENT

Economic analysis can help to explain the effects of the ZEC program on FERC-regulated capacity and energy auctions in NYISO, as well as the broader impacts of the ZEC program on existing and potential new generators and on the stated goals of advancing public health and protecting the environment.

First, the ZEC program has impacts on the FERC-regulated NYISO auction-based markets that the district court failed to consider based on the incorrect assumption that receipt of ZEC program credits does not require participation in the wholesale energy market. *See*, *e.g.*, Op. 20. That assumption fails to take into consideration that, in the real world – as a matter of both physics and tariff requirements – nuclear generators such as the ZEC recipients *must* inject the power they generate into the electric grid. This injection constitutes a sale into the relevant ISO's or RTO's energy market. In this context, there is no difference between the production and injection of energy by a generator interconnected with an ISO or RTO grid and the sale of that energy into that ISO's or RTO's FERC-regulated market.

Second, the ZEC program will distort prices in the NYISO energy and capacity auctions in two ways. Without the ZEC program, according to their owners, the eligible nuclear plants would receive insufficient revenue to cover their operating costs, and thus would choose to retire. The ZEC program's subsidy prevents this retirement. For this reason, the program results in a greater supply of energy in the market and, through the dynamics of supply and demand, reduces market-clearing prices of energy in the wholesale market below the prices that the market would otherwise produce had these units retired. Moreover, the ZEC program similarly results in a greater supply of capacity eligible to bid into the

capacity market, again shifting the supply curve outward from where it would have been absent the subsidy. This shift produces lower prices in the capacity market than it would produce were these units retired. These effects are unambiguous and directly impact market prices (in a downward direction) for both energy and capacity.

Third, the lower prices in the energy and capacity markets will dampen or prevent the entry of new resources directly, and the potential for continued subsidies for additional favored existing resources may further undermine developers' and investors' trust in competitive wholesale markets' ability to reward efficient new investment. Current and expected market prices serve as the primary signal to potential entrants and affect their willingness to enter the market. Government action that artificially suppresses market prices will discourage entry of new generation into the market, including the new renewable and flexible resources best suited to achieving the goals of timely decarbonization. In this regard, the ZEC program may not be a "bridge to the future," but instead a roadblock, deterring investment in new electricity resources that will not emit carbon.

Fourth, the ZEC program is sharply at odds with one of the fundamental premises behind competitive wholesale electricity markets – nondiscrimination among generating resources. The ZEC program designates a "winner" with

respect to generating capacity by propping up facilities that would otherwise close; it does not reflect any across-the-board pricing mechanism reflecting (for example) the social costs associated with carbon emissions, open to all market participants. FERC has repeatedly recognized that such discrimination seriously undermines competitive markets. The potential for adverse consequences from such discriminatory subsidies is underscored by the well-accepted "theory of the second best," which in layman's terms means that a partial solution to a complex problem, rather than solving the problem, may actually make it worse. Without careful study, there can be no assurance that the ZEC program will promote reduction in carbon emissions, particularly where the incentives so far have been approved only for three generators out of the entirety of generators selling into the NYISO. For example, the ZEC program could force the retirement of more efficient low-emissions generators, block the entry of more efficient zero-emissions generators, or displace other, lower-cost zero-emission resources.

Furthermore, the least-cost path to a low-carbon future is virtually certain to include increased variable wind and solar power generation, which require an increasing amount of highly flexible generation and load management resources; regulators and economists have recognized that markets as currently structured undervalue such flexibility. Nuclear generation is extremely *in*flexible. By artificially prolonging the life of these three nuclear facilities, the ZEC program

creates a barrier to entry for the very flexible resources likely to be essential to the overall grid structure needed to achieve significant reductions in greenhouse gas emissions. Thus, the economic reality is that the ZEC program may create very real barriers to the rapid, efficient, market-driven deployment of lower cost, clean energy systems. The process of picking winners outside of market mechanisms is inevitably coupled with the creation of losers. In this case, the losers are likely to be the types of units that are needed to meet the very goal that the subsidy is intended to achieve.

ARGUMENT

I. For Nuclear Power Plants Operating in NYISO, the Production of Energy Is the Same as the Sale of Energy

The district court believed that the ZEC program was "critically different" from the subsidy program challenged in *Hughes v. Talen Energy Marketing, LLC*, 136 S. Ct. 1288 (2016), because, according to the district court, "the nuclear generators receive ZECs for their zero-emissions *production* of energy, and not for the sale of that energy into the wholesale market." Op. 20 ("[T]he challenged program in *Hughes* . . . specifically *conditioned* subsidy payments on the generator's sale of capacity into the auction."). The court stated that, even if generators "do, as a matter of fact, sell their entire output into the auction, that is a business decision; it is not a requirement imposed by New York." *Id.* (citation omitted).

The district court's understanding that there is a distinction between the plants' production of electricity and their sale of their electricity into the wholesale market is incorrect. The nuclear power plants that are eligible for the ZEC subsidy cannot produce power if they do not inject and, thereby, sell it into an ISO- or RTO-administered power system. In order to inject electricity into that system, any generator that is a market participant in the ISO and RTO markets must offer the unit into the day-ahead or real-time market, and all such injections constitute a sale and are compensated through the ISO's or RTO's settlement process at the relevant market's clearing price. This means that a subsidy on the generation of power by these facilities is necessarily also a subsidy on the sale of power in a FERC-regulated wholesale market. There are no two ways about it. The power these plants inject into NYISO is sold, like all power injected into NYISO's bulk power transmission grids, and, consequently, paid for by load interests through the market settlement processes.

Because of this, any subsidy tied to production of energy is necessarily linked to the resource clearing in the energy market and, equivalently, to the resource selling into that market.

II. The ZEC Program Will Distort Prices in the Wholesale Energy and Capacity Markets

By paying a subsidy for each MWh generated and sold by the ZEC-eligible nuclear generators, the ZEC program influences pricing in the energy and capacity markets operated by NYISO in two ways.[2]

First, the three ZEC-eligible nuclear plants have been represented as planning on shutting down and exiting the NYISO capacity and energy markets. (Indeed, if the nuclear plants were *not* otherwise intending to shut down, the ZEC program would be a pure windfall.) The existence of the ZEC program will now keep these ZEC-eligible nuclear plants in the energy market, even though they would shut down if they were subject to market forces without the subsidy. *See* Compl. ¶¶ 55-57 (A61-62). This artificially increases supply in the energy market, relative to the level that would result in the absence of the subsidy. Through this greater supply and the dynamics of supply and demand, the ZEC program therefore suppresses the market-clearing price for energy in the wholesale market. The

[2] As the U.S. District Court for the Northern District of Illinois acknowledged in evaluating a challenge to an analogous program in Illinois, the ZEC program "will affect the FERC-approved energy market auction structure not only because the nuclear plants will not retire as scheduled, but also because they will continue to bid into the wholesale market auctions at artificially lower prices." *Village of Old Mill Creek v. Star*, No. 17-CV-1163, 2017 WL 3008289, at *4 (N.D. Ill. July 14, 2017); *see also id.* at *14 n.32 ("There is no dispute that ZECs will affect the market and that Illinois has created a subsidy that favors certain participants in the wholesale auctions.").

FERC-sanctioned auction-based markets are designed to produce just and reasonable rates. *See Hughes*, 136 S. Ct. at 1291-92. This just-and-reasonable result, however, can only happen if price signals provide accurate information leading excess or uneconomic generation to exit the market in response to prices that are too low to justify their continued operation.

Second, the continued operation of these ZEC-eligible nuclear generators also results in an excess supply of capacity eligible to bid into the NYISO capacity markets. The greater supply relative to demand for capacity has the potential to artificially depress prices in the capacity market relative to the operation of the market in the absence of the ZEC program. *See NRG Power Mktg., LLC v. FERC*, 862 F.3d 108, 111 (D.C. Cir. 2017) (explaining that "below-cost bidding in capacity auctions" – which "state subsidies" make possible – "may reduce the supply of electricity in the long run").

III. The Price Distortions Will Influence Decisions To Exit and Enter the Market for Wholesale Power Generation

Distorting equilibrium pricing has consequences: the ZEC program will interfere with efficient market entry and exit decisions. The clearing price has functions outside of simply setting the amount paid and received by buyers and sellers. The auction system "identif[ies] need for new generation." *Hughes*, 136 S. Ct. at 1293. "A high clearing price in the capacity auction encourages new generators to enter the market, increasing supply and thereby lowering the clearing

price in same-day and next-day auctions . . . ; a low clearing price discourages new entry and encourages retirement of existing high-cost generators." *Id.* If a generator's marginal cost is above the expected market-clearing price, the owner should take that as a signal to exit the market; if a prospective generator believes its marginal cost will be below the expected market-clearing price, the investor-developer should take that as a signal to enter the market.

Prior to the creation of the ZEC program (according to the complaint, which the district court accepted as true), market signals in NYISO indicated that the ZEC-eligible nuclear power plants were not economical and should retire. *See* Op. 7 n.5 ("Plaintiffs allege that without financial support from the State, the Ginna, FitzPatrick, and Nine Mile Point nuclear generators would have gone out of business."). The plan to close those plants was not the result of a market failure. On the contrary, it reflected the reality of competition among generators to meet energy demand and reliability needs in the wholesale power market. In particular, lower gas prices have reduced costs broadly in electricity markets – which pressures *all* sellers (and benefits consumers).[3] The reduction in supply that would have resulted from plant retirement would have tended to raise near-term energy

[3] *See* U.S. Department of Energy, *Staff Report to the Secretary on Electricity Markets and Reliability* 35-39 (Aug. 2017) ("DOE Staff Report").

prices, encouraging new generators to enter the generation market if they could be profitable at the new energy prices.

Instead, the ZEC program is keeping the nuclear plants in the generation market, maintaining excess capacity and insulating these noncompetitive resources from the market pressures faced by other participants. The lower market equilibrium price created by the ZEC subsidy acts as a barrier to entry for new resources, including (perversely) more efficient, renewable resources and the flexible generation needed to support them. The artificially lower market-clearing price discourages investment in new generators that would be more efficient than the nuclear plants at the competitive market price. With the ZEC program, more efficient new generators are instead signaled to stay out of the market because they cannot recoup their operating costs. Similarly, existing, more efficient generators that would be profitable at the competitive market price, may not be profitable at the artificially lower market price created by the ZEC program and be forced from the market. The power of market incentives to drive innovation is muted.

IV. The ZEC Program Is at Odds with Fundamental Market Principles and May Undermine Efforts To Transition to Cleaner Energy

The ZEC program raises special concerns because by picking winners – propping up the operation of three politically favored generators – and inevitably creating losers, the subsidy is sharply at odds with the fundamental nondiscrimination principle animating competitive wholesale markets.

Furthermore, economic analysis indicates that, to the extent the ZEC program is justified by the policy goal of promoting transition to lower-carbon generation, there is no assurance that the program will actually promote that goal.

A. For many years, Congress and FERC have sought to foster competition in wholesale electricity markets; the cornerstone of that policy has been to open up access to the market to all generators on nondiscriminatory terms. As FERC has explained, nondiscriminatory auction pricing "has the benefit of encouraging all sellers to place bids that reflect their actual marginal opportunity costs." *Commonwealth Edison Co.*, 113 FERC ¶ 61,278, at 62,121 (2005). By contrast, paying "different amounts to different generators based on the level of compensation needed to keep the generator in operation would create a unit-specific cost-based system and undermine the advantages of a market for capacity." *Devon Power LLC*, 110 FERC ¶ 61,315, at 62,227 (2005).

In the view of *amici*, a state's selection of specific winners and the inevitable creation of losers from among those that would otherwise have remained in wholesale electricity markets – what New York has done in its ZEC program – constitutes discrimination that is fundamentally incompatible with any efficient wholesale market design. In a recent FERC technical conference, a number of economists expressed concern that state government intervention in wholesale markets – including, in particular, the creation of ZEC programs to keep nuclear

plants in operation – is putting the operation of competitive wholesale markets at risk.[4] Indeed, such discrimination damages wholesale markets where they are perhaps most vulnerable – that is, in undermining the ability of wholesale markets to send accurate signals regarding investment and retirement decisions. Day-ahead and same-day energy markets do an effective job, at least at times of high demand, of matching wholesale prices to the marginal cost of generation. But it has become apparent – in part because of well-intended regulatory interventions – that short-term market prices do not allow generators to recover their fixed costs; capacity markets are intended to help to address that problem and provide appropriate incentives for needed resources to remain in or to enter the market.[5] By keeping uneconomic capacity in the market, ZEC programs undermine capacity markets and severely distort investment decision by competitors.

B. As a result of these serious distortions, there can be no assurance that ZEC programs will do what they are purportedly intended to do – that is, provide a path to lower-emissions power generation.

Economic analysis helps to explain why subsidies like the ZEC program at issue here may delay, rather than promote, achievable, beneficial, and cost-effective carbon emission reductions. A stated goal of the ZEC program is to

[4] *See* DOE Staff Report 116-17.

[5] *See id.* at 108-11.

create a "bridge to the clean energy future." CES Order at 1 (A85); *see also id.* App. E, at 1 (A254) ("to encourage the preservation of the environmental values or attributes of zero-emissions nuclear-powered electric generating facilities for the benefit of the electric system, its customers and the environment"). The ZEC program – unlike the accompanying Renewable Energy Credits ("REC") program – is not, however, a broad effort to promote zero-emissions generation resources or reflect carbon costs in the market as a whole; it favors only the three ZEC-eligible nuclear generators and only operates when prices are below a benchmark.

The "theory of the second best" states that achieving an efficient price (such as by fully internalizing an externality) for one good or service in a market with multiple inefficient prices for goods and services without also setting efficient prices for those other goods and services cannot be relied on to improve the overall efficiency of the market. *See generally* R.G. Lipsey & Kelvin Lancaster, *The General Theory of Second Best*, 24 Rev. Econ. Stud. 11, 11-31 (1956). Correcting one inefficient pricing problem may make the overall market less efficient rather than more efficient. Further, if one necessary condition to produce an optimal or first-best allocation of resources is absent, it is not necessarily true that the rest of the necessary conditions, if they exist, will lead to a beneficial "second-best" allocation. Rather, the resulting allocation may involve multiple distortions from

optimal conditions, and the true "second-best" allocation might look very different from the first-best allocation.

In layman's terms, if one is baking cookies, and the best possible cookie contains both chocolate chips *and* coconut, it is not necessarily true that the second-best cookie contains either chocolate chips *or* coconut. The second-best cookie might be a gingersnap, something completely different from the first-best cookie.[6]

The theory of the second best is not a reason not to aspire to incremental progress, but it does counsel careful consideration of the collateral impact of such partial achievements. The theory is at play here. Rather than the first-best solution, such as a price on all carbon-emitting resources or even a reasonably broad approximation – such as New York's REC program – New York is providing a selective subsidy to three low-carbon resources out of all the suppliers of energy and capacity in NYISO with a broad mix of operating technologies and carbon intensity. This cannot be counted on to improve the economic efficiency of the New York power sector, to result in lower costs over time for safe and reliable power, to result in the least-cost "bridge" to carbon emissions reductions, or even to lead to a net reduction in carbon emissions at all.

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[6] *See* Free Exchange, *Making the second best of it – What it means to do our second best*, Economist (Aug. 21, 2007), https://www.economist.com/blogs/freeexchange/2007/08/making_the_second_best_of_it.

For example, the ZEC program could force the retirement of low-emissions generators that are more flexible in operation than the ZEC-eligible nuclear plants and that would have survived had the ZEC-eligible plants retired. Similarly, beyond removing the necessary flexible units, the artificially suppressed price of power may also simply prevent the entrance of new zero-emissions generators that the ZEC program nominally supports. Other unforeseen consequences might be to discourage new transmission that would bring clean hydroelectric power from the north. If markets are allowed to operate, market participants can use their own initiative (and investments) to figure out the best response to the changes in market prices that have rendered the nuclear units noncompetitive. Thus, the ZEC program may result in *less* overall low-emissions generation supplying New York consumers than if it were never created. Additionally, the fact that rising energy prices can reduce or even eliminate any ZEC program credit payments linked to the social cost of carbon undermines any potential claim that the subsidy reflects some internalization of an externality and an improvement in overall social welfare, as opposed to a protectionist subsidy.

C. The ZEC program may be particularly pernicious because of its impact on flexible generation resources. By far the lowest cost, new, zero-carbon resources are variable wind and solar power generators. The least-cost path to a low-carbon future is virtually certain to include significant increases in their

deployment. These renewable resources, however, are variable; they cannot guarantee to match their power injections with consumption, which system operators require for reliability. "Suppliers must generate – every day, hour, and minute – the exact amount of power necessary to meet demand from the utilities and other [LSEs] that buy power at wholesale for resale to users." *Electric Power Supply Ass'n*, 136 S. Ct. at 768. Otherwise, massive outages could occur.

To integrate these variable renewable resources into the power grids effectively, what is needed are flexible generation resources (in addition to flexible loads) – that is, generators that can come online quickly, ramp up to meet demand that the wind and solar cannot meet, and go offline quickly when supply rises or demand falls. But because current markets do not do a good job of assigning value to such flexibility – even absent state intervention – current energy markets may provide inadequate incentives to invest in flexible generation.

In this context of integrating new intermittent clean energy supplies, the ZEC program makes things worse, acting as a barrier to entry and (what amounts to the same thing) an inducement to exit to these flexible generators. Instead, the ZEC program preserves expensive, inefficient, and inflexible generation that must

operate even when there is ample wind and solar energy to meet demand – even causing prices to fall into negative territory.[7]

For these reasons, the ZEC program would distort the efficient market dynamics that FERC relies on to produce wholesale market prices that are just and reasonable; would act as a barrier to the entry of new, less costly and more efficient generation, including the efficient zero-carbon resources and complementary flexible resources needed to achieve reasonable carbon reduction goals; and, in doing so, may impair progress toward a zero-carbon electric grid.

CONCLUSION

The Court should reverse the district court's order dismissing the complaint.

Dated: October 20, 2017

Respectfully submitted,

/s/ *Aaron M. Panner*

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[7] DOE Staff Report 114-16.

CERTIFICATE OF COMPLIANCE

I certify that this brief complies with the type-volume limitation of Local Rule 29.1(c), the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5)(A), and the type-style requirements of Federal Rule of Appellate Procedure 32(a)(6). This brief was prepared using a proportionally spaced typeface (Times New Roman, 14 point). Exclusive of the portions exempted by Federal Rule of Appellate Procedure 32(f), this brief contains 4,945 words. This certificate was prepared in reliance on the word-count function of the word-processing system (Microsoft Word 2013) used to prepare this brief.

/s/ *Aaron M. Panner*
Aaron M. Panner

October 20, 2017

APPENDIX

List of *Amici Curiae*[*]

Mark Cooper holds a doctorate from Yale University. He is a former Yale University and Fulbright Fellow, a recipient of the Esther Peterson Award for Consumer Service, and a fellow at the Institute for Energy and the Environment at Vermont Law School and Silicon Flatirons at the University of Colorado School of Law. He has published six books and hundreds of articles and papers on energy, media, telecommunications, and high-technology industries. Most recently, he is the author of *The Political Economy of Electricity: Progressive Capitalism and the Struggle to Build a Sustainable Power Sector* (Praeger, 2017). He has provided expert testimony more than 400 times for public interest clients including attorneys general, people's counsels, and citizen interveners before state and federal agencies, courts, and legislators in dozens of jurisdictions in the United States and Canada.

Andrew N. Kleit, Ph.D., is a Professor of Energy and Environmental Economics and MICASU Faculty Fellow in the Department of Energy and Mineral Engineering at the Pennsylvania State University.

Robert J. Michaels, Ph.D., is Professor of Economics at California State University, Fullerton, and Adjunct Scholar at the Cato Institute and the Institute for Energy Research. He has published extensively in these topic areas and testified before FERC, state utility commissions, and congressional committees.

Byron Schlomach is Director of the 1889 Institute in Oklahoma and has served as chief economist at the Texas Public Policy Foundation and Director of the Center for Economic Prosperity at the Goldwater Institute. He has coauthored and supervised research on electric competition in Arizona and Oklahoma.

Roy J. Shanker, Ph.D., has been an independent consultant in energy markets since 1980 and consultant on electric industry matters since 1973. He has been actively involved in the design, development, and conduct of the PJM and New York Independent System Operator markets since 1995. He has been an invited speaker at the FERC and testified on numerous occasions as an expert witness.

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[*] Affiliations provided for informational purposes only.