

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

OFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the Matter of

Docket No. 52-007-ESP

Exelon Generation Company, LLC

ASLBP No. 04-821-01-ESP

(Early Site Permit for Clinton ESP Site)

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**INTERVENORS' REPLY IN SUPPORT OF  
MOTION TO AMEND CONTENTION 3.1**

Intervenors Environmental Law and Policy Center, Blue Ridge Environmental Defense League, Nuclear Energy Information Service, Nuclear Information and Resource Service, and Public Citizen hereby reply to the Answers of Exelon Generation ("Exelon") and the Nuclear Regulatory Commission Staff ("NRC Staff") to the Intervenor's Motion to Amend Contention 3.1 ("Motion"). As Intervenors explained in their Motion, Exelon and the NRC Staff, in their additional filings since the admission of Contention 3.1, continue to improperly reject better, lower-cost, safer and environmentally preferable clean energy alternatives to new nuclear power. Intervenors seek to amend Contention 3.1 in order to challenge the fundamental flaws in those additional filings and ensure that the "rigorous exploration and objective evaluation of alternatives" required by the National Environmental Policy Act ("NEPA") occurs. 40 C.F.R. 1502.14(a).

The rejection of clean energy alternatives by Exelon and the NRC Staff is based on discussions that are "inadequate, biased, inaccurate, and based upon out-of-date information." (Biewald Affidavit, § IV). First, Exelon and the NRC Staff have overstated the impacts of clean energy alternatives and understated the impacts of nuclear power. Second, Exelon's cost estimates for nuclear power are inconsistent with strong evidence that nuclear power is not

economical and is more costly than clean energy alternatives. Third, Exelon's and the NRC Staff's purported consideration of a combination of alternatives is wholly insufficient as it fails to recognize the real and beneficial role for wind power.

The Answers filed by Exelon and the NRC Staff ignore the evidence in the record and Intervenor's expert testimony, and fail to overcome the genuine disputes of material fact regarding the rejection of clean energy alternatives. Exelon asserts that the Intervenor's have failed to contradict the specifics of its discussion of the comparative impacts of nuclear power and clean energy alternatives. The Intervenor's fundamental point, however, is that Exelon's and the NRC Staff's own discussions show that clean energy alternatives would have fewer impacts than nuclear power. In addition, Intervenor's plainly did challenge Exelon's portrayal of the impacts of wind, natural gas, and nuclear, especially with regards to land use and other issues.

As for costs, Exelon claims primarily that one of the studies relied on by Intervenor's sets forth assumptions and a cost estimate for nuclear power that is consistent with Exelon's own estimate. In reality, the studies submitted by Intervenor's demonstrate that nuclear power is not likely to be economical, and include only one "optimistic" scenario involving "significant" and "unproven" cost reductions that is "consistent" with Exelon's maximum cost estimate.

With regards to a combination of alternatives, Exelon now claims that any combination of alternatives involving wind and solar power is "absurd" (Exelon Answer at 33) because those alternatives contribute nothing to the creation of baseload power. This response plainly does not justify Exelon's decision to ignore the beneficial contributions that wind and solar power can make to such a combination. The NRC Staff, meanwhile, asserts that any combination of alternatives would not be environmentally preferable because of the impacts of natural gas generation. Yet, Exelon's and the NRC Staff's own discussions show that natural gas would

have fewer impacts than new nuclear power, especially as part of a combination of alternatives that involves a greater amount of wind power.<sup>1</sup>

**I. THE DRAFT EIS AND EXELON FILINGS IMPROPERLY CONCLUDE THAT CLEAN ENERGY ALTERNATIVES ARE NOT ENVIRONMENTALLY PREFERABLE TO NEW NUCLEAR POWER.**

As Intervenors explained in their Motion (pp. 10-14), Exelon and the NRC Staff have incorrectly concluded that clean energy alternatives are not environmentally preferable to new nuclear power. In fact, the evidence provided in Exelon's own filings and the Draft EIS contradicts Exelon's and the NRC Staff's claim that clean energy alternatives are not environmentally preferable to new nuclear power. (Motion at 11-12). In addition, both Exelon and the NRC Staff overstate the impacts of clean energy alternatives and/or understate the impacts of nuclear power. (Motion at 12-14).

In response, Exelon and the NRC Staff assert that the Intervenors failed to demonstrate any genuine dispute regarding the comparative environmental impacts of clean energy alternatives and nuclear power. The bulk of Exelon's argument focuses on a claim that none of the data that Intervenors presented regarding the environmental impacts of the various alternatives actually contradicts the information presented by Exelon in its filings. (Exelon

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<sup>1</sup> Exelon also contends that the Intervenors' have failed to demonstrate compliance with the standards for late-filed contentions set forth in 10 C.F.R. 2.309(c). The Panel, however, has already concluded that the Intervenors' Motion would not be considered untimely so long as it was filed by April 22, 2005. Panel Memorandum, April 6, 2005, at 3. Therefore, as the NRC Staff acknowledge (Staff Answer at 3, n. 4), while the Panel noted that Intervenors would have to satisfy the general admissibility standards of 10 C.F.R. 2.309(f), any Motion to amend would have to demonstrate compliance with 10 C.F.R. 2.309(c) only if it was filed after the April 22 "safe harbor" expired. In addition, even if Intervenors' Motion were considered untimely, the late-filed contention standards of 10 C.F.R. 2.309(c) are clearly met here as the amended Contention 3.1 is designed to address the substance of the new data and conclusions presented in the Draft EIS and by Exelon since the admission of Contention 3.1. *In re Sacramento Municipal Utility Dist.*, 37 N.R.C. 355, at \*16-\*17 (1993) ("a showing that the staff's environmental review documents significantly differ from the applicant's environmental report [is] ordinarily sufficient to show good cause for lateness.").

Answer at 21-27). According to Exelon, therefore, its conclusions regarding environmental impacts remain uncontested.

This response fails for two reasons. First, Intervenor's have demonstrated genuine disputes regarding the impacts of clean energy alternatives and nuclear power. (Motion at 10-14; Biewald Affidavit § III). For example, with regards to the land use impacts of wind power, Intervenor's have shown that wind would use only approximately 0.35 acres/MWe, rather than the 0.43 to 0.73 acres/MWe claimed by Exelon. (Biewald Affidavit at § III.G). More significantly, Exelon's simple acreage comparison ignores the fundamentally greater impact that nuclear power has on the land that is used. In particular, the impacts to land of the mining and enrichment of uranium, construction and operation of a nuclear power plant, and storage of waste for thousands of years is plainly much greater in both intensity and duration than the placement of a wind turbine that is fully compatible with surrounding land uses. (*Id.*) Therefore, Intervenor's have demonstrated a genuine dispute regarding Exelon's claim that the land use impacts of wind power are likely to be greater than those of nuclear power.

Second, Exelon's response misses the point that even accepting Exelon's own discussions of impacts, it is clear that clean energy alternatives are environmentally preferable to nuclear power. As Intervenor's explained (Motion at 11-12), Exelon's own filings demonstrate that nuclear power would impact at least 10 resource areas, including human health, waste management, and accident impacts, while wind power would impact only four resources areas, and natural gas would not have human health or accident impacts. It is plainly arbitrary and capricious to assume that an energy source that presents human health, accident, and eight other impacts is environmentally preferable to alternatives that would impact far fewer resources.

Exelon attempts to counter this point with the facially illogical claim that there is “no material difference between ‘no impacts’ and SMALL impacts.” (Id. at 21). Under Exelon’s theory, wind and natural gas are not environmentally preferable to nuclear power because the impacts of each of those energy sources on all relevant resources can be categorized as SMALL. This approach does not withstand scrutiny as it is simply not defensible to claim that the impacts of wind or natural gas and nuclear power on a particular resource are the same when wind or natural gas would have no impact on that resource and nuclear would have some impact.

The NRC Staff similarly responds that Intervenors have confused the number of impacts that each energy source has with the significance of those impacts. (NRC Staff Answer at 13). As Intervenors have demonstrated, and Exelon’s filings and the Draft EIS largely support, however, for any resource that wind or natural gas does impact, the impact would be SMALL, just as the impacts of nuclear power on various resources are all purportedly SMALL. (Motion at 11-12) Therefore, the Staff’s response fails as there is no distinction in the significance of the impacts for the resources that wind and/or natural gas actually does impact. Instead, the distinction shown in the record is that nuclear power impacts more resources than wind or natural gas alternatives.

Finally, Exelon asserts that Intervenors’ challenges to various discussions of the impacts of natural gas and nuclear power are foreclosed because such challenges either should have been raised earlier or represent an impermissible challenge to NRC regulations. (Exelon Answer at 7-9, 11-13, 26-27). In fact, Intervenors are entitled to dispute the information regarding the impacts of natural gas and nuclear power to the extent that it is being used now to reject clean energy alternatives because otherwise there is no way to ensure that the objective evaluation of alternatives required by NEPA is occurring. In addition, Intervenors’ challenges to the

discussion of the impacts of the uranium fuel cycle and spent fuel transportation cannot be considered an improper attack on agency regulations because those regulations specifically note that tables S-3 and S-4 are simply a “basis for evaluating” such impacts and “may be supplemented.” 10 C.F.R. § 51.51. Finally, as noted above, even accepting Exelon’s and the NRC Staff’s own discussion of impacts, it is clear that clean energy alternatives are environmentally preferable to nuclear power.

**II. EXELON’S ASSERTION THAT NUCLEAR POWER IS LESS COSTLY THAN CLEAN ENERGY ALTERNATIVES IS ERRONEOUS.**

As Intervenors explained in their Motion (pp. 14-17), Exelon’s rejection of clean energy alternatives is also arbitrary and capricious because it is based on the incorrect assertion that nuclear power is less costly than wind and natural gas. In fact, the record demonstrates that new nuclear power would not be economical, and Exelon’s cost estimates are based on overly optimistic assumptions that are not supported by the evidence. (*Id.*; Biewald Affidavit § IV.B).

In response, Exelon first asserts that there is no genuine dispute of material fact on this issue because one of the studies cited by Intervenors, *The Future of Nuclear Power*, is purportedly consistent with Exelon’s cost estimate. (Exelon Answer at 29-31) In particular, Exelon notes that the *Future of Nuclear Power* identifies an “optimistic” cost estimate of 5.5 cents per kWh, which is the same figure that Exelon cites for the upper-bounding value for its much lower estimate.

Exelon’s attempt to equate its conservative maximum cost estimate with the optimistic estimate in the *Future of Nuclear Power* ignores the analysis in that study and other evidence in the record. In its filings, Exelon estimates that new nuclear power will cost between 3.1 and 4.6 cents per kWh, and provides the 5.5 cents figure (which is the cut-off above which nuclear power

would not be economical) only as a conservative upper-bounding estimate. (Exelon Statement of Facts I.D). These estimates are directly contradicted by the U.S. DOE's 2005 Annual Energy Outlook ("AEO"), which states that "new [nuclear] plants are not expected to be economical," and which Exelon fails to address. Similarly, the *Future of Nuclear Power* study sets forth a base estimated cost of 6.7 cents per kWh (*Future of Nuclear Power* at 39-40), which Exelon itself acknowledges is not economical. (Exelon Affidavit at 5). The 5.5 cent figure in the *Future of Nuclear Power* study is identified only as part of an "optimistic" scenario that assumes that "significant" and "unproven" cost improvements take place in the future. (*Future of Nuclear Power* at 41). Certainly, a claim that nuclear power will cost between 3.1 and 4.6 cents per kWh with a maximum of 5.5 cents is not consistent with a cost estimate that shows that nuclear power will cost a not economical 6.7 cents per kWh and may be reduced to a barely economical 5.5 cents per kWh only if "significant" and "unproven" improvements take place.

Exelon also contends that Intervenors have not challenged the assumptions upon which its estimates of nuclear power costs are based, most notably the assumed capital costs of \$1,200 to \$1,500 per kWe. (Exelon Answer at 30). In fact, Intervenors demonstrated that such optimistic cost assumptions are not realistic given the capital costs of recently built plants and the greater than 200% cost overruns experienced in the construction of 75 existing plants in the U.S. (Motion at 16; Biewald Affidavit at § IV.B and Ex. 3). In addition, the *Future of Nuclear Power* study assumes a capital cost of \$2,000 per kWe based on information provided by the Energy Information Administration, estimates from other countries, and costs for recent nuclear plant construction abroad. (*Future of Nuclear Power*, at 39-40). That study notes that capital costs estimates would actually be "much higher" if recent construction cost data for U.S. plants completed in the late 1980s and early 1990s were considered, and that a reduction to even \$1,500

per kWe in capital costs could occur only if there are “significant” and “unproven” cost improvements in the future. (*Future of Nuclear Power*, at 39-41). Plainly, Exelon’s \$1,200 to \$1,500 per kWe capital cost assumptions are not supported by the record.

Perhaps realizing that the evidence shows that nuclear power is not likely to be economical, Exelon and the NRC Staff asserts that cost is not material to this proceeding because clean energy alternatives are not environmentally preferable and do not serve the purpose of the project. (Exelon Answer at 27; NRC Staff Answer at 11-12). In fact, as demonstrated in the Motion (pp. 10-14) and in Section I above, clean energy alternatives are environmentally preferable to new nuclear power. In addition, as explained in the Motion (pp. 17-20) and Section III below, clean energy alternatives in combination can serve Exelon’s stated purpose of producing baseload power. In addition, the NRC regulations call for a weighing of the environmental and economic benefits and costs in a proceeding such as this. 10 C.F.R. 51.105(a)(3). Therefore, the fact that new nuclear power is not economical and is more costly than clean energy alternatives is relevant to the consideration of alternatives in this proceeding and Intervenors have demonstrated a genuine dispute of material fact on this issue.

### **III. THE DRAFT EIS AND EXELON FILINGS FAIL TO OBJECTIVELY EVALUATE COMBINATIONS OF CLEAN ENERGY ALTERNATIVES.**

Intervenors also demonstrated in their Motion that the additional Exelon and NRC Staff discussions of alternatives failed to objectively evaluate clean energy alternatives in combination. In particular, Exelon and the NRC Staff both erroneously concluded that any combination of clean energy alternatives would not be environmentally preferable to new nuclear power (Motion at 17-18), and Exelon also arbitrarily concluded that such combination would be more costly. (*Id.* at 18). In addition, both Exelon and the NRC Staff improperly biased their

discussions against clean energy alternatives by failing to assign a large enough role in such combination alternatives to wind power. (*Id.* at 19-20).

In a response that suggests that Exelon has not engaged in a serious or objective analysis of combinations of clean energy alternatives, Exelon states that any alternative involving wind or solar power is “absurd.” (Exelon Answer at 33). In particular, because wind and solar power purportedly do not create baseload power, Exelon asserts that they cannot contribute meaningfully to a combination of alternatives. (*Id.* at 17-18, 31-33). Therefore, Exelon continues to maintain that any combination of alternatives must involve a natural gas facility that is equivalent to the proposed Clinton 2 nuclear plant, and that such facility would simply reduce operations when the wind was blowing. (*Id.*)

Exelon’s response, however, does not actually address any of the expert opinion submitted by Intervenors. As Intervenors have shown, wind power plays a beneficial and quantifiable role in the power system because it can be relied on to produce approximately 35% of its rated capacity, i.e. it has a capacity value of 35%. (Biewald Affidavit at § IV.C). Exelon entirely discounts this fact, claiming that such power cannot be relied on or sold on the power market. (Exelon Answer at 32). This response, however, is simply untrue, as numerous companies, including Exelon subsidiaries, buy and sell wind power on the market all the time. Major system operators also recognize that wind provides capacity value, as they assign a capacity credit to wind sources. (Biewald Affidavit at § IV.C). Exelon has simply provided no reason to ignore such capacity value that is well-recognized in today’s power markets.

In addition, even assuming that Exelon is correct in contending that wind power would have to be backed up with natural gas capacity equivalent to the proposed Clinton 2 facility, Exelon has not explained why wind power (with its 35% capacity value) should not be viewed as

supplementing such capacity. Intervenors have demonstrated that if wind is not viewed as substituting for some of the natural gas capacity needed to replace the power that would be produced by the Clinton 2 plant, it should be viewed as supplementing any such natural gas capacity in a combination that would actually produce more power at lower cost per kWh than the Clinton 2 plant. (Biewald Affidavit at § IV.C). Exelon provides no explanation for why Intervenors' argument is incorrect and, instead simply labels the entire analysis "absurd." (Exelon Answer at 33-34). It goes without saying that that is no response at all.

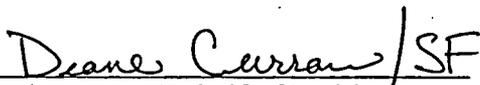
The NRC Staff continues to maintain that any combination of alternatives would not be environmentally preferable to nuclear power due to the impacts of natural gas generation. But, as Intervenors have explained, a combination involving natural gas generation would have less impacts than nuclear, especially if the amount of wind power involved is increased to well over the 60MW included in the Draft EIS discussion. (Biewald Affidavit at § III.B; Motion at 20). In response, the NRC Staff contends that the amount of wind power involved would not reduce the environmental impact of a combination of alternatives. (NRC Staff Answer at 14). As Exelon itself acknowledges, however, because wind power produces no air quality impacts, increasing the wind component would reduce the air quality impacts of the natural gas component of any combination. (RAI Response at 17; Biewald Affidavit at § III.B). In addition, the NRC Staff contends that Intervenors have confused the number of impacts that natural gas would have with the significance of those impacts in concluding that a combination of alternatives is environmentally preferable. (NRC Staff Answer at 13). As explained in Section I above, however, all of the impacts of natural gas are small (especially when the wind component of the combination is increased), so the fact that natural gas impacts less resources than nuclear power demonstrates that such a combination would be environmentally preferable.

## CONCLUSION

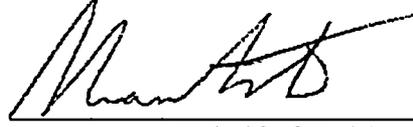
Exelon and the NRC Staff have failed to demonstrate that there is a lack of genuine dispute of material facts regarding the analysis of clean energy alternatives in this proceeding. In particular, the record is plain that, contrary to the claims of Exelon and the NRC Staff, clean energy alternatives are environmentally preferable to new nuclear power. In addition, the evidence shows that nuclear power is not likely to be economical, contrary to Exelon's claim that nuclear is the cheapest form of power. Finally, both Exelon and the NRC Staff have biased their consideration of combinations of clean energy alternatives by failing to recognize the capacity, reliability, and environmental contributions of wind power to such combinations. Therefore, the Panel should grant Intervenors' Motion to Amend Contention 3.1 and allow Intervenors to make the case in favor of better, lower-cost, safer and environmentally preferable clean energy alternatives to the new nuclear power that Exelon is proposing.

Dated: May 20, 2005

Respectfully Submitted,

  
Attorney on Behalf of Petitioner  
Blue Ridge Environmental Defense League

Diane Curran  
Harmon, Curran, Spielberg & Eisenberger LLP  
1726 M Street NW, Suite 600  
Washington D.C. 20036  
dcurran@harmoncurran.com

  
Attorneys on Behalf of Petitioner  
Environmental Law and Policy Center

Howard A. Learner  
Shannon Fisk  
35 East Wacker Drive, Suite 1300  
Chicago, IL 60601  
(312) 673-6500  
hlearner@elpc.org and sfisk@elpc.org

Dave Kraft / SF  
On Behalf of Petitioner  
Nuclear Energy Information Service

Dave Kraft  
P.O. Box 1637  
Evanston, IL 60204-1637  
(847) 869-7650

Paul Gunter / SF  
On Behalf of Petitioner  
Nuclear Information and Resource Services

Paul Gunter  
1424 16<sup>th</sup> St. NW #404  
Washington D.C. 20036  
(202) 328-0002

Michele Boyd / SF  
On Behalf of Petitioner Public Citizen

Michele Boyd  
215 Pennsylvania Ave. SE  
Washington D.C. 20003  
(202) 454-5134  
mboyd@citizen.org

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD PANEL

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In the Matter of

Exelon Generation Company, LLC

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CERTIFICATE OF SERVICE

I, Shannon Fisk, hereby certify that copies of Intervenor's Reply In Support Of Motion To Amend Contention 3.1 in the above captioned proceeding have been served on the following via electronic mail and by deposit in the U.S. mail, first class, on this 20<sup>th</sup> day of May, 2005.

Office of the Secretary  
U.S. Nuclear Regulatory Commission  
ATTN: Rulemakings and Adjudications  
Staff  
Washington, D.C. 20555-0001  
(E-mail: HEARINGDOCKET@nrc.gov)

Paul B. Abramson, Chair  
Atomic Safety and Licensing Board Panel  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001  
(E-mail: pba@nrc.gov)

David L. Hetrick  
Atomic Safety and Licensing Board Panel  
8740 E. Dexter Drive  
Tucson, AZ 85715  
(E-mail: dlmwh@dakotacom.net)

Anthony J. Baratta  
Atomic Safety and Licensing Board Panel  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001  
(E-mail: AJB5@nrc.gov)

Office of Commission Appellate  
Adjudication

U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Ann P. Hodgdon  
Antonio Fernandez  
Mauri T. Lemoncelli  
Robert M. Weisman  
Shana Zipkin  
Office of General Counsel  
U.S. Nuclear Regulatory Commission  
Washington D.C. 20555-0001  
(E-mail: aph@nrc.gov;  
axf2@nrc.gov; mtl1@nrc.gov;  
rmw@nrc.gov; scz@nrc.gov)

Stephen P. Frantz, Esq.  
Paul Bessette, Esq.  
Morgan, Lewis & Bockius, LLP  
1111 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004  
(E-mail: sfrantz@morganlewis.com,  
pbessette@morganlewis.com,  
apolonsky@morganlewis.com)

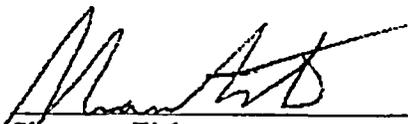
Thomas S. O'Neill, Esq.  
Associate General Counsel  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555  
(E-mail: thomas.oneill@exeloncorp.com)

Diane Curran, Esq.  
Harmon, Curran, Spielberg  
& Eisenberg LLP  
1726 M. Street N.W., Suite 600  
Washington, D.C. 20036  
(E-mail: dcurran@harmoncurran.com)

Dave Kraft  
Executive Director, Nuclear Energy  
Information Service  
PO Box 1637  
Evanston, IL 60204-1637  
(E-mail: neis@neis.org)

Michele Boyd  
Legislative Representative, Public Citizen  
215 Pennsylvania Avenue, SE  
Washington, D.C. 20003  
(E-mail: mboyd@citizen.org)

Paul Gunter  
Director, Reactor Watchdog Project  
Nuclear Information and Resource Service  
1424 16th Street, N.W. #404  
Washington, D.C. 20036  
(E-mail: pgunter@nirs.org)



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Shannon Fisk  
One of the Attorneys  
For the Intervenors