

Declaration of Dr. Anthony R. Ingraffea

My name is Dr. Anthony R. Ingraffea. I am the Dwight C. Baum Professor of Engineering, Emeritus, at Cornell University and a Distinguished Member of the American Society of Civil Engineers. I am author or co-author of over 250 peer-reviewed technical publications, including papers in the PNAS. I have been a Co-Editor-In-Chief of a peer-reviewed journal, *Engineering Fracture Mechanics*, for over 15 years. I have authored or co-authored papers related to the ongoing national energy transition, including papers co-authored by Prof. Mark Jacobson.

I am aware of the litigation filed by Dr. Jacobson and certain claims related to some of his papers published in the PNAS. I have thoroughly studied a related paper, *Evaluation of a proposal for reliable low-cost grid power with 100% wind water and solar*, PNAS, doi:1073/pnas.1610381114, 2017 (hereafter, the “Clack paper”). I am not a co-author of any of those papers, and I am commenting on them herein as an independent scholar.

On July 22, 2020, I wrote a Declaration about the Clack paper. Prof. Jacobson has now requested that I provide an expert opinion on additional questions related to that paper. Below are his questions and my answers to them:

1. Is omitting data, or changing the definition of data to the wrong definition an "interpretation or judgment of data", or is it "not an interpretation/judgment of data but instead altering the factual definition of data" in the following four cases:

a) Changing the definition of values in a table from average to maximum values?

My answer: This is clearly an instance of altering the factual definition of data.

b) Omitting the inclusion of Canadian hydropower from total hydropower production?

My answer: This is clearly another instance of apparently purposeful obscuring of the factual definition of data.

c) Claiming authors made a "modeling error" after wrongly assuming that data values in a paper are maximum rather than average values?

My answer: This is an instance where authors of the Clack paper made an incorrect inference about the model based on their own altering and obscuring of factual data.

d) Claiming authors made a "modeling error" with respect to hydropower output after omitting the fact that computer model output both in the paper and externally available to all authors shows no mathematical computer modeling error?

My answer: The unsupported inference of “modeling error” should have been obvious to the authors had they thoroughly checked for mathematical computer modeling error.

2. Is an author who makes a factual mistake in a review of other people's work following due diligence or acting in reckless disregard for the truth or in bad faith when he or she:

a) Fails to request clarification from the authors of the reviewed paper before publication if he or she is uncertain about an issue in the paper?

My answer: In this instance authors are not following due diligence expected from reviewers of scientific papers.

b) Hides the publication from a student he or she mentored and is now criticizing, until after acceptance of the paper?

My answer: This is an instance of reckless disregard for the ethics of peer-reviewed publication.

c) Refuses to correct the factual mistake when informed about it, with evidence, before publication?

My answer: This is an instance of reckless disregard for the truth.

d) Refuses to correct the factual mistake when informed about it, with evidence, after publication?

My answer: This is an instance of reckless disregard for the truth.

3. Is it standard practice in the sciences for authors of a paper to issue a correction to the paper AFTER publication if a material FACTUAL error is discovered in their paper?

My answer: Yes, definitely.

4. Is it unethical or ethical for authors of a paper to REFUSE to issue a correction to their paper AFTER publication if a material FACTUAL error is discovered in their paper?

My answer: It is unethical.

Thank you for your attention to this matter.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 20, 2021.



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