

# Testimony from Dr. Alvin Compaan in support of the repeal of House Bill 6

Dear Chair Wilson and members of the Senate Energy and Public Utilities Committee:

Thank you for the opportunity to present this testimony in support of SB 346 and for the repeal of HB 6.

My name is Dr. Alvin Compaan. My title is Distinguished University Professor of Physics, Emeritus at The University of Toledo. My residence is in Holland, Ohio, 43528. My main expertise is in solar and renewable energy; however I also have training in nuclear and radiation physics.

Others will speak more knowledgably about the corrupt processes that led to the passage of House Bill 6; I wish to focus on the technological and environmental impacts of electricity generation and the relative merits of nuclear vs. wind and solar, particularly as it applies to the Davis Besse and Perry nuclear power plants.

Although 60 to 70 years ago nuclear fission reactors were viewed as a tremendous advancement and were promoted as giving us electricity "too cheap to meter," however, today nuclear reactors are an outdated, dangerous, and very expensive electricity generation technology.

Unfortunately as their reactors neared the end of their 40-year design life, the management of the FirstEnergy Nuclear Operating Company (FENOC), failed to recognize that old power reactors like Davis Besse were fast becoming non-competitive and pushed forward relentlessly, investing hundreds of millions of dollars to get a 20-year license extension for the 40-year-old Davis Besse. FENOC received the renewal license in 2016. So the Davis Besse operating license now has been extended to 2036 in spite of the fact that nuclear power can no longer compete in the electricity marketplace, and the U.S. still has no repository for high level radioactive waste generated there. I believe the Perry license extension is still pending.

In spite of a license extension, there are serious and increasing dangers associated with continuing to operate these plants. It's important to recognize that all nuclear power plants in the United States are storing all of their spent radioactive fuel on site and this constitutes a major environmental and security hazard. Therefore, continuing to operate these plants creates and daily increases the environmental and terrorist security threats from the storage of vast quantities of spent nuclear fuel on-site, right in the "backyard" of the citizens of Northern Ohio.

Contrary to the claims of the management of First Energy, now Energy Harbor, electricity generated from nuclear power plants is not carbon free. It has lower carbon emissions than coal and natural gas, but the life-cycle emissions are significantly higher than for renewable sources of electricity such as wind and solar. Life-cycle carbon emissions and other pollutant emissions from nuclear electricity come from the fact that there is a huge energy input required for isotopic enrichment of the nuclear fuel that's needed for these plants. The uranium isotope enrichment process, as well as the mining and purification of uranium is very energy intensive and utilizes electricity generated from sources with high levels of carbon dioxide emissions and other pollutants. By contrast, solar energy and wind energy have much lower contributions to the carbon footprint from life-cycle emissions during their manufacture and installation. They use no fuel, so once built make no continuing emissions of greenhouse gases. For nuclear power plants, when one adds the carbon and other pollutant emissions generated from the construction and decommissioning of these massive power stations with thousands of tons of concrete and steel, those life-cycle carbon emissions are much higher than for renewables such as wind and solar.

In addition to the bailout of two old, dangerous, and uneconomic nuclear plants, one of the other harmful consequences of House Bill 6 was that it terminated the benefits that were established through Senate Bill 221 in 2008. This bipartisan law established the advanced energy and energy efficiency standard from which Ohio citizens have received many benefits. The energy efficiency standards and incentives saved consumers \$2.65 for every \$1 paid in by ratepayers, according to data from the Public Utilities Commission of Ohio (PUCO). In addition, SB221 established some subsidies for renewable energy. (SB221 also made potential subsidies available for advanced nuclear power; however there has been no successful development of “new” forms of nuclear power. The nuclear power industry likes to promote “small modular reactors” as their vision for the future, but this vision is already 30 or more years old and, in my opinion, still far from commercial viability.)

One of the purposes of Senate Bill 221 for incentivizing advanced renewable energies, was to encourage the further development of these energy resources and hopefully to achieve lower pricing for wind and solar. In fact this objective has been wildly successful for wind and solar. The cost for wind has come down by about a factor of two since 2008 and the cost of solar has come down by more than a factor of 10! In 2008 the price of a solar module was approximately \$4 per peak watt and today you can buy an improved solar panel for a cost that is well below \$0.40 per peak watt. This is not entirely due to Senate Bill 221, of course, but the technology for solar has advanced at a stunning pace.

Furthermore, much of the key development of solar modules has occurred actually in the State of Ohio by the company, First Solar, which is located in Northwest Ohio in the Toledo metro area. First Solar is now the US’s largest manufacturer of solar modules and their products accounted for about 20% of the installed solar electricity capacity in the United States last year. Ohioans should be proud of this development which is a tribute to the glass technology, engineering expertise, and manufacturing know-how present here in the state of Ohio and particularly in Northwest Ohio, right in the back yards of the Davis Besse and Perry nuclear power plants.

In summary Ohio legislators should recognize the amazing spirit of innovation and technological expertise that's present here in the state of Ohio, and repeal HB 6 by passing SB346 or an equivalent. Secondly, I would argue that Ohio should be even more aggressive and forward-looking in support of the development of solar and wind electricity generation. These technologies are advancing rapidly and Ohio citizens would realize further benefits through incentives to provide clean and renewable electricity with some of the cheapest rates around.

Let’s leave a legacy for our children and grandchildren that we can be proud of!

Thank you.



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