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Cc: New York Times, Washington Post, US Secretary of Energy Granholm

Dear allegedly 'Concerned' Scientists:

In reading “Advanced Isn't Always Better” (oddly tautological title) by Edwin Lyman, it's clear he hasn't advanced his arguments against nuclear power since I confronted him at the California Energy Commission some years back. Then, he and your other nuclear-industry-aggrieved contributor Lochbaum were warning, among other things, of used-fuel assembly fires in leaky storage pools. Fortunately, his misleading testimony was countered by actual data on fuel-assembly cooling behavior and standard abilities to relocate fuel assemblies.

“Advanced Isn't Always Better” (AIAB) has lots of nuclear information in it. And, it has lots of misleading, even false statements as well. That means its author failed to realize the oath he (and any scientist/engineer) took upon his acceptance of a diploma. He, I and all scientists/engineers are implicitly oathed to be honest brokers of information and fact. Otherwise, we fail society's purpose for education and study. Sadly, UCS leadership apparently fails to value that in underwriting Lyman's propensity to mislead.

There are so many defective statements and scenarios represented by Lyman in AIAB that it's a trove of hackneyed, anti-nuclear propaganda. One of the most revealing, exposing seemingly willful ignorance and anti-environment bias, is the following excerpt regarding U-Pu breeder reactors...

*“Security measures for protection against theft of weapon-usable materials are generally more stringent—and costly—than those for protection against sabotage. Some fast reactor advocates are keenly aware that the additional costs associated with this technology would make nuclear power less economical than for the current fleet of LWRs, which is already struggling to compete with low-cost natural gas-fired generation and wind and solar power.”*

This is remarkable evidence that Lyman's purpose is to mislead, for whatever personal bias, even in a time of global environmental crises. It also makes clear UCS' uncritical support of such. Let's examine:

- a) “*weapon-usable materials*” (like the “-usable” vs “-grade” gambit) don't directly exist in fission power-plant fuel, unless an illegal design, like the old USSR's RBMK, is somehow magically, illegally built in an IAEA-compliant country. Fissile to start a 1GWe fast-neutron machine is in the realm of 5+ times the typical LWR's 4-5% need (still more compared to a CANDU machine, which

uses natural U). It can be any fissile. Any sovereign nation can produce whatever fissile it wishes for any weapon it wishes, independently of nuclear power plants, unless it has agreed to be limited by treaty. UCS knows this.

Once in operation, the breeder will produce Pu239/240/241, etc., from U238, or will produce U233 from Thorium232 (but little of the Transuranics like Pu). It will fission those products for heat energy and sustaining neutrons. A terrorist is welcome to try to steal Pu fissiles or U233, particularly from molten-salt reactors operating at about 700°C. He/she is welcome also because Pu240 fissions by itself unpredictably, making Pu bomb production from used fuel 'exciting', as one of Caldicott's cohorts, Makhijani, learned from a wise Congresswoman...

<https://www.youtube.com/watch?v=-rWt3aa8pIQ>

The IAEA specifies Pu240 content needed to make Pu taken from used fuel "self protective". Similarly, the use of Thorium230 (Thorite) to produce U232 can make U233 fuel "self protective", in the sense that U232's very strong gamma emissions make it easily traceable anywhere in and above the world. And, US attempts to make bombs with U233 didn't work well. Since anyone can make U233 from common Thorium via any neutron source, preclusion of Thorium-U233 reactors is senseless. However, they're quite sensible for U233's lack of transuranic production – oddly missing facts in Lyman's text. Missing too is mention of our history of weapons elimination via power plants, as in the "Megatons to Megawatts" program with Russia.

- b) Now to Lyman's odd statement that LWRs (or CANDUs) are: "*already struggling to compete with low-cost natural gas-fired generation and wind and solar power*". Lyman must know the word "subsidy". He must also know words like: "Capacity Factor" (CF) and "Energy Density" and "GHG emissions" and "backup". If wind/solar subsidies were removed, they'd have no economic use...

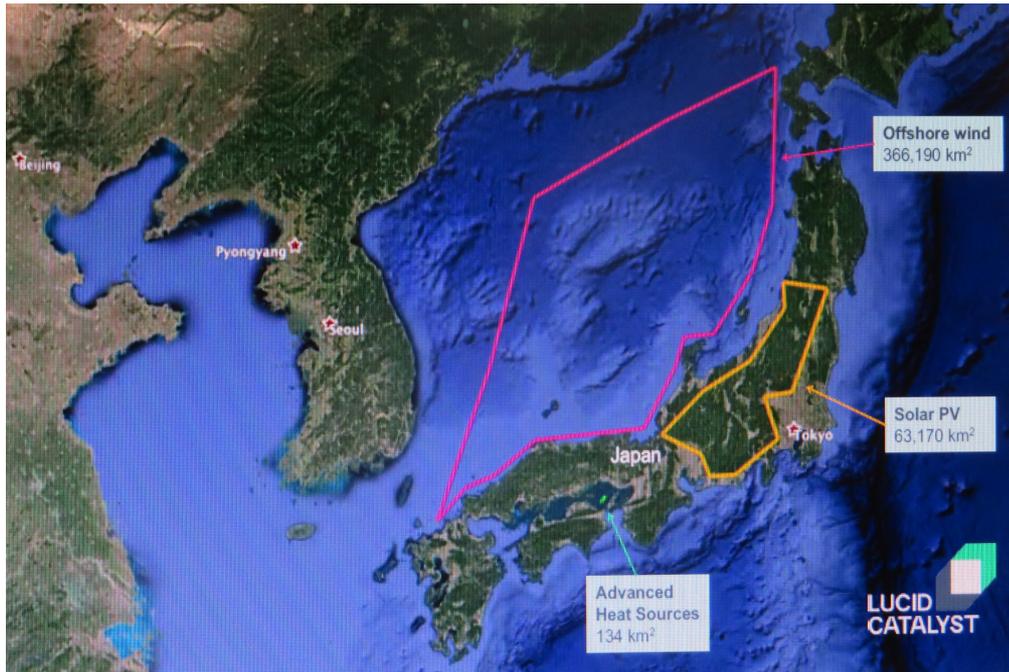
Warren Buffet (2014). "*...on wind energy, we get a tax credit if we build a lot of wind farms. That's the only reason to build them. They don't make sense without the tax credit.*" <http://tinyurl.com/meule2r>

Add in their need for more backup energy each year than they generate, because of their low CFs that Lyman is well aware of, and we see the immensity of the lie 'renewables' marketing promulgates and UCS/Lyman appear to endorse – a violation of their oaths to fact? Wind/solar already have no net environmental benefit, as The World Bank has already explained. They cannot even be built out fast enough to address IPCC targets. For example: <http://tinyurl.com/v65belox>

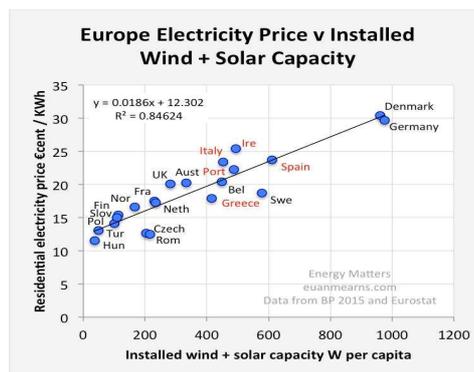
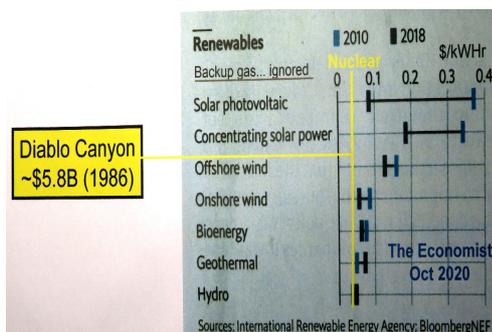
Only nuclear power has been environmentally and economically identified as able to sustain/improve world environmental conditions while minimizing environmental and human threats. Even incremental suggestions, as to use wind/solar to electrolyze water for hydrogen-combustion applications are fraught -- just trying to do that to replace Japanese oil power displays atrocious environmental intrusion/destruction (red & orange realms below). Yet, the tiny

green dot indicated below on Japan's map, would, if nuclear, suffice to entirely replace all Japanese oil use. The same is true for the map of England in the indicated Terra Praxis reference...

Areas needed for **wind/solar** to make H2 to replace Japan's oil  
 Terra Praxis: Climate Solution Profile (February 2021)



We can even show advantage in existing LWR plants, such as 2GWe Diablo Canyon's audited cost versus Germany's naïve waste of citizen's money, environment and reliability...



The bigger 'renewables' lie is that they exist – they don't. Someone, if not Lyman, at UCS must recall the First Law of Thermodynamics. Further, Lyman and UCS know that nuclear fission is about a million times denser in energy release per unit mass than any combustion, and that any combustion electricity generation is far

more energy dense than wind/solar, which fall far below 1kW per square meter on Earth. Add in wind/solar's low CFs and we see why combustion is the backup of choice for wind/solar's unpredictability (see Appendix example). That means, even with batteries, wind/solar can't escape increasing combustion use relative to nuclear fission. It looks like UCS/Lyman owe us all a C-tax. And then there's methane use & leakage.

Wind/solar's larger environmental problem: mining/ refining/pollution from the far greater (and more exotic) materials demands they make. Why do UCS & Lyman ignore this reality? DoE fortunately, has not. Their Quadrennial Review, Table 10.4 displays the tonnages of raw materials needed to build a kW of capacity in each technology. Wind consumes >10 times that of standard nuclear; solar PV consumes >16 times nuclear's demand. Thus their threats to us all...

Solar/Wind/Battery Materials

<https://tinyurl.com/n3frxms>

<https://tinyurl.com/ybwpqzvu>

<https://tinyurl.com/z97vxqc>

<https://tinyurl.com/v9p45ujn>

<http://tinyurl.com/vcg32mbt>

<https://tinyurl.com/j38as7g>

<https://tinyurl.com/yb2ewv74>

<https://tinyurl.com/v7byqmt>

<https://tinyurl.com/vdgg3rp>

And, critical materials barely appear in nuclear's demands. Wind/solar, however, if widely rolled out, would make demands that increased worldwide mining/pollution by about 3 times, per The World Bank, with associated pollution increases and materials-pricing increases that would endanger struggling economies and social justice.

Bottom line is that just examining two erroneous points in this UCS/Lyman piece, we see that intentionally or not, it misleads the unsuspecting into un-environmental, anti-nuclear beliefs that threaten the very environmental well being so many of us around the world are working to protect and restore. Our descendants are watching.

I used to support UCS. Want to discuss? Just let me know.

Sincerely,

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**Appendix:** Why combustion folks love wind & solar...

## Gas, Wind & Solar



Share of fuel 1990-2030 (% shares of world energy use)		1990	2030
	Renewables*	0.4	6.3
	Nuclear	5.6	6.0
	Hydroelectric	6.0	6.8
	Coal	27.3	27.7
	Natural gas	21.8	25.9
	Oil	38.9	27.2

\*Renewable energy includes biofuels



Wind turbines are flying high. But how do you keep the lights on when the wind stops blowing? At BP, we see a simple answer: We see cleaner-burning natural gas. It's a perfect partner to renewables.

This sad slice of US anti-science history appears fine with UCS/Lyman and delights the combustion industry... <https://tinyurl.com/nf6pr37n>