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Why the Diablo Canyon plan should keep operating

The steady, dependable power provided by the Diablo Canyon power plant is essential to the reliability of our electric grid. As more intermittent wind and solar power comes online, and as our hydro resources as well become increasingly uncertain, such firm power is more important than ever. Please keep it operating.

I'm attaching an article I've written explaining why nuclear energy is essential to address climate change. Not only is it reliable but it is among the safest of all sources of energy. In more than three decades of operation worldwide, there have been no deaths or illnesses from the operation of nuclear facilities. Again, keep Diablo Canyon running.

Additional submitted attachment is included below.

https://newlaborforum.cuny.edu/2021/08/12/why-anyone-concerned-about-climate-change-should-support-nuclear-power/

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Why Anyone Concerned about Climate Change Should Support Nuclear Power

August 2021

By Leonard Rodberg

Though many environmentalists and climate change advocates reject nuclear power, without this reliable source of clean power, we will be unable to meet the climate challenge successfully. Three propositions underlie this statement:

1. Solar and wind energy are simply too weak, too widely dispersed, too environmentally destructive, and too variable and weather-dependent to replace fossil fuels as the principal source of energy for our modern technological society.

2. Nuclear power is the only carbon-free energy source that exists today and can reliably, safely, and economically be expanded sufficiently to replace fossil fuels.

3. New types of nuclear reactors will be even safer, leave minor amounts of waste, have small environmental footprints, be adaptable to local circumstances, and cost far less than what solar and wind systems of equivalent output would cost.

The Reality of Solar and Wind Energy

To address the climate crisis, we must eliminate our burning of fossil fuels, not only from the generation of electricity, but from all other uses of energy including transportation and the heating of homes and factories. Since the early 1970s, solar and wind have enjoyed favorable public attention and substantial government subsidies as primary means for accomplishing this transition. Nevertheless, these sources are still a minor part of our national energy mix, accounting for just 9 percent of total electric output and 3 percent of total energy production. Nuclear power, the other scalable carbon-free energy source, supplies 21 percent of our electricity, even though little has been added since the mid-1980s. Here in New York State, all the solar and wind ever installed in the state produces less electricity than just one of the five nuclear reactors now operating here.

The discrepancy between the expectation and reality of solar and wind suggests the existence of very basic structural barriers to their expansion. Is it opposition from the fossil fuel industry? Definitely not. Oil and gas interests recognize that, because solar and wind are intermittent, they depend upon backup from a reliable, flexible source, and the gas and oil industry is happy to provide it. BP has advertised for years that it is an eager "partner" to solar and wind.

Do we just have to try harder with solar and wind? Initial installations have focused on the low-hanging fruit, desert-like landscapes and the open plains, but this cannot hide the fact that these energy sources are inherently weak, widespread, and intermittent. To expand their use on the scale needed to power our modern technological society, millions of localities and hundreds of millions of residents worldwide will have to be willing to invite these intrusive, land-hungry, and costly facilities into their communities. Only in a powerful authoritarian society would this happen on the time scale it is needed. As one example, early last year the Governor of New York sought and received authority to override local opposition to the siting of wind and solar installations. By contrast, nuclear plants occupy small amounts of land, have little or no impact on the local environment, and are usually welcomed by their local community for the well-paying jobs and tax revenues they bring.

Expansion of solar and wind faces significant economic, technical, and environmental challenges as well. The value of each additional solar and wind installation declines as their penetration increases. This is because they produce power only when the sun shines and the wind blows, and added power is not always needed at the time they are active. Their output has to be discarded or "curtailed." For this reason, no country, including Germany, the most ambitious, has reached even 40 percent of solar and wind penetration. In California, with just 13 percent solar penetration, a portion of the solar electricity they produce is being dumped because the excess supply is unusable.

One solution is to expand the transmission grid and share these sources across regions. However, this runs into the same local resistance as the placement of the facilities themselves. Another solution is to incorporate large amounts of storage (e.g., batteries or thermal storage), but such long-term storage does not exist. Many developers are experimenting with new storage technologies, but no solution has yet emerged. If it does, it is likely to be as expensive as the facilities that produce the energy. And, of course, the energy sources themselves have to be substantially oversized to provide the excess energy that can be stored for later, even seasonal, use.

All of this increases their cost many-fold. Studies indicate that systems which try to supply power entirely with these variable weather-dependent sources will cost up to five times as much as systems that include "firm," reliable sources like nuclear power that can supply power when it is needed.

Further, the environmental impact of the mining required to produce sufficient wind turbines and photovoltaic panels will be devastating to many communities, especially in the developing world. Moreover, the fact that these facilities last just two-decades at most means that the waste, much of it toxic, will be vast and rapidly expanding.

The current romance with visions of a 100 percent renewable future will be short-lived, as the reality of the unreliability of solar and wind, their extraordinary cost, and their material requirements sink in. Further, there is a clear contradiction between the growing concentration of population in cities around the world and the idea of powering those cities with widely dispersed wind and solar facilities. It makes little sense to move our energy system into the countryside, as required by solar and wind energy, while people move into the cities. Instead, modular nuclear reactors, sized to meet the local need, can be located in and near cities where the demand is located, enabling shorter transmission lines and readily available construction and operating staff.

Is Nuclear Power Too Risky, or Too Costly?

If solar and wind are not capable of providing the carbon-free power we need, the question remains: can nuclear power meet the challenge? I believe it can. In little more than twenty years, the U.S. built enough reactors to provide a fifth of our electricity. In a similar period of time, France and Sweden each installed enough nuclear capacity to generate more than half their electricity.

Nuclear power provides a vast amount of power in a very small space. In New York State, Governor Andrew M. Cuomo, responding to environmentalist opposition to nuclear power, directed the closure of the Indian Point Nuclear Plant on the Hudson River. For nearly five decades that plant, occupying just a few hundred acres, has been providing 25 percent of the electricity and 80 percent of the clean power used in the Metro area, and it could continue doing so for years to come. Nevertheless, the closing last year of just one of the two reactors at Indian Point eliminated more clean electricity than is produced by all the solar and wind facilities ever installed in this state.

In spite of negative public perceptions, the safety record of nuclear power has been remarkable. Possible radiation impacts are truly minimal. The widespread misunderstanding about radiation is, unfortunately, the result of fearmongering by well-meaning but misinformed advocates. Since the Chernobyl accident over three decades ago, there have been no deaths or identifiable illnesses from the operation of any nuclear power plant anywhere in the world. At Fukushima, for instance, though three reactors melted down, the UN Scientific Committee on the Effects of Atomic Radiation found that “cancer rates are expected to remain stable for the population affected by the accident. A discernible difference from pre-existing levels due to radiation exposure is unlikely.” Meanwhile, millions have died worldwide from air pollution caused by the burning of fossil fuels, and deaths have even been associated with solar and wind construction and operation.

The poor reactor construction record in the United States in recent years, with long delays and large cost overruns, is a result of the limited experience that American contractors have had lately, not of anything inherent in the nuclear power process itself. The hiatus in construction in the US, a result of the flattened demand for electricity nationally, has taken its toll. We and other countries developed our nuclear capacities within just a few short years in the 1960s and 70s when a large number of reactors were built. There has been little construction experience since then. However, recent nuclear installations in China, South Korea, and elsewhere have shown

that costs can be contained and construction times for large facilities limited to 4-6 years, particularly when experience is gained and similar models are replicated.

Furthermore, new small modular Generation IV reactor designs have been developed which can be manufactured in quantity in factories. Because of their inherent physical characteristics, they are "passively safe" — that is, if they overheat, they shut themselves down without any operator intervention and cannot melt down. They do not need to be located alongside rivers or other bodies of water and can even consume, as fuel, much of the waste that is now of such great public concern.

Today, when new electric capacity is needed, it can usually be supplied at lower cost by natural gas, which has been in abundant supply because of the fracked gas boom. The large investments that current nuclear plants require can only be justified if public policy requires that carbon-free sources replace the fossil fuel power plants we are now using. When such a policy emerges, nuclear plants, especially the new designs, can and will be built in the U.S. and many other countries. Further, nuclear energy can be used to produce carbon-neutral fuels whose use would avoid the massive cost and disruption of converting tens of millions of residences, commercial buildings, and trucks to electric power, and they can power aviation with carbon-neutral fuel as well.

Nuclear Energy Deserves Urgent and Broad Support

Nuclear power's energy density gives it the smallest ecological footprint of any energy source. Its ability to produce electricity as well as carbon-neutral fuels at scale will allow us to retain our built environment and transportation system for their full useful life. As the only dispatchable, scalable zero-carbon source we have, it deserves broad public support, with the accelerated development of advanced models and carbon-neutral fuel generators to meet the climate emergency we face.

Several years ago, four eminent climate scientists — James Hansen, Kerry Emanuel, Ken Caldeira, and Tom Wigley — warned that an expansion of nuclear power is the only practical path to address the threat of climate change: "The climate issue is too important for us to delude ourselves with wishful thinking…Nuclear will make the difference between the world missing crucial climate targets or achieving them…The future of our planet and our descendants depends on basing decisions on facts, and letting go of long-held biases when it comes to nuclear power."

We are fortunate that nuclear power exists and can replace the fossil fuels that are overheating the planet. We should listen to the words of Hansen and his colleagues, and act.

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