

# **Billionaire's Blunder :**

## **A Report by Blue Ridge Environmental Defense League**

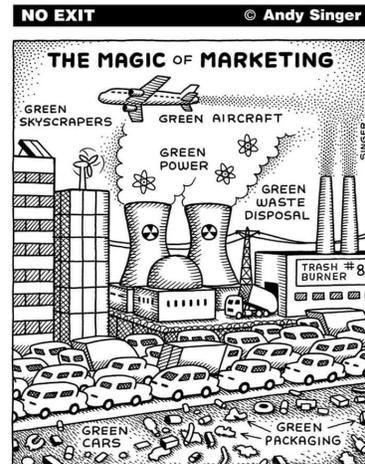
By Jenn Galler

Bill Gates believes he has figured out a solution for combating climate change: a return to nuclear power. Gates has been a proponent of nuclear energy and he just recently came out again, during the 10th anniversary of the Fukushima nuclear disaster, stating:

Nuclear energy will “absolutely” be politically palatable. That’s because the need for clean energy is dire, and the operation of nuclear power plants produces no greenhouse gas emissions.

According to Gates, new innovations in nuclear technology (in which he is an investor of) are making nuclear energy safer and more affordable, while countries around the world are starting to adopt nuclear power. But, the Intergovernmental Panel on Climate Change (IPCC) has warned us that to keep climate change to 1.5 degrees Celsius, we must decrease emissions by 45 percent from 2010 levels by 2030 and reach net zero emissions by 2050. <sup>1</sup>

Many experts in the nuclear field say that Gates’s company TerraPower is pursuing a flawed technology and that any new nuclear design is likely to come at an excessive economic cost and take decades to properly function, market and construct in any significant numbers. Dr. Edwin Lyman, a nuclear expert at the Union of Concerned Scientists, said TerraPower is one of many companies that is raising the public’s hopes for advanced nuclear reactor designs even though they’re still on the drawing boards and will remain unable to combat climate change for many years. Lyman said:



We think the vendors of advanced nuclear power designs are saying they can commercially deploy them in a few years and all over the world. We think that is counterproductive because it is misleading the public on how fast and effective these could be.

We at Blue Ridge Environmental Defense League and others around the world know that nuclear energy and power are not the future we should look to. Below are a series of arguments against nuclear power and what the true consequences are. It’s no solution to climate change.

### *A Variety of Negative Environmental and Human Health Impacts*

The nuclear fuel chain from start to finish involves releasing radioactivity that contaminates the environment. Radiation can affect the air, water, soil, plants, animals, places of residence and recreation

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and elsewhere. Aside from the fuel chain, the nuclear power plant itself emits a large amount of radioactive gases. A nuclear plant that has zero or close to zero emissions does not exist. Moreover, existing plants emit carbon dioxide due to the continuous mining and refining of uranium needed for the plant. Grams of carbon dioxide per kilowatt hour describes greenhouse gas emissions in terms of energy production (g-CO<sub>2</sub>/kwh).

Emissions from new nuclear are 78 to 178 g-CO<sub>2</sub>/kWh, not close to 0. Of this, 64 to 102 g-CO<sub>2</sub>/kWh over 100 years are emissions from the background grid while consumers wait 10 to 19 years for nuclear to come online or be refurbished, relative to 2 to 5 years for wind or solar. In addition, all nuclear plants emit 4.4 g-CO<sub>2</sub>e/kWh from the water vapor and heat they release. Advanced reactors emit large amounts of radioactive gases which would be another problematic waste stream. Ed Lyman from Union of Concerned Scientists, said money going into advanced nuclear would be better spent on bolstering conventional nuclear plants from the risks of earthquakes and climate change, such as flooding. <sup>2</sup>

The by-product of nuclear reactors, nuclear waste, will remain hazardous to humans and other living beings for hundreds of thousands of years. Other radioisotopes will remain hazardous for millions of years. Therefore, the radioactive waste must be shielded for centuries and isolated from the living environment for hundreds of millenia.

#### *There are No Efficient and Practical Solutions for Nuclear Waste*

There is no safe or permanent solution that has been found anywhere in the world and may never be found for the nuclear waste problem. In the U.S. the only identified high-level radioactive waste deep repository site at Yucca Mountain, Nevada has been canceled. Small modular reactors are experimental experimental nuclear reactors.

The results from a Stanford study show that SMRs and nuclear power in general will not reduce the size of a geologic repository for spent nuclear fuel, nor the associated future dose rates. Rather, SMRs are poised to discharge spent fuel with relatively high concentrations of fissile material, which may pose re-criticality risks in a geologic repository. <sup>3</sup>

There needs to be an end to the production of nuclear energy to stop nuclear waste. More resources should be going towards securing the existing reactor waste in hardened on-site storage. There is no justification to spread nuclear and radioactive waste. New and better technology is available now.

#### *Small Modular Reactors and Microreactors Are Not Cost Effective*

Regarding new and advanced reactors such as SMR's and microreactors, experts say they are not yet finalized and cost claims made by designers are not reliable. Actual costs and maintenance could be far higher. Along with the upfront costs of SMR's, Lyman states there is also maintenance, operational, and labor costs in a safe and secure way.

SMRs should not go into effect, because it relies on the usage and 'cost effectiveness' of SMR's and Microreactors. "Affordable" doesn't necessarily mean "cost-effective." According to basic

economic principles, the cost per kilowatt-hour of the electricity produced by a small reactor will be higher than that of a large reactor, all other factors being equal. That is because SMRs are penalized by the economies of scale of larger reactors—a principle that drove the past industry trend to build larger and larger plants. <sup>4</sup>

SMRs are not a viable or practical solution unless economic and safety problems are realized by the nuclear industry. There will be challenges with SMRs to keep the electricity costs low enough to have an economic advantage with other sources, including larger reactors. Because of economic factors and competitiveness, companies could cut corners with safety features and systems.

### *Nuclear Energy is a Struggling Industry*

The nuclear industry is a struggling industry as more and more plants get shut down and retire. Since 2012, six reactors have shut down and there are plans that seven others will close. Meanwhile, solar and renewables are growing.

Renewables are set to be the only energy source that will grow in 2020, with their share of global electricity generation projected to jump thanks to their priority access to grids and low operating costs. Despite supply chain disruptions that have paused or delayed deployment in several key regions this year, solar PV and wind are on track to help lift renewable electricity generation by 5% in 2020, aided by higher output from hydropower. <sup>5</sup>

Shutting nuclear plants down is not a short term trend, while the price of renewables gets cheaper. We believe that nuclear power should not be used at all and, in fact, should be replaced with truly renewable energy and energy efficiency.

### *Energy Demands are Decreasing*

The total demand for energy is decreasing and building new nuclear power plants does not match this change for energy. Predictions in energy reduction were borne out with our changing global picture.

A new report released by the International Energy Agency projects that energy demand will fall 6% in 2020 – seven times the decline after the 2008 global financial crisis. In absolute terms, the decline is unprecedented – the equivalent of losing the entire energy demand of India, the world's third largest energy consumer. Advanced economies are expected to see the biggest declines, with demand set to fall by 9% in the United States and by 11% in the European Union. The impact of the crisis on energy demand is heavily dependent on the duration and stringency of measures to curb the spread of the virus. For instance, the IEA found that each month of worldwide lockdown at the levels seen in early April reduces annual global energy demand by about 1.5%. <sup>5</sup>

Renewables were the only energy source to see demand grow in 2020, partly driven by new wind and solar installations coming on stream that year. Renewable energy production is the future we should look to.

## Conclusion

Bill Gates has a powerful voice, but he is misleading the public in stating that nuclear power is a solution to climate change. As you have examined the evidence and facts, nuclear is no solution to climate change and will actually worsen it starting with the mining of uranium, greenhouse gas emissions from the nuclear reactor itself, and then ending with highly radioactive nuclear waste that we still have no solution to store. As we progress forward to combat climate change, we need to invest and focus on renewable energy production, that is where change will happen.

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## Endnotes

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