

A Better Energy and Climate Plan for Nevada

The Governor's Plan is Anti-Science and Irrational

Norman Rogers

The governor has released a lengthy and expensively produced document "Nevada's Climate Strategy." Governor Sisolak is "clear" that he won't "spend a single second" debating the issues. His report states that "the science of climate change is beyond question." Apparently, the people who wrote the report consider themselves to be followers of infallible climate scientists.

Climate science is produced by cliques of quarreling scientists. There is no infallible group of climate scientists.

The governor's report is full of unsupported, wrong and exaggerated claims. If implemented, the plan would be a boondoggle. It would burden the economy with useless renewable energy. It would not help the environment. It would be a bonanza for the manufacturers of solar farms.

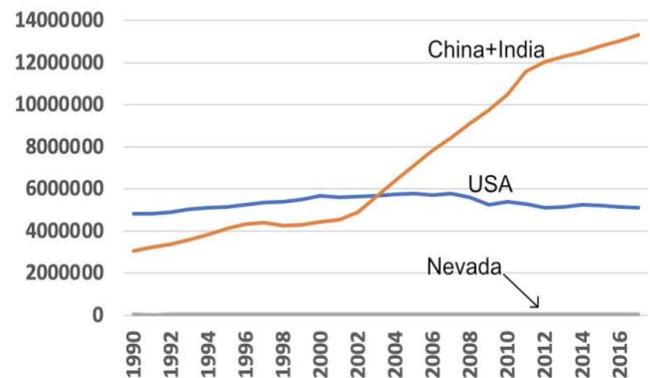
The report urgently requires that carbon dioxide (CO2) emissions be reduced but neglects to mention that China emits 300 times as much CO2 as Nevada.

Nevada has laws requiring that 50% of our electricity should come from renewable sources by 2030. Renewable is mostly solar in Nevada. These laws will be discussed further later in this article.

It would cost about \$12 billion to build enough solar energy to meet Nevada's 50 percent renewable electricity by 2030 mandate. That would be \$14,000 for each Nevada household. It would be paid off over

25 years by a mixture of taxes and higher electric rates. This expenditure would have no beneficial effect for the economy or for the environment. CO2 levels are controlled by events in Asia. The effect of Nevada's proposed reductions in emissions is negligible.

China+India Compared to USA Thousands Metric Tons CO2 Emissions 1990-2017



CO2 emissions anywhere spread rapidly over the entire world. Nevada's emissions don't just affect Nevada.

If we stick with natural gas for our electricity, we can continue to enjoy reasonably priced and plentiful electricity as the population grows. No increase in electrical rates would be needed as extra population would pay the extra cost.

The governor's report claims that increasing climate change (global warming) is causing all kinds of disasters. But floods, wildfires and hurricanes are caused by many things. It is sketchy science to suggest that global warming is causing weather disasters.

Weather disasters are not new. They are costing more because more people are building houses on the coast and on river flood plains.

Temperatures in southern Nevada show no tendency toward increasing hot spells. We are still waiting for global warming to arrive in Southern Nevada where most of the population lives. The record of 118 degrees in 1931 for Las Vegas has yet to be broken.

The Nevada mandates for new renewable energy will likely increase household electric bills by \$50 to \$150 per month. The summer increase would be much larger due to air conditioning. The exact amount would vary depending on continuation of federal subsidies. If Nevada further copies California and introduces tiered electric rates, the increase could be much higher for less favored groups. Some Californians pay five times what we pay for electricity. According to a [Gallup poll¹](#) only three percent of Americans think that Environment/ Pollution/ Climate change is the most important problem. Twenty two percent think the government is the biggest problem.

Natural Gas is a Wonder Fuel

Most people don't realize just how beneficial natural gas is. It used to be quite expensive. It is considered a premium fuel. But new methods of extracting the gas have resulted in a great expansion of the domestic supply and a great reduction of the cost. We have so much natural gas that large quantities are being exported.

Natural gas is a low carbon fuel. It doesn't contain large quantities of pollution causing substances, like sulfur. For the same amount of electricity natural gas emits one third as much CO₂ compared to coal.

Natural gas burns cleanly. The only smokestack pollutant of consequence is nitrogen oxide (NO_x). This is easily controlled. Most NO_x is from cars.

One area where natural gas is inferior to coal is reliability, in the case of a fuel supply interruption. A large pile of coal can be easily kept at the generating plant site. Natural gas generation depends on just in time delivery of fuel by pipeline. Some natural gas plants have backup oil tanks with dual fuel turbines, but this is much more expensive than maintaining a pile of coal. Reliability is a serious problem that needs to be tackled before disaster strikes.

Nuclear has even a larger supply of fuel on site as a nuclear plant can run for a year or more before refueling is necessary.

The True Cost of Solar Electricity

Solar electricity costs 5 or 10 times more than natural gas electricity. This may seem incredible, given the propaganda touting solar as being a cheap form of energy.

The reason that it is so expensive is rooted in its erratic nature. Because it doesn't work at night or if it is cloudy, it can't replace Nevada's existing natural gas plants. Although batteries play a role, they don't solve the basic problem that solar can't

¹ <https://news.gallup.com/poll/1675/Most-Important-Problem.aspx>

replace the existing plants. Batteries are sometimes added to solar plants to move excessive solar generation from daytime to early evening. Solar is a supplement to the existing plants, not a replacement.

Solar does have an economic benefit; it reduces fuel consumption in existing plants that throttle back when solar electricity appears. If a megawatt hour of solar electricity displaces a megawatt hour of electricity from a natural gas plant, \$15 worth of fuel consumption in the natural gas plant is saved. That benefit is dwarfed by the direct and indirect cost of the solar electricity.

(A megawatt hour is a unit of energy equal to a flow of one million watts of electricity for one hour. Home electricity is usually billed by kilowatt hours, a unit of energy 1000 times smaller.)

Solar electricity, without battery assist, costs about \$30 per megawatt hour with current large subsidies. Without the subsidies the cost is about \$72.

The entire natural gas fleet has to remain in place, ready to generate when clouds obscure the sun or the sun sets. Adding or subtracting a natural gas megawatt hour costs or saves \$15 for the fuel. But solar costs \$72 without subsidies, or near 5 times as much as natural gas. With subsidies solar costs \$30 or two times as much as natural gas.

The cost of solar electricity is mostly the cost of building the plant spread over the

electricity generated during the life of the plant.

If solar becomes a big player, the economics become much worse. The Nevada goal of 50 percent renewable electricity by 2030 will make solar be a big player.

When a large amount natural gas electricity is displaced by solar, the cost of the gas electricity that remains increases because the fixed cost of gas plants is spread over fewer megawatt hours.

To make things worse, when solar is a big player, battery assist has to be added to the solar to avoid excessive daytime solar generation. The batteries absorb excess daytime solar and release it in the early evening. The batteries can double the cost of the solar. The Gemini plant underway north of Las Vegas is an example of solar with battery assist.

The bottom line is that when solar is a small player in the grid and heavily subsidized, it costs double what natural gas electricity costs. But without the subsidies the cost is 5 times as much. Then when solar becomes a big player, with equal amounts of natural gas and solar electricity in the grid and with battery assist, the solar without subsidies ends up costing about 10 times as much as natural gas electricity. The subsidies are not a real reduction in cost because they are paid by taxpayers and electricity consumers.

A technical article explaining subsidies and costs in detail is [here](#)².

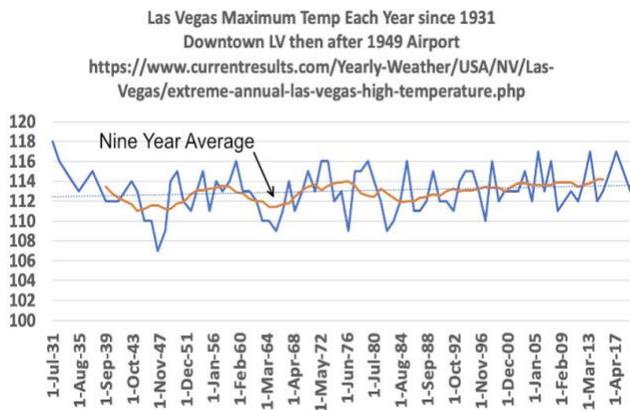
² <http://perfect-power.com/files/TrueCost.pdf>

Battery assisted solar is a dubious path due to the cost and fragility of the batteries. The new Gemini plant battery can store 1400 megawatt hours of electricity, the same amount of energy as contained in five million sticks of dynamite. These batteries can burn or explode as happened in Arizona. The Gemini battery will cost about \$300 million and must be periodically replaced because these batteries wear out.

Trends in Nevada Global Warming

Three graphs are shown below. These graphs use data from the USCRN modern computerized weather stations, except for the Las Vegas graph.

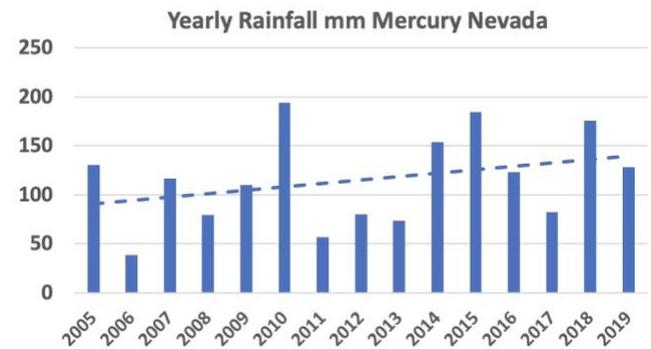
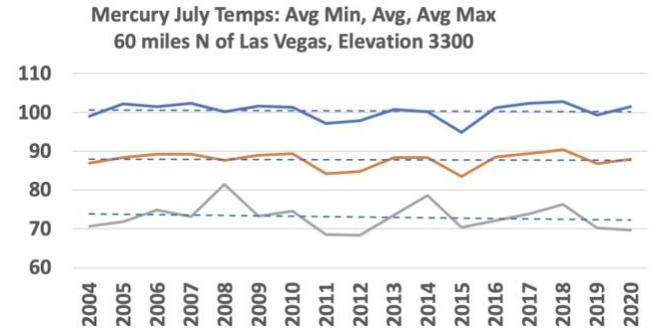
The first graph is the maximum temperature reached each year since 1931 in Las Vegas. There is no significant increase in the maximum temperature over the last 90 years.



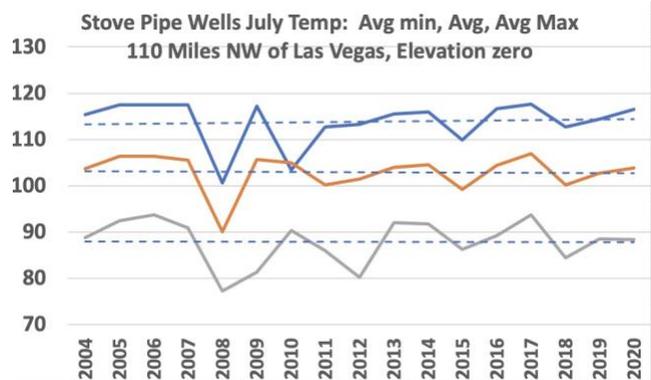
This is surprising, since during that time Las Vegas grew from a small village to a large city. One would expect the peak temperature to have increased substantially due to the urban heat island effect.

The second graph is the July, average minimum, average, and average maximum, temperature by year at Mercury, Nevada, a

desert location 60 miles north of Las Vegas. If heat waves are increasing, we should see the worst in the hottest month of July. No trend is evident. Rainfall shows a normal pattern.



The third graph is for July at Stovepipe wells, 110 miles northwest of Las Vegas in Death Valley. This is near the location where the world record for hottest temperature of 134 was set in 1913. The next highest temperature was 130 in August 2020.



Once again, no trend is evident.

The graphs, except for the Las Vegas graph, only go back to the early 2000's when the modern weather stations were installed. Records before that time depended on volunteer observers and are less reliable and accurate.

A 16-year record is not sufficient to establish or not establish a global warming trend. Neither does a trend establish that a CO2 increase is the cause. There are many things that can create a warming trend and warming trends have appeared in the pre-CO2 era. What the graphs do show is that there is no need for panic. There are no rapid and drastic elevations of high temperatures. Two other weather stations, Baker in east central Nevada and Denio in northwest Nevada show similar behavior.



The Nuclear Advantage

Nuclear electricity is not now competitive in the U.S. for new plants. This is because fossil fuel is cheap in the U.S. and the anti-nuclear political movement has erected massive regulatory roadblocks to building nuclear plants. About 20% of our electricity is from nuclear plants built before the anti-nuclear movement stopped the construction of new plants.

Even existing nuclear plants have competitiveness problems due to massive regulation. Huge staffs are kept busy pushing

papers. The staff for a nuclear plant is 10 or 20 times larger than for an equivalent natural gas plant.

Nuclear fuel is the cheapest fuel, costing less than half what natural gas costs.

Nuclear is competitive in countries such as South Korea or France. France is 80 percent nuclear powered.

Although the hysterical anti-nuclear movement has planted the idea in the public mind that nuclear generating plants and atomic bombs are similar, nuclear is actually very safe. Of the hundreds of plants operating for many years only one bad accident that harmed people took place, Chernobyl in the Soviet Union. This was a poorly designed and recklessly operated plant. Forty people were killed, and the plant was destroyed. About 2000 people got thyroid cancer because the government failed to distribute iodine pills promptly. Almost all survived this easily cured form of cancer.

Nuclear is on the verge of a technical renaissance. New generations of plants are failsafe against meltdown. Small modular plants will be built in factories and buried where they can safely run for decades without additional fuel. This is taking place even though little government funds are spent on nuclear energy research compared to money spent on virtually useless renewable energy.

Nuclear plants don't emit CO2 or smoke pollution. Climate scientists that worry about global warming have noticed the value of nuclear for reducing CO2 emissions as well as

the ineffectiveness of wind and solar for reducing CO2 emissions. These scientists, [Climate Scientists for Nuclear](https://environmentalprogress.org/climate-scientists-for-nuclear)³, advocate Nuclear energy and dismiss renewable energy as useless.

Although it is not currently feasible for Nevada to build a nuclear plant, it may be in the future, long before the expensive contracts for renewable energy expire.

Concrete Steps for Nevada

Renewable energy is useless. Nevada's plan to adopt renewable energy will produce a modest decline in CO2 emissions at great cost. That will have no effect on climate because CO2 levels are the consequence of policy in Asia. Nevada's contribution is nil. Nevada should stick with natural gas generation that serves us well. Some consideration should be given to boosting the reliability and sustainability of the electricity supply.

We have the problem of Proposition 6 that was passed for the second time in November. Proposition 6 puts a 50 percent renewable energy quota by 2030 into the state constitution. It doesn't belong there. It was put there by the efforts of the eccentric California Billionaire Tom Steyer.

Fortunately, Proposition 6 does not define what renewable energy is, although some examples are given in the text. Nor does Proposition 6 mention reducing CO2 emissions as a goal. The definition of renewable energy is in the hands of the legislature.

Proposition 6 lists the benefits of renewable energy as:

“improving air quality and public health, reducing water use, reducing exposure to volatile fossil fuel prices and supply disruptions, and providing a more diverse portfolio of resources for generating electricity.”

All of these benefits can be obtained by defining natural gas and nuclear as renewable. Natural gas provides excellent air quality. The plants in Nevada use air cooling rather than water evaporative cooling. Natural gas prices will not be volatile due to the vast domestic supply. Continuing with natural gas, coal, and in the future, nuclear, will provide a diverse set of supplies.

Currently Nevada's definition of renewable energy is based on the three No's:

No fossil fuels
No hydroelectricity if a dam is involved
No nuclear

Based on the discussion here the three No's should be changed to the three Yes's.

Norman Rogers, educated as a physicist and a former entrepreneur in California, is an activist trying to expose the truth about renewable energy. His app with bite size nuggets of information about renewable power is [here](#).

³ <https://environmentalprogress.org/climate-scientists-for-nuclear>

Questions and Answers

Q. So you think global warming is a hoax?

A. No, I think it is highly politicized and exaggerated. Detecting past global warming is difficult because previous weather records were adequate for the intended purpose but dubious for detecting global warming. A general global warming has been underway for centuries. Separating this from global warming caused by CO2 is a daunting task. Better electronic weather stations are a more recent development. Predictions of future global warming are from very complicated computer models that disagree with each other and don't model the climate of the Earth properly. They have predicted more warming than has occurred.

Q. In the 1990's and early 2000's global warming was considered the big threat. But somehow that morphed into climate change. What's going on?

A. The world was failing to warm up to expectations, so the threat name was changed from global warming to climate change to obscure this fact.

Q. Don't fossil fuels emit dangerous smoke that kills hundreds of thousands of people?

A. No. Even before the era of pollution controls on electric generating plants hundreds of thousands of people weren't being killed. Controls on coal plants can remove almost all the pollutants. Natural gas plants are naturally low polluting, and the only important pollutant, NOx, is easily controlled. Hysterical claims of deaths from

fossil fuel emissions serve the purpose of environmental organizations that want to raise money. The alleged deaths can't be documented and are based on dubious assumptions about the effect of very low levels of pollutants.

Q. Why would the governor propose a major program to reduce CO2 emissions if it will have no effect. Even if China emits 300 times as much CO2 as Nevada, shouldn't we do our part to reduce CO2 emissions?

A. It is obvious that the governor's program is useless since world CO2 emissions would change by an undetectable amount even if Nevada eliminated all CO2 emissions. Doing our part assumes that everyone else is doing their part. It also assumes that the mission is worthwhile.

As the Climate Scientists for Nuclear group stated, nuclear is the only solution for reducing world CO2 emissions from electricity generation. Renewable, wind and solar, is a dead end. The governor is embarking on the wrong solution to a hypothetical problem.

Q. Shouldn't we just get a committee of scientists to study these issues and tell us what to do?

A. Ha, Ha. Science is highly politicized. Scientists fight each other and other interest groups for money and attention. They are not above sensationalizing the science or worse. Getting accurate information from scientists can be like getting accurate information from the teachers' union about education. That is not to say that science is useless. You just have to be careful. Follow the science is a

great idea, but first you have to figure out what the science is.

As an example, the National Academy of Sciences commissioned a major study of climate models. Most of the people on the committee were studying climate models. Climate models have serious problems such as bad predictions and poor modeling accuracy. Improvements have been slow. But the committee did not suggest cutting back on climate model research costing billions of dollars. They suggested a major increase of money and effort in the climate model area. In other words, they were asking for more money for their own scientific empires, while pretending to make an objective study.

Q. What about wind power?

A. Nevada is a sunshine rich and wind poor state. There is only one wind farm in Nevada. Wind has the same problems as solar with erratic generation of electricity.

Q. What about geothermal energy?

A. Geothermal energy is extracting energy from hot underground rocks of volcanic origin. Nevada some substantial sites. The problem is cost which is quite high, even with subsidies. Often the rocks cool down after a while and the site has to be closed. An advantage is that it the delivery of electricity is steady.

Q. Is environmentalism a religion?

A. According to Michael Shellenberger:

Environmentalism today is the dominant secular religion of the educated, upper-

middle-class elite in most developed and many developing nations. It provides a new story about our collective and individual purpose. It designates good guys and bad guys, heroes and villains. And it does so in the language of science, which provides it with legitimacy.

Shellenberger, Michael. Apocalypse Never (p. 263). Harper. Kindle Edition.