
GAIA
CO2

FORWARD

The following constitutes a compendium of emails forwarded to the Pennsylvania State Legislature in an effort to correct poor judgement in the matter of Catastrophic Anthropogenic Global Warming (CAGW) which was altered to "Climate Change" during the two decades (1998- 2018) "pause" in temperatures. Apparently Alarmists had difficulty selling this fairy Tale which accounted for the change. In a UN poll in 2016 this failed theory finished dead last in risk by world citizens.

The first thing to know about global climate models (GCMs) is that they're all government products, created by a small closed clique of govt.-funded lifers owned by the globalist Marxists centered in the U.N. and not based in the Scientific Method, requiring evidenced based empirical observations. Using that time-tested procedure the Theory/ Models that they are based upon are round file candidates.

The U.N. extols its politician-run IPCC octopus of kept scientists, academics, journalists, and politicians, so no wonder they all closely track each other while all being wrong, with all 103 models statistically being off by over 2-sigma, in the warming direction. No surprise, they all try to reduce the gigantic atmosphere to a grid of elements, often 100,000, and lamely try to use supercomputers to advance the elements in time via patchwork physics, some based on parameterization, not equations, because the physical phenomena take place in a smaller volume than the elements. That brings up the question of how they initialize all the elements, namely, by taking a small motley collection of data points and interpolating.

In an effort to destroy Capitalism the Obama Administration's USEPA used "Secret Science" to convince the SCOTUS, in Massachusetts v. EPA, in the worst legal ruling, that the EPA would regulate CO2 under the Clean Air Act in their "Endangerment Finding". It will be reversed. EPA's Green Blob answer was Renewables.

Renewable contraptions cannot outlast fossil fuels, because they are utterly dependent on fossil fuels from birth to death to mine, crush, and smelt the ore, deliver the ore to a blast furnace, fabricate 8,000 wind turbine parts at hundreds of manufacturing plants all over the world, and deliver the parts to the assembly plant. For each turbine, dozens of trucks are needed to prepare the wind turbine site so that dozens of trucks can pour tons of concrete and fabricate steel rebar for the platform, deliver pieces of the huge parts of the turbine, and diesel powered cranes to lift the parts hundreds of feet into the air.

Public backlash will intensify from growing outrage over child labor, near-slave labor, and minimal to nonexistent worker health and safety, pollution control and environmental reclamation regulations in foreign countries where materials are mined and "renewable" energy technologies manufactured. Solar panels (bird fryers) and wind turbine bird shredders create enormous balancing electrical load problems and threatens GRID Infrastructure performance.

As the shift to GND energy systems brings increasing reliance on Chinese mining and manufacturing, sends electricity rates skyrocketing, kills millions of American jobs and causes US living standards to plummet, any remaining support for wind, solar and other "renewable" technologies will plummet or evaporate.

Many links were provided to debunk the "Settled Science" and the 97% of scientists Propaganda by numerous "Real Scientists" opining on https://wattsupwiththat.com , https://principia-scientific.org, https://friendsofscience.org and the https;//heartlandinstitute.org to name a few.

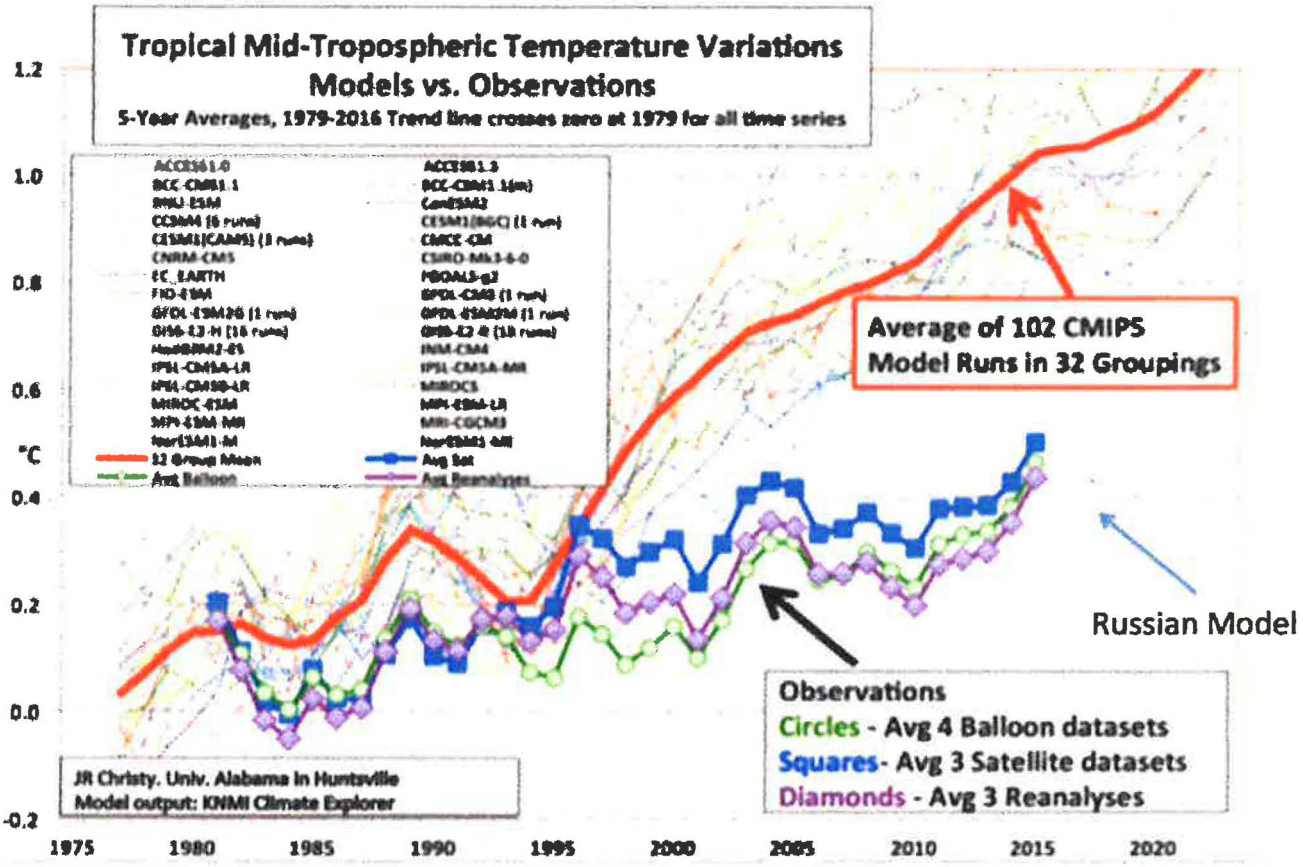
The latter sponsored 13 International Climate Change Conferences (ICCC) which the writer attended (five in person). His additional CV is available in the first email, which is a response to an unsavory attack on Representative David Maloney. The email also explains how three(3) prominent ALARMISTS have finally recognized which we TRUE SCIENTISTS have known for many decades---Climate is Natural and that Man-produced carbon dioxide (CO2) is a small contributor at <3%.

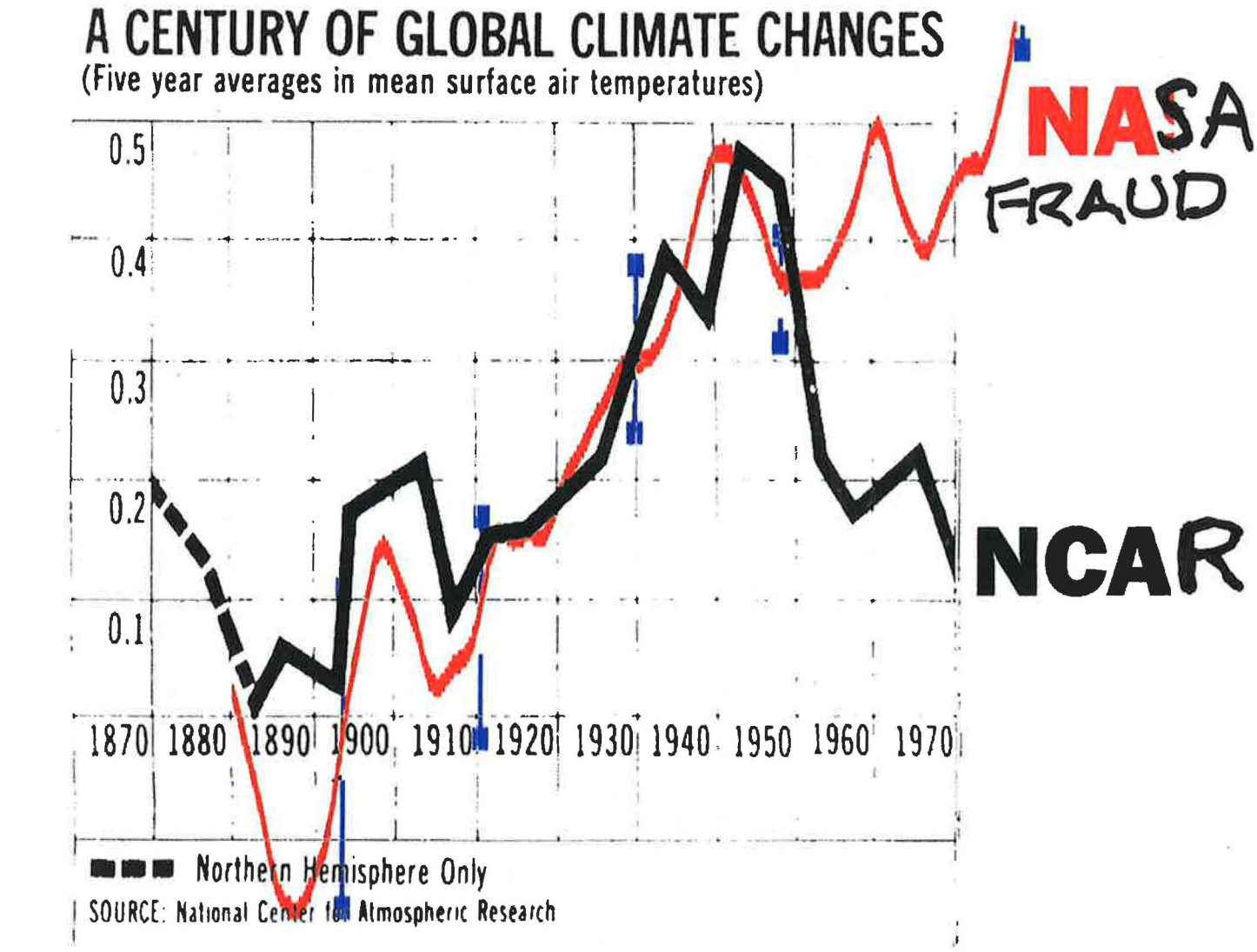
As the writer is permanently disabled from three strokes, he suffers from Anomic & Expressive Aphasia, so recognized that his language and spelling skills suffer at times. However that does not impact is Science & Engineering critical thinking, or his twenty seven (27) years of studying this issue.

This report submitted in regard to the RGGI mistake, entered into without regard to the science, engineering, taxpayer objection or Federal Law prohibiting Inter-State Regulation.

As always I reserve the right to extent and modify my remarks and add additional information as required.

John M. Chenosky, PE
Energy Specialist for 50 years
Debunker of the Faux Science of CAGW for 27 years

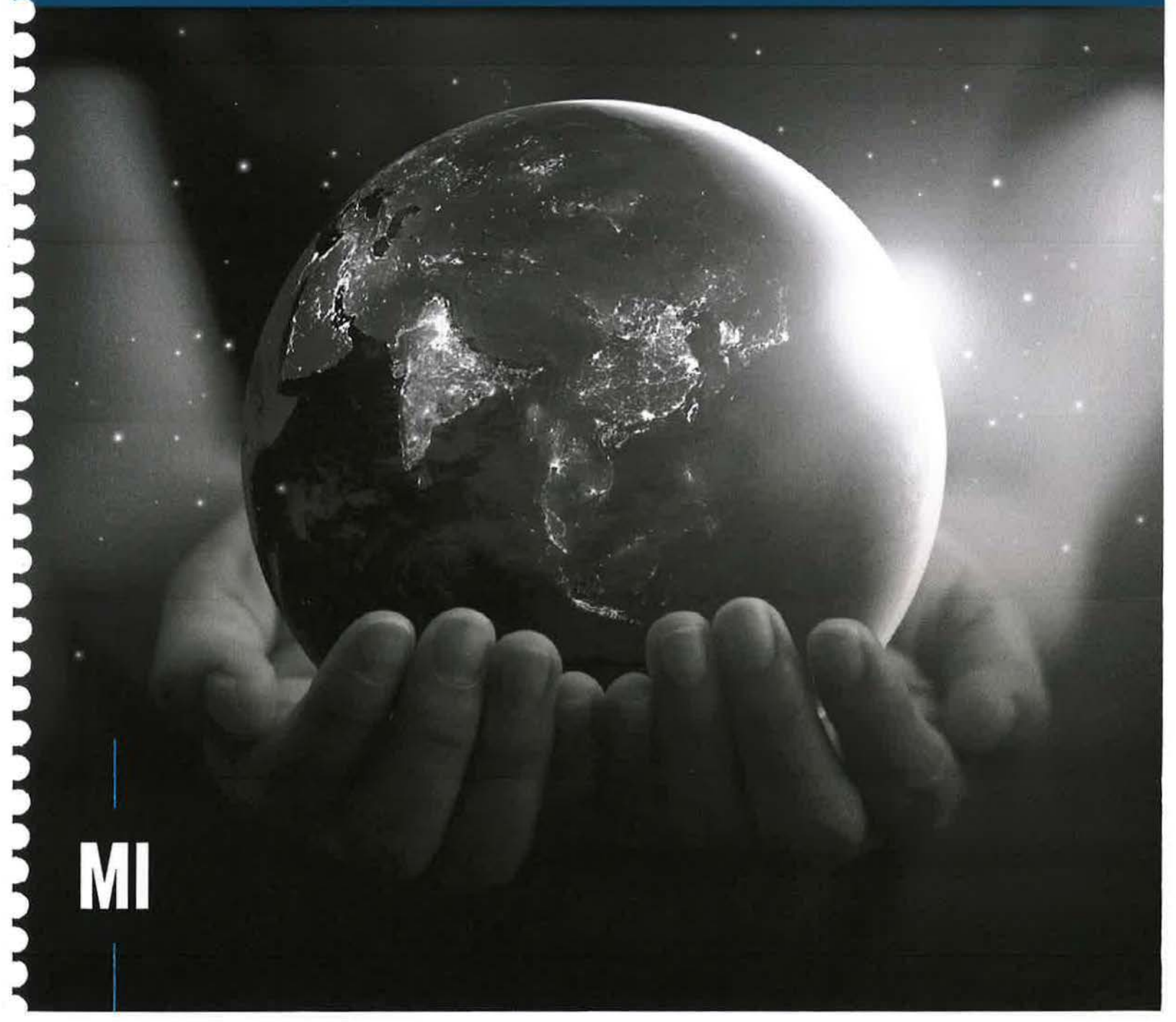

Tropical Mid-Tropospheric Temperature Variations
Models vs. Observations
5-Year Averages, 1979-2016 Trend line crosses zero at 1979 for all time series
Average of 102 CMIPS
Model Runs in 32 Groupings
Russian Model
Observations
Circles - Avg 4 Balloon datasets
Squares- Avg 3 Satellite datasets
Diamonds - Avg 3 Reanalyses
JR Christy, Univ. Alabama in Huntsville
Model output: KNMI Climate Explorer
°C
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020


A CENTURY OF GLOBAL CLIMATE CHANGES
(Five year averages in mean surface air temperatures)
0.5
0.4
0.3
0.2
0.1
1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970
NASA
FRAUD
NCAR
Northern Hemisphere Only
SOURCE: National Center for Atmospheric Research

REPORT | March 2019

THE "NEW ENERGY ECONOMY": AN EXERCISE IN MAGICAL THINKING

Mark P. Mills
Senior Fellow



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About the Author

Mark P. Mills is a senior fellow at the Manhattan Institute and a faculty fellow at Northwestern University's McCormick School of Engineering and Applied Science, where he co-directs an Institute on Manufacturing Science and Innovation. He is also a strategic partner with Cottonwood Venture Partners (an energy-tech venture fund). Previously, Mills cofounded Digital Power Capital, a boutique venture fund, and was chairman and CTO of ICx Technologies, helping take it public in 2007. Mills is a regular contributor to Forbes.com and is author of *Work in the Age of Robots* (2018). He is also coauthor of *The Bottomless Well: The Twilight of Fuel, the Virtue of Waste, and Why We Will Never Run Out of Energy* (2005). His articles have been published in the *Wall Street Journal*, *USA Today*, and Real Clear. Mills has appeared as a guest on CNN, Fox, NBC, PBS, and The Daily Show with Jon Stewart. In 2016, Mills was named "Energy Writer of the Year" by the American Energy Society.

Earlier, Mills was a technology advisor for Bank of America Securities and coauthor of the *Huber-Mills Digital Power Report*, a tech investment newsletter. He has testified before Congress and briefed numerous state public-service commissions and legislators. Mills served in the White House Science Office under President Reagan and subsequently provided science and technology policy counsel to numerous private-sector firms, the Department of Energy, and U.S. research laboratories.

Early in his career, Mills was an experimental physicist and development engineer at Bell Northern Research (Canada's Bell Labs) and at the RCA David Sarnoff Research Center on microprocessors, fiber optics, missile guidance, earning several patents for his work. He holds a degree in physics from Queen's University in Ontario, Canada.

Contents

Executive Summary

A movement has been growing for decades to replace hydrocarbons, which collectively supply 84% of the world's energy. It began with the fear that we were running out of oil. That fear has since migrated to the belief that, because of climate change and other environmental concerns, society can no longer tolerate burning oil, natural gas, and coal—all of which have turned out to be abundant.

So far, wind, solar, and batteries—the favored alternatives to hydrocarbons—provide about 2% of the world's energy and 3% of America's. Nonetheless, a bold new claim has gained popularity: that we're on the cusp of a tech-driven energy revolution that not only can, but inevitably will, rapidly replace all hydrocarbons.

This "new energy economy" rests on the belief—a centerpiece of the Green New Deal and other similar proposals both here and in Europe—that the technologies of wind and solar power and battery storage are undergoing the kind of disruption experienced in computing and communications, dramatically lowering costs and increasing efficiency. But this core analogy glosses over profound differences, grounded in physics, between systems that produce energy and those that produce information.

In the world of people, cars, planes, and factories, increases in consumption, speed, or carrying capacity cause hardware to expand, not shrink. The energy needed to move a ton of people, heat a ton of steel or silicon, or grow a ton of food is determined by properties of nature whose boundaries are set by laws of gravity, inertia, friction, mass, and thermodynamics—not clever software.

This paper highlights the physics of energy to illustrate why there is no possibility that the world is undergoing—or can undergo—a near-term transition to a "new energy economy."

Among the reasons:

- Scientists have yet to discover, and entrepreneurs have yet to invent, anything as remarkable as hydrocarbons in terms of the combination of low-cost, high-energy density, stability, safety, and portability. In practical terms, this means that spending $1 million on utility-scale wind turbines, or solar panels will each, over 30 years of operation, produce about 50 million kilowatt-hours (kWh)—while an equivalent $1 million spent on a shale rig produces enough natural gas over 30 years to generate over 300 million kWh.

- Solar technologies have improved greatly and will continue to become cheaper and more efficient. But the era of 10-fold gains is over. The physics boundary for silicon photovoltaic (PV) cells, the Shockley-Queisser Limit, is a maximum conversion of 34% of photons into electrons; the best commercial PV technology today exceeds 26%.

- Wind power technology has also improved greatly, but here, too, no 10-fold gains are left. The physics boundary for a wind turbine, the Betz Limit, is a maximum capture of 60% of kinetic energy in moving air; commercial turbines today exceed 40%.

- The annual output of Tesla's Gigafactory, the world's largest battery factory, could store three minutes' worth of annual U.S. electricity demand. It would require 1,000 years of production to make enough batteries for two days' worth of U.S. electricity demand. Meanwhile, 50–100 pounds of materials are mined, moved, and processed for every pound of battery produced.

THE "NEW ENERGY ECONOMY": AN EXERCISE IN MAGICAL THINKING

Introduction

A growing chorus of voices is exhorting the public, as well as government policymakers, to embrace the necessity—indeed, the inevitability—of society's transition to a "new energy economy." (See sidebar, **Peak Hydrocarbons Just Around the Corner**.) Advocates claim that rapid technological changes are becoming so disruptive and renewable energy is becoming so cheap and so fast that there is no economic risk in accelerating the move to—or even mandating—a post-hydrocarbon world that no longer needs to use much, if any, oil, natural gas, or coal.

Central to that worldview is the proposition that the energy sector is undergoing the same kind of technology disruptions that Silicon Valley tech has brought to so many other markets. Indeed, "old economy" energy companies are a poor choice for investors, according to proponents of the new energy economy, because the assets of hydrocarbon companies will soon become worthless, or "stranded."[1] Betting on hydrocarbon companies today is like betting on Sears instead of Amazon a decade ago.

"Mission Possible," a 2018 report by an international Energy Transitions Commission, crystallized this growing body of opinion on both sides of the Atlantic.[2] To "decarbonize" energy use, the report calls for the world to engage in three "complementary" actions: aggressively deploy renewables or so-called clean tech, improve energy efficiency, and limit energy demand.

This prescription should sound familiar, as it is identical to a nearly universal energy-policy consensus that coalesced following the 1973–74 Arab oil embargo that shocked the world. But while the past half-century's energy policies were animated by fears of resource depletion, the fear now is that burning the world's abundant hydrocarbons releases dangerous amounts of carbon dioxide into the atmosphere.

To be sure, history shows that grand energy transitions are possible. The key question today is whether the world is on the cusp of another.

The short answer is no. There are two core flaws with the thesis that the world can soon abandon hydrocarbons. The first: physics realities do not allow energy domains to undergo the kind of revolutionary change experienced on the digital frontiers. The second: no fundamentally new energy technology has been discovered or invented in nearly a century—certainly, nothing analogous to the invention of the transistor or the Internet.

Before these flaws are explained, it is best to understand the contours of today's hydrocarbon-based energy economy and why replacing it would be a monumental, if not an impossible, undertaking.

Moonshot Policies and the Challenge of Scale

The universe is awash in energy. For humanity, the challenge has always been to deliver energy in a useful way that is both tolerable and available when it is needed, not when nature or luck offers it. Whether it be wind or water on the surface, sunlight from above, or hydrocarbons buried deep in the earth, converting an energy

Peak Hydrocarbons Just Around the Corner

"[Clean tech is] a perfect example of a 10x exponential process which will wipe fossil fuels off the market in about a decade."
—TONY SEBA, STANFORD ECONOMIST

"Until now, observers mostly paid attention to the likely effectiveness of climate policies, but not to the ongoing and effectively irreversible technological [energy] transition."
— JEAN-FRANÇOIS MERCURE, CAMBRIDGE UNIVERSITY

"[By] 2030, the cost [of solar] could be so near to zero it will effectively be free."
— SAM ARIE, UBS RESEARCH ANALYST

"The world is experiencing a global energy transformation driven by technological change and new policy priorities."
— EUROPEAN UNION, MISSION POSSIBLE REPORT FOR THE G20

"Global shift to clean energy is under way, but much more needs to be done."
— LETTER TO G7 SUMMIT BY 288 OF THE WORLD'S LARGEST INVESTORS

"A carbon tax should increase every year until emissions reductions goals are met [which] ... will encourage [carbon-free] technological innovation and large-scale infrastructure development."
— BAKER-SHULTZ PLAN, SIGNED BY ECONOMISTS, NOBELISTS, FED RESERVE CHAIRS, ETC.

"Green technologies, like batteries and solar and wind power, are improving far faster than many realize ... [It's] the biggest reshuffling of the economy since the Industrial Revolution."
— JEREMY GRANTHAM, INVESTOR, BILLIONAIRE

"Smartphone substitution seemed no more imminent in the early 2000s than large-scale energy substitution seems today."
— INTERNATIONAL MONETARY FUND

Source: Tony Seba, "Clean Disruption" (video), Stanford University, 2017; Jean-François Mercure quoted in Steve Hanley, "Carbon Bubble About to Burst, Leaving Trillions in Stranded Assets Behind, Claims New Research," Clean Technica, June 5, 2018; Sam Arie, "Renewables Are Primed to Enter the Global Energy Race," *Financial Times*, Aug. 13, 2018; OECD, "Mission Possible," Energy Transitions Commission, November 2018; Steve Hanley, "Ahead of G7 Meeting, Investors Urge an End to Coal Power & Fossil Fuel Subsidies," Clean Technica, June 5, 2018; "Economists' Statement on Carbon Dividends; "Investing Prophet Jeremy Grantham Takes Aim at Climate Change," Bloomberg, Jan. 17, 2019; *Wall Street Journal*, Jan. 16, 2019 (Baker-Shultz plan); International Monetary Fund, "Riding the Energy Transition: Oil Beyond 2040," May 2017

source into useful power always requires capital-intensive hardware.

Considering the world's population and the size of modern economies, scale matters. In physics, when attempting to change any system, one has to deal with inertia and various forces of resistance; it's far harder to turn or stop a Boeing than it is a bumblebee. In a social system, it's far more difficult to change the direction of a country than it is a local community.

Today's reality: hydrocarbons—oil, natural gas, and coal—supply 84% of global energy, a share that has decreased only modestly from 87% two decades ago (**Figure 1**).[3] Over those two decades, total world energy use rose by 50%, an amount equal to adding two entire United States' worth of demand.[4]

The small percentage-point decline in the hydrocarbon share of world energy use required over $2 trillion in cumulative global spending on alternatives over that period.[5] Popular visuals of fields festooned with windmills and rooftops laden with solar cells don't change the fact that these two energy sources today provide less than 2% of the global energy supply and 3% of the U.S. energy supply.

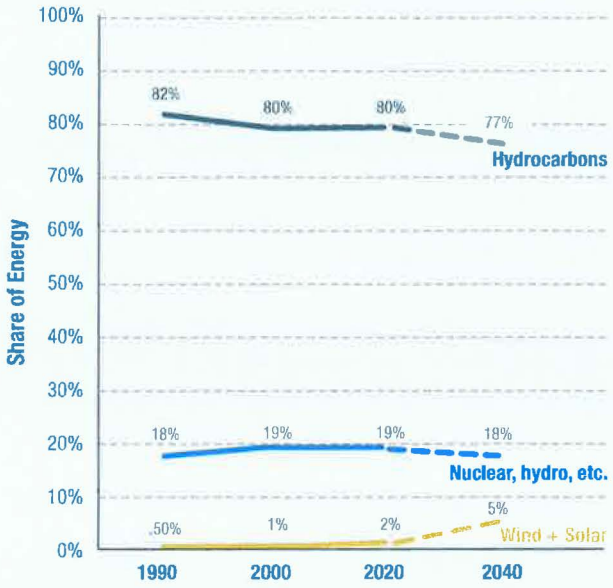
The scale challenge for any energy resource transformation begins with a description. Today, the world's economies require an annual production of 35 billion barrels of petroleum, plus the energy equivalent of another 30 billion barrels of oil from natural gas, plus the energy equivalent of yet another 28 billion barrels of oil from coal. In visual terms: if all that fuel were in the form of oil, the barrels would form a line from Washington, D.C., to Los Angeles, and that entire line would increase in height by one Washington Monument every week.

To completely replace hydrocarbons over the next 20 years, global renewable energy production would have to increase by at least 90-fold.[6] For context: it took a half-century for global oil and gas production to expand by 10-fold.[7] It is a fantasy to think, costs aside, that any new form of energy infrastructure could now expand nine times more than that in under half the time.

If the initial goal were more modest—say, to replace hydrocarbons only in the U.S. and only those used in electricity generation—the project would require an industrial effort greater than a World War II–level of mobilization.[8] A transition to 100% non-hydrocarbon *electricity* by 2050 would require a U.S. grid construction program 14-fold bigger than the grid build-out rate that has taken place over the past half-century.[9] Then, to finish the transformation, this Promethean

FIGURE 1.

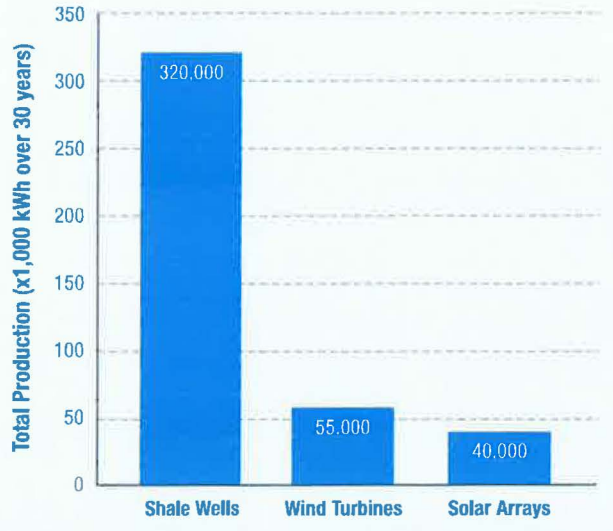
How the World Is Fueled



Source: ExxonMobil, "2018 Outlook for Energy: A View to 2040"; Energy Information Agency (EIA), "International Energy Statistics"

FIGURE 2.

Total 30-Year Electricity Production from $1 Million in Hardware: Wind Turbines, Solar Arrays, and Shale Wells



Source: Lazard, "Lazard's Levelized Cost of Energy Analysis," 2018; Gulfport Energy, Credit Suisse Energy Summit, 2019; Cabot Oil & Gas, Heikkinen Energy Conference, Aug. 15, 2018

effort would need to be more than doubled to tackle nonelectric sectors, where 70% of U.S. hydrocarbons are consumed. And all that would affect a mere 16% of world energy use, America's share.

This daunting challenge elicits a common response: "If we can put a man on the moon, surely we can [fill in the blank with any aspirational goal]." But transforming the energy economy is not like putting a few people on the moon a few times. It is like putting all of humanity on the moon—permanently.

The Physics-Driven Cost Realities of Wind and Solar

The technologies that frame the new energy economy vision distill to just three things: windmills, solar panels, and batteries.[10] While batteries don't produce energy, they are crucial for ensuring that episodic wind and solar power is available for use in homes, businesses, and transportation.

Yet windmills and solar power are themselves not "new" sources of energy. The modern wind turbine appeared 50 years ago and was made possible by new materials, especially hydrocarbon-based fiberglass. The first commercially viable solar tech also dates back a half-century, as did the invention of the lithium battery (by an Exxon researcher).[11]

Over the decades, all three technologies have greatly improved and become roughly 10-fold cheaper.[12] Subsidies aside, that fact explains why, in recent decades, the use of wind/solar has expanded so much from a base of essentially zero.

Nonetheless, wind, solar, and battery tech will continue to become better, within limits. Those limits matter a great deal—about which, more later—because of the overwhelming demand for power in the modern world and the realities of energy sources on offer from Mother Nature.

With today's technology, $1 million worth of utility-scale solar panels will produce about 40 million kilowatt-hours (kWh) over a 30-year operating period (**Figure 2**). A similar metric is true for wind: $1 million worth of a modern wind turbine produces 55 million kWh over the same 30 years.[13] Meanwhile, $1 million worth of hardware for a shale rig will produce enough natural gas over 30 years to generate over 300 million

kWh.[14] That constitutes about 600% more electricity for the same capital spent on primary energy-producing hardware.[15]

The fundamental differences between these energy resources can also be illustrated in terms of individual equipment. For the cost to drill a single shale well, one can build two 500-foot-high, 2-megawatt (MW) wind turbines. Those two wind turbines produce a combined output averaging over the years to the energy equivalent of 0.7 barrels of oil per hour. The same money spent on a single shale rig produces 10 barrels of oil, per hour, or its energy equivalent in natural gas, averaged over the decades.[16]

The huge disparity in output arises from the inherent differences in energy densities that are features of nature immune to public aspiration or government subsidy. The high energy density of the physical chemistry of hydrocarbons is unique and well understood, as is the science underlying the low energy density inherent in surface sunlight, wind volumes, and velocity.[17] *Regardless of what governments dictate that utilities pay for that output, the quantity of energy produced is determined by how much sunlight or wind is available over any period of time and the physics of the conversion efficiencies of photovoltaic cells or wind turbines.*

These kinds of comparisons between wind, solar, and natural gas illustrate the starting point in making a raw energy resource useful. But for any form of energy to become a primary source of power, additional technology is required. For gas, one necessarily spends money on a turbo-generator to convert the fuel into grid electricity. For wind/solar, spending is required for some form of storage to convert episodic electricity into utility-grade, 24/7 power.

The high cost of ensuring energy availability

Availability is the single most critical feature of any energy infrastructure, followed by price, followed by the eternal search for decreasing costs without affecting availability. Until the modern energy era, economic and social progress had been hobbled by the episodic nature of energy availability. That's why, so far, more than 90% of America's electricity, and 99% of the power used in transportation, comes from sources that can easily supply energy any time on demand.[18]

In our data-centric, increasingly electrified, society, always-available power is vital. But, as with all things, physics constrains the technologies and the costs for supplying availability.[19] For hydrocarbon-based systems, availability is dominated by the cost of equipment that can convert fuel-to-power continuously for at least 8,000 hours a year, for decades. Meanwhile, it's inherently easy to store the associated fuel to meet expected or unexpected surges in demand, or delivery failures in the supply chain caused by weather or accidents.

It costs less than $1 a barrel to store oil or natural gas (in oil-energy equivalent terms) for a couple of months.[20] Storing coal is even cheaper. Thus, unsurprisingly, the U.S., on average, has about one to two *months'* worth of national demand in storage for each kind of hydrocarbon at any given time.[21]

Meanwhile, with batteries, it costs roughly $200 to store the energy equivalent to one barrel of oil.[22] Thus, instead of months, barely two *hours* of national electricity demand can be stored in the combined total of all the utility-scale batteries on the grid plus all the batteries in the 1 million electric cars that exist today in America.[23]

For wind/solar, the features that dominate cost of availability are inverted, compared with hydrocarbons. While solar arrays and wind turbines do wear out and require maintenance as well, the physics and thus additional costs of that wear-and-tear are less challenging than with combustion turbines. But the complex and comparatively unstable electrochemistry of batteries makes for an inherently more expensive and less efficient way to store energy and ensure its availability.

Since hydrocarbons are so easily stored, idle conventional power plants can be dispatched—ramped up and down—to follow cyclical demand for electricity. Wind turbines and solar arrays cannot be dispatched when there's no wind or sun. As a matter of geophysics, both wind-powered and sunlight-energized machines produce energy, averaged over a year, about 25%–30% of the time, often less.[24] Conventional power plants, however, have very high "availability," in the 80%–95% range, and often higher.[25]

A wind/solar grid would need to be sized to meet both peak demand *and* to have enough extra capacity beyond peak needs in order to produce and store additional electricity when sun and wind are available. This means, on average, that a pure wind/solar system would necessarily have to be about threefold the capacity of a hydrocarbon grid: i.e., one needs to build 3 kW of wind/solar equipment for every 1 kW of combustion equipment eliminated. That directly translates into a threefold cost disadvantage, even if the per-kW costs were all the same.[26]

Even this necessary extra capacity would not suffice. Meteorological and operating data show that average monthly wind and solar electricity output can drop as much as twofold during each source's respective "low" season.[27]

The myth of grid parity

How do these capacity and cost disadvantages square with claims that wind and solar *are already* at or near "grid parity" with conventional sources of electricity? The U.S. Energy Information Agency (EIA) and other similar analyses report a "levelized cost of energy" (LCOE) for all types of electric power technologies. In the EIA's LCOE calculations, electricity from a wind turbine or solar array is calculated as 36% and 46%, respectively, more expensive than from a natural-gas turbine—i.e., approaching parity.[28] But in a critical and rarely noted caveat, EIA states: "The LCOE values for dispatchable and non-dispatchable technologies are listed separately in the tables because comparing them *must be done carefully*"[29] (emphasis added). Put differently, the LCOE calculations do not take into account the array of real, if hidden, costs needed to operate a reliable 24/7 and 365-day-per-year energy infrastructure—or, in particular, a grid that used only wind/solar.

The LCOE considers the hardware in isolation while ignoring real-world system costs essential to supply 24/7 power. Equally misleading, an LCOE calculation, despite its illusion of precision, relies on a variety of assumptions and guesses subject to dispute, if not bias.

For example, an LCOE assumes that the future cost of competing fuels—notably, natural gas—will rise significantly. But that means that the LCOE is more of a forecast than a calculation. This is important because a "levelized cost" uses such a forecast to calculate a purported average cost over a long period. The assumption that gas prices will go up is at variance with the fact that they have decreased over the past decade and the evidence that low prices are the new normal for the foreseeable future.[30] Adjusting the LCOE calculation to reflect a future where gas prices don't rise radically increases the LCOE cost advantage of natural gas over wind/solar.

An LCOE incorporates an even more subjective feature, called the "discount rate," which is a way of comparing the value of money today versus the future. A low discount rate has the effect of tilting an outcome to make it more appealing to spend precious capital today to solve a future (theoretical) problem. Advocates of using low discount rates are essentially assuming slow economic growth.[31]

A high discount rate effectively assumes that a future society will be far richer than today (not to mention have better technology).[32] Economist William Nordhaus's work in this field, wherein he advocates using a high discount rate, earned him a 2018 Nobel Prize.

An LCOE also requires an assumption about average multi-decade capacity factors, the share of time the equipment actually operates (i.e., the real, not theoretical, amount of time the sun shines and wind blows). EIA assumes, for example, 41% and 29% capacity factors, respectively, for wind and solar. But data collected from operating wind and solar farms reveal actual median capacity factors of 33% and 22%.[33] The difference between assuming a 40% but experiencing a 30% capacity factor means that, over the 20-year life of a 2-MW wind turbine, $3 million of energy production assumed in the financial models won't exist—and that's for a turbine with an initial capital cost of about $3 million.

U.S. wind-farm capacity factors have been getting better but at a slow rate of about 0.7% per year over the past two decades.[34] Notably, this gain was achieved mainly by reducing the number of turbines per acre trying to scavenge moving air—resulting in average land used per unit of wind energy increasing by some 50%.

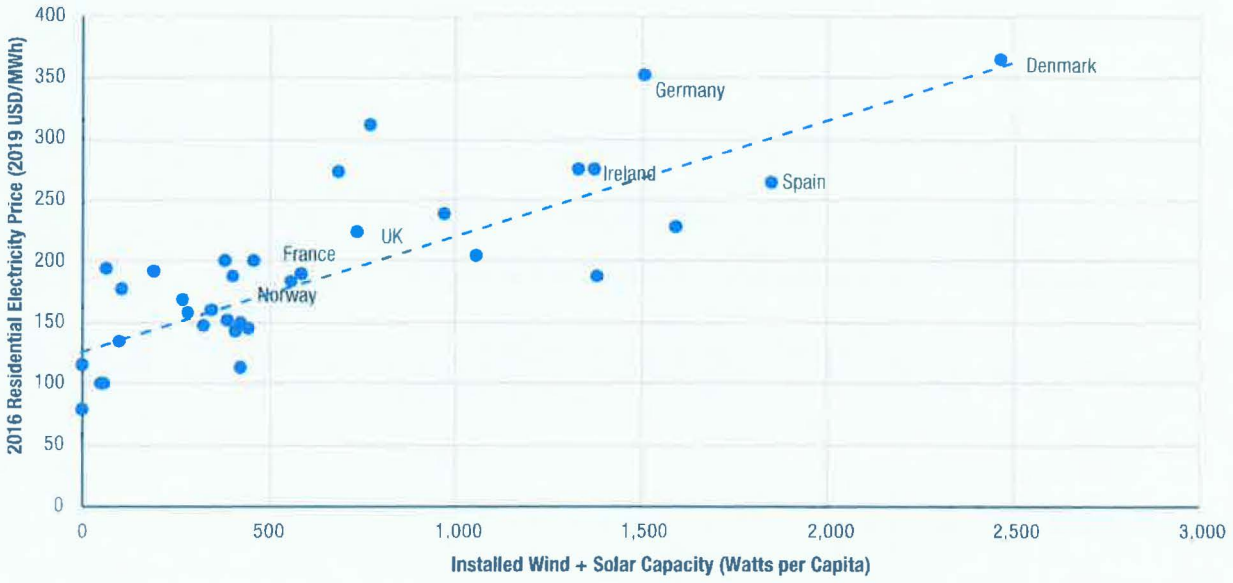
LCOE calculations do reasonably include costs for such things as taxes, the cost of borrowing, and maintenance. But here, too, mathematical outcomes give the appearance of precision while hiding assumptions. For example, assumptions about maintenance costs and performance of wind turbines over the long term may be overly optimistic. Data from the U.K., which is further down the wind-favored path than the U.S., point to far faster degradation (less electricity per turbine) than originally forecast.[35]

To address at least one issue with using LCOE as a tool, the International Energy Agency (IEA) recently proposed the idea of a "value-adjusted" LCOE, or VALCOE, to include the elements of flexibility and incorporate the economic implications of dispatchability. IEA calculations using a VALCOE method yielded coal power, for example, far cheaper than solar, with a cost penalty widening as a grid's share of solar generation rises.[36]

One would expect that, long before a grid is 100% wind/solar, the kinds of real costs outlined above should already be visible. As it happens, regardless of putative LCOEs, we do have evidence of the economic impact that arises from increasing the use of wind and solar energy.

FIGURE 3.

European Wind/Solar Capacity and Electricity Prices



Source: Eurostat, "Electricity Prices for Household Consumers—Bi-Annual Data (from 2007 Onwards)"

The Hidden Costs of a "Green" Grid

Subsidies, tax preferences, and mandates can hide real-world costs, but when enough of them accumulate, the effect should be visible in overall system costs. And it is. In Europe, the data show that the higher the share of wind/solar, the higher the average cost of grid electricity (**Figure 3**).

Germany and Britain, well down the "new energy" path, have seen average electricity rates rise 60%–110% over the past two decades.[37] The same pattern—more wind/solar and higher electricity bills—is visible in Australia and Canada.[38]

Since the share of wind power, on a per-capita basis, in the U.S. is still at only a small fraction of that in most of Europe, the cost impacts on American ratepayers are less dramatic and less visible. Nonetheless, average U.S. residential electric costs have risen some 20% over the past 15 years.[39] That should not have been the case. Average electric rates should have gone down, not up.

Here's why: coal and natural gas together supplied about 70% of electricity over that 15-year period.[40] The price of fuel accounts for about 60%–70% of the cost to produce electricity when using hydrocarbons.[41] Thus, about half the average cost of America's electricity depends on coal and gas prices. The price of both those fuels has gone down by over 50% over that 15-year period. Utility costs, specifically, to purchase gas and coal are down some 25% over the past decade alone. In other words, cost savings from the shale-gas revolution have significantly insulated consumers, so far, from even higher rate increases.

The increased use of wind/solar imposes a variety of hidden, physics-based costs that are rarely acknowledged in utility or government accounting. For example, when large quantities of power are rapidly, repeatedly, and unpredictably cycled up and down, the challenge and costs associated with "balancing" a grid (i.e., keeping it from failing) are greatly increased. OECD analysts estimate that at least some of those "invisible" costs imposed on the grid add 20%–50% to the cost of grid kilowatt-hours.[42]

Furthermore, flipping the role of the grid's existing power plants from primary to backup for wind/solar leads to other real but unallocated costs that emerge from physical realities. Increased cycling of conventional power plants increases wear-and-tear and maintenance costs. It also reduces the utilization of those expensive assets, which means that capital

costs are spread out over fewer kWh produced—thereby arithmetically increasing the cost of each of those kilowatt-hours.[43]

Then, if the share of episodic power becomes significant, the potential rises for complete system blackouts. That has happened twice after the wind died down unexpectedly (with some customers out for days in some areas) in the state of South Australia, which derives over 40% of its electricity from wind.[44]

After a total system outage in South Australia in 2018, Tesla, with much media fanfare, installed the world's single largest lithium battery "farm" on that grid.[45] For context, to keep South Australia lit for one half-day of no wind would require 80 such "world's biggest" Tesla battery farms, and that's on a grid that serves just 2.5 million people.

Engineers have other ways to achieve reliability; using old-fashioned giant diesel-engine generators as backup (engines essentially the same as those that propel cruise ships or that are used to back up data centers). Without fanfare, because of rising use of wind, U.S. utilities have been installing grid-scale engines at a furious pace. The grid now has over $4 billion in utility-scale, engine-driven generators (enough for about 100 cruise ships), with lots more to come. Most burn natural gas, though a lot of them are oil-fired. Three times as many such big reciprocating engines have been added to America's grid over the past two decades as over the half-century prior to that.[46]

All these costs are real and are not allocated to wind or solar generators. But electricity consumers pay them. A way to understand what's going on: managing grids with hidden costs imposed on non-favored players would be like levying fees on car drivers for the highway wear-and-tear caused by heavy trucks while simultaneously subsidizing the cost of fueling those trucks.

The issue with wind and solar power comes down to a simple point: their usefulness is impractical *on a national scale* as a major or primary fuel source for generating electricity. As with any technology, pushing the boundaries of practical utilization is possible but usually not sensible or cost-effective. Helicopters offer an instructive analogy.

The development of a practical helicopter in the 1950s (four decades after its invention) inspired widespread hyperbole about that technology revolutionizing personal transportation. Today, the manufacture and use of helicopters is a multibillion-dollar niche industry providing useful and often-vital services. But one would no more use helicopters for regular Atlantic travel—though doable with elaborate logistics—than employ a nuclear reactor to power a train or photovoltaic systems to power a country.

Batteries Cannot Save the Grid or the Planet

Batteries are a central feature of new energy economy aspirations. It would indeed revolutionize the world to find a technology that could store electricity as effectively and cheaply as, say, oil in a barrel, or natural gas in an underground cavern.[47] Such electricity-storage hardware would render it unnecessary even to build domestic power plants. One could imagine an OKEC (Organization of Kilowatt-Hour Exporting Countries) that shipped barrels of electrons around the world from nations where the cost to fill those "barrels" was lowest; solar arrays in the Sahara, coal mines in Mongolia (out of reach of Western regulators), or the great rivers of Brazil.

But in the universe that we live in, the cost to store energy in grid-scale batteries is, as earlier noted, about 200-fold more than the cost to store natural gas to generate electricity when it's needed.[48] That's why we store, at any given time, months' worth of national energy supply in the form of natural gas or oil.

Battery storage is quite another matter. Consider Tesla, the world's best-known battery maker: $200,000 worth of Tesla batteries, which collectively weigh over 20,000 pounds, are needed to store the energy equivalent of one barrel of oil.[49] A barrel of oil, meanwhile, weighs 300 pounds and can be stored in a $20 tank. Those are the *realities* of today's lithium batteries. Even a 200% improvement in underlying battery economics and technology won't close such a gap.

Nonetheless, policymakers in America and Europe enthusiastically embrace programs and subsidies to vastly expand the production and use of batteries at grid scale.[50] Astonishing quantities of batteries will be needed to keep country-level grids energized—and the level of mining required for the underlying raw materials would be epic. For the U.S., at least, given where the materials are mined and where batteries are made, imports would increase radically. Perspective on each of these realities follows.

How many batteries would it take to light the nation?

A grid based entirely on wind and solar necessitates going beyond preparation for the normal daily variability of wind and sun; it also means preparation for the frequency and duration of periods when there would be not only far less wind and sunlight combined but also for periods when there would be none of either. While uncommon, such a combined event—daytime continental cloud cover with no significant wind anywhere, or nighttime with no wind—has occurred more than a dozen times over the past century—effectively, once every decade. On these occasions, a combined wind/solar grid would not be able to produce a tiny fraction of the nation's electricity needs. There have also been frequent one-hour periods when 90% of the national electric supply would have disappeared.[51]

So how many batteries would be needed to store, say, not two months' but two days' worth of the nation's electricity? The $5 billion Tesla "Gigafactory" in Nevada is currently the world's biggest battery manufacturing facility.[52] Its total annual production could store three *minutes'* worth of annual U.S. electricity demand. Thus, in order to fabricate a quantity of batteries to store two days' worth of U.S. electricity demand would require 1,000 years of Gigafactory production.

Wind/solar advocates propose to minimize battery usage with enormously long transmission lines on the observation that it is always windy or sunny somewhere. While theoretically feasible (though not always true, even at country-level geographies), the length of transmission needed to reach somewhere "always" sunny/windy also entails substantial reliability and security challenges. (And long-distance transport of energy by wire is twice as expensive as by pipeline.)[53]

Building massive quantities of batteries would have epic implications for mining

A key rationale for the pursuit of a new energy economy is to reduce environmental externalities from the use of hydrocarbons. While the focus these days is mainly on the putative long-term effects of carbon dioxide, all forms of energy production entail various unregulated externalities inherent in extracting, moving, and processing minerals and materials.

Radically increasing battery production will dramatically affect mining, as well as the energy used to access, process, and move minerals and the energy needed for the battery fabrication process itself. About 60 pounds of batteries are needed to store the energy equivalent to that in one pound of hydrocarbons. Meanwhile, 50–100 pounds of various materials are mined, moved, and processed for one pound of battery produced.[54] Such underlying realities translate into enormous quantities of minerals—such as lithium, copper, nickel, graphite, rare earths, and cobalt—that would need to be extracted from the earth to fabricate batteries for grids and cars.[55] A battery-centric future means a world mining gigatons more materials.[56] And this says nothing about the gigatons of materials needed to fabricate wind turbines and solar arrays, too.[57]

Even without a new energy economy, the mining required to make batteries will soon dominate the production of many minerals. Lithium battery production today already accounts for about 40% and 25%, respectively, of all lithium and cobalt mining.[58] In an all-battery future, global mining would have to expand by more than 200% for copper, by at least 500% for minerals like lithium, graphite, and rare earths, and far more than that for cobalt.[59]

Then there are the hydrocarbons and electricity needed to undertake all the mining activities and to fabricate the batteries themselves. In rough terms, it requires the energy equivalent of about 100 barrels of oil to fabricate a quantity of batteries that can store a single barrel of oil-equivalent energy.[60]

Given the regulatory hostility to mining on the U.S. continent, a battery-centric energy future virtually guarantees more mining elsewhere and rising import dependencies for America. Most of the relevant mines in the world are in Chile, Argentina, Australia, Russia, the Congo, and China. Notably, the Democratic Republic of Congo produces 70% of global cobalt, and China refines 40% of that output for the world.[61]

China already dominates global battery manufacturing and is on track to supply nearly two-thirds of all production by 2020.[62] The relevance for the new energy economy vision: 70% of China's grid is fueled by coal today and will still be at 50% in 2040.[63] This means that, over the life span of the batteries, there would be *more* carbon-dioxide emissions associated with manufacturing them than would be offset by using those batteries to, say, replace internal combustion engines.[64]

Transforming personal transportation from hydrocarbon-burning to battery-propelled vehicles is another

central pillar of the new energy economy. Electric vehicles (EVs) are expected not only to replace petroleum on the roads but to serve as backup storage for the electric grid as well.[65]

Lithium batteries have finally enabled EVs to become reasonably practical. Tesla, which now sells more cars in the top price category in America than does Mercedes-Benz, has inspired a rush of the world's manufacturers to produce appealing battery-powered vehicles.[66] This has emboldened bureaucratic aspirations for outright bans on the sale of internal combustion engines, notably in Germany, France, Britain, and, unsurprisingly, California.

Such a ban is not easy to imagine. Optimists forecast that the number of EVs in the world will rise from today's nearly 4 million to 400 million in two decades.[67] A world with 400 million EVs by 2040 would decrease global oil demand by barely 6%. This sounds counterintuitive, but the numbers are straightforward. There are about 1 billion automobiles today, and they use about 30% of the world's oil.[68] (Heavy trucks, aviation, petrochemicals, heat, etc. use the rest.) By 2040, there would be an estimated 2 billion cars in the world. Four hundred million EVs would amount to 20% of all the cars on the road—which would thus replace about 6% of petroleum demand.

In any event, batteries don't represent a revolution in personal mobility equivalent to, say, going from the horse-and-buggy to the car—an analogy that has been invoked.[69] Driving an EV is more analogous to changing what horses are fed and importing the new fodder.

Moore's Law Misapplied

Faced with all the realities outlined above regarding green technologies, new energy economy enthusiasts nevertheless believe that true breakthroughs are yet to come and are even inevitable. That's because, so it is claimed, energy tech will follow the same trajectory as that seen in recent decades with computing and communications. The world will yet see the equivalent of an Amazon or "Apple of clean energy."[70]

This idea is seductive because of the astounding advances in silicon technologies that so few forecasters anticipated decades ago. It is an idea that renders moot any cautions that wind/solar/batteries are too expensive today—such caution is seen as foolish and shortsighted, analogous to asserting, circa 1980, that the average citizen would never be able to afford a computer. Or saying, in 1984 (the year that the world's first cell phone was released), that a billion people would own a cell phone, when it cost $9,000 (in today's dollars). It was a two-pound "brick" with a 30-minute talk time.

Today's smartphones are not only far cheaper; they are far more powerful than a room-size IBM mainframe from 30 years ago. That transformation arose from engineers inexorably shrinking the size and energy appetite of transistors, and consequently increasing their number per chip roughly twofold every two years—the "Moore's Law" trend, named for Intel cofounder Gordon Moore.

The compound effect of that kind of progress has indeed caused a revolution. Over the past 60 years, Moore's Law has seen the efficiency of how logic engines *use* energy improve by over a billionfold.[71] But a similar transformation in how energy is *produced* or *stored* isn't just unlikely; it can't happen with the physics we know today.

In the world of people, cars, planes, and large-scale industrial systems, increasing speed or carrying capacity causes hardware to expand, not shrink. The energy needed to move a ton of people, heat a ton of steel or silicon, or grow a ton of food is determined by properties of nature whose boundaries are set by laws of gravity, inertia, friction, mass, and thermodynamics.

If combustion engines, for example, could achieve the kind of scaling efficiency that computers have since 1971—the year the first widely used integrated circuit was introduced by Intel—a car engine would generate a thousandfold *more* horsepower and shrink to the size of an *ant*.[72] With such an engine, a car could actually fly, very fast.

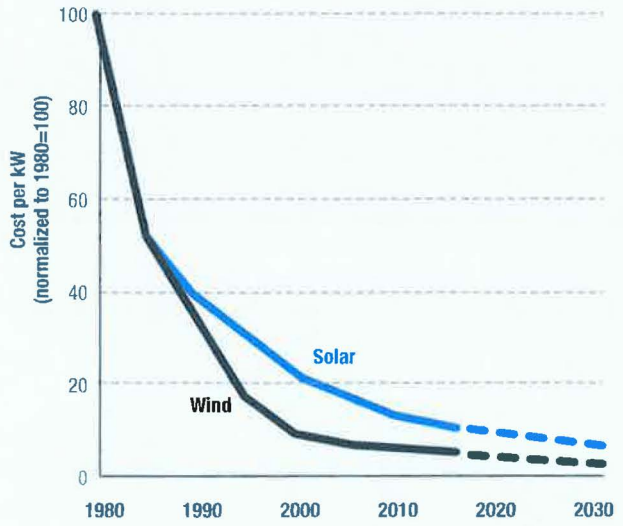
If photovoltaics scaled by Moore's Law, a single postage-stamp-size solar array would power the Empire State Building. If batteries scaled by Moore's Law, a battery the size of a book, costing three cents, could power an A380 to Asia.

But only in the world of comic books does the physics of propulsion or energy production work like that. In our universe, power scales the other way.

An ant-size engine—which has been built—produces roughly 100,000 times *less* power than a Prius. An ant-size solar PV array (also feasible) produces a thousandfold less energy than an ant's biological muscles. The energy equivalent of the aviation fuel actually used by an aircraft flying to Asia would take $60 million worth of Tesla-type batteries weighing five times more than that aircraft.[73]

FIGURE 4.

Cost Reductions for Wind and Solar Power, 1980–2030



Source: Data drawn from Massachusetts Institute of Technology, Energy Initiative, "The Future of Solar Energy: An Interdisciplinary MIT Study," 2015; Johannes N. Mayer, "Current and Future Cost of Photovoltaics," Agora Energiewende, February 2015; David Feldman et al., "NREL Photovoltaic Pricing Trends: Historical, Recent, and Near-Term Projections," National Renewable Energy Laboratory (NREL), Aug. 25, 2015; Ryan Wiser et al., "Forecasting Wind Energy Costs and Cost Drivers," Lawrence Berkeley National Laboratory, June 2016; Ran Fu, David Feldman, and Robert Margolis, "U.S. Solar Photovoltaic System Cost Benchmark: Q1 2018," NREL, November 2018

The challenge in storing and processing information using the smallest possible amount of energy is distinct from the challenge of producing energy, or of moving or reshaping physical objects. The two domains entail different laws of physics.

The world of logic is rooted in simply knowing and storing the fact of the binary state of a switch—i.e., whether it is on or off. Logic engines don't produce physical action but are designed to manipulate the *idea* of the numbers zero and one. Unlike engines that carry people, logic engines can use software to do things such as compress information through clever mathematics and thus reduce energy use. No comparable compression options exist in the world of humans and hardware.

Of course, wind turbines, solar cells, and batteries will continue to improve significantly in cost and performance; so will drilling rigs and combustion turbines (a subject taken up next). And, of course, Silicon Valley information technology will bring important, even dramatic, efficiency gains in the production and management of energy and physical goods (a prospect also taken up below). But the outcomes won't be as miraculous as the invention of the integrated circuit, or the discovery of petroleum or nuclear fission.

Sliding Down the Renewable Asymptote

Forecasts for a continual rapid decline in costs for wind/solar/batteries are inspired by the gains that those technologies have already experienced. The first two decades of commercialization, after the 1980s, saw a 10-fold reduction in costs. But the path for improvements now follows what mathematicians call an asymptote; or, put in economic terms, improvements are subject to a law of diminishing returns where every incremental gain yields less progress than in the past (**Figure 4**).

This is a normal phenomenon in all physical systems. Throughout history, engineers have achieved big gains in the early years of a technology's development, whether wind or gas turbines, steam or sailing ships, internal combustion or photovoltaic cells. Over time, engineers manage to approach nature's limits. Bragging rights for gains in efficiency—or speed, or other equivalent metrics such as energy density (power per unit of weight or volume) then shrink from double-digit percentages to fractional percentage changes. Whether it's solar, wind tech, or aircraft turbines, the gains in performance are now all measured in single-digit percentage gains. Such progress is economically meaningful but is not revolutionary.

The physics-constrained limits of energy systems are unequivocal. Solar arrays *can't* convert more photons than those that arrive from the sun. Wind turbines *can't* extract more energy than exists in the kinetic flows of moving air. Batteries *are* bound by the physical chemistry of the molecules chosen. Similarly, no matter how much better jet engines become, an A380 will *never* fly to the moon. An oil-burning engine *can't* produce more energy than what is contained in the physical chemistry of hydrocarbons.

Combustion engines have what's called a Carnot Efficiency Limit, which is anchored in the temperature of combustion and the energy available in the fuel. The limits are long established and well understood. In theory, at a high enough temperature, 80% of the chemical energy that exists in the fuel can be turned into power.[74] Using today's high-temperature materials, the best hydrocarbon engines convert about 50%–60% to power. There's still room to improve but nothing like the 10-fold to nearly hundredfold revolu-

tionary advances achieved in the first couple of decades after their invention. Wind/solar technologies are now on the same place of that asymptotic technology curve.

For wind, the boundary is called the Betz Limit, which dictates how much of the kinetic energy in air a blade can capture; that limit is about 60%.[75] Capturing all the kinetic energy would mean, by definition, no air movement and thus nothing to capture. There needs to be wind for the turbine to turn. Modern turbines already exceed 45% conversion.[76] That leaves some real gains to be made but, as with combustion engines, nothing revolutionary.[77] Another 10-fold improvement is not possible.

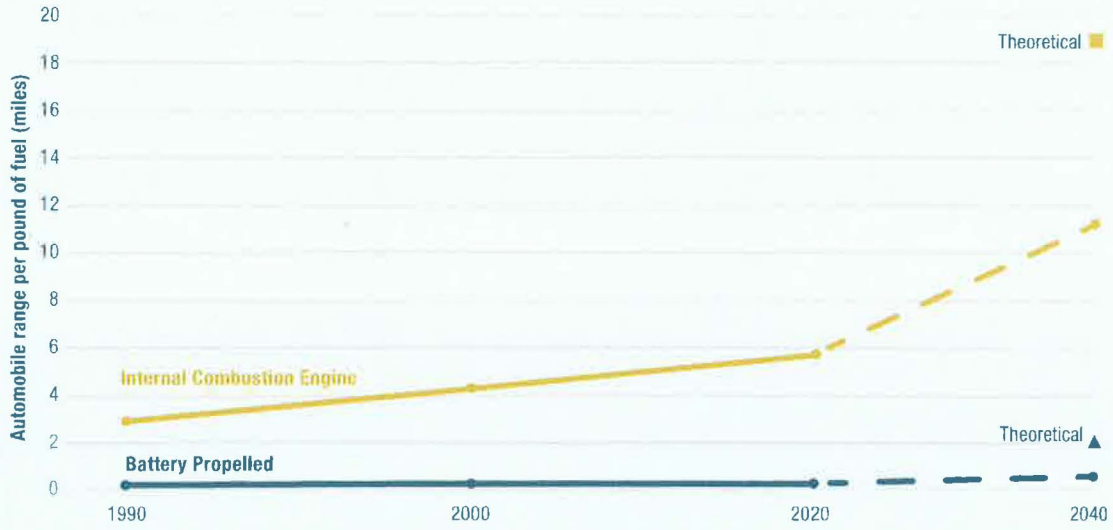
For silicon photovoltaic (PV) cells, the physics boundary is called the Shockley-Queisser Limit: a maximum of about 33% of incoming photons are converted into electrons. State-of-the-art commercial PVs achieve just over 26% conversion efficiency—in other words, near the boundary. While researchers keep unearthing new non-silicon options that offer tantalizing performance improvements, all have similar physics boundaries, and none is remotely close to manufacturability at all—never mind at low costs.[78] There are no 10-fold gains left.[79]

Future advances in wind turbine and solar economics are now centered on incremental engineering improvements: economies of scale in making turbines enormous, taller than the Washington Monument, and similarly massive, square-mile utility-scale solar arrays. For both technologies, all the underlying key components—concrete, steel, and fiberglass for wind; and silicon, copper, and glass for solar—are all already in mass production and well down asymptotic cost curves in their own domains.

While there are no surprising gains in economies of scale available in the supply chain, that doesn't mean that costs are immune to improvements. In fact, all manufacturing processes experience continual improvements in production efficiency as volumes rise. This experience curve is called Wright's Law. (That "law" was first documented in 1936, as it related then to the challenge of manufacturing aircraft at costs that markets could tolerate. Analogously, while aviation took off and created a big, worldwide transportation industry, it didn't eliminate automobiles, or the need for ships.) Experience leading to lower incremental costs is to be expected; but, again, that's not the kind of revolutionary improvement that could make a new energy economy even remotely plausible.

FIGURE 5.

Tale of the Tape: Battery vs. Hydrocarbon Energy Density for Propulsion



Source: Author calculations; Michael M. Thackeray, Christopher Wolverton, and Eric D. Isaacs, "Electrical Energy Storage for Transportation—Approaching the Limits of, and Going Beyond, Lithium-Ion Batteries," *Energy & Environmental Science* 7, no. 5 (May 2012): 7854-63; Richard Van Noorden, "The Rechargeable Revolution: A Better Battery," *Nature* 507, no. 7490, (March 2014): 26–8; Anton Wahlman, "The New 39 MPG Toyota SUV vs. Tesla Model 3: Same Fuel Cost per Mile," Seeking Alpha, Nov. 20, 2018; Kevin Bullis, "70 mpg, Without a Hybrid," MIT Technology Review, Oct. 25, 2010; Justin Hughes, "Toyota Develops World's Most Thermally Efficient 2.0-Liter Engine," The Drive, Mar. 1, 2018

As for modern batteries, there are still promising options for significant improvements in their underlying physical chemistry. New non-lithium materials in research labs offer as much as a 200% and even 300% gain in inherent performance.[80] Such gains nevertheless don't constitute the kinds of 10-fold or hundredfold advances in the early days of combustion chemistry.[81] Prospective improvements will still leave batteries miles away from the real competition: petroleum.

There are no subsidies and no engineering from Silicon Valley or elsewhere that can close the physics-centric gap in energy densities between batteries and oil (**Figure 5**). The energy stored per pound is the critical metric for vehicles and, especially, aircraft. The maximum potential energy contained in oil molecules is about 1,500% greater, pound for pound, than the maximum in lithium chemistry.[82] That's why the aircraft and rockets are powered by hydrocarbons. And that's why a 20% improvement in oil propulsion (eminently feasible) is more valuable than a 200% improvement in batteries (still difficult).

Finally, when it comes to limits, it is relevant to note that the technologies that unlocked shale oil and gas are still in the early days of engineering development, unlike the older technologies of wind, solar, and batteries. Tenfold gains are still possible in terms of how much energy can be extracted by a rig from shale rock before approaching physics limits.[83] That fact helps explain why shale oil and gas have added 2,000% more to U.S. energy production over the past decade than have wind and solar combined.[84]

Digitalization Won't Uberize the Energy Sector

Digital tools are already improving and can further improve all manner of efficiencies across entire swaths of the economy, and it is reasonable to expect that software will yet bring significant improvements in both the underlying efficiency of wind/solar/battery machines and in the efficiency of how such machines are integrated into infrastructures. Silicon logic has improved, for example, the control and thus the fuel efficiency of combustion engines, and it is doing the same for wind turbines. Similarly, software epitomized by Uber has shown that optimizing the efficiency of *using* expensive transportation assets lowers costs. Uberizing all manner of capital assets is inevitable.

Uberizing the electric grid without hydrocarbons is another matter entirely.

The peak demand problem that software can't fix

In the energy world, one of the most vexing problems is in optimally matching electricity supply and demand (**Figure 6**). Here the data show that society and the electricity-consuming services that people like are generating a growing gap between peaks and valleys of demand. The net effect for a hydrocarbon-free grid will be to increase the need for batteries to meet those peaks.

All this has relevance for encouraging EVs. In terms of managing the inconvenient cyclical nature of demand, shifting transportation fuel use from oil to the grid will make peak management far more challenging. People tend to refuel when it's convenient; that's easy to accommodate with oil, given the ease of storage. EV refueling will exacerbate the already-episodic nature of grid demand.

To ameliorate this problem, one proposal is to encourage or even require off-peak EV fueling.[85] The jury is out on just how popular that will be or whether it will even be tolerated.

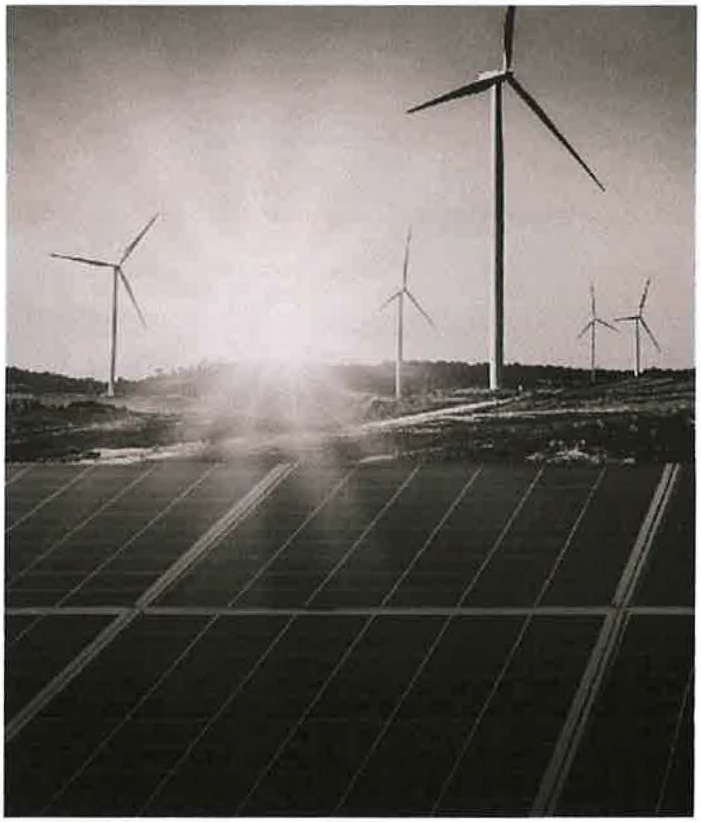
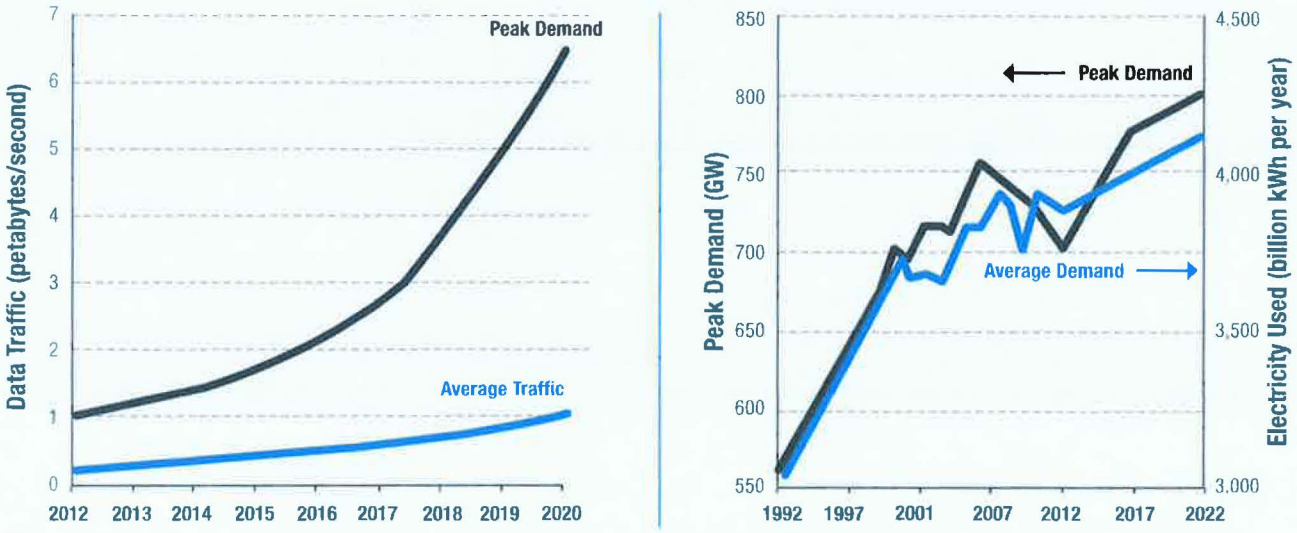


FIGURE 6.

Peak vs. Average Demand: Data Traffic & Electricity



Source: Cisco, "Visual Networking Index: Forecast and Trends, 2017–2022 White Paper," Feb. 27, 2019; EIA, "Annual Energy Outlook 2019," EIA; "Electricity Data: Noncoincident Peak Load," 2016; EIA, "Peak-to-Average Electricity Demand Ratio Rising in New England and Many Other U.S. Regions," Feb. 18, 2014; EPRI (Electric Power Research Institute), "The Integrated Grid: Capacity and Energy in the Integrated World," 2015

Although kilowatt-hours and cars—key targets in the new energy economy prescriptions—constitute only 60% of the energy economy, global demand for both is centuries away from saturation. Green enthusiasts make extravagant claims about the effect of Uber-like options and self-driving cars. However, the data show that the economic efficiencies from Uberizing have so far increased the use of cars and peak urban congestion.[86] Similarly, many analysts now see autonomous vehicles amplifying, not dampening, that effect.[87]

That's because people, and thus markets, are focused on economic efficiency and not on energy efficiency. The former can be associated with reducing energy use; but it is also, and more often, associated with increased energy demand. Cars use more energy per mile than a horse, but the former offers enormous gains in economic efficiency. Computers, similarly, use far more energy than pencil-and-paper.

Uberizing improves energy efficiencies but increases demand

Every energy conversion in our universe entails built-in inefficiencies—converting heat to propulsion, carbohydrates to motion, photons to electrons, electrons to data, and so forth. All entail a certain energy cost, or waste, that can be reduced but never eliminated. But, in no small irony, history shows—as economists have often noted—that improvements in efficiency lead to increased, not decreased, energy consumption.

If at the dawn of the modern era, affordable steam engines had remained as inefficient as those first invented, they would never have proliferated, nor would the attendant economic gains and the associated rise in coal demand have happened. We see the same thing with modern combustion engines. Today's aircraft, for example, are three times as energy-efficient as the first commercial passenger jets in the 1950s.[88] That didn't reduce fuel use but propelled air traffic to soar and, with it, a fourfold rise in jet fuel burned.[89]

Similarly, it was the astounding gains in computing's energy efficiency that drove the meteoric rise in data traffic on the Internet—which resulted in far more energy used by computing. Global computing and communications, all told, now consumes the energy equivalent of 3 billion barrels of oil per year, *more* energy than global aviation.[90]

The purpose of improving efficiency in the real world, as opposed to the policy world, is to reduce the cost of enjoying the benefits from an energy-consuming engine

or machine. So long as people and businesses want more of the benefits, declining cost leads to increased demand that, on average, outstrips any "savings" from the efficiency gains. **Figure 7** shows how this efficiency effect has played out for computing and air travel.[91]

Of course, the growth in demand growth for a specific product or service can subside in a (wealthy) society when limits are hit: the amount of food a person can eat, the miles per day an individual is willing to drive, the number of refrigerators or lightbulbs per household, etc. But a world of 8 billion people is a long way from reaching any such limits.

The macro picture of the relationship between efficiency and world energy demand is clear (**Figure 8**). Technology has continually improved society's energy efficiency. But far from ending global energy growth, efficiency has enabled it. The improvements in cost and efficiency brought about through digital technologies will accelerate, not end, that trend.

Energy Revolutions Are Still Beyond the Horizon

When the world's poorest 4 billion people increase their energy use to just 15% of the per-capita level of developed economies, global energy consumption will rise by the equivalent of adding an entire United States' worth of demand.[92] In the face of such projections, there are proposals that governments should constrain demand, and even ban certain energy-consuming behaviors. One academic article proposed that the "sale of energy-hungry versions of a device or an application could be forbidden on the market, and the limitations could become gradually stricter from year to year, to stimulate energy-saving product lines."[93] Others have offered proposals to "reduce dependency on energy" by restricting the sizes of infrastructures or requiring the use of mass transit or car pools.[94]

The issue here is not only that poorer people will inevitably want to—and will be able to—live more like wealthier people but that new inventions continually create new demands for energy. The invention of the aircraft means that every $1 billion in new jets produced leads to some $5 billion in aviation fuel consumed over two decades to operate them. Similarly, every $1 billion in data centers built will consume $7 billion in electricity over the same period.[95] The world is buying both at the rate of about $100 billion a year.[96]

The inexorable march of technology progress for things that *use* energy creates the seductive idea that something radically new is also inevitable in ways to *produce* energy. But sometimes, the old or established technology is the optimal solution and nearly immune to disruption. We still use stone, bricks, and concrete, all of which date to antiquity. We do so because they're optimal, not "old." So are the wheel, water pipes, electric wires ... the list is long. Hydrocarbons are, so far, optimal ways to power most of what society needs and wants.

More than a decade ago, Google focused its vaunted engineering talent on a project called "RE<C," seeking to develop renewable energy cheaper than coal. After the project was canceled in 2014, Google's lead engineers wrote: "Incremental improvements to existing [energy] technologies aren't enough; we need something truly disruptive. ... We don't have the answers."[97] Those engineers rediscovered the kinds of physics and scale realities highlighted in this paper.

An energy revolution will come only from the pursuit of basic sciences. Or, as Bill Gates has phrased it, the challenge calls for scientific "miracles."[98] These will emerge from basic research, not from subsidies for yesterday's technologies. The Internet didn't emerge from subsidizing the dial-up phone, or the transistor from subsidizing vacuum tubes, or the automobile from subsidizing railroads.

However, 95% of private-sector R&D spending and the majority of government R&D is directed at "development" and not basic research.[99] If policymakers want a revolution in energy tech, the single most important action would be to radically refocus and expand support for *basic* scientific research.

Hydrocarbons—oil, natural gas, and coal—are the world's principal energy resource today and will continue to be so in the foreseeable future. Wind turbines, solar arrays, and batteries, meanwhile, constitute a small source of energy, and physics dictates that they will remain so. Meanwhile, there is simply no possibility that the world is undergoing—or can undergo—a near-term transition to a "new energy economy."

FIGURE 7.

Increasing Energy Efficiency Increases Demand

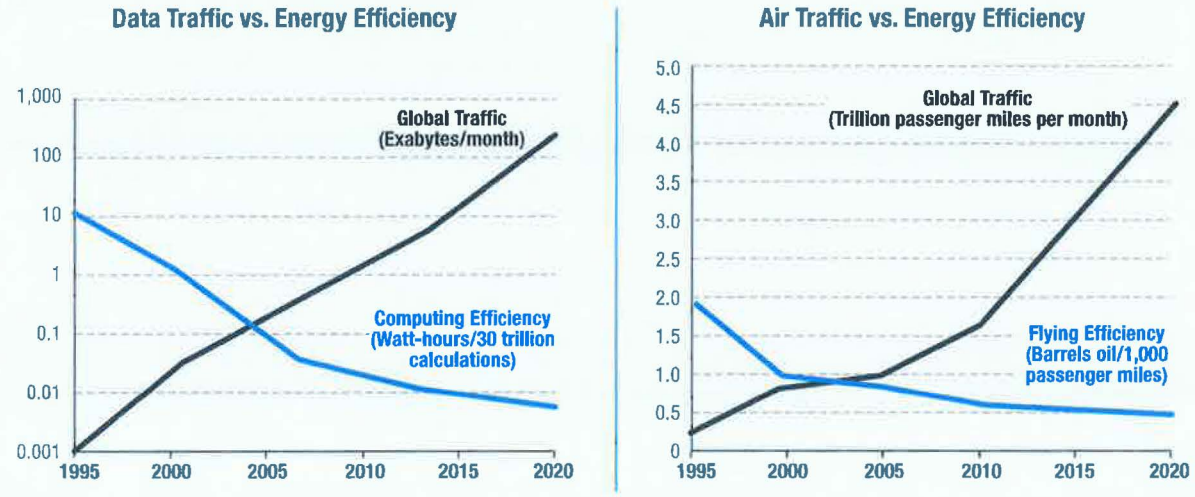


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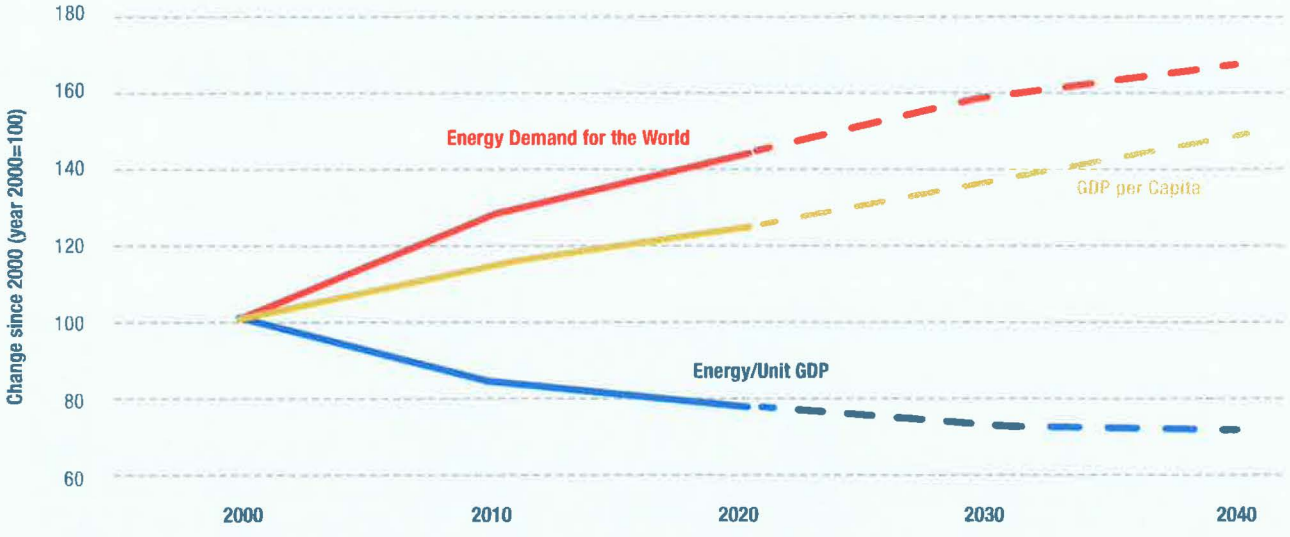
FIGURE 8.

As Global Efficiency Improves, Energy Demand Rises



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Acknowledgments

Connor Harris, Preston Turner, Eric Li, and Chris DeSante provided research assistance for this report.

March 2019

MANHATTAN
INSTITUTE

John Chenosky

From: John Chenosky <johnsuzy@windstream.net>
Sent: Wednesday, July 15, 2020 5:55 PM
To: 'info@oleyvalleyorganics.com'
Cc: dmaloney@pahousegop.com
Subject: Mike Deitrich's Misinformed e-mail to Dave Maloney

Mr. Dietrich:

My friend and colleague Dave Maloney forwarded your recent email because we share common interests and understandings.
Generally I don't respond to third party emails unless I know or have a working knowledge of the person including their CV.
I have a service that I use to uncover people's backgrounds so I can address their opinions no matter how wrong they might be.

I see you have served in the military—thank you for your service. My family has amassed over a 100 years—your welcome.

What I find disturbing is that a degreed Business Major can't express his opinions without being belligerent and insulting. You certainly are entitled to your opinion but not your interpretation of the facts—which by the way are seriously devoid of science. And I didn't see any expertise in your CV that would allow you to state that the science is overwhelming.

My CV includes a B.S. ChE, including Physics, Thermodynamics, Chemistry, Reaction Kinetics, Heat & Mass Transfer and over 50 years of Professional Engineering with significant experience in Energy and innovative applications. I also specialized in Environmental Design in air side pollution control. One of my clients was the U.S. Capitol Power Plant in DC.

I have been a student of Catastrophic Anthropogenic Global Warming since the early 90s and have attended Eleven (11) International Climate Change Conferences (ICCC) five of those in person. I've attended the first two American Energy conferences this past decade.

The following is a recent edited email that I forwarded to another Alarmist equally misinformed since the early 2000s. Many of my colleagues opine on the link WUWT which is changing platforms soon so I hope you take advantage of the Award Winning Science link.

After the CLIMATEGATE scandal of 2011 I and many of my colleagues became Charter Members of https://principia-scientific.org which welcomes scientific opinion from everyone even Alarmists. I am also recognized as a Special Member. Here is an example:
https://principia-scientific.org/climate-the-man-made-warming-myth-explodes-part-3/

Here is the recent email that puts a stake in the Failed Theory of CAGW---CO2 is the gas of life without which we cease to exist.
https://wattsupwiththat.com/2020/06/27/a-winning-trifecta-for-climate-science-and-rationality/

The author Charles Battig a retired physician and graduate engineer describes how three extreme environmentalists have finally joined the skeptics, which is what scientists and engineers (if they are truly professionals) must be.
I encourage you to watch *"Planet of the Humans"* by none other than Michael Moore. He sees right through the BS.

With his recent book, *False Alarm,* Bjorn Lomborg continues to straddle the fence on global warming, aka climate change. As the original "skeptical environmentalist," Bjorn has argued that there are more productive ways to aid humanity than spending billions trying to influence climate change. He has argued for improving sanitation, clean water supplies, basic nutrition, and providing paths out of poverty for the millions living in underdeveloped countries. In this book, he continues to press for a concerted effort to alleviate these ills, rather than accepting the decades of panic driven calls for "fixing the climate."

Michael Shellenberger has green activist credentials going back to his high school years. Yet over the ensuing years, he has had an environmental reality epiphany which now has manifested itself most clearly in his recent book *"Apocalypse Never,"* and with his starting the ecomodernism movement. The subtitle of the book, "Why

Environmental Alarmism Hurts Us All," echoes the similar conclusions of Moore and Lomborg.

If you really want to address a real threat go to http://pasafetech.org and join us in stopping saturation of the biosphere by microwave and millimeter wave radiation caused by Wireless Communications.

John M. Chenosky, PE
Debunker of Carbon Dioxide (Gas-of-Life) Green House Fairy Tales for 27 years

John Chenosky

From: John Chenosky <johnsuzy@windstream.net>

Sent: Tuesday, March 17, 2020 11:22 AM
To: dmetcalf@pahousegop.com; dmaloney@pahousegop.com; broae@pahousegop.com; tmehaffie@pahousegop.com; tsankey@pahousegop.com; 'rwarner@pahousegop.com'; cdush@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov); 'tkillion@pasen.gov'; 'boscola@pasen.gov'; pbrowne@pasen.org; 'costa@pasenate.com'; 'yudichak@pasenate.com'; 'farnese@pasenate.com'; 'Senatorsantarsiero@pasenate.com'; 'brewster@pasenate.com'; 'fontana@pasenate.com'; 'info@senatorsharifstreet.com'; 'senatorblake@pasenate.com'; 'senatorcollett@pasenate.com'; 'senatorleach@pasenate.com'; dargall@pasen.gov; 'Wlangerholc@pasen.gov'; cbartolotta@pasen.gov; 'SenatorLindseyWilliams@pasenate.com'; 'Dlaughlin@pasen.gov'; 'jward@pasen.gov'; 'tim.kearney@pasenate.com'
Cc: WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); kenmatthews@whp580.com; greattalkradio@aol.com; rdevlin@readingeagle.com
Subject: THE GOVERNOR'S DELUSION

Recipients:

Dr. Ellen Langer, professor of psychology at Harvard University, stated in her 1975 paper, The Illusion of Control, published in the *Journal of Personality and Social Psychology*, defined the "illusion of control" as:
... an expectancy of a personal success probability inappropriately higher than the objective probability would warrant.
Let's put that in easier-to-understand terms. The Science Daily webpage about illusion of control begins:
Illusion of control is the tendency for human beings to believe they can control or at least influence outcomes that they demonstrably have no influence over.
***Illusion of control* is appropriate for the current groupthink (more commonly referred to as a consensus) that mankind can control future global temperatures and sea levels and that we can also control climate—control how often weather events occur, how strong they are and how long those events last—simply by limiting carbon dioxide. In other words, the ever-increasing, whimsically optimistic fantasies about modifying and controlling climate through cuts in carbon dioxide levels are clear-cut examples of illusion of control. Real studies verify massive amounts of carbon dioxide are expelled naturally from submarine volcanoes and vents.**

Day in, day out, everywhere we turn—TV, internet, movies, magazines, newspapers—we're bombarded with global warming and climate change propaganda from the mainstream media and in advertisements that proclaim we'll save the Earth if we purchase company *A*'s product, making our world a better place for people four generations in the future.

Hopefully you're not buying the hoopla. To you it sounds too hokey—too contrived—like bad science fiction. You may find the climate science community's call for additional research funding undermines their repeated statements that the science is settled. As was demonstrated in the ClimateGate emails, which showed faux climate scientists behaving fraudulently.

YOU WANT AN IDEA OF WHAT IT IS LIKE TO ELIMINATE FOSSIL FUELS----YOU'RE EXPERIENCING IT RIGHT NOW---HOW'S IT FEEL?
DEFUND ALL GOVERNOR WOLF'S CLIMATE ABERATIONS BEFORE HE AND OTHERS DESTROY PENNSYLVANIA'S ECONOMY.

Yours in Science, Technology & Truth,

John M. Chenosky, PE
Science Is Not Done by Consensus

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Wednesday, February 05, 2020 8:14 AM
To:	'jsruzzi@pahousegop.com'; 'Doberlander@pahoussegop.com'; 'psnyder@pahouse.net'; dmetcalf@pahousegop.com; dmaloney@pahousegop.com; tsankey@pahousegop.com; tmehaffie@pahousegop.com
Cc:	WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); kenmatthews@whp580.com; rswift@timesshamrock.com
Subject:	REGIONAL GREENHOUSE GAS INITIATIVE (RGGI) 02FEB20
Attachments:	Cloud_Begins_With_Coal

https://wattsupwiththat.com/2020/02/02/will-humanity-ever-reach-2xco2-possibly-not/

Legislators:

Last decade I was one of hundreds of Pennsylvanians, in total, 31,000+ world-wide scientists, (real) climatologists, engineers, physicists, geologists, meteorologists, astrophysicists, environmentalists, earth scientists and 9000 of whom where PhDs, who signed the Petition Project https://oism.org/pproject/. The petition is incorporated in the Federal Register.

Conclusion was, and still is-- CARBON DIOXIDE (CO2) is the GAS of LIFE without it our SPECIES and most of the BIOSPHERE CEASES TO EXIST. During the Cambrian Explosion (530 mybp) when the majority of life was formed the CO2 concentration was 7000 ppm. The above link by esteemed Climate Scientist Dr. Roy Spencer suggests that the Doomsday Scenario of Alarmists has no bearing in fact. There are thousands of complementary scientific studies supporting this position, many of which I have shared with the Legislature.

Then one (even those that lack STEM credentials) would have to query..."why are we headed down the path of species extinction and economic suicide." Those energy questions and scientific FACTS are answered in the PDF written by genius author Dr. Mark Mills and Energy Expert, a fellow at The Manhattan Institute.

The biological impacts are discussed by Greenpeace Co-Founder, Dr. Patrick Moore: https://fcpp.org/sites/default/files/documents/Moore%20-%20Positive%20Impact%20of%20Human%20CO2%20Emissions.pdf

The implications of Environmentalism Gone Mad is not even hidden any longer and is stated by UN Official Ottmar Edenhofer, a German economist and IPCC Co-chair of Working Group III on Mitigation of Climate Change, told the *Neue Zürcher Zeitung* (translated) that "climate policy is redistributing the world's wealth" and that "it's a big mistake to discuss climate policy separately from the major themes of globalization." AOC's campaign manager basically reiterate the same mantra.

Read about how California's green crusade direction and actions are increasing the costs of electricity and fuels which guarantees growth of the homeless, poverty, and welfare populations, and further fuels (no pun intended) the housing affordability crisis. https://wattsupwiththat.com/2020/01/17/california-energy-policies-are-fueling-the-housing-crisis-and-homelessness/.

Is that what you want for Pennsylvanians that are living on the financial edge---out on the streets in our cold climate? That's what a CARBON TAX delivers. 400 ppm of CO2 has not impacted Climate, it has greened the planet—we need more CO2—not less.

The Governor and his environmental minions do not have the taxpayers of Pennsylvania in mind. You might want to check how the money of Mike Bloomberg and Tom Steyer, who have financial agendas, has impacted this movement.

As always, I reserve the right to revise and extend my remarks and add extraneous information as it becomes available.

Yours in Science, Technology & Truth,

John M. Chenosky, PE
Debunker of the Myth of Carbon Dioxide CAGW for 27 years
Energy and Environmental Specialist for 50 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Tuesday, December 03, 2019 3:29 PM
To:	dmetcalf@pahousegop.com; dmaloney@pahousegop.com; tsankey@pahousegop.com; tmehaffie@pahousegop.com; broae@pahousegop.com
Cc:	WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); kenmatthews@whp580.com; mfaust@weeu.com; greattalkradio@aol.com; rdevlin@readingeagle.com
Subject:	ECONOMIC ENERGY FACTS RABB & VITALI DENIES

https://wattsupwiththat.com/2019/11/19/study-says-fracking-is-saving-families-2500-annually-significantly-lowering-greenhouse-gas-emissions/

Legislators:

To use a real life example to put this into some context ...

4 wells on the Carpenter pad (EQT, Greene county, PA) have produced a total of 35 billion cubic feet in 6 to 10 months online production
Using average numbers of ~62,000 cubic feet per year per household and 3 people per residence, these 4 wells would provide natgas to about a million and a half people for a year.

That is to say, a ~$50 million dollar investment from EQT can offer the cities' residents of Cleveland, Cincinnati, Pittsburgh, St. Louis a year's worth of fuel to heat their water, cook their food, dry their clothes, warm their homes. With just 4 wells and a few months online production.

There is nothing comparable to the high energy density of carbon based fuels. I tried to explain that to the attendees of the first Climate Change Committee Meeting at the DEP (2006 ?) when it was discovered that there was 1.6 Trillion cu.ft. in the Marcellus Shale deposit. You see there was no one in attendance with any credentials, except me, that understood that this deposit was all the alternative energy needed for the foreseeable energy needs of Pennsylvania residents and many, many others.

The U.S. Energy Administration estimated in 2012 that the Marcellus contains 141 Trillion cu.ft. and Pennsylvania has 60% of that amount. There is nothing short of Nuclear that rivals that energy security.

And yet the Climate Derangement Syndrome that too many PA Legislators suffer from while they sponsor intellectually bankrupt legislation, i.e., HB 1425, HB 2132, and the latest adolescent, virtual signaling, SB-596. I have to take that apart separately-- more to come soon.

What makes this alternative energy fuel so important, unlike wind turbines and solar panels, it ADDS CO2, the GAS OF LIFE to naturally fertilize the biosphere and provide essential food for VEGANS and TASTY ANIMALS that we consume. WE NEED MORE CARBON DIOXIDE NOT LESS.

The sooner PA Legislators get off this "Save The Planet" nonsense and recognize that thermodynamically carbon-based fuels are irreplaceable, as they are continually replaced by internal earth reactions, meaning they are self-sustaining.

Do Rabb, Vitali & other Unicorns expect an Amish Farmer from Lancaster County to deliver their food by "Horse & Buggy" in 2050??

Seriously? Time to stop the insanity of self-imposed economic suicide, of 2050 Fairy Dust Climate Clownology.

As always I reserve the right to revise and extend by remarks and provide additional pertinent information.

John M. Chenosky, PE

PS Please forward this email to the Rabb & Vitali since they RBL'd me.

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Monday, June 24, 2019 8:54 AM
To:	broae@pahousegop.com; 'cquinn@pahousegop.com'; 'Ffarry@pahousegop.com'; tsankey@pahousegop.com; 'Sdelozie@pahousegop.com'; 'gdigirol@pahosegop.com'; 'jemrick@pahousegop.com'; 'rkauffman@pahousegop.com'; rmackenzie@pahousegop.com; 'jpayne@pahousegop.com'; 'enelson@pahouse.com'; 'tpicket@pahousegop.com'; 'Tstephen@pahousegop.com'; 'mwhite@pahousegop.com'; 'rmatzie@pahouse.net'; 'adavis@pahouse.net'; 'pschweyer@pahouse.net'; psnyder@pahouse.com; 'rbizz@pahouse.net'; dbullock@pahouse.com; 'fburns@pahouse.net'; 'tdavis@pahouse.net'; 'mflynn@pahouse.net'; 'enelson@pahouse.com'
Cc:	dmaloney@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov); mfaust@weeu.com; WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); jscarnati@pasen.gov
Subject:	FOOD (MEAT) SHORTAGES

https://www.youtube.com/channel/UCI-Am0t4qQaP_Do9FwMWw3Q
https://principia-scientific.org/crop-failure-year-looms-ice-age-pattern/
https://www.youtube.com/watch?v=8mLrpT-ssqA

Legislators:

While you struggle with inconsequential legislation like renewable energy and the pipe dream of fossil fuel elimination, one of the biggest threats facing the World and more importantly, the taxpayers in Pennsylvania is upon us. Significant food shortages are in our IMMEDIATE FUTURE.

The excessive rainfall of the last two years is characteristic of weather patterns experienced in the LITTLE ICE AGE (1645-1840) and the significant Global Cooling caused by the GRAND SOLAR MINIMUM that we have been experiencing. You see the SUN has essentially entered a period of considerable downturn in energy flux known as the Maunder, or Dalton Minimum Effect. Sunspots are infrequent and energy output of the sun is considerably reduced. Shielding normally provided by the Sun protecting the Earth from Cosmic Ray bombardment, accounts for increased cloud formation, cooling and the adverse weather (Svensmark's Cosmic Ray Theory).

Additionally eccentricity, axial tilt and precession of the earth's orbit is identified by the acknowledged 100,000 year Milankovitch Cycle. None of this is human caused, or can it be ameliorated by eliminating fossil fuels, addition of current renewable technology, or other geoengineering.

61 MILLION ACRES in the United States are either under water or have planted crops that have failed. A direct result of late planting due to RECORD COLD in most of our bread basket States. This information has been available on http://www.iceagefarmer.com. for some time and is explained in the link videos.

This is in direct conflict with the 30 year old Global Warming Narrative created by agenized bureaucrats and the sycophant media. Even NASA cannot avoid the REAL FACTS and manipulating their own data is no longer an option to reinforce the unscientific propaganda of CO2 induced GHG global warming.

The Pennsylvania Department of Agriculture must craft plans to avoid this apocalyptic tragedy and will require that food grown (protein) or vegetables cultivated in this State stays within our geographic borders for the use of OUR RESIDENTS. And only bartered for other foodstuffs.

Barring this action, while you are on your Fourth of July Holiday I want you to enjoy the inexpensive pork, beef or chicken in your family outings. It may be the last inexpensive meats you will enjoy for a while, or what I expect---the limited supply of same due to potential meat rationing.

Remember WWII and its rationing coupons? Of course not,...." those of you who do not learn from History are Doomed to Repeat It."

Yours in Science & Technology,

John M. Chenosky, PE
Truth Disciple

PS: The Chinese are suffering their worst swine flu epidemic and are eradicating their pig population to bring it under control. They are desperate to replace this very important food supply by cornering World piglets, further exasperating the problem of future pork supply. It would not be out of the question that this epidemic extends to and infects our USA pig population-stay tuned.

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Wednesday, June 05, 2019 7:13 AM
To:	dmaloney@pahousegop.com; dmetcalf@pahousegop.com; 'cquinn@pahousegop.com'; crabb@pahouse.net; broae@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov)
Cc:	gvitali@pahouse.net; WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); mfaust@weeu.com; greattalkradio@aol.com
Subject:	OHIO ENERGY POLICY MOVE

https://wattsupwiththat.com/2019/06/03/renewables-in-retreat-ohio-democrats-vote-to-support-nuclear-and-coal-power/

Legislators & Media:

Time to move to Ohio where legislators have come to their senses where taxes, regulations and real estate are less than half that of Pennsylvania.

Even Democrats realize that unless they must stop Virtue Signaling and recognize that the New Green Deal is DOA. This Fantasy is based on emotion of Government Trough Feeders whose jobs are dependent on continuing the False Narrative of Catastrophic Anthropogenic Global Warming (CAGW).

Ohio Democrats also realize that they (Politicians) will become irrelevant if they allow the WORLD WIDE TECHNOCRACY MOVEMENT to continue to impose rules on our sovereignty through Environmental Communism. Don't agree--- take a half hour of your time and become informed.

https://www.youtube.com/watch?v=ul5oQ3wbstQ

OH HAPPY DAY!!

Yours in Science & Technology,

John M. Chenosky, PE
Debunking CAGW for 27 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Thursday, December 06, 2018 8:16 AM
To:	'Mensch, Senator Bob'; gyaw@pasen.gov; cbartolotta@pasen.gov; jscarnati@pasen.gov; 'smartin@pasen.gov'; shutchinson@pasen.gov; kward@pasen.gov; dwhite@pasen.gov; jyudichak@dem.pasen.gov; 'adinniman@pasen.gov'; 'dleach@pasen.gov'; 'awilliams@pasen.gov'
Cc:	WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); mfaust@weeu.com; greattalkradio@aol.com; shenshaw@readingeagle.com; ebrandt@pottsmerc.com; jmicek@pennlive.com
Subject:	RE: Contact Form - Other - Chenosky
Attachments:	CARBON DIOXIDE THE GAS OF LIFE; HB 2132 Legislation Providing For Transition to 100% Renewable Energy

Senator Mensch:

You notice I addressed you as Senator—I am not your child or friend. In the future show me the respect of my 75 years by addressing me as Mr. Chenosky, John is reserved for friends and intellectual colleagues.

In the late sixties I worked as an Environmental Engineer trying to resolve Air & Water Pollution problems. My boss, Dick Ross, had a way of dealing with clients that were not receptive to the solutions our company manufactured. Our equipment offered waste incineration as an alternative to US chemical industry contracting with the Gypsies (the New Jersey Mob) who would haul barrels of toxic waste and dump it in the ocean, or in the Pine Barrens. (I and others were activists in establishing what you know as the USEPA---over the decades they have lost their mission.)

On one occasion I wrote a letter to a Client that questioned a design they conceived and a scathing reply ensued. Dick called me in his office and after reading me the riot act, he started to laugh. "John (he paid my salary) he said... we never sold those bastards anything—it's OK." He then reiterated a sales & engineering philosophy of his. Paraphrasing "... sometimes when you are being ignored...you figuratively need to JUMP ON A CLIENT'S DESK-- DROP YOUR DRAWERS AND TAKE A DUMP." I obviously was successful in that regard. And I continued to use that in similar situations over 50 years, both professionally and personally, especially when I felt patronized by condescending incompetents.

My father taught me " to pay my bills in 30 days...and always tell the truth." As a result I have an 800+ FICO score...AND FEW FRIENDS--- humans that don't critically think are a disappointment.

Did I ever tell you that I am Permanently Disabled?... as I suffer from Anomic & Expressive Aphasia, the result of three strokes over 26 years. As a result I have NO FILTERS. Doesn't the recent interpretations of the American Disabilities Act (AKA the ADA) require you and others to provide an ACCOMODATION for my disability??

Now to your response. I think I've addressed your insinuation that I insulted you. As a Politician, when you OPEN YOUR PIE HOLE without having all of the facts you become targets for your poorly researched, and scientifically anemic opinions. Just because some Academic intellectually masturbates a theory without using the Scientific Method, it does not become a proven fact until others empirically reproduce it. Hockey Stick Michael Mann, Penn State, comes to mind, he's never shared his data. I hear his lawsuits and counter lawsuits against him are not going well.

I can provide you with all the scientific reasons and opinions of REAL SCIENTISTS that would put to bed this poorly conceived notion of yours, i.e., that H2 powered vehicles will become a cost competitive alternative---they are of course out there—at a fortune with no practicality. I doubt you would ever study the scientific/economic articles. Many of them are found on the award winning scientific blog where real science is scrutinized by INDEPENDENT SCIENTISTS , http://wattsupwiththat.com, over 350,000,000 views since inception in 2007.

" Frankly, I do feel obligated to promote...global society....alternative solutions...solutions to current fossil fuel dilemma....fuel alternatives. " **No you don't Senator, not while you're on the Pennsylvania's Taxpayer's dollar. We as Voters sent you to Harrisburg to protect the Sovereignty of Pennsylvania—its LAWS, RESOURCES, the STABILITY of ITS INTRASTRUCTURE, INCLUDING MEASURES TO PREVENT THE PENDING FAILURE OF THE ELECTRIC GRID. Without a SECURED BASELOAD PROVIDED BY NUCLEAR and COAL INDUSTRIES, alternatives including the natural gas being implemented across PA will not guarantee grid reliability. Renewables are not reliable or cost effective and need to stand on their own---their preferential rates increase electric costs to the poor.**

As I told that PADEP environmental extremist, John Quigley at the first PA Climate Change Conference in 2006 (?), the only Alternative Energy that Pennsylvania needs is the MARCELLUS MIRACLE. I also made a fool of him at Moravian College when he tried to defend Obummer's Clean Power Plan. Yes I'm always right---ask my wife.

BTB was Quigley ever indicted or prosecuted for his collusion with NGO environmental extremist groups? Has his salary been clawed back—how about his pension?

You and your colleagues need to send a delegation to Albany, NY and to Washington DC to lobby for the already certified pipelines so that New England does not have to buy RUSSIAN LNG---this is the REAL RUSSIAN COLLUSION!! At the height of last year's ENERGY crisis the price New Englanders paid was $170/MM BTU for NG. We in Pennsylvania were paying $5/MMBTU. In fact Massachusetts Attorney General Laura Healey stated she would rather import Russian LNG than to build a pipeline in her State?? Some of that good Gobmint guidance you talk about.

I have spent the last 26 years trying to educate the PUBLIC & POLITICIANS about the FAILED THEORY of CAGW (AKA Gorebull Warbling). Having attended five (5) International Climate Change Conferences, read over 25 books, thousands of articles on the Science, and I am also a daily viewer of several Blogs covering the subject. In 2007 I was signatory of THE PETITION PROJECT along with 31,000+ hard scientist/engineers that disputed the CAGW and that CO2 was the cause-- www.oism.org/pproject. Edward Teller of Hydrogen Bomb fame was also a signatory.

This one I couldn't pass up.---- *...hundreds of millions of gasoline bombs...automobiles...somehow they are made practical & safe....*" Senator do you understand that Hydrogen (H2) will explode in small and large concentrations with air, has major containment issues under high & low pressures, causes metal embrittlement and is subject to leakage because of the minute molecule size.
And as explained in my original email H2 is ENERGY NEGATIVE to produce it as a fuel—meaning it is not a realistic alternative. In desperation to make unrealistic EPA Fleet CAFÉ standards, the AUTO Industry substituted plastic fuel tanks for metal to reduce weight and increase mileage---that's why you have gasoline bombs. Some more of that GOVERNMENT GUIDANCE your so fond of?? Diesel is not necessarily as flammable, but USEPA bogus Clean Air Act is destroying diesel powered automobiles--just ask Volkswagen, or my wife with the maintenance issues of her 2014 Mercedes

GLK BlueTec which used to be a great vehicle. FYI---Fires are a problem with Lithium Batteries in Teslas, as contact with air or water will initiate a H2 explosion or fire.

The fact that you highlighted PDC Machines for specialty H2 equipment still does not make their technology cost effective or practical. They are a COTTAGE INDUSTRY and always will be. I still wish them luck, they have found their niche, but nothing more. Plug Power was a H2 Fuel Cell Manufacturer that almost went bankrupt if it weren't funded by Detroit Power. The current leader in FUEL CELLS is Bloom Energy as they are fueled by Nat Gas or Propane. They have stationary power generated by modular fuel cells and have currently an impressive list of Fortune 500 companies with multiple installations providing economic on site power. They offer power that is not Grid dependent. I own 500 shares of Bloom Energy because the SCIENCE IS SOUND.

The SECRET SCIENCE of the USEPA with their malfeasance of FAKE PM 2.5 modifications to the Clean Air Act, attempted to provide epigenetic justification with their EXPERIMENTS ON HUMANS, both the elderly up to 75 years old and children 10-14 years old. They subjected these US citizens to toxic levels of diesel exhaust fumes in violation of USA Common Rule, EPA 1000.17 and Nuremburg Protocol. And this is the ACADEMIA & GOVERNMENT THAT YOU HAVE CONFIDENCE IN. Read "Scare Pollution" by colleague Steve Milloy & his website, http://junkscience.com.

I realize the MORON-ATOR (a real scientist?) that was Governor in Californication was big on H2 and they have a few charging stations---how is that working? As a Professional Engineer I dread the day I wake up when a news report that --- if it bleeds it leads—a poor Hydrogen car owner's body parts are scattered across a CA Filling Station--when a spark ignited the H2 filling process.

What I've found is that when presented with the facts that carbon dioxide, CO2, is the gas of life, and THE REAL FACTS THAT THERE HAS BEEN NO SIGNIFICANT GLOBAL WARMING FOR THE LAST FORTY YEARS, the general public is far more understanding of the science than Politicians who cater to the ALARMISTS.

You see Politicians like to engage in VIRTURE SIGNALING taking advice from agenized advisers that also engage in the PRECAUTIONARY PRINCIPLE to justify keeping their/your jobs and wasting the Taxpayer's money and resources.

As a scientist & engineer I am not subject to FAUX NARRATIVES generated by agenized bureaucrats/academics whose salary or grants is dependent on the GROUP THINK OF AGENDIZED ENVIROMENTALISTS and supported by the sycophants in the media. My actions and applications are based upon the pure LAWS OF PHYSICS & THERMODYNAMICS developed by my heroes, NEWTON & EISTEIN.

You see what happens when you don't respond in a timely manner to a constituents concerns-----you open PANDORA'S BOX & GET MORE THAN YOU BARGAIN FOR!!

John M. Chenosky, PE
Energy Specialist/Environmentalist for 48 years
Dispeller of the FAUX SCIENCE of the Kyoto Protocol & CAGW for 26 years

PS: I am an admirer of the financial legislation that you proffered in the Senate to correct years of malfeasance. Stick to the work you know and seek advice on the Science and Engineering from experts, not State Bureaucrats, PADEP, Media, or Staff. That goes for your Senate colleagues as well.

From: Mensch, Senator Bob [mailto:bmensch@pasen.gov]
Sent: Tuesday, December 04, 2018 2:18 PM
To: johnsuzy@dejazzd.com
Cc: Walter, Lisa
Subject: RE: Contact Form - Other - Chenosky

John,

If you are referring to the Resolution I offered in October recognizing the potential for hydrogen fuel vehicles, you are mistaken that there was any reference for funds to be spent. I cannot imagine where you even conceived the insults you offer in your letter. Frankly, I do feel obligated to promote the notion that our global society must find practical alternative solutions to our current fossil fuel dilemma.

If or when a practical solution is found to any or all of the fuel alternatives, I feel confident there will be sufficient guidance from industry, academia and government to deploy these technologies practically and safely.

I fully intend to continue to promote alternative fuels for all energy needs. They will need to provide the proper economics without subsidies, they will need to be environmentally clean, and they will need to be safe. Just imagine the hundreds of millions of gasoline bombs on the roads every day—they're called automobiles, and somehow they have been made safe and practical (to a point at least).

Cc: Walter, Lisa
Subject: RE: Contact Form - Other - Chenosky

John,

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Sincerely,

Bob Mensch
Senator,24th District
Majority Caucus Chair

District Office:
56 West 4th Street
Floor 2
Red Hill, PA18076
O: 215.541.2388
F: 215.541.2387

Harrisburg Office:
Room 16, East Wing
Harrisburg, PA
O: 717.787.3110
F: 717.787.8004

"A wise and frugal government, which shall leave men free to regulate their own pursuits of industry and improvement, and shall not take from the mouth of labor the bread it has earned-this is the sum of good government." Thomas Jefferson

Zipcode: 18011
County: Berks
Municipality: District Twp

Issue: Other

Questions and Comments: Now that the pressure of getting re-elected is behind you are you and your peers continuing your unrealistic love affair with the HYDROGEN CARTEL?? As I wrote to you prior to the election, which you chose not to answer, HYDROGEN is a fool's errand. I have no objection to Air Products and Ballard Power investing their own resources in such an unrealistic business---but I object to Pennsylvania Taxpayer Money being spent on this, as there are major unresolved technical and safety issues that cannot be economically overcome, e.g., electrolysis of water to synthesize hydrogen is energy negative, i.e., you utilized much more energy than you gain. You can always give back the money the industries and their lobbyists gave you at election time to promote this nonsense. And while I'm at it, the recent National Climate Change Report is nothing but PROPAGANDA promoted by OBAMA left-over agenized environmental extremists, supported by NGOs determined to destroy Capitalism. Pennsylvania needs to amend its rate structure to stabilize the electric grid utilizing NUCLEAR, COAL because RENEWABLES ARE A JOKE. Thought you should know.

Lists Subscribed To:

First Name:	John M
Last Name:	Chenosky, PE
Organization	
Email Address	johnsuzy@dejazzd.com
Phone Number	(610) 845-0279 Home
Secondary Phone	(__) ___-____ Cell
Address1	POB 423
Address2	
City	Alburtis
State	PA
Zipcode	18011

Signup for lists

☐ **ENewsletter**

Select an Issue

Berks
District Twp

Questions and Comments

I am disappointed in The Senate's action with respect to Hydrogen respectability as a fuel. I recall attending an AIChE seminar in 2007 where Air Products & Chemicals presented this Hydrogen Proposal. I rejected the idea when comments from the audience were solicited.
Although present in the Universe in abundance Hydrogen has major Containment & Safety issues. The lower & higher explosive limits make it an unrealistic energy source.
Harvesting H2 from natural resources (current biological processes), nor synthesis from water (electrolysis) provide a cost effective means of producing energy, either mechanical, or electrical.
Thermodynamically it requires more energy to produce it than would be generated by other fuel sources.

Submit Reset

If you sign up to receive electronic correspondence, your email address will not be disclosed to any person who is not employed by the Senate of Pennsylvania. All updates sent from this Senate office will consist solely of legislative information.

John Chenosky

From: John Chenosky <johnsuzy@windstream.net>
Sent: Sunday, October 06, 2019 10:37 PM
To: dmetcalf@pahousegop.com; dmaloney@pahousegop.com; tsankey@pahousegop.com; tmehaffie@pahousegop.com; broae@pahousegop.com
Cc: WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com)
Subject: CUB OF ROME

https://greatclimatedebate.com/prosecutorial-abstract/

Legislators:

Every now and then we need to remind ourselves how this nonsense (or as I prefer non-science) started, especially in light of those doubling down by parroting their trough-feeding scams of Renewables and their recognition that their Grant-gravy train is coming to an end.

"Let's start at the very beginning....it's a very good place to start....."
The patently false notion of anthropogenic global warming (AGW) and climate change was first conceived of by the Club of Rome in its efforts to promote the need for population reduction based on the restricted availability of energy, under the guidance of a united worldwide government.

The movement took root in October 1975 when Dr. Margaret Mead, president of AAAS, aided by associates Paul Ehrlich, Stephen Schneider, John Holdren and George Woodwell, held the "Atmosphere: Endangered and Endangering" conference in North Carolina where Mead used global warming caused by CO2 as the predicate for population reduction and eugenics.

Subsequently, individuals in the United States fraudulently established and promulgated "carbon trading" institutions for purposes of levying taxes on those who purchase hydrocarbon based fuels. As a component of this scheme to initiate, mandate, and facilitate carbon taxes, the U.S. Environmental Protection Agency (EPA) was fraudulently induced to define Carbon Dioxide (CO_2) as a "pollutant"; a ruling which was later upheld by the U.S. Supreme Court during litigation.

The U.S. Congress attempted to hold hearings and issued subpoenas to the leaders of the EPA to investigate why CO_2 was improperly defined as a pollutant. This resulted in outright lies, lack of responses, and the resignation of the Director of the EPA.
The scientific community unknowingly and unwittingly aided and abetted the deceit based on the computer generated hockey stick curve created by Dr. Michael Mann, et al, and first publically discredited by "MIT Technology Review" in October of 2004.

Government published statistics show that $178 billion dollars of tax payer funds has been spent on direct climate change related technology, science, and funds given to other nations as a result of the climate change hoax, from 1993 to 2017.
The government has systematically enabled the continuation of this fraud through billions of dollars spent annually by funding university research and government labs doing "climate research."

The false notion of AGW and/or man induced climate change has spawned tens of thousands of new businesses worldwide. The total Climate-Industrial Complex is a $2-trillion-per-year business. These companies are virtually 100% dependent on the politically driven notion of "dangerous manmade global warming and climate change."

The media, public, and political establishment constantly recite the assertion that 97% of scientists say the problem is real and manmade carbon dioxide (CO_2) is the cause. However, increased concentrations of CO_2 in the atmosphere do not lead to global warming and climate change. Carbon dioxide is a trace gas in the atmosphere.

The major "greenhouse gas" is water vapor. An intricate feedback system regulates the Earth's temperature, maintaining immunity from temperature increases and decreases due to such trace gases. The global warming hoax has taken root the world over.
The United Nation's IPCC along with the Club of Rome have become political bodies whose intentions are the restriction of energy avaliability, the reduction of population, and the establishment of a one world government institution. As a result of this reckless activity, millions of people's lives will be negatively impacted, including a tremendous loss of life.

This entire set of facts and their basis in fact must be brought to the attention of the vast majority of the American people and then to the people of all nations. The 2019 Democrat political party is making the false notion of climate change a principal issue, and the Republican Party is becoming more receptive to that position.

One of the big three lies of all time.... the other two ....Roswell was a weather balloon.....I didn't have sexual relations with that woman.

One needs to be reminded of the facts.

Yours in Science, Technology & Truth,

John M. Chenosky, PE
Debunking the CAGW Theory for 27 years

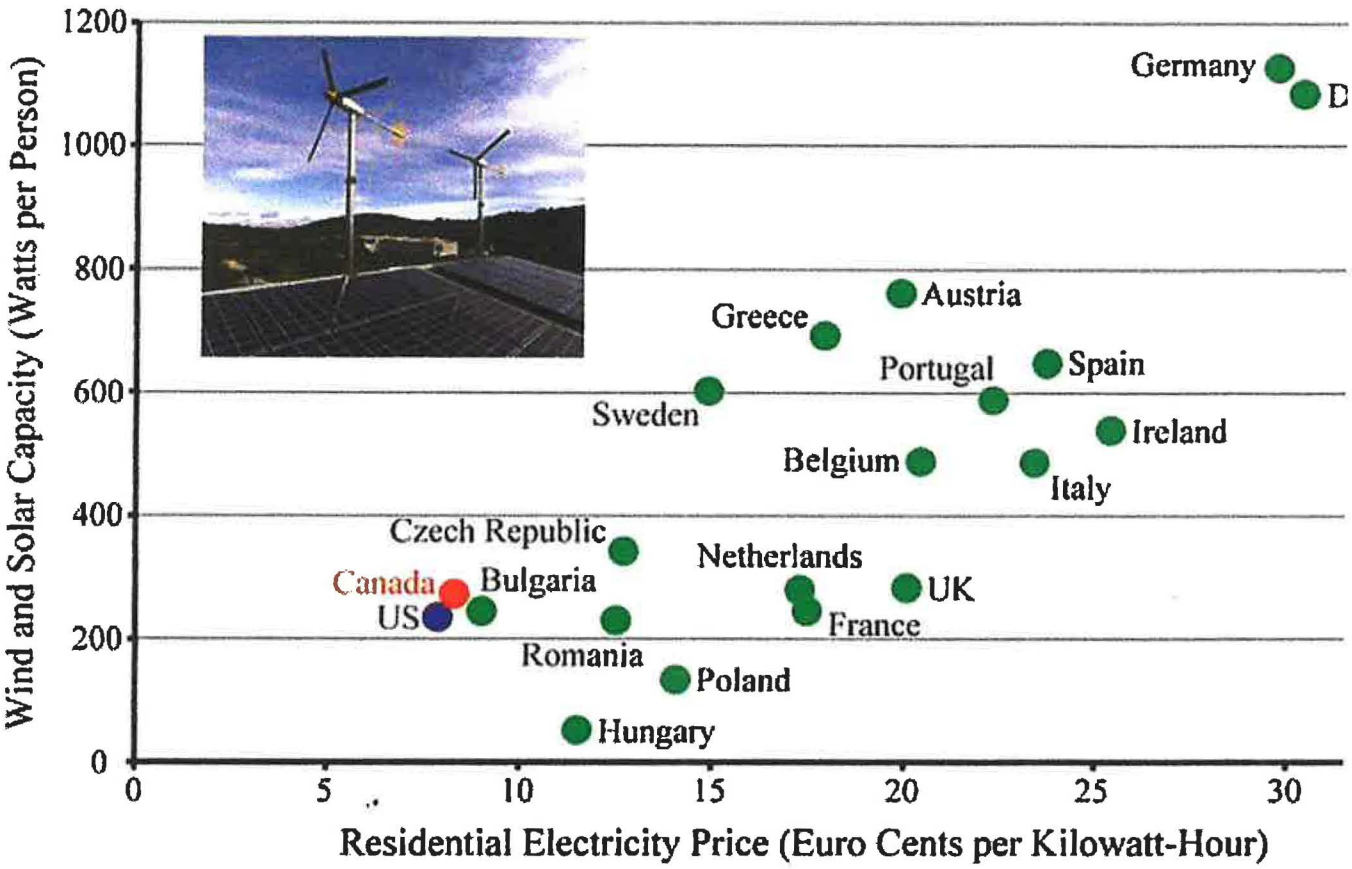
John Chenosky

From: John Chenosky <johnsuzy@windstream.net>
Sent: Wednesday, August 21, 2019 11:21 AM
To: dmetcalf@pahousegop.com; dmaloney@pahousegop.com; broae@pahousegop.com; tsankey@pahousegop.com
Cc: 'sbarrar@pahousegop.com'; 'kboyle@pahouse.net'; 'mbradfor@pahouse.net'; tbriggs@pahouse.net; 'dbullock@pahouse.net'; 'mcarroll@pahouse.net'; 'mcephas@pahouse.net'; 'ccomitta@pshouse.net'; 'acruz@pahouse.net'; 'mjdaley@pahouse.net'; 'tdavis@pahouse.net'; 'ddeasey@pahouse.net'; 'ddigirol@pahousegop.com'; 'mdonatuc@pahouse.net'; 'ifitzgerald@pahouse.net'; 'dfrankel@pahouse.net'; 'rfreeman@pahouse.net'; 'egainey@pahouse.net'; 'pharkins@pahouse.net'; 'chill-evans@pahouse.net'; 'jharris@pahouse.net'; 'pkim@pahouse.net'; 'skinsey@pahouse.net'; 'kruege-braneky@pahouse.net'; 'mmadden@pahouse.net'; 'mmccarte@pahouse.net'; 'jmcclinton@pahouse.net'; 'gmullery@pahouse.net'; tmurt@pahousegop.com; epashinski@pahouse.net; cquinn@pahousegop.com; 'aravenstahl@pahouse.net'; 'jroebuck@pahouse.net'; 'mrossi@pahouse.net'; 'ssamuels@pahouse.net'; 'bsims@pahouse.net'; 'msturla@pahouse.net'; gvitali@pahouse.net; 'pwarren@pahouse.net'; 'ryoungbl@pahouse.net'
Subject: POTENTIAL ELECTRIC RATES HB 1425

Legislators:

I asked my friend and colleague Steve Goreham, PE, electrical engineer, Climate Realist and author of three major works on the fallacy of Catastrophic Anthropogenic Global Warming, to provide a simple picture on what happens when Environmentalism Goes Wild. Here it is--do you think PA ratepayers will tolerate this??

Wind, Solar, and Electricity Prices in Europe



Ontario Hydro, Eurostat, EurObserv'ER, World Bank, E

Not only are electric rates in Germany 4X what we pay here in Pennsylvania, their *"Renewables First Experiment"* is all but dead as described in this article https://larouchepub.com/pr/2019/190703_german_power_grid.html ----one you won't find in our sycophant MSM.

What is even more dramatic is that there have been major nameplate capacity issues with Windmills, Solar Panels and the systems that makes renewable energy non-dispatchable. If it were not for France and Sweden's Nuclear Fleet, the European Electric Grid would have failed recently.

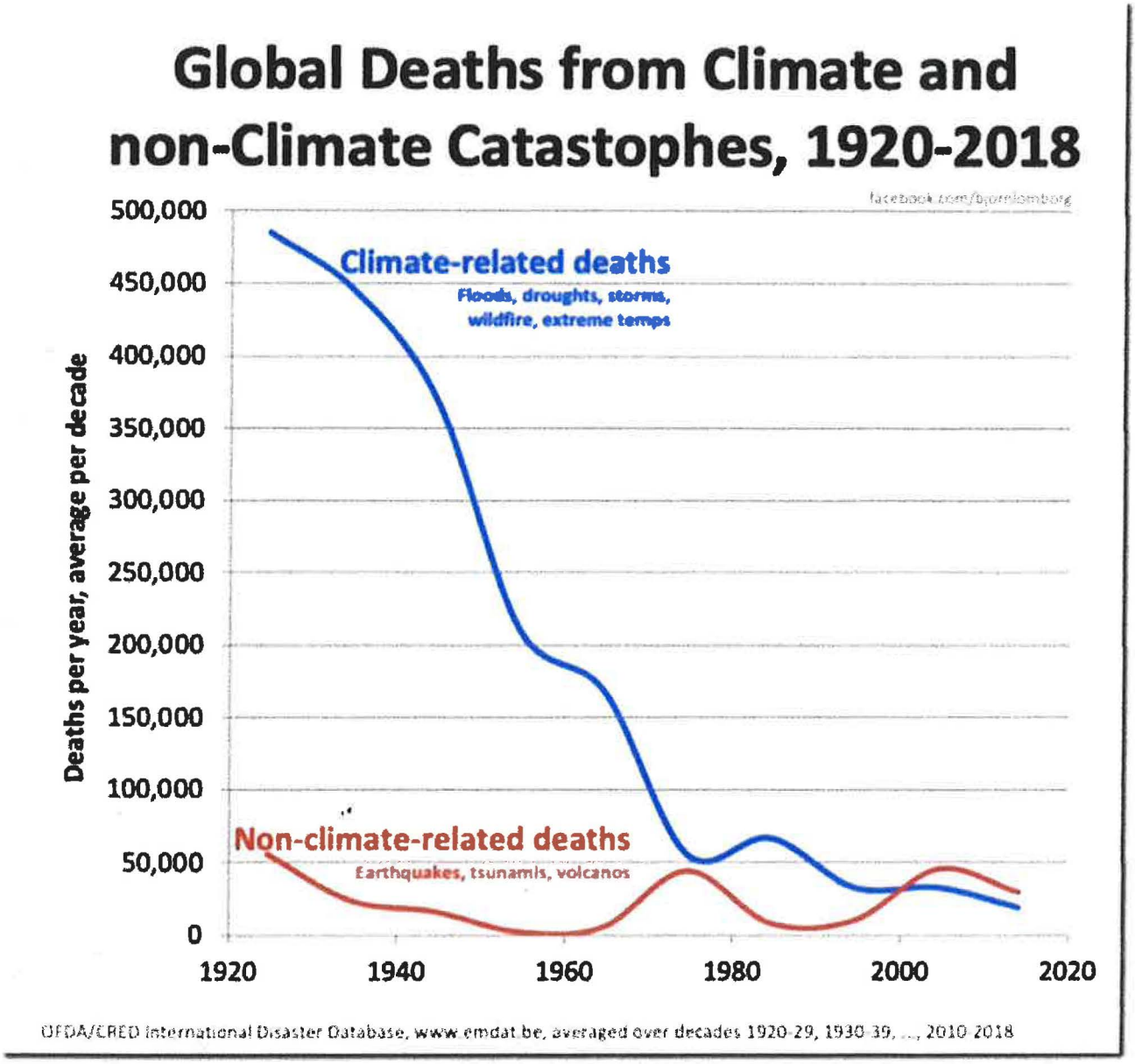
The only reason any of these renewables provide any continuous service, it's because they are backed up by turbine generators which are fueled by natural gas. This

intermittent operation is not conducive to longevity of the equipment, or efficiency of the process.

Having spent 50 years in energy and energy related fields, I have also spent the last 27 years studying and debunking the Man-Made Global Warming Madness. Last month I attended my sixth International Climate Change Conference ICCC-13 which was streamed on Heartland Institute's website, https://heartland.org., and the buzz word was $13/gal. gasoline—that is only if we as the responsible adults in the room don't allow the "Save the Planet" children have their way.

Pennsylvania has made serious mistakes in the past with the implementation of poorly constructed Alternative Energy Legislation. Much of that was crafted by John Quickly, PADEP, in collusion with extreme environmental NGOs. When you don't baseload the GRID with Nuclear, Coal and NG, Renewables present issues of inertia, voltage collapse, variability and rotational frequency with serious consequences.

When you consider that a carbon fueled society has resulted in less Climate-related deaths, the Narrative that we have to fear the future, is suspect are shown:



Flood related damage to buildings and infrastructure would be considerably less if encroachment to waterways were minimized by stricter zoning laws. Building Code's structural design can be upgraded in all buildings, commercial and residential, minimizing loss of life by hurricane & tornados.

This unrealistic idea that policy makers can legislate the elimination of fossil (carbon) fuels is absurd. There is no technology around today, or in the foreseeable future that can replace petroleum and its derivatives. Physics won't allow it. Common sense won't allow it. Anyone with the mine set that actually believes that carbon-based

(fossil) fuels can be eliminated has no grasp of the thermodynamics of energy reality, and has no grasp of science.

Anytime the Legislature wants to debate these energy issues, I am available to provide the expertise of my experience, and with advanced notice arrange for other colleagues to provide additional debate expertise, one of which I hope would be available is Pennsylvania's own Joe Bastardi, of Weather Bell Analytics.

Yours in Science, Technology and Truth,

John M. Chenosky, PE
Energy Specialist for 50 years

PS: "Laws are like sausages---it is better not to see either one being made." HB 1425 is a Strawman Sausage stuffed with Red Herring.

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Sunday, October 27, 2019 9:26 AM
To:	dmetcalf@pahousegop.com; dmaloney@pahousegop.com; broae@pahousegop.com; tmehaffie@pahousegop.com; tsankey@pahousegop.com; 'rwarner@pahousegop.com'; cdush@pahousegop.com
Cc:	WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); kenmatthews@whp580.com
Subject:	CARBON DIOXIDE AIRING 10/28/19

https://www.youtube.com/watch?v=FPH7HPaNHTg

Legislators:

I'm sorry I have been preoccupied trying to protect my health from the onslaught of Dirty Electricity's RF/EMF of my electric service, caused by the Smart Meter rollout. But I haven't forgot about the subject and I hope the numerous emails that I have sent will be added to the proceedings.

Some of the most important work has been done by another INDEPENDENT, RETIRED EARTH SCIENTIST a GEOLOGIST. He did the work SELF-FUNDED---just for the thrill of Scientific Inquiry. You see "Climate Science" does not resemble Science that I have engaged in the last fifty (50) years, i.e., requiring evidence, empirical evidence. You see models which people in this "field" utilize are a failure and don't prove any global warming. The lack of empirical evidence has demolished their theories. This was proven in the HOCKEY STICK CLIMATEGATE SCANDAL of 2009 despite the "Whitewash" cover and the double-down and triple down noise that has followed.

CONCLUSIVELY:

- **There are fundamental problems with the PHYSICS of the GREENHOUSE GAS THEORY.**
- **Climate models have not predicted temperature since 1998 by a factor of 3X the actual—a total failure.**
- **It has NEVER been shown EXPERIMENTALLY that increasing concentrations of greenhouse gases warms air significantly.**

- **When you view the linked video it becomes readily apparent that substantial evidence exists in the Greenland Ice Cores and the isotope C18, demonstrating significant correlation between periods of warming and glaciation.**
- **A balance driven by plate tectonics between frequent explosive volcanic eruptions and persistent effusive basaltic outflow provides a clear and detailed explanation of REAL CLIMATE CHANGE throughout Earth History.**
- **The fundamental footprint is erratic sudden major global warming followed by cumulative cooling over centuries to millennia where an average cycle lasts only a few thousand years.**
- **VOLCANOES RULE THE CLIMATE NOT CARBON DIOXIDE. 1 molecule in 10,000--- Seriously?**

These conclusions are further reinforced in the following article published in the Scientific Website that I am a charter member of, Principia Scientific, in which NASA data describes the UNPRECIDENTED COOLING PLUNGE in over a CENTURY..... https://principia-scientific.org/global-temps-continue-century-record-plunge-despite-rising-emissions/.

Since it is almost "Trick or Treat Time" I recommended you un-fund the illegal Zero Carbon Pact our agenized Governor signed. I also suggest you reign in the Fairy Tale Legislation of HB-1425 of Chris Rabb and his uninformed co-sponsors.

There is NO SUBSTITUTE FOR CARBON BASED FUELS. PERIOD. Please share this with your agenized colleagues who have black listed me because they don't want to hear the truth.

As always, I reserve the right to revise and extend my remarks and add extraneous information as it becomes available.

Yours in Science, Technology & Truth,

John M. Chenosky, PE
Debunker of the Myth of Carbon Dioxide CAGW for 27 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Wednesday, October 02, 2019 7:57 AM
To:	'dmaloney@pahousegop.com'; 'joritay@pahousegop.com'; 'sbloom@pahousegop.com'; 'mcauser@pahousegop.com'; 'bcorbin@pahousegop.com'; 'geverett@pahouse.com'; 'mgabler@pahousegop.com'; 'rmackenzie@pahousegop.com'; 'jmarshall@pahousegop.com'; 'cmetzgar@pahousegop.com'; 'jpyle@pahousegop.com'; 'krapp@pahousegop.com'; 'tsankey@pahousegop.com'; 'wtallman@pahousegop.com'; 'dzimmerman@pahousegop.com'; 'ccomitta@pahouse.com'; dmetcalf@pahousegop.com; broae@pahousegop.com; cquinn@pahousegop.com; tmehaffie@pahousegop.com; tsankey@pahousegop.com
Cc:	mfaust@weeu.com; greattalkradio@aol.com; WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); weather@wfmz.com
Subject:	TONY HELLER VIRAL VIDEO

https://www.youtube.com/watch?v=8455KEDitpU

Legislators:

One of the most prolific INDEPENDENT CLIMATE SKEPTICS, Tony Heller has been busy exposing the FRAUD of CLIMATE ALARMISM, especially in light of the despicable use of propagandized children to do their bidding. Marx would be proud.

A twelve minute video entitled *" My Gift to Climate Alarmists"* has gone viral on You Tube. Before the little climate trolls decide to censure its content I suggest you view it at your earliest convenience.

Essentially it provides an enlightening explanation of the magic of manipulation of statistics. Any time you switch time scales in data start dates to emphasize a specific theory it amounts to fraud—at least in the Science I have applied over the last 50 years.

This manipulation was exposed in the CLIMATEGATE scandal in 2009 as one fraudster explained…." *we can use Mike's Nature Trick"*., explaining how the debunked "HOCKEY STICK" was created.

Please pass it on to your Alarmists colleagues as they have all RBL'd me. Ask them why they don't want to debate this issue. Religion?

Yours in Science, Technology & Truth,

John M. Chenosky, PE
Energy Specialists for 50 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Thursday, September 12, 2019 6:03 PM
To:	dmetcalf@pahousegop.com; broae@pahousegop.com; tsankey@pahousegop.com; tmehaffie@pahousegop.com; dmaloney@pahousegop.com
Cc:	WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); kenmatthews@whp580.com
Subject:	Professor Ian Plummer "Not for Greens"

https://www.youtube.com/watch?v=lMfYjKauHbs

Legislators:

In anticipation of the meeting of September 19, 2019, where it appears that a one-sided presentation will be delivered by the DEP Secretary, not STEM trained. Have invitations been extended to Independent Experts with opposing views??

As numerous email testimonies presented by me in the past, this matter is a non-issue of Climate Change Initiatives. Allow me to submit into evidence the above video testimony by of one of the finest minds on the planet, Professor Ian Plummer, Professor Emeritus of Earth Science at University of Melbourne and Geologist.

In the video Professor Plummer recaps the Real Science and Economics of the hypocrisy of the GREEN CABAL who continues the FAUX SCIENCE of the Environmental Cult of Anthropogenic Climate Alarmists, who he describes as agenized "THUGS" and Marxists.

You probably have never heard of the Professor but he articulates the position of the 31,478 Scientists, Real Climatologists, Engineers, Meteorologists, Physicists & Solar Scientists, Biochemists & Biologists, Chemists, Earth & Environmentalists, Medical Doctors & Researchers, Computer, Math, Statistic and Forecasting Specialists, of which included over 9,000 PhDs, who signed the Global Warming Petition which is part of the Federal Register which states:

" There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gases is causing or will, in the foreseeable future, cause

catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth." **I'm listed on p. 144 and honored to sign with Dr. Edward Teller, credited with the "H" Bomb development, quoted as saying--- "Science attempts to find logic and simplicity in Nature."**

The Petition is available a https://oism.org/pproject never heard of it? --doesn't surprise me-- it doesn't fit the MSM and left-over Obama Narrative (propaganda).

The book "Not for Greens" is available at Amazon and should be acquired by committee staff and submitted into evidence:
https://www.amazon.com/Not-Greens-Devil-Should-Spoon/dp/1925138194?SubscriptionId=AKIAILSHYYTFIVPWUY6Q&tag=duckduckgo-d-20&linkCode=xm2&camp=2025&creative=165953&creativeASIN=1925138194

I retain the right to revise and extend my remarks and submit additional information as appropriate.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 50 years

PS: The previous submitted evidence includes: https://media4.manhattan-institute.org/sites/default/files/R-0319-MM.pdf

https://blog.friendsofscience.org/wp-content/uploads/2018/11/In-the-Dark-on-Renewables-FINAL-Nov-18-2018.pdf

John Chenosky

To:	dmetcalf@pahousegop.com; broae@pahousegop.com; tmehaffie@pahousegop.com; tsankey@pahousegop.com
Cc:	Mensch, Senator Bob (bmensch@pasen.gov); dmaloney@pahousegop.com; mfaust@weeu.com; WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); greattalkradio@aol.com; rdevlin@readingeagle.com
Subject:	ENERGY SECURITY NOT ACCOMPLISHED BY ALTERNATE (RENEWABLES) ENERGY STANDARDS AEPS ACT

https://www.instituteforenergyresearch.org/the-grid/utilities-call-for-americans-to-conserve-energy-as-frigid-weather-exhausts-supplies/
https://principia-scientific.org/april-2019-and-its-snowing-in-saudi-arabia/

Legislators:

Barely a month has elapsed since the weather commonly identified as the Polar Vortex of 2019 has gone into the annals of forgotten history. Since we escaped the longevity of the frigid conditions, we watched the TV news coverage of the below-zero temperatures in the Midwest and Great Plains. Over 220 million Americans experienced below-freezing temperatures across the lower-48 states, and about 26 million people were living with temperatures at or below -20 degrees.

Despite the sound bite coverage of the MSM they never seem to address the Obama-era mistakes proffered by the EPA, the Dept. of Energy and an NGO inspired Clean Power Plant (CPP) FUBAR, which decimated the Coal Industry and prematurely retired many GRID-STABIILIZING Coal Plants. Since the Obama Administration chose not to employ policy makers with demonstrated industrial Energy Experience and settled for Agenized Environmentalists, significant critical thinking was bypassed in favor of an Utopian Energy Policy not based in any Scientific, Thermodynamic Reality. No folks--carbon dioxide from burning carbon fuels, AKA, fossil fuels has not warmed the planet—get over it.

Let's see how Utilities and Regulators that bought into the Propaganda faired in this latest Weather Event as I highlight the reality:

- **Utility companies in parts of the Upper Midwest had to ask customers to conserve energy by turning down their thermostats to ensure that there was enough natural gas to meet demand.**
- **Midcontinent Independent System Operator declared a "maximum generation event," calling on idle power plants from Minnesota to Louisiana to meet demand.**
- **In Michigan, Consumers Energy—which serves 1.8 million residents—asked customers to set their temperature at 65 degrees or lower and large industrial users to lower usage.**
- **General Motors suspended operations at more than 11 plants and asked 20,000 employees at its Warren Tech Center to stay home during the worst period. Ford Motor Co. lowered the temperature at some plants and stopped heat treatment and paint production.**
- **Consumers Energy has boasted of being one of the most aggressive utilities in the country at closing coal plants and replacing that electricity production with natural gas and increasing amounts of renewable energy. That strategy increased demand for natural gas quickly-- it found itself with an insufficient supply of natural gas. Natural gas demand was expected to hit 3.7 billion cubic feet, compared with a regular winter day's average of 2.3 billion—over 60 % higher!!**
- **A fire at a natural gas compressor station added to the utility's limited ability to access gas storage. Two of the station's three plants were down. This doesn't happen in Coal Plants with stockpiles of coal.**
- **DTE Energy, which provides electricity to millions of customers in southeast Michigan, requested that customers reduce their electricity usage because its system is connected to energy grids in other states and Canada that were experiencing issues due to the weather. DTE has not been as aggressive in switching to natural gas and renewables as has Consumers Energy.**
- **Minnesota experienced a natural gas "brownout," as Xcel Energy requested its customers set their thermostats to 60 degrees or lower and avoid using hot water, as cold weather increased demand and taxed the equipment.**
- **On Wednesday, January 30, when the morning temperature in the Twin Cities was -24 degrees, wind energy provided only 4 percent of the electricity needed and used just 24 percent of its installed capacity in the Midcontinent Independent Systems Operator's region.**

- **Meanwhile, coal-fired power plants provided 45 percent of the system operator's power and nuclear provided 13 percent—mostly from Minnesota's Prairie Island and Monticello nuclear plants. Natural gas provided 26 percent of electricity demand, and the remainder was imported from Canada and other U.S. states.**
- **Thus, coal, natural gas, and nuclear provided over 80 percent of the needed electricity generation. At the same time, natural gas heated the homes of about 66 percent of Minnesotan, but there was not enough gas to combat the frigid temperatures.**
- **This should make Minnesota lawmakers think twice about doubling the state's renewable energy mandate to 50 percent by 2030. Clearly, intermittent, unreliable sources of energy like wind and solar would not be part of our energy system if they were not mandated by politicians, provided with federal subsidies, and thus, increasing the earnings of regulated utilities that profit off of the construction of new wind and solar farms.**

And, pursuing an UNSTABLE grid powered entirely by solar, wind, and natural gas would require more natural gas pipeline capacity, which is currently being opposed by activist factions and by certain state governments. New York is a prime example Governor Andrew Cuomo blocked a 124-mile pipeline to deliver natural gas from Pennsylvania to New York and New England. The pipeline would have allowed millions of Americans to convert to natural gas from heating oil, which would save an upstate New Yorker about *$1,000 a year*. Perhaps this action by President Trump may correct this foolhardy exercise-- https://www.reuters.com/article/us-usa-gas-trump/trump-to-sign-order-seeking-to-clear-gas-pipeline-hurdles-kudlow-idUSKCN1RF1V5.

Prior to that, Mr. Cuomo banned hydraulic fracturing in the state. New York has access to the Marcellus Shale gas deposit that is supplying large amounts of natural gas today by using hydraulic fracturing mainly in Pennsylvania and Ohio. Those natural gas supplies in New York are located in some of the poorest counties in the state where investment, jobs, and income would be welcomed.

In February of 1994 I lived in Wayne County on Lake Wallenpaupack and on 19th of that month our temperature was -35 deg. F. The temperature in my house dropped to 62 deg. F and I had concern that my water pipes in unconditioned spaces would freeze and burst. My envelope of Styrofoam prevented that.

However two great room sliders weren't so lucky, as difference in specific heat of the glass and wood frame resulted in warping and failure. Stuffing the gaps between the leafs (doors) with towels helped, but $4500 later I was forced to replace the defective sliders due to seal failure.

So don't think it can't happen here in Pennsylvania. And as we approach the next ice age, don't shoot ourselves in the foot to avoid shooting ourselves in the head, by continuing this attack on Nuclear, Carbon (fossil) oil, nat. gas and coal. We will need them all going forward.

Please add this information to the record on Updating the Pennsylvania Alternative Energy Portfolio Standards (AEPS) Act. I reserve the right to revise and extent my remarks.

Yours in Science, Technology and Truth,

John M. Chenosky, PE
Living Happily in the Holocene Interglacial

John Chenosky

From: John Chenosky <johnsuzy@windstream.net>

Sent: Wednesday, April 24, 2019 5:50 PM
To: tsankey@pahousegop.com; tmehaffie@pahousegop.com; dmetcalf@pahousegop.com; broae@pahousegop.com
Cc: dmaloney@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov); WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); editorial@standardspeaker.com; jmicek@pennlive.com; ebrandt@pottsmerc.com; 'kenmatthews@whp580.com'
Subject: UPDATING PENNSYLVANIA ALTERNATIVE ENERGY PORTFOLIO STANDARDS (AEPS) ACT

https://wattsupwiththat.com/2019/04/24/weekly-climate-and-energy-news-roundup-357/
https://andymaypetrophysicist.com/?s=renewables

Legislators:

One of my heroes, Albert Einstein stated..." Insanity is repeating the same thing over and over again expecting different results".

That would apply to the RENEWABLES which several countries had adopted and has resulted in dismal failures. That has been clearly demonstrated in "Crash Test Dummy" South Australia, with its recent fortnight GRID FAILURE and even worse, in Germany, as the first link explains. Can you imagine being without electricity for two weeks----the pitchforks will descend on Harrisburg???

Finally the Pennsylvania Legislature has seen fit to reconsidered the lunacy of Wind & Solar, including the policies favoring their priority dispatching which is killing the Coal and Nuclear Industries. Without these policies and gobmint subsidies the W&S RENEWABLE INDUSTRY cannot compete. See Andy May's link.

The first linked article has an interesting comment from a German Reporter which underscores the futility and failure of their Renewables: (translated)

"The guaranteed output of PV is nevertheless 0%; for onshore wind it is only 1% and for offshore wind it's 2%. In plain language, the 120 GW of renewables that we have

built up over the last 15 years make almost no contribution to the secured output. We will never build a secure power supply with wind and PV alone. Ten years ago, we had around 100 GW of power from secure energy sources at our disposal – coal, gas, nuclear, biomass and hydroelectric plants."

The Germans have had to reactivate their Brown Coal Plants, buy Nuclear-generated electricity from France in order to stabilize their GRID to the tune of $.35/kwh for their citizens OUCH!! Their atmospheric CO2 has increased--- so much for meeting their Virtue Signaling Paris Accord Goals.

And there have been several recent articles on German Climate Blog, https://notrickszone.com/, that emphasize the success of increased CO2 (the gas of life) in Greening the Planet. These articles fly in the face of comments by Penn State's Michael Mann of Hockey Stick fame, who was debunked for his "Nature Trick" Statistical Manipulation, "Hide the Decline", in the CLIMATEGATE SCANDLE in 2009. Apparently MM hasn't learned his lesson and has doubled-down on his ZERO CO2 by 2050. Incredible. Perhaps the only thing that will stop this abuse of Science is for Penn State to be sued, just as North Carolina recently found out, as they were fined $120 million by the Justice Department for falsifying gobmint-funded research.

Albert Einstein has also stated....."Only two things are infinite, the Universe and Stupidity and I'm not sure about the Universe".

As you review the impact of this economic suppository, i.e., Pennsylvania's AEPS, that has created for ratepayers in this Commonwealth, one must recognize that Carbon Dioxide, CO2, is NOT a pollutant. The Obama EPA provided "Secret Science" false data to the US SCOTUS resulting in a false "Endangerment Finding" in Massachusetts v. EPA. US Science Advisor Will Harper will complete the reversal of this false paradigm in the future.

And most importantly 400 ppm of CO2 does NOT provide any meaningful impact on World Weather, or Climate. https://www.youtube.com/watch?v=BC1l4geSTP8

The Marcellus Miracle is the only realistic RENEWABLE as it stands behind base-load COAL & NUCLEAR as a Grid Stabilizer. I told this to John Quigley in 2006. Had he not been such an eco-extremist, his actions and that of others, would not have been such a financial disaster for Pennsylvania.

As always, I reserve the right to revise and extend my remarks and provide additional evidence to support REAL Science.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 48 years & Debunker of CAGW for 26 years

John Chenosky

From: John Chenosky <johnsuzy@windstream.net>
Sent: Monday, April 08, 2019 1:00 PM
To: broae@pahousegop.com; tmehaffie@pahousegop.com; tsankey@pahousegop.com
Subject: FW: Dr. Mark Miles Professional Energy Forecaster

Legislators:

As you embark on the restructuring of the poorly crafted Pennsylvania Alternative Energy Portfolio Standards (AEPS) Act, the Committee needs to focus on the Laws of Economics, the Laws of Physics and Chemistry and the Laws of Human Behavior. Aspirational forecasting is not included in this focus. To those not on the original distribution I summarize:

Having attended Five (5) International Climate Change Conferences and meeting hundreds of scientists, engineers, geologists, meteorologists and climate experts, one of several with the ability to deliver the message of climate and energy reality was Dr. Mark Mills. His linked hour presentation *"New Energy Economy Delusion"* is classic. This should be compulsory continuing education for Policy Makers as his forecast is provocative, enlightening and positive---well worth your attention.

Other scientific presentations will be provided in time that conclusively proves that Carbon Dioxide, the gas that makes life possible on this planet, is not a pollutant. The Junk Science of the USEPA stemming from the idiotic SCOTUS interpretation in Massachusetts v. EPA was never based on an scientific reality, although SCOTUS was led astray by the *Secret Science pal-reviewed Nonsense of the USEPA*. It is time to put that agenized propaganda to bed.

I reserve the right to change and extend my remarks and request the attached are entered into the record.

Yours in Science, Technology and Truth,

John M. Chenosky, PE

From: John Chenosky [mailto:johnsuzy@windstream.net]
Sent: Sunday, March 03, 2019 8:04 AM
To: Mensch, Senator Bob (bmensch@pasen.gov); dmaloney@pahousegop.com; jmaher@pahousegop.com
Cc: mfaust@weeu.com; greattalkradio@aol.com; WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); rdevlin@readingeagle.com
Subject: Dr. Mark Miles Professional Energy Forecaster

https://www.youtube.com/watch?v=F4Nh134LhS4

In my many years of fighting the lunacy of CAGW, I have had the honor of meeting many charismatic scientists whose clarity is beyond reproach.

Introducing Dr. Mark Mills, Astro-Physicist, who after graduation, realized there were few jobs in his field, became an Engineer building Integrated Circuits & Computer Code.

His career gravitated to working in a Science Advising Role in the Bush 41 Administration, became a Professional Forecaster, is a Fellow at the Manhattan Institute and is a Professor at Northwestern University and works in what he describes in the "Pundits' Sphere". And for brevity he is a prolific author and speaker. I became familiar with Dr. Mills at the International Climate Change Conference ICCC-10 in DC in 2015. He gave a 20 minute presentation "Shale 2.0 Will End Green Dreams " : https://www.youtube.com/watch?v=6j0RDf4GMYY.

In the first link his presentation at the Basin Electric Board Meeting in 2018, he expands on the "New Energy Economy Delusion" introduced as part of his ICCC-10 dissertation.

His talk focuses on the Reality of World Energy Consumption and his forecast for future economic growth is mind boggling and well worth the hour's video---Mark is a very compelling speaker:

Highlighting the methods of accurate Forecasting are the following Laws that must be consider in an rational assessment of policy, they are:

Laws of Human Behavior which follow Maslow's Hierarchy of Needs.

Laws of Economics which never change and are those least understood.

Laws of Physics, which can by violated by Religious Fanatics, with devastating results.

This should be a necessary Continuing Education Course requirement for all Engineers, Scientists and Policy Makers.

Since many of us are in the grips of inclement weather Nationwide, that is if you have power generated by the miracle of Fossil Fuels, this is a great opportunity to expand your knowledge base with facts---not propaganda.

You will be grateful you took the time to view this video.

John M. Chenosky, PE
Energy Specialist for 48 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Monday, April 08, 2019 8:56 AM
To:	tmehaffie@pahousegop.com
Subject:	FW: AFFORDABLE ENERGY

From: John Chenosky [mailto:johnsuzy@windstream.net]
Sent: Friday, April 05, 2019 11:38 AM
To: 'broae@pahousegop.com'; tsankey@pahousegop.com; 'cquinn@pahousegop.com'; 'jpayne@pahousegop.com'
Cc: dmetcalf@pahousegop.com; dmaloney@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov)
Subject: FW: AFFORDABLE ENERGY

Legislators:

Attached is an email forwarded in 2017 to another committee, perhaps not understanding why Nuclear Energy is under the prevue of Consumer Affairs. So be it.

As this email describes briefly is the unfair competition imposed by unreliable "Renewables". This will be augmented by other emails with appropriate links to other white papers on the subject.

Pennsylvania is at a reality check threshold--- either we recognized that efforts on behalf of Extreme Environmentalists has been a Dismal Failure and listen to expert Professional Engineers, Geologists and Physicists, or face the loss of our Electric Grid.

As I told environmental cultist John Quiqley in 2006 that the Marcellus Shale Miracle was the real Renewable that will provide a bridge to Miniature Thorium Nuclear Reactor placements. Much safer, mini-grid capable, which is less vulnerable to total terrorist shutdowns of the main grid.

Please include this email, attachment and links, as testimony to the upcoming April 9th meeting. I reserve my right to revise and extend my remarks on the subject.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 48 years

From: John Chenosky [mailto:johnsuzy@dejazzd.com]
Sent: Sunday, June 11, 2017 5:17 PM
To: jmaher@pahousegop.com; dmaloney@pahousegop.com
Cc: mfaust@weeu.com; gunther@waeb.com; rdevlin@readingeagle.com
Subject: AFFORDABLE ENERGY

https://judithcurry.com/2015/05/12/true-costs-of-wind-electricity/
https://wattsupwiththat.com/2017/03/13/renewable-energy-what-is-the-cost/

Legislators:

The disturbing announcement this past week from the operators of the Three Mile Island Nuclear that the facility can no longer compete with the subsidies afforded alternative energy, i.e., wind and solar.

The only way alternative energy is reliable is with gas turbine technology back-up, as the wind doesn't blow consistently and the sun only provides daylight in this part of the Northern Hemisphere for 190 days on average.....and did I mention not at night.

Not only has the Obama administration almost driven Coal Powered electrical generation out of business with its failed CAGW Faux Theory and its CPP fiasco, COAL remains one of the only stalwart base load grid proven electrical generation. The reason being it is the only fuel that can be stockpiled and staged to prevent fuel interruption. NG pipelines are subject to unforeseen interruptions like contractor excavation accidents and terrorist sabotage.

The other is Nuclear Power. Its reliability and safety are second to none as no one was effected medically at the Three Mile Island Facility. Despite the operating mishaps the facility can compete effectively in today's energy market by eliminating the unfair advantages of GREEN subsidies.

A misinformed public needs to be re-educated in the many benefits of carbon-based fuels inappropriately named "fossil" as they are the products of internal Earth Core nuclear-daughter reactions and they are sustainable fuels generated by Earth Mechanisms.

In addition the stigma associated with NUCLEAR POWER also needs re-education and a FAIR MARKET to provide its cost effective electricity.

The links provide the REAL ECONOMICS of " Renewable Energy Alternatives" not the tainted figures provided by the GREEN LOBBY.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 45 years

John Chenosky

From: John Chenosky <johnsuzy@windstream.net>
Sent: Sunday, April 07, 2019 5:09 PM
To: 'tmehaffie@pahousegop.com'
Subject: FW: ENERGY SUBSIDIES
Attachments: moore-positive-impact-of-human-co2-emissions.pdf; In-the-Dark-on-Renewables-FINAL-Nov-18-2018.pdf

From: John Chenosky [mailto:johnsuzy@windstream.net]
Sent: Friday, April 05, 2019 1:32 PM
To: broae@pahousegop.com; 'tsankey@pahousegop.com'; 'cquinn@pahousegop.com'; jpayne@pahousegop.com
Cc: dmetcalf@pahousegop.com; dmaloney@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov)
Subject: FW: ENERGY SUBSIDIES

Legislators:

Here is the additional testimony as a Licensed Pennsylvania Professional Engineer Energy Specialist which was proffered in my last email of even date.

Based upon both emails submitted, the preponderance of the evidence demonstrates, despite the drumbeat of the misinformed, that the CAGW Meme is no longer a viable theory and has not been for over 40 years. This would no longer justify the fairy dust and unicorns of a zero carbon energy pipe dream, and the elimination of the failed Renewables ,i.e., Wind, Solar and Pond Scum. Nor does it require the gas of life--- carbon dioxide be reduced for any reason as it is NOT a pollutant.

It is unreasonable to provide an economic advantage to these renewables as they are not competitive and the poorest of our residents are unfairly paying for this increase. They have their place where no alternative is viable and when they can be isolated, but not on our Main Grid. If you don't believe that, all you need to recognize that Germany pays $.35/KWH making many of their industries non-competitive. And the Crash Test Dummy of Renewables, South Australia frequently has rolling blackouts and in the recent past had a fortnight grid failure.

I would be delighted to offer additional information the kind you don't find in normal media outlets. That is because publishing that does not fit the Man Caused Global

Warming Narrative of Extreme Environmentalism, perpetuated by the Green Cabal. Pennsylvania needs market-based solutions based on sound science that includes our support for our NUCLEAR ASSETS.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 48 years

From: John Chenosky [mailto:johnsuzy@dejazzd.com]
Sent: Tuesday, June 20, 2017 12:48 AM
To: jmaher@pahousegop.com; dmaloney@pahousegop.com; joritay@pahousegop.com; sbloom@pahousegop.com; mcauser@pahousegop.com; bcorbin@pahousegop.com; geverett@pahouse.com; mgabler@pahousegop.com; jlee@pahousegop.com; rmackenzie@pahousegop.com; jmarshall@pahousegop.com; cmetzgar@pahousegop.com; jpyle@pahousegop.com; krapp@pahousegop.com; tsankey@pahouse.com; wtallman@pahousegop.com; dzimmerman@pahousegop.com; mcarroll@pahouse.com; dbullock@pahouse.com; ccomitta@pahouse.com; ddeasey@pahouse.com; mgergely@pahouse.com; jharris@pahouse.com; cmetzgar@pahousegop.com; lkrueger-braneky@pahouse.com; smccarter@pahouse.com; bneuman@house.com; psnyder@pahouse.com; pwarren@pahouse.com
Cc: gunther@waeb.com; mfaust@weeu.com; rdevlin@readingeagle.com
Subject: ENERGY SUBSIDIES

Legislators & Media:

Below is a portion of a weekly posting that I receive from SEEP that covers factual information about Science, Energy & Environmental Policy. It is germane to the current discussion about the state of Nuclear Power in Pennsylvania and the US. The entire weekly posting and relevant archives are available at http://www.sepp.org. It is self-explanatory and it follows:

Energy Subsidies: The EPA planned a meeting on Scientific Integrity, which was cancelled at the last minute. The Heartland Institute arranged a small conference to prepare for the meeting. Whether the meeting was cancelled due to the conference is a matter of speculation. But, the Heartland conference took place. One of the many informative presentations was on Energy Policy by Roger Bezdek. He announced a new study on US energy subsidies from 1950 to 2016 by his firm, Management Information Services, Inc. The study was sponsored by The Nuclear Energy Institute to examine if subsidies for nuclear were damaging wind and solar electricity generation.
The study is painstakingly thorough. It examines five different types of incentives: Tax Policy; Regulation; Research and Development; Market Activity; Government Services and Direct

Disbursements; for seven different energy sources: Oil, Natural Gas, Coal, Hydro, Nuclear, Renewables (primarily wind, solar, and biomass), and Geothermal. The take-home message is:
'Over the past six years, 2011 through 2016, renewable energy received more than three times as much help in federal incentives as oil, natural gas, coal, and nuclear combined, and 27 times as much as nuclear energy.'
The solar and wind industries have no basis for claiming they need subsidies because other industries have big subsidies. Further, according to the US EIA the domestic energy production by source in 2016, one finds that natural gas provides 33%, petroleum (crude & natural gas liquids) 28%, coal 17%, renewables 12% (to which the EIA includes hydropower), and nuclear electric power 10%. The subsidies for renewables are outrageously large for energy they produce – plus wind and solar are not reliable.
Though occurring before the timeframe of the study, a bit of tax history is desirable to address the claims by the wind and solar industries that historic subsidies of fossil fuels illustrate the need for wind and solar subsidies. Starting in 1859, the early petroleum industry did not need subsidies to sell kerosene, replacing candles and whale oil. It was a superior product at an affordable price. Tax incentives did not come into play until the newly enacted income tax was suddenly increased to 'pay for World War I.' Incentives for the oil industry were needed because the government discovered that it needed oil to help win the war.
Similarly, particularly after WW I, fossil-fuel fired power plants offered a superior product, reliable electricity, at an affordable price. Governments became involved to make the electricity more affordable and available for everyone. The saying that it is hard to get the kids back to the farm once they see the bright lights of the city was well put.
By contrast, solar and wind offer an inferior product at a high price. The electricity is non-dispatchable – meaning that it cannot be turned on, off, or adjusted on demand, unlike a gas burner. Until that problem is resolved, solar and wind will remain inferior sources of electricity, regardless of how much is spent in subsidies. See links under Subsidies and Mandates Forever and
https://www.eia.gov/energyexplained/?page=us_energy_home

The PA Legislature must do everything to ensure the continued use of Nuclear Energy in this state, if we are interested in maintaining a sound industrial base and the taxes it generates. Reliable, affordable energy is the way we accomplish that.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 45 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Friday, April 05, 2019 11:38 AM
To:	'broae@pahousegop.com'; tsankey@pahousegop.com; 'cquinn@pahousegop.com'; 'jpayne@pahousegop.com'
Cc:	dmetcalf@pahousegop.com; dmaloney@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov)
Subject:	FW: AFFORDABLE ENERGY

Legislators:

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John M. Chenosky, PE
Energy Specialist for 48 years

From: John Chenosky [mailto:johnsuzy@dejazzd.com]
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To: jmaher@pahousegop.com; dmaloney@pahousegop.com
Cc: mfaust@weeu.com; gunther@waeb.com; rdevlin@readingeagle.com
Subject: AFFORDABLE ENERGY

https://judithcurry.com/2015/05/12/true-costs-of-wind-electricity/
https://wattsupwiththat.com/2017/03/13/renewable-energy-what-is-the-cost/

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The links provide the REAL ECONOMICS of " Renewable Energy Alternatives" not the tainted figures provided by the GREEN LOBBY.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 45 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Thursday, March 28, 2019 8:14 AM
To:	dmetcalf@pahousegop.com
Cc:	dmaloney@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov)
Subject:	INCONVIENT FACTS
Attachments:	R-0319-MM.pdf

https://cornwallalliance.org/2019/03/is-apple-censoring-gregory-wrightstones-climate-change-app-join-the-discussion/?eType=EmailBlastContent&eId=08de7ea9-bd1b-439a-97c2-3a6f821e65c0

Chairman Metcalf:

I was delighted that your committee held an Informational Meeting on the Fallacy of CAGW, AKA Human Caused Global Warming featuring Geologist, Author and Pennsylvania Native, Gregory Whitestone. The Cornwall Alliance link reinforces the censorship Apple applied to his APP due to Board Member Al Gore, but he probably told you that.

I have yet to have the pleasure of meeting Mr. Whitestone and hopefully he'll attend one of the next International Climate Change Conferences sponsored by National Think Tank sponsor, The Heartland Institute, of which I am a Sustaining Member. Heartland is a treasure chest of Science on the subject available at https://www.heartland.org/Center-Climate-Environment/index.html.

With respect to where Policy Makers should consider the correct framework going forward, I have linked Manhattan Institute's Fellow, Dr. Mark Mills recent paper The "New Energy Economy": An Exercise in Magical Thinking. The PDF is linked in the subject and a brief notice of this report was posted on the World's Best Science Blog: wattsupwiththat.com, now approaching 400MM views since its founding in 2006. This website exposed the scandal of Michael Mann et al known as Climategate.

The WUWT posting is attached and the PDF is more easily downloadable and readable at the end of the article https://wattsupwiththat.com/2019/03/27/report-green-energy-economy-is-simply-impossible/.

If the need arises and further clarifications of the reasonable and Scientific Method of Skeptical Scientists, please contact me for further assistance.

John M. Chenosky, PE
Energy Specialist for 48 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Tuesday, March 26, 2019 4:39 PM
To:	dmaloney@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov); 'dmetcalf@pahousegop.com'
Cc:	WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); rdevlin@readingeagle.com; mfaust@weeu.com; greattalkradio@aol.com
Subject:	EXPELLING MITHS ABOUT EMP

https://www.youtube.com/watch?v=UZIDDghSIhs

While all Legislators are busy with the state's budget issues and the Virtue Signaling & the Precautionary Principle of wasted resources on Climate Change forced upon us by the Environmental Extremists with their attack on Fossil Fuels--- this is what keeps me up at night.

Notwithstanding the threat imposed by the erratic operation of Renewables (Wind & Solar) on the Electric Grid, this video describes the most critical Energy Issue facing our State and Nation.

And that gentlemen is EMP (electromagnetic pulse), Solar Storm Protection and DIY Terrorism. Have any of you viewed the film "Ocean's Eleven" where Clooney's crew disabled the power in the whole City of Las Vegas? That action was verifiable by the speaker in this video in an experiment sanctioned by the US Navy---at a cost of a mere $20,000, chump change for Osama's son.

While legislation forcing Smart Meter installation on the taxpayers of Pennsylvania---- that money should have been better spent on GRID and SUB-STATION PROTECTION.

In the event that the potential seriousness of this situation escapes you, perhaps you might consider the purchase of a whole house emergency generator, a year's supply of food and make security arrangements for your property and love ones when the food and energy riots takeover.

I offer to accompany a contingent of PA Legislators, PAPUC & Utility Executives to Advanced Fusion Systems to initiate the process of implementation of these vital protections.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 48 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Wednesday, March 06, 2019 2:21 PM
To:	dmetcalf@pahousegop.com; mcauser@pahousegop.com; 'cdush@pahousegop.com'; 'jfritz@pahousegop.com'; jlee@pahousegop.com; rmackenzie@pahousegop.com; cmetzgar@pahousegop.com; 'toneal@pahousegop.com'; jortitay@pahousegop.com; jpyle@pahousegop.com; 'krapp@pahousegop.com'; tsankey@pahousegop.com; 'pschemel@pahouse.com'; dzimmerman@pahousegop.com; gvitali@pahousedem.com; ccomitta@pahouse.com; 'efielder@pahouse.com'; 'misaacson@pahouse.com'; psnyder@pahouse.com; pwarren@pahouse.com; 'mzabel@pahouse.ccom'
Cc:	dmaloney@pahousegop.com; WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); rdevlin@readingeagle.com
Subject:	ENDOCRINE DISRUPTER SCARE

https://junkscience.com/the-endocrine-disrupter-scare/

Chairman Metcalf:

Congratulations on your appointment as Environmental & Energy Chair. I look forward to providing Professional Engineering & Technology Information for legislation coming in front of your committee this session.

Despite being Permanently Disabled and saddled with Anomic & Expressive Aphasia, I offer my 48 years of Energy, Environmental, CAGW Skepticism and Chemical Engineering experience to your efforts to provide Science-based, cost effective legislation for Pennsylvania Taxpayers.

As a Disciple of Facts and Science about issues in the Policy Sphere, I am not afforded the Emotionally Dysfunctional Opinions exhibited by many FAUX scientists.

The link provided comes from my friend and colleague, Steve Milloy and his website, https://junkscience.com, one of many science blogs I peruse daily. Steve is a prolific writer, his latest work *"Scare Pollution....Why & How To Fix the EPA",* NYT Best Seller. I have had the pleasure of seeing his International Climate Change Conferences presentations on the faulty epidemiologic studies conducted by the USEPA and their agenized consultants.

As this link describes recent studies that debunks the continuing decades old FALSE NARRATIVE of Non-Monotomic dose response curve. Toxicology is the study of poisons. A basic tenant of Toxicology is …." the dose makes the poison", advanced by a Swiss Physician & Chemist, Paracelsus nearly 500 years ago.

I request that this information be entered into the record when debating modifications of the Pennsylvania Clean Water Act.

Yours in Science & Technology,

John M. Chenosky, PE

John Chenosky

To:	broae@pahousegop.com; tsankey@pahousegop.com; cquinn@pahousegop.com; jpayne@pahousegop.com
Cc:	dmetcalf@pahousegop.com; dmaloney@pahousegop.com; Mensch, Senator Bob (bmensch@pasen.gov)
Subject:	FW: ENERGY SUBSIDIES
Attachments:	moore-positive-impact-of-human-co2-emissions.pdf; In-the-Dark-on-Renewables-FINAL-Nov-18-2018.pdf

Legislators:

Here is the additional testimony as a Licensed Pennsylvania Professional Engineer Energy Specialist which was proffered in my last email of even date.

Based upon both emails submitted, the preponderance of the evidence demonstrates, despite the drumbeat of the misinformed, that the CAGW Meme is no longer a viable theory and has not been for over 40 years. This would no longer justify the fairy dust and unicorns of a zero carbon energy pipe dream, and the elimination of the failed Renewables ,i.e., Wind, Solar and Pond Scum. Nor does it require the gas of life--- carbon dioxide be reduced for any reason as it is NOT a pollutant.

It is unreasonable to provide an economic advantage to these renewables as they are not competitive and the poorest of our residents are unfairly paying for this increase. They have their place where no alternative is viable and when they can be isolated, but not on our Main Grid. If you don't believe that, all you need to recognize that Germany pays $.35/KWH making many of their industries non-competitive. And the Crash Test Dummy of Renewables, South Australia frequently has rolling blackouts and in the recent past had a fortnight grid failure.

I would be delighted to offer additional information the kind you don't find in normal media outlets. That is because publishing that does not fit the Man Caused Global Warming Narrative of Extreme Environmentalism, perpetuated by the Green Cabal.

Pennsylvania needs market-based solutions based on sound science that includes our support for our NUCLEAR ASSETS.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 48 years

From: John Chenosky [mailto:johnsuzy@dejazzd.com]
Sent: Tuesday, June 20, 2017 12:48 AM
To: jmaher@pahousegop.com; dmaloney@pahousegop.com; joritay@pahousegop.com; sbloom@pahousegop.com; mcauser@pahousegop.com; bcorbin@pahousegop.com; geverett@pahouse.com; mgabler@pahousegop.com; jlee@pahousegop.com; rmackenzie@pahousegop.com; jmarshall@pahousegop.com; cmetzgar@pahousegop.com; jpyle@pahousegop.com; krapp@pahousegop.com; tsankey@pahouse.com; wtallman@pahousegop.com; dzimmerman@pahousegop.com; mcarroll@pahouse.com; dbullock@pahouse.com; ccomitta@pahouse.com; ddeasey@pahouse.com; mgergely@pahouse.com; jharris@pahouse.com; cmetzgar@pahousegop.com; lkrueger-braneky@pahouse.com; smccarter@pahouse.com; bneuman@house.com; psnyder@pahouse.com; pwarren@pahouse.com
Cc: gunther@waeb.com; mfaust@weeu.com; rdevlin@readingeagle.com
Subject: ENERGY SUBSIDIES

Legislators & Media:

Below is a portion of a weekly posting that I receive from SEEP that covers factual information about Science, Energy & Environmental Policy. It is germane to the current discussion about the state of Nuclear Power in Pennsylvania and the US. The entire weekly posting and relevant archives are available at http://www.sepp.org. It is self-explanatory and it follows:

Energy Subsidies: The EPA planned a meeting on Scientific Integrity, which was cancelled at the last minute. The Heartland Institute arranged a small conference to prepare for the meeting. Whether the meeting was cancelled due to the conference is a matter of speculation. But, the Heartland conference took place. One of the many informative presentations was on Energy Policy by Roger Bezdek. He announced a new study on US energy subsidies from 1950 to 2016 by his firm, Management Information Services, Inc. The study was sponsored by The Nuclear Energy Institute to examine if subsidies for nuclear were damaging wind and solar electricity generation.
The study is painstakingly thorough. It examines five different types of incentives: Tax Policy; Regulation; Research and Development; Market Activity; Government Services and Direct Disbursements; for seven different energy sources: Oil, Natural Gas, Coal, Hydro, Nuclear, Renewables (primarily wind, solar, and biomass), and Geothermal. The take-home message is:
'Over the past six years, 2011 through 2016, renewable energy received more than three times as much help in federal incentives as oil, natural gas, coal, and nuclear combined, and 27 times as much as nuclear energy.'

The solar and wind industries have no basis for claiming they need subsidies because other industries have big subsidies. Further, according to the US EIA the domestic energy production by source in 2016, one finds that natural gas provides 33%, petroleum (crude & natural gas liquids) 28%, coal 17%, renewables 12% (to which the EIA includes hydropower), and nuclear electric power 10%. The subsidies for renewables are outrageously large for energy they produce – plus wind and solar are not reliable.

Though occurring before the timeframe of the study, a bit of tax history is desirable to address the claims by the wind and solar industries that historic subsidies of fossil fuels illustrate the need for wind and solar subsidies. Starting in 1859, the early petroleum industry did not need subsidies to sell kerosene, replacing candles and whale oil. It was a superior product at an affordable price. Tax incentives did not come into play until the newly enacted income tax was suddenly increased to 'pay for World War I.' Incentives for the oil industry were needed because the government discovered that it needed oil to help win the war.

Similarly, particularly after WW I, fossil-fuel fired power plants offered a superior product, reliable electricity, at an affordable price. Governments became involved to make the electricity more affordable and available for everyone. The saying that it is hard to get the kids back to the farm once they see the bright lights of the city was well put.

By contrast, solar and wind offer an inferior product at a high price. The electricity is non-dispatchable – meaning that it cannot be turned on, off, or adjusted on demand, unlike a gas burner. Until that problem is resolved, solar and wind will remain inferior sources of electricity, regardless of how much is spent in subsidies. See links under Subsidies and Mandates Forever and https://www.eia.gov/energyexplained/?page=us_energy_home

The PA Legislature must do everything to ensure the continued use of Nuclear Energy in this state, if we are interested in maintaining a sound industrial base and the taxes it generates. Reliable, affordable energy is the way we accomplish that.

Yours in Science & Technology,

John M. Chenosky, PE
Energy Specialist for 45 years

John Chenosky

From:	John Chenosky <johnsuzy@windstream.net>
Sent:	Sunday, March 03, 2019 8:04 AM
To:	Mensch, Senator Bob (bmensch@pasen.gov); dmaloney@pahousegop.com; jmaher@pahousegop.com
Cc:	mfaust@weeu.com; greattalkradio@aol.com; WALSH, BOBBYGUNTHER (Gunther@iheartmedia.com); rdevlin@readingeagle.com
Subject:	Dr. Mark Miles Professional Energy Forecaster

https://www.youtube.com/watch?v=F4Nh134LhS4

In my many years of fighting the lunacy of CAGW, I have had the honor of meeting many charismatic scientists whose clarity is beyond reproach.

Introducing Dr. Mark Mills, Astro-Physicist, who after graduation, realized there were few jobs in his field, became an Engineer building Integrated Circuits & Computer Code.

His career gravitated to working in a Science Advising Role in the Bush 41 Administration, became a Professional Forecaster, is a Fellow at the Manhattan Institute and is a Professor at Northwestern University and works in what he describes in the "Pundits' Sphere". And for brevity he is a prolific author and speaker. I became familiar with Dr. Mills at the International Climate Change Conference ICCC-10 in DC in 2015. He gave a 20 minute presentation "Shale 2.0 Will End Green Dreams " : https://www.youtube.com/watch?v=6j0RDf4GMYY.

In the first link his presentation at the Basin Electric Board Meeting in 2018, he expands on the "New Energy Economy Delusion" introduced as part of his ICCC-10 dissertation.

His talk focuses on the Reality of World Energy Consumption and his forecast for future economic growth is mind boggling and well worth the hour's video---Mark is a very compelling speaker:

Highlighting the methods of accurate Forecasting are the following Laws that must be consider in an rational assessment of policy, they are:

Laws of Human Behavior which follow Maslow's Hierarchy of Needs.

Laws of Economics which never change and are those least understood.

Laws of Physics, which can by violated by Religious Fanatics, with devastating results.

This should be a necessary Continuing Education Course requirement for all Engineers, Scientists and Policy Makers.

Since many of us are in the grips of inclement weather Nationwide, that is if you have power generated by the miracle of Fossil Fuels, this is a great opportunity to expand your knowledge base with facts---not propaganda.

You will be grateful you took the time to view this video.

John M. Chenosky, PE
Energy Specialist for 48 years

John Chenosky

To:	jmaher@pahousegop.com; dmaloney@pahousegop.com; sbloom@pahousegop.com; mcauser@pahousegop.com; bcorbin@pahousegop.com; geverett@pahouse.com; mgabler@pahousegop.com; jlee@pahousegop.com; rmackenzie@pahousegop.com; jmarshall@pahousegop.com; cmetzgar@pahousegop.com; jpyle@pahousegop.com; krapp@pahousegop.com; tsankey@pahousegop.com; wtallman@pahousegop.com; dzimmerman@pahousegop.com; mcarroll@pahouse.com; dbullock@pahouse.com; ccomitta@pahouse.com; ddeasey@pahouse.com; mgergely@pahouse.com; jharris@pahouse.com; cmetzgar@pahousegop.com; lkrueger-braneky@pahouse.com; smccarter@pahouse.com; bneuman@house.com; psnyder@pahouse.com; pwarren@pahouse.com; pharkins@pahouse.net; sconklin@pahouse.net; epashinski@pahouse.net; dmcneill@pahouse.net; jorittay@pahousegop.com
Cc:	dmetcalfe@pahousegop.com; cmrabb@pahouse.net; gunther@waeb.com; mfaust@weeu.com; shenshaw@readingeagle.com; greattalkradio@aol.com; ebrandt@pottsmerc.com; hinkelm@phillynews.com; jmicek@pennlive.com
Subject:	HB 2132 Legislation Providing For Transition to 100% Renewable Energy
Attachments:	Cloud_Begins_With_Coal.pdf

https://www.youtube.com/watch?v=6j0RDf4GMYY

Legislators & Media:

In my inbox this morning I read the outline of the proposed PA Unicorn House Bill 2132, which was sprinkled with Fairy Dust. After a bout of hysterical laughter, I collected myself and crafted this well enlightened critique of this grand illusion.

Obviously Representative Chris Rabb, District 200, was probably lured into this proposal by others because the bill, and/or his CV does not support any understanding of Energy or Economics, or more importantly Capitalism. Anyone that has studied Energy, especially Renewables, knows that thermodynamically they will not replace carbon fuels for energy generation and transportation for several centuries, if ever. Thankfully, carbon dioxide (CO2) a byproduct of carbon fuel combustion has been instrumental in greening the planet and increased crop yields. CO2 is the gas of life—not the villain climate alarmists portray it to be. Catastrophic Anthropogenic Global Warming (CAGW) is a failed theory that skeptics have dismantled, despite what you read or see in the MSM--none of the alarmists' Global Warming predictions have come to fruition in the last 30+ years, in fact temperatures have declined.

Germany bought into the CAGW hype and now its major industries are leaving the country, because at 35 cents/kwh, caused by renewable energy generation, they are unable to compete in the world economy. Or better yet, read about South Australia, the Crash Test Dummy for Renewable Energy, as they as now famous for rolling blackouts due to an energy grid instability caused by unreliable Windmills and Solar Panels. Apparently we sent a Pennsylvania Delegation to Australia to lure companies to our state because of our cheap energy—if they relocated and Rep. Rabb and his handlers have their way, Pennsylvania's Electric Grid will not be able to sustain their energy requirements, or for that matter---ours. And despite over whelming evidence that fracking is environmentally safe, the Delaware River Basin Commission (DRBC) is attempting to shut down our Marcellus Miracle—influenced by agenized extremists.

Representative Rabb's proposed legislation would drive Pennsylvania and its citizens into energy bankruptcy. Any thought of adding other State Agencies to implement such a non-scientific based Energy Policy, crafted by left over Obama-era Environmental Extremists, is not worthy of the thought, or the paper it's written on.

Having the opportunity to attend Five (5) International Climate Change Conferences since 2009 the myriad of world energy knowledge I acquired is priceless. In July of 2015 I attended the ICCC-10 Conference and had the pleasure of listening to Dr. Mark Mills who gave an entertaining presentation on "Energy Reality" (the above Youtube link), intended for policy makers and those of us in the energy field. It is required viewing for all email recipients in order to expand their comprehension of the realities of World Energy Consumption.

For those who need substantially more facts about the reality of the enormous problem the world faces, I enclose a link to Dr. Mark Mills' white paper " The Cloud Begins With Coal", replete with projected energy requirements for a Digital Society. Those of you familiar with Bitcoin might not be aware that the current "Bitcoin Mining" consumes more energy than 159 countries, including more than Ireland and Nigeria. I submit to you that Renewables supported by Energy Unicorns and their Fairy Dust will not support that technology, or any future energy needs. Grid power also needs a commitment by Pennsylvania Legislators to a viable Nuclear Energy Program.

In closing, the Oil Industry spends $6 Trillion in annual Global Cap-X to extract the God-created carbon fuels from their hiding places, they are the real renewables as explained by the Abiogenic Theory. The Industry has more than $100 Trillion in Global Assets, they account for Global GDP in the tens of Trillions every year affecting almost everyone on the planet, except the poor, because the anti-humanists do everything to block cheap carbon-based energy to improve their lives. Read about it in Dr. Robert Zubrin's *" Merchants of Despair: Radical Environmentalists, Criminal Pseudo-Scientists, And The Fatal Cult of Anti-Humanism".* A synopsis is available here https://www.youtube.com/watch?v=ei6jbrcX8ao--.

Yours in Science & Technology,

John M. Chenosky, PE

John Chenosky

From:	John Chenosky <johnsuzy@dejazzd.com>
Sent:	Monday, January 01, 2018 6:49 PM
To:	dmaloney@pahousegop.com; jmaher@pahousegop.com; sbloom@pahousegop.com; mcauser@pahousegop.com; bcorbin@pahousegop.com; mgabler@pahousegop.com; jlee@pahousegop.com; rmackenzie@pahousegop.com; cmetzgar@pahousegop.com; jpyle@pahousegop.com; tsankey@pahousegop.com; wtallman@pahousegop.com; dzimmerman@pahousegop.com; mcarroll@pahouse.com; dbullock@pahouse.com; ccomitta@pahouse.com; mgergely@pahouse.com; jharris@pahouse.com; cmetzgar@pahousegop.com; lkrueger-braneky@pahouse.com; smccarter@pahouse.com; bneuman@house.com; psnyder@pahouse.com; pwarren@pahouse.com; jortitay@pahousegop.com; geverett@pahousegop.com; jmarshal@pahousegop.com; klrapp@pahousegop.com; ddeasy@pahouse.net
Cc:	WALSH, BOBBYGUNTHER; mfaust@weeu.com; shenshaw@readingeagle.com; greattalkradio@aol.com
Subject:	CLIMATE REFUGEES

https://wattsupwiththat.com/2017/12/29/climate-policy-refugees-trump-energy-policies-tempting-foreign-companies-to-relocate-to-the-usa/
https://wattsupwiththat.com/2017/12/10/survey-south-australians-fed-up-with-unreliable-expensive-green-power/

Legislators & Media:

I thought I'd start off the New Year by asking all of you how you were enjoying the Catastrophic, Anthropogenic, Global Warming (CAGW) this Holiday Season?

There is a scientific reason for this. Our SUN has had virtually NO SUNSPOTS for the last two months and is about to enter a natural weak Solar Cycle due to declining solar intensities similar to the Little Ice Age, portending significant cooling. New white papers by Real Scientists are predicting a cool down on the order of several degrees centigrade. So much for the CAGW—more on that in another post.

I was astounded by the linked article that suggested that a contingent of Pennsylvania Big Wigs have made a safari to Australia to poach several industries, encouraging them to pull up stakes and move to Pennsylvania. The news appeared in an Australian paper that unfortunately is a "paywalled" subscription. I'm too cheap to subscribe but you folks have the option.

When one considers that Western Australia is the Crash Test Dummy for GREEN Renewables that have been an unmitigated disaster--- leading to brown-outs and system failures state wide, it is understandable. The Politicians even demolished their last coal generating station insuring the disaster and the gas turbines backing-up the GREEN un-reliables were overwhelmed.

Even the Europeans understand this migration and they call it *"carbon leakage"* ---how fitting.

Of course the basis of offering this change of venue for these poached industries is economically steady utility rates and grid-reliable electricity. Probably a tax break as well.

The problems I foresee is that for the last eight years the Obama Greens have waged a war on energy in this country, implemented in state by a dutifully ignorant PADEP.

So here are my concerns with respect to this anticipated program. Pennsylvania needs to:

1 – Immediately cease the War On Coal that sent 56 companies into bankruptcy and the loss of $64 billion in their corporate equity. For those unfamiliar with coal it is the perfect base-load fuel and the stock piles on site insure the continuation of power in emergency situations. Provide loans or tax relief to existing power stations (clean coal technology).
2 – Stop the unfair subsidies for unreliable RENEWABLES and cease construction of solar and wind power supported by PA State confers.
3 – Immediately re-structure the Nuclear Rate Structure to make it a viable Grid-stabilizing contributor it once was. Approve the siting of new Nuclear Generators when proposed.
4 – Stop caving to ignorant Environmental NGOs who are attempting to sabotage the MARCELLUS MIRACLE and the pipe lines necessary to deliver the product where needed. Massive storage tanks need to be constructed to insure the NG is properly processed and stored for instant availability.
5 – Reign in the PADEP---provide a committee for Industry and Professional Engineers to review and oversee any and all PADEP regulations stifling energy growth and those that created excessive environmental standards.

When the PADEP implemented their Climate Change Committee I attended the first meeting. After listening to the diatribe about Renewables and the silliness of the CAGW, I told those in attendance that Pennsylvania was sitting on a MASSIVE deposit of Marcellus Shale Gas and that was the RENEWABLE that was the only viable one available. You won't find this in the minutes because Quigley and his minions sanitized the record. No one was going to rain on his environmental charade.

And last but not least, I am reminder of the Volkswagen Rabbit gambit. Can someone tell me how much that financial suppository cost Pennsylvania Taxpayers? Legislators don't make that mistake again especially since we have advantages to offer in reduced operating costs—these foreign industries don't need their pie sweetened to lure them here.

Yours in Science & Technology,

John Chenosky

From: John Chenosky <johnsuzy@dejazzd.com>

Sent: Thursday, November 23, 2017 3:30 PM
To: dmaloney@pahousegop.com; sbloom@pahousegop.com; mcauser@pahousegop.com; bcorbin@pahousegop.com; mgabler@pahousegop.com; jlee@pahousegop.com; rmackenzie@pahousegop.com; cmetzgar@pahousegop.com; jpyle@pahousegop.com; tsankey@pahousegop.com; wtallman@pahousegop.com; dzimmerman@pahousegop.com; mcarroll@pahouse.com; dbullock@pahouse.com; ccomitta@pahouse.com; jmaher@pahousegop.com; mgergely@pahouse.com; jharris@pahouse.com; cmetzgar@pahousegop.com; lkrueger-braneky@pahouse.com; smccarter@pahouse.com; bneuman@house.com; psnyder@pahouse.com; pwarren@pahouse.com; jortitay@pahousegop.com; geverett@pahousegop.com; jmarshal@pahousegop.com; klrapp@pahousegop.com; ddeasy@pahouse.net
Cc: WALSH, BOBBYGUNTHER; mfaust@weeu.com; rdevlin@readingeagle.com
Subject: ANTHROPOMORPHIC BASIS FOR CLIMATE FRAUD

Legislators & Media:

One of the most strident Climate Experts, Dr. Tim Ball has penned a new article which contained a quote from a United States Forest Ranger suggesting that humans have gone down the wrong evolutionary track and I want to share this lunacy with you.

Human happiness, and certainly human fecundity, are not as important as a wild and healthy planet. I know social scientists who remind me that people are part of nature, but it isn't true. Somewhere along the line – at about a billion years ago – we quit the contract and became a cancer. We have become a plague upon ourselves and upon the Earth. It is cosmically unlikely that the developed world will choose to end its orgy of fossil energy consumption, and the Third World its suicidal consumption of landscape. Until such time as Homo Sapiens should decide to rejoin nature, some of us can only hope for the right virus to come along.

It would be logical to conclude that this individual has a meager understanding of Ancient History as the Pre-Cambrian Explosion 530 MYA which accounts for the first animal phyla and in the Cambrian Geologic Period which ended 485 MYA, representatives of 26 major animal groups that FIRST APPEARD in the sedimentary rock (fossil) record ---HUMANS NOT THERE.

All of this is Scientifically documented in Dr. Stephen C. Meyer's *" Darwin's Doubt --The Explosive Origin of Animal Life and the Case For Intelligent Design".*

The Ranger appears to be a Disciple of Radical Environmentalism, which has been the mode of oporende of the FAUX SCIENTISTS and their deposed theory of CAGW, and their unsubstantiated conclusion that CO2, the gas of life is to blame. And while we are at it, carbons are not emissions, they are part of the Carbon Cycle---perhaps subject of another scientific email.

Now take a look at where else the conventional green narrative is falling apart:

- **In the west, for over a century, hydrocarbon fuels have been termed 'fossil fuels' even though we now know they don't come from fossils, being abundant in our solar system (beyond dead dinosaurs or rotting vegetation);**
- **It is a lie that 'fossil fuels' are bad for life on our planet. In fact, there is a rising scientific argument that 'fossil fuels' are green energy; geomicrobiology now proves microbes consume them as food, thus not toxic to life;**
- **Cambridge Energy Research Associates among many independent studies, have debunked 'peak oil' fears that the world is running out of oil.**
- **Abiogenic (or Abiotic) oil theory proves hydrocarbons have geothermal origin, regenerate continuously and naturally from rocks under pressure, thereby truly renewable;**
- **Greens claim better, 'cleaner' energy sources are available, even though electric vehicles emit double the CO2 emissions and their batteries require never-ending quantities of toxic rare earth metals that, for industrial use, are in short supply;**
- **Greens claim 'poisonous' carbon dioxide is harmful to the biosphere, but empirical evidence proves the opposite – more CO2 is spurring global plant growth – it is essential plant food!**

John D. Rockefeller Sr., the founding patriarch of the Rockefeller oil dynasty, who gained a virtual monopoly over the U.S. energy industry by the 1880's, loved the story about oil coming from dead dinosaurs and promoted it. The idea oil was going to gradually run out guaranteed to make it an increasingly valuable commodity, as per the economics of supply and demand. The rest is history, as they say.

The Washington, D.C.-based watchdog Energy and Environment Legal Institute (E&E Legal) offers a great insight with The Rockefeller Way: The Family's Covert "Climate Change" Plan. See also 'New Report: Global Warming Is A Rockefeller Scam' (January 2017)

Some of the highlighted paragraphs have been drawn from the following article: https://principia-scientific.org/why-electric-vehicles-are-not-renewable-clean-or-green/. The remaining were taken from Tim Ball's website,

References to COP 23 being held in Bonn suggest that these Marxists seem to invent more lies and seek to reinforced mysticism of their Religious Environmentalism.

"Fracturing the Fossil Fuel Fable" by Olson & Ashworth a related article is linked at the end of the article. Enrich your lives with Scientific Evidence supporting the Abionic Theory.

Yours in Science & Technology,