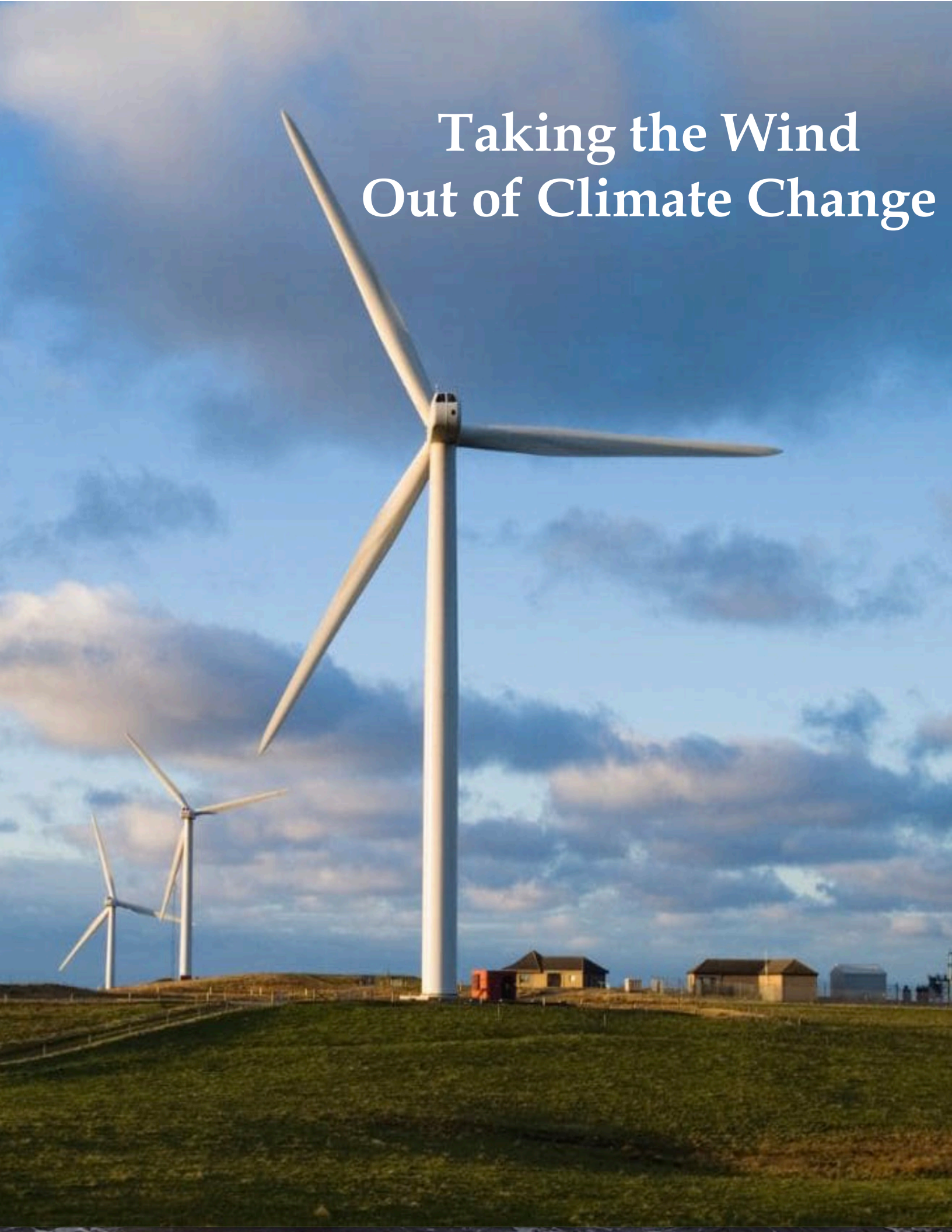

Taking the Wind Out of Climate Change

The proponents of Climate Change insist that we are facing an imminent existential threat to our very existence. To prevent this catastrophe they assert that we must make **immediate**, **impactful** changes — particularly regarding our energy policies. The primary solution advocated by the major Climate Change advocates (e.g., the IPCC and the scientists comprising the so-called 97% consensus) is industrial wind energy.

The fundamental question is: if we accept the Climate Change contention *and* then spend Trillions of dollars to assiduously implement their wind energy solution, **will the existential threat be extinguished in the short time-table they say we have?**

The answer is an unequivocal NO, for at least the following six (6) reasons:

1 - There is **no scientific proof** that wind energy saves *any* consequential CO2.

Industrial wind energy has been around now for over 20 years, so there is plenty of empirical data available. However, if we ask for scientific proof that wind energy actually saves a meaningful amount of CO2, what wind proponents provide are "studies" based on *computer models*. There are two major problems with that non-answer:

a) Computer models are appropriate for when there is **no actual data available**. However, since there are 200,000+ operating wind turbines on the planet, there is an enormous amount of real-world data about exactly how much CO2 is really being saved. *So why would empirical data be hidden, and computer models put forward instead?* Because that data evidently is not favorable to the wind industry lobby, as it shows little CO2 being saved.

b) The other reason that wind marketers love computer models, is that they can easily hide important assumptions in the code. For example, one of their favorite tricks is to compare wind energy produced CO2 to coal produced CO2. The problem is that this is a straw man comparison. If we are going to add 1 GW of new electrical energy generation, the comparison should be between what the *likely* options are **today** — not what they were before. In other words, compare wind to nuclear or gas, not coal.

A second serious problem with models, is that wind-generated CO2 is not accurately calculated in the computer models put forth by wind lobbyists. E.g., they typically do not take into account all the manufacturing and assembly generated CO2 (e.g. 2± million pounds of concrete per turbine). E.g., they usually do not take into account the CO2 produced by the gas generator that is typically paired with each wind project (see #2 below). Etc.

2 - There is good evidence that **wind energy can produce *more CO2 than gas*.**

This non-intuitive reality is based on the fact that there is no such thing on the Grid as Wind energy by itself. What typically exists is a **Wind+Gas** package. (*See "a" below.*)

There are two very different types of Gas electricity generators (Single-Cycle *and* Combined-Cycle). Briefly, they differ in three major ways (cost, response time, and CO2 generated).

Most of the time (because of cost and response time), Wind is paired with Single-Cycle Gas — so the Wind+Gas package is **Wind+Gas (Single-Cycle).**

The kicker is to be aware that analyses done by independent experts have concluded that: Wind+Gas (Single-Cycle) can produce **more CO2** than Gas (Combined-Cycle)! (*See "b" below.*)
a) Sample references regarding the Wind+Gas package:
one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen (p67), seventeen, eighteen, nineteen, 20, 21, 22, and 23.

b) Sample references regarding how Gas can produce less CO2 than the Wind+Gas package: How Less Became More, Wind Power Paradox, USAEE report. Wind Integration Emissions Report: part 1, part 2, part 3, part 4, and part 5... Wheatley study... More Wind CO2 info.

3 - There are quality studies that conclude that wind turbines **add to global warming**.

The reasons for this unsuspected outcome are a bit complex, and range from "increased boundary layer mixing" to "altered large-scale atmospheric flow." Some sample studies that have come to such conclusions are:

PNAS study (2004), MIT study (2010), MIT study (2011), Texas study (2012), MN study (2013), SUNY study (2014), Colorado study (2015), Kansas study (2015), Harvard study (2018).

4 - Several studies conclude that **turbines affect local meteorological conditions**.

This is related to the prior item but is more on a local level. One consequence of these influences is that crop production can be adversely affected. Some sample studies that have concluded that local weather is affected are:

PNAS study (2010), U Illinois study (2010), Oklahoma study (2011), Purdue study (2011), U Illinois (2013), SUNY (2015), Scotland (2016), Rutgers (2020), China (2023).

5 - Multiple studies show that **turbine performance drops steadily with age**.

This shouldn't really be a surprise. Such a decline is attributable to some of the mechanical parts of the turbine wearing down, to increased resistance built up on turbine blades. Some sample studies that have analyzed this performance decline are:

Study 1 (2011); Study 2 (2012); Study 3 (2012); Study 4 (2013); Study 5 (2014); Study 6 (2017).

6 - Several studies demonstrate the **diminishing returns** of adding more Turbines.

Electricity is generated by wind turbines extracting (converting) energy from solar-generated wind. However, put simply, there quickly comes a point where adding more turbines results in a lower amount of electricity generated per turbine. The mechanics are explained in a variety of studies, and some sample studies are:

University of Kansas (2015), PNAS study (2016), Harvard study (2018), NSF study (2018), Journal of Physics study (2018).

The bottom line is that there is **no scientific proof** that wind energy saves *any consequential amount of CO2* — and plenty of evidence that wind energy is **not a good solution to a claimed catastrophic threat** (that requires a large, short-term change). What does it say about the "experts" who propose an illegitimate solution? It either means that: **a)** they are not real experts, or **b)** they are pushing an undeclared agenda.

All this should be no surprise as (regarding the global warming issue) we have left the security of genuine Science, and are now sinking into the quagmire of political science.

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