Some Misc Wind Energy Realities

1 - Some sample studies and reports about the typical **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.

2 - Some sample studies and reports about how Wind Energy **can produce more CO_2 than Gas** (i.e. Wind+Gas_T CO_2 > Gas_{CC} CO_2):
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 - Some sample studies showing that turbine performance drops steadily with age:
Study 1 (2011); Study 2 (2012); Study 3 (2012); Study 4 (2013); Study 5 (2014); Study 6 (2017).

4 - Sample studies how Wind Energy **can increase regional atmospheric temperatures**:
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).

And how Wind Turbines **can adversely affect local meteorological conditions**:
PNAS study (2010), U Illinois study (2010), Oklahoma study (2011), Purdue study (2011), U Illinois study (2013), SUNY study (2015), Scotland study (2016), Rutgers study (2020).

5 - Some sample studies about the **diminishing returns** of adding more Wind Turbines:
University of Kansas (2015), PNAS study (2016), Harvard study (2018), NSF study (2018), Journal of Physics study (2018).

6 - Some sample studies indicating that **climate change will result in less wind for turbines:** Chinese study (2017), Colorado study (2017), Nature Geoscience study (2018).

—> Wind is promoted as a "clean" electrical energy source, but consider the following:

To minimize the size and weight of the generator at the top of a very high "pole," an extensive amount of rare-earths are used in the turbine generator — approximately **2000 pounds per MW of generation** (sample ref)! In other words, a single 3 MW wind turbine will have 6000± pounds of rare earths in it.

Next, for every ton of refined (produced) rare-earths, there is also about a ton of *radioactive waste generated* (sample ref). To put that into perspective: **Wind Energy produces more radioactive waste than does nuclear power** (sample ref)**!**

Considering this — plus the gas component — how "clean" does Wind energy sound?

For some additional concerns, see 25 Wind Energy Deceptions...

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