

Wind and Solar Power, Mathematics Revisited and Corrected?

How wind and solar power are reshaping mathematics with a magic wand: a report on the biased communication of intermittent "renewable" energy companies and lobbyists.

On the occasion of the Olympic Games and the publicity surrounding the supply of electricity from renewable sources, we took the opportunity to express our astonishment that "the country that provides Europe's most low-carbon electricity at all times, thanks to its nuclear power fleet and its hydroelectricity, is hiding behind the clichés of intermittent renewables as a cloak of virtue and an advertising argument."

A necessary reminder of the facts: French electricity production is almost totally carbon-free, so much so that a nuclear kilowatt-hour (kWh), which accounts for 70% of the electricity generated, "costs climate change" only 3.7 grams CO₂, compared to over 1000 grams (300 times more) for German lignite, or coal for example, these accounting for a fourth of the German production!

What then of the production from the so-called renewable energies?

According to the French public agency ADEME¹ and the Life Cycle Assessment (LCA) method, French nuclear power generates 3.7 grams CO₂ per kWh, onshore wind power 14.1 g CO₂ per kWh (i.e., 4 times more than nuclear power), offshore wind power 15.6 g CO₂ per kWh, photovoltaic solar power 43.9 g CO₂ per kWh (i.e., 12 times more than nuclear power), gas 418 g CO₂ per kWh and coal 1060 g CO₂ per kWh. Note: for the renewables, these figures do not take into account the additional CO₂ arising from their intermittency management and their countless connections to electricity distribution and transmission networks.

So the real question is: how much of a gain in CO₂ do wind and solar PV renewable energies provide for France?

In fact, except in winter, when they reduce French imports of carbon-intensive German electricity and France's small domestic fossil fuel based production, they degrade France's carbon footprint, since they take precedence over nuclear power², which has to reduce its output when they produce, even though they emit more CO₂!

So how do we explain the communication (by solar PV sales agents, sometimes encouraged at the highest level of government) claiming that intermittent renewable energies are useful for France and its carbon footprint? A scam? Well, not if you are replacing gas or oil heating with photovoltaics or wind turbines but deception and false good idea if you are selling a photovoltaic system or wind turbines to people who already use nuclear or hydroelectric power for domestic heating.

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1 ADEME – The French Agency for Ecological Transition. <https://base-empreinte.ademe.fr/donnees/jeu-donnees>

2 Thanks to their near-zero marginal cost and guaranteed production income independently of demand ("purchase obligations" and/or "remuneration supplements" and/or "contracts for difference"), i.e., thanks to subsidies which, let us not forget, are nothing but taxes for the end consumer.