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Yet another bogus renewables versus coal cost study

By David Wojick | March 29th, 2019 | Energy | 70 Comments

These days there is a recurring refrain from the greens to the effect that renewable power is cheaper than coal power. This is a half truth at best and the false half is the worst part.

There may well be circumstances where the unit cost of power produced by a wind or solar generator is in fact lower than the unit cost from a coal fired power plant. But the extensive intermittency of renewable power makes this cost saving irrelevant, because the cost to overcome the intermittency is astronomical.

What we are seeing is an endless stream of studies that ignore this fundamental

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Remember the real agenda this

fact, that intermittency makes renewables very expensive when it comes to providing reliable power. The latest such [study](#) is "THE COAL COST CROSSOVER: ECONOMIC VIABILITY OF EXISTING COAL COMPARED TO NEW LOCAL WIND AND SOLAR RESOURCES" (all caps in original) from *Energy Innovation* and *Vibrant Clean Energy*.

This study is impressive in its way, because it takes a fine chained look at the whole country. In this respect it has a good bit of useful information. But its basic claim that renewable power is now cheaper than coal fired power is so misleading that it is wrong.

The study is largely based on a comparison of independent power contracts, especially for renewables. But these contracts do not provide reliable power, quite the contrary. They just provide wind and solar power when it happens to be available, in many cases even if it is not needed at the time.

When it comes to wind and solar power the facts are starkly simple. A typical wind farm produces little or no power about 25% of the time. It produces full power less than half of the time and those times are unpredictable.

Even worse, the meteorological conditions that create peak need for electricity are often long periods of low to no wind. These are stagnant high pressure systems that cause maximum hot and cold weather.

Fixed array solar power generators only produce good power around four hours a day, while moveable arrays might generate for eight hours, both centered on noon or so. Peak daily power usage is typically before or after this period. In cold weather the peak can even be at night.

What all of this means is that some other way of producing power is required, for most of the day, or even for several days. This is the intermittency problem and it is profound. The fact that when solar and wind power are available, it is relatively cheap, does not address this profound problem. Making intermittent power reliable is a big part of the high cost of wind and solar.

Of course the *Energy Innovation* and *Vibrant Clean Energy* people know about this profound problem but they slide right by it. Here is their studiously vague acknowledgement:

"Other resources will be required to complement wind and solar and provide essential reliability services, but the increasingly attractive relative value proposition for the raw energy available from wind and solar versus more expensive coal generation can generate more and more money to directly address grid challenges. Steep declines in costs for resources like battery storage will stretch that money even more."

At today's prices the cost of [batteries](#) to provide reliable wind and solar power

#EarthHour2019
#EarthHour
pic.twitter.com/sz6FXI
2 days ago

Authors



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For over 100 prior articles for CFACT see <http://www.cfact.org/author/david-wojick-ph-d/>
Available for confidential research and consulting.



would be well into the trillions of dollars. The fact that wind or solar power, when available, is a bit cheaper than reliable coal fired power in no way makes battery backup affordable.

Thus this study is misleading at best. They then go on to make this totally false claim:

"The data in this report provide an economic rationale for a coal phase-out in the next decade led by wind and solar, happening a lot quicker than most had imagined. It's time to get on with the coal-to-clean transition."

It is economically impossible to phase out coal using wind and solar power.

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reagangs • 3 days ago

Yes, eventually our hydrocarbon based energy resources will begin to play out over the next century. The resource isn't infinite. The respective industries need to keep working on renewable resources, but not at breakneck speeds and at the expense of the hard working Patriotic tax payers. One constant infinite resource is geothermal wells at well placed stable zones and capable of 500+*F temps that are capable of massive continuous steam flows under elevated pressures. I didn't say it was going to be easy. Nothing worthwhile is never easy. But with todays technology, anything is possible. After working for petroleum service companies for 40+ years, I've witnessed many wells with temps around 500°F at 15,000 to 20,000 feet depth. It wouldn't take any stretch of the imagination to pull this off. Regards, retired engineer, physicist, astronomer and petroleum geologist.

5 ^ | v • Reply • Share ›



Vindaloo Bugaboo → reagangs • 3 days ago

Or just develop MSR nuclear, i.e. thorium, and eventually fusion. Way cheaper and way more ROI.

4 ^ | v • Reply • Share ›



kuhnkat → reagangs • a day ago

"Yes, eventually our hydrocarbon based energy resources will begin to

res, eventually our hydrocarbon based energy resources will begin to play out over the next century."

You have no idea what you are talking about. Please study before speaking.

^ | v · Reply · Share ›



Brin Jenkins → kuhnkat · 20 hours ago

Actually he has a good understanding based on his career. We all have alternative ideas for what we favour. I like gravity as an energy store. I also promote my chums Tornado Generator that can produce generation and distilled water as a bye product. Any one of these might well be our saviour if we don't blow it all on the current fads.

^ | v · Reply · Share ›



ptsstaff · 3 days ago

The mining for rare earth minerals for "clean" electricity are creating giant, toxic and radioactive lakes worldwide. It's a serious problem they we'll be dealing with for decades. Industrial wind and solar projects kill a lot of wildlife, require huge acreage, cause visual blight, and have negative health impacts for the people who live around them, are facing resistance from residents who don't want them in their back yards. Even though vehicle miles traveled has doubled from 1988 to 2015, the EPA data shows that pollution coming out of the tailpipes of our cars and trucks has been reduced by 99 percent. New energy propagandists need to clean up their act and stop using the word "clean" when talking about wind and solar.

6 ^ | v · Reply · Share ›



guitardude → ptsstaff · 2 days ago

But, but, but, it is going for a good cause, which somehow negates all the detrimental impacts.

Or something like that. I don't speak snowflake, which means my impersonation may fall a bit short.

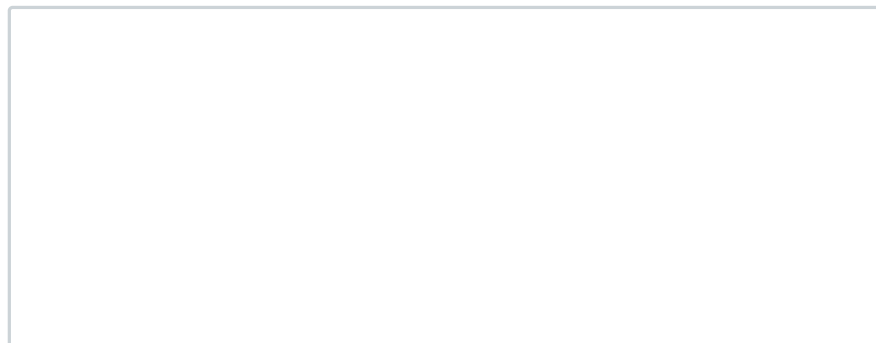
2 ^ | v · Reply · Share ›



Derpitudinous_Neologism · 3 days ago

Weird how more and more studies - across the world - are finding the same thing...and the fossil fool lobbyists all complain that they are bohooooooooooooo-GUS.

Coinkydink, surely.





[see more](#)

3 ^ | v • [Reply](#) • [Share](#) ›



Vindaloo Bugaboo → [Derpitudinous_Neologism](#) • 3 days ago

How big of an effin' fool are you, Derpy? Right in your lovely little graphic header it reads, "Certain Alternative Energy generation technologies are cost-competitive with conventional generation technologies **under certain circumstances.**" The Lazard study clearly states,

Although alternative energy is increasingly cost-competitive and storage technology holds great promise, **alternative energy systems alone will not be capable of meeting the base-load generation needs of a developed economy for the foreseeable future.**

Therefore, the optimal solution for many regions of the world is to use complementary conventional and alternative energy resources in a diversified generation fleet.

Gee, since it's the cheapest form of energy generation, why then can't the world just make the switch to renewables?

Oh yeah. Like it says above, **intermittency and low power density of the renewable portfolio** is its Achilles heel. If you don't want to guess when the lights will turn on and for how long they'll last, stick with conventional power generation.

5 ^ | v • [Reply](#) • [Share](#) ›



James Owens → [Vindaloo Bugaboo](#) • 3 days ago

Careful, Lazard notes in another report that storage technologies (lithium and flow batteries) are emerging as solutions at the field level for wind and solar farms. This would raise the possibilities for renewables from 30% to nearly 60% - which, although significant, is still a complimentary position, not total replacement.

Remember, Denmark is running at 50% and more of their own local renewables - but they are also tied into Norway's hydro and Sweden's hydro and nuclear via high voltage DC lines. The latter being one of the grid developments the US needs to begin to install.

And please don't jump on Danish electricity pricing without acknowledging their very high value added tax (VAT) - taxes are almost 60% of their cost!

5 ^ | v • [Reply](#) • [Share](#) ›



classicalmusiclover → [James Owens](#) • 3 days ago

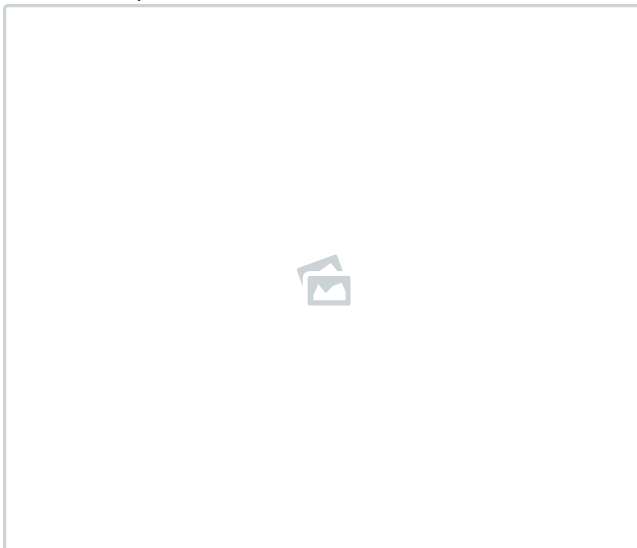
Failure to reckon the VAT is a hallmark of most of the misleading attacks on European green energy developments one sees.

5 ^ | v • [Reply](#) • [Share](#) ›



James Owens → [classicalmusiclover](#) • 3 days ago

Correct. Here's a bar graph from 2017 for European electricity prices - residential and priced in euros per 100 KWHr (a euro is about \$1.13 right now). The actual electricity cost is the bottom blue part of the bar. The taxes are the upper red part. Yes, Germany and Denmark have HIGH taxes that double or more the price



2 ^ | v • Reply • Share ›



kuhnkat → [James Owens](#) • a day ago

You did not explain that the high taxes were due to the necessity of subsidizing the renewables.

1 ^ | v • Reply • Share ›



James Owens → [kuhnkat](#) • 14 hours ago

The Danish and German value added taxes apply to just about everything - not just electricity.

2 ^ | v • Reply • Share ›



Brin Jenkins → [James Owens](#) • 2 days ago

Possibilities? Why are the greenies full of this crap?

1 ^ | v • Reply • Share ›



James Owens → [Brin Jenkins](#) • 2 days ago

The figure is just electricity prices in different EU countries, Brin - showing the various splits between taxes and actual cost.

Nothing about possibilities.

1 ^ | v • Reply • Share ›



Brin Jenkins → [James Owens](#) • 2 days ago

"Careful, Lazard notes in another report that storage technologies (lithium and flow batteries) are emerging as solutions at the field level for wind and solar farms. This would raise the possibilities for renewables from 30% to

nearly 60% - which, although significant, is still a complimentary position, not total replacement. "

This is the quote I was replying to James. There is no chance of batteries ever taking on more than a few mins of full demand in a switching transition.

3 ^ | v · Reply · Share ›



James Owens → Brin Jenkins · 2 days ago

Careful - the units have grown in size and ambition in just a few years - from 25 megawatts, to 50 MW, to the South Australia 125 MW, and now the FPL announcement. <http://newsroom.fpl.com/201...>

Experience, continued price declines, and technical innovation will ultimately decide what they can or cannot do - not you or I on comment threads.

2 ^ | v · Reply · Share ›



Brin Jenkins → James Owens · 2 days ago

We would need GW hrs! Not 500 Mw for 10 mins.

1 ^ | v · Reply · Share ›



James Owens → Brin Jenkins · 2 days ago

For what, Brin?

As with the FP&L link, utilities are putting their toes in the water at new or existing solar and wind farms - also as storage replacements for gas turbine peakers.

It's a gradual introduction of a very new technology. The current units are online either storing or releasing 24/7. Totalled installations scheduled here in the US in the next 2 years exceeds a GW.

So let the utilities, technologists, and engineers learn, reduce costs, and raise reliability.

3 ^ | v · Reply · Share ›



Brin Jenkins → James Owens · a day ago

Gw, or Gw hrs James. The UK winter demand peaks at some 60Gw so if it was to be provided by batteries on a windless day 1440 Gw hrs would see us through the 24 hours. Lets pray we don't have a second calm day, and photo voltaic panels only produce 12% of rated output in the three coldest months Dec Jan and Feb. I expect the US demand to be 4/5 times more than the UK.

1 ^ | v · Reply · Share ›



James Owens → Brin Jenkins · a day ago

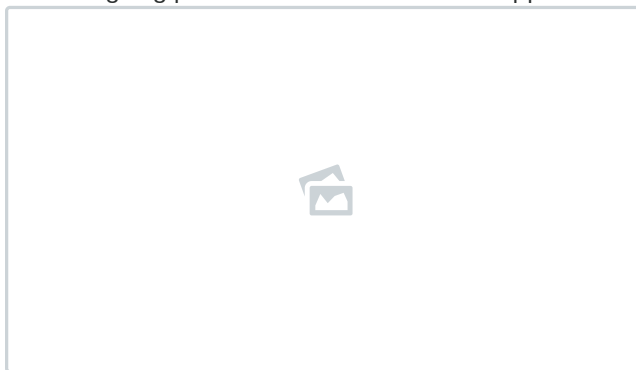
Brin, yesterday in the afternoon California got almost 70% of its electricity from large hydro + renewables (don't know why they split large hydro out).

Yes, almost 20 GW on a weekend.

Their grid is flexible and batteries are being introduced to make it more so. Again, the battery storage process is just

Energy business and utilities have begun to explore. C-

barely beginning and utilities have begun to explore. So it's an ongoing process - relax and watch it happen



4 ^ | v • Reply • Share ›



kuhnkat → James Owens • a day ago

ONE DAY they do 70%. What about the days and possibly WEEKS with little production by the renewables??? Yeah, Gigawatt Days are required to get rid of conventional generation. Let me remind you that in California there are enough loons that want to get rid of the dams that it is still being argued. The fight against dams is why they have so many problems with water shortage, not just the west coast propensity to droughts. They haven't built new reservoirs in decades.

<http://www.capoliticalrevie...>

^ | v • Reply • Share ›



James Owens → kuhnkat • 14 hours ago

Calm down, take a breath, think context. The point is a snapshot in time. The grid is very flexible and can provide power at 70% renewables. Meanwhile, new solar, new wind, new batteries are being added. So progress is one step at a time. If you want to trace the supply swings from day to day and month to month out in California , then here's the link - a data site, not a political hack site:

<http://www.caiso.com/Todays...>

2 ^ | v • Reply • Share ›



Brin Jenkins → James Owens • a day ago

We still have the time factor here. The Black Mountain reservoir in Wales UK pumps water uphill as a battery for the UK Grid. It covers a spike in demand for a few mins when a TV series pauses and people put the electric kettles on for tea. Then they start pumping overnight for the next days spike.

Is the California demand around 30Gw at present? How much is bought in from elsewhere for load balancing? Has there been any load shedding at all which might be done via smart meters?

^ | v • Reply • Share ›



James Owens → [Brin Jenkins](#) • a day ago

Variable loads, Brin.
Grids are becoming more and more flexible - and one piece of that is storage as we've been discussing. And are you referring to the Dinorwig Power Station in Wales - capable of 9 gigawatt hours of storage? And yes - California draws from the Pacific Northwest hydro system and also the Palo Verde Arizona nuclear facility (about 3.4 gigawatts)

3 ^ | v • [Reply](#) • [Share](#) ›



kuhnkat → [James Owens](#) • a day ago

As the other states move to renewables only that hydro backup will be spread thin. How long can they go without some major increases in hydro production that will be fought by the same eco loons that think renewables can run the world??

^ | v • [Reply](#) • [Share](#) ›



James Owens → [kuhnkat](#) • 14 hours ago

The Northwest hydro comes down from Washington, Oregon, and Idaho - which are also adding wind and solar to grow their electricity production. Other hydro comes from Colorado River - mainly Hoover and Glen Canyon dams which is shared with Nevada and Arizona - who are also adding renewables, mainly solar.

3 ^ | v • [Reply](#) • [Share](#) ›



Dave James → [kuhnkat](#) • a day ago

eco loons

Insults are not the sign of a strong argument.

3 ^ | v • [Reply](#) • [Share](#) ›



Brin Jenkins → [Dave James](#) • 20 hours ago

Quite correct, insults are not my argument, but I have been following the fudge for some 15 years in the UK. Had it not been for demand reduction by a variety of means we would have seen massive blackouts already. Some of these has been improvements of air-conditioning technologies like the condenser Flow, and reversal the new lighting technology cutting back go heat waste. The new generation smart meter is progressing to switching off domestic appliances by the hundreds of thousands to shed load without folk being aware of this.

The UK grid Templer site is privately run without any subsidies by an Electrical Engineer who ports industry data in real time, so we know its accurate. He also notes the University data on green energy is unreliable. I have corresponded with him and his motivation is the inaccuracy of green projections on load balancing. I

inaccuracies of green projections on load balancing, I think he still states this in his info page.

California relies heavily upon generation in other States for load balancing not its own battery packs. None could be self sufficient without massive conventional generation. The move towards electric vehicles will exacerbate unbalance. Its a gigantic problem that is yet to be confronted head on.

^ | v · Reply · Share ›



Dave James → Brin Jenkins · 11 hours ago

Your comments about new technologies undermine both your assertions that "load balancing is a nightmare" and "100% backup is required on standby 24/7" and Dr. Worick's assertions that "The extensive intermittency of renewable power makes any cost savings irrelevant, because the cost to overcome the intermittency is astronomical."

No where on G.B. National Grid Status website <https://gridwatch.templar.c...> does it claim "University data on green energy is unreliable" nor does it claim because it is privately funded it is more accurate. In fact the website notes the data is from the Elexon portal and **Sheffield University**.

You wrote, "100% backup is required on standby 24/7. Load balancing is a nightmare..." but now you contend "None could be self sufficient without massive conventional generation." You've moved the goal post from "100% backup is required on standby 24/7" to 0% backup does not work.

1 ^ | v · Reply · Share ›



Brin Jenkins → Dave James · 10 hours ago

No I have not. Green energy is unreliable and must have 100% backup cover 24/7. For California it seems its supplied out of State.

^ | v · Reply · Share ›



Dave James → Brin Jenkins · 10 hours ago

Clearly we have reached an impasse. You deny moving the goal posts but your comments are clear.

You have nothing to back-up your unsupported assertion "Green energy is unreliable and must have 100% backup cover 24/7."

Good bye and good luck.

1 ^ | v · Reply · Share ›



Brian James → Dave James · 3 hours ago

Here are just a couple out of numerous links and data I

have. Enjoy!
 May 3, 2017 Offshore wind farm costs \$150,000 per home currently powered

An offshore wind farm in Rhode Island went online Monday, but building it costed \$150000 for every household powered.

<http://www.cfact.org/2017/0...>

Jan 4, 2019 Why renewables can't save the planet | Michael Shellenberger | TEDxDanubia

Environmentalists have long promoted renewable energy sources like solar panels and wind farms to save the climate.

[see more](#)

^ | v · [Reply](#) · [Share](#) ›



Dave James → [Brian James](#) · 3 hours ago

An op-ed from cfact and a ted-talk is not data. Good bye and good luck

1 ^ | v · [Reply](#) · [Share](#) ›



Derpitudinous_Neologism → [Vindaloo Bugaboo](#) · 3 days ago

Yes? Do you think you have a point? Or are you parroting FF lobbying text?

3 ^ | v · [Reply](#) · [Share](#) ›



Brin Jenkins → [Derpitudinous_Neologism](#) · 2 days ago

Grant Foster why not give up on your rubbish?

1 ^ | v · [Reply](#) · [Share](#) ›



Vindaloo Bugaboo → [Derpitudinous_Neologism](#) · 2 days ago

Oh that's right, I forgot you lack the intelligence to understand simple things like qualifiers. God forbid you read drug interaction warning labels because "they don't have a point".

1 ^ | v · [Reply](#) · [Share](#) ›



David Wojick → [Vindaloo Bugaboo](#) · 3 days ago

Yes, LCOE if just the scam I am talking about. For renewables it does not include the cost of backup generation or battery backup.

4 ^ | v · [Reply](#) · [Share](#) ›



guitardude → [Vindaloo Bugaboo](#) · 2 days ago

"How big of an effin' fool are you, Derpy?"

That was rhetorical, right?

3 ^ | v · Reply · Share ›



Immortal600 → Vindaloo Bugaboo · 3 days ago

Forgive Twerp. He isn't the brightest bulb in the pack. LOL

2 ^ | v · Reply · Share ›



RealOldOne2 → Vindaloo Bugaboo · a day ago

Answer: A very big one.

1 ^ | v · Reply · Share ›



kuhnkat → Derpitudinous_Neologism · a day ago

Levelized costs are a scam. Yes, they will find what they were designed to find.

^ | v · Reply · Share ›



Dave James · 2 days ago

The extensive intermittency of renewable power makes any cost savings irrelevant, because the cost to overcome the intermittency is astronomical.

Dr. Wojick offers nothing to support his claims teasing the article.

<https://www.cfact.org>

3 ^ | v · Reply · Share ›



Brin Jenkins → Dave James · 2 days ago

Hardly a point. With full power developed at 26mph at 13 mph its not even half, but only a fraction on a log reduction curve. The cut off point is about 6mph below with there is no generation at all even if the blade rotates. The highest efficiency is probably the Germans with just 16% of the installed power. 100% backup is required on standby 24/7. Load balancing is a nightmare and some load will be shed, that's blackout for those hapless customers.

2 ^ | v · Reply · Share ›



Dave James → Brin Jenkins · a day ago

Who told you "load balancing is a nightmare" and "100% backup is required on standby 24/7?" Like Dr. Wojick you provide nothing to support you assertions.

5 ^ | v · Reply · Share ›



James Owens → Dave James · a day ago

There's a border somewhere between assertions with some merit and fantasies - Brin likely has crossed it. So let's move on

Utilities around the globe are learning to be highly flexible - whether in Germany, Denmark, and the UK or in the US in California and Texas.

Example with some data (so no assertion), here's the ERCOT (Texas) wind data so far today (31 March) from 11.5 GW at midnight to 2.5 GW at the time the screen shot was taken. All in a day's work and handled without interruptions.



[see more](#)

4 | • [Reply](#) • [Share](#)



kuhnkat → [James Owens](#) • a day ago

"Utilities around the globe are learning to be highly flexible
"

While the cost of electricity skyrockets..

You believers are somehow disconnected from reality to keep making up your excuses.

1 | • [Reply](#) • [Share](#)

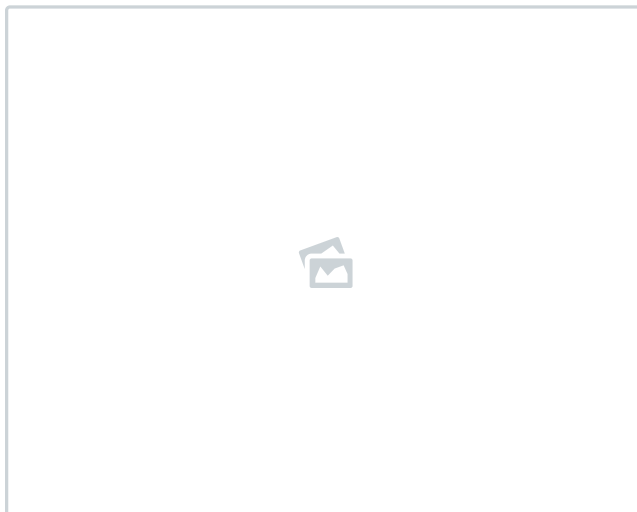


James Owens → [kuhnkat](#) • 14 hours ago

Electricity prices are fairly stable here in the US. Pull the EIA data for the major wind states - put the data into Excel and graph - here's the result.

If you look at the annualized rate increase for the US as a whole (red line, diamond symbol), then it's a bit less than 1.4% for the nine years - clearly no skyrocket.

So find and think about actual data.



3 | • [Reply](#) • [Share](#)



Brin Jenkins → [James Owens](#) • a day ago

Don't think so James? The crazy scramble to be green is emotionally led, not based on reality. How reliable would a train service be based on wind turbines?

The photovoltaic panels to cover demand in Winter months require 8 times more acreage than the Summer and still no generation in darkness.

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James Owens [→ Brin Jenkins](#) • a day ago

See - just unrealistic examples and nothing about crazy scambles.

We've consistently talked about how grids have become remarkably flexible in just a decade

And I'm talking about a mix of sources as is every other realistic person - you seem to keep trying to imply a single source

And look at how Europe is beginning to develop a DC grid to exchange power over long distances without the difficulties of keeping the AC frequency in synch.

And remember batteries and you mentioned the pumped water storage in another comment

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Immortal600 — Good ! Kids are being brainwashed into believing that something is happening that ...

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