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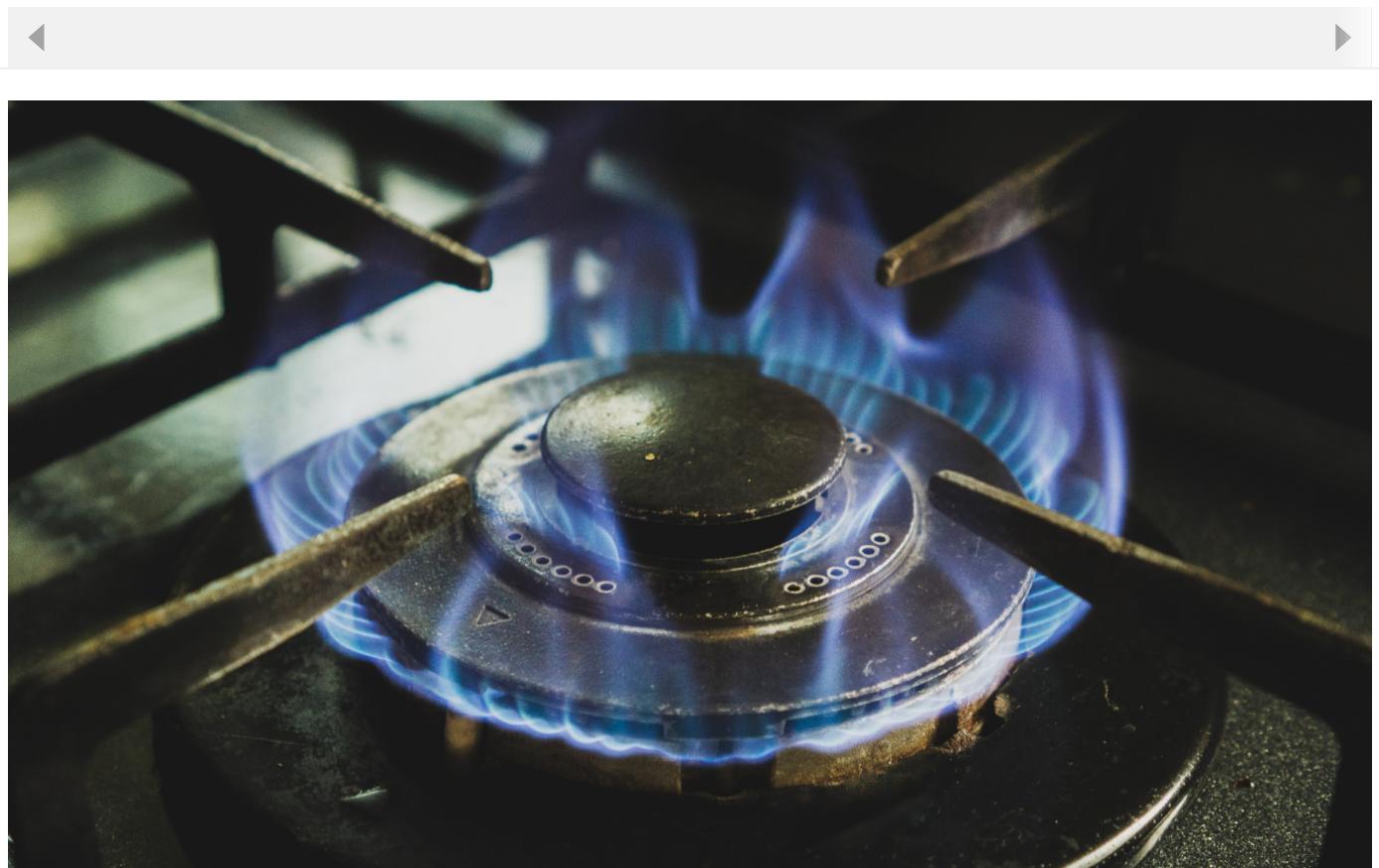


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Hyping the Energy Transition

Consumption of fossil fuels is growing faster than ever.

**Robert Bryce**

18 Oct 2022 • 7 min read



We are in the midst of what some analysts are calling the "biggest global energy crisis in history." But amid the crisis, which threatens to leave the European economy in ruins, plunge tens of millions of people into energy poverty, and result in widespread food shortages, one phrase continues to be used with

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astonishing regularity: “energy transition.” Indeed, the phrase is constantly used by NGOs, politicians, and the media. On its website, Friends of the Earth Europe says that the “world needs a rapid exit from all fossil fuels … part of that picture is the energy transition. We need a new, just energy system that is 100% renewable.”

During negotiations over the Inflation Reduction Act—the \$700 billion spending bill that was signed into law by President Biden in August—an article written by three *Washington Post* reporters said the measure faced early opposition because it would “accelerate the country’s energy transition too quickly.” In July, the Sierra Club, the biggest climate-activist group in America, declared that “The right way forward is to double-down on the clean energy transition.” Meanwhile, BlackRock, the world’s biggest investment firm, says it is “committed to an inclusive, equitable, and prosperous transition” to “net-zero emissions.”

But there’s a problem: despite more than \$2 trillion in spending on renewables over the past three decades, there is scant evidence that an energy transition is underway. Last year, according to data from the BP Statistical Review of World Energy, in both the US, and the world as a whole, the growth in hydrocarbons—oil, natural gas, and coal—far exceeded the growth of wind and solar by huge margins.

Renewable energy’s inability to displace hydrocarbons isn’t due to a lack of money. According to Statista, between 2004 and 2019, spending on renewables in the US was some \$577 billion. Meanwhile, over that same time frame, the rest of the world spent another \$1.5 trillion on renewables. But the BP numbers show that despite all that spending, wind and solar are not making a significant dent in our insatiable thirst for oil, gas, and coal. The reasons for that are many, including the gargantuan scale of global energy use, and the limits on the availability of neodymium, steel, aluminum, copper, and myriad other commodities that will be needed by the gigaton to make any large-scale move away from hydrocarbons.

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Before going further, I will readily concede that energy-related greenhouse gas emissions in some parts of the world are falling. For instance, emissions in the US and many countries in Europe have been declining. Those declines are due to several factors including offshoring of heavy industry, adoption of renewables, natural gas displacing coal in the power sector, and energy efficiency. But the hard reality is that, as I explain in my latest book, *A Question of Power*, more than three billion people on the planet today are still living in energy poverty. Furthermore, throughout Asia and Africa, energy consumption from hydrocarbons—and the emissions from that energy use—continue to climb at a rapid clip. According to the last [BP Statistical Review of World Energy](#), the average African uses less than 15 gigajoules of energy per year. By comparison, the average resident of the US consumes 18 times more, and the average European uses eight times more.

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Furthermore, the electric sector isn't decarbonizing, it's recarbonizing. Global coal demand is soaring. The Newcastle benchmark price for thermal coal going into the Asian market has been at, or near, [\\$400 per ton for several months in a row](#). That's an eight-fold increase over the levels seen in early 2020. European electric utilities are scrambling to buy as much coal as they can to replace Russian natural gas. In July, the International Energy Agency said that global coal use will hit [an all-time high this year](#).

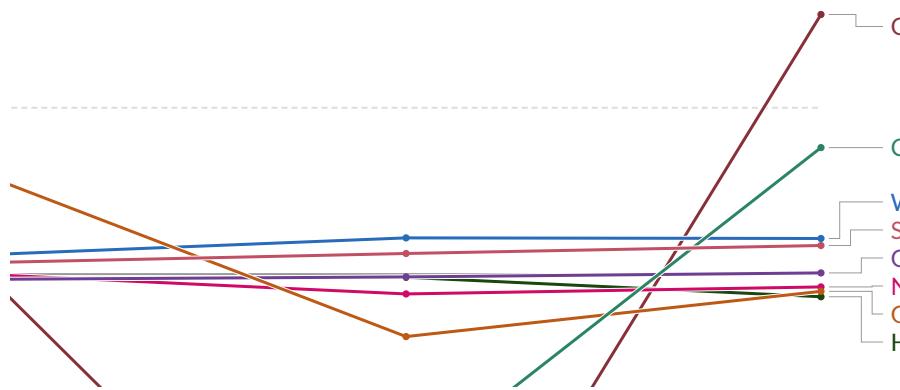
Now back to the numbers. Let's start with a look at what is happening in the US. According to updated figures from BP's [Statistical Review](#), in 2021, energy use grew by 2.8 exajoules (EJ). (An exajoule is roughly equal to one quadrillion BTUs.)

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or the energy contained in 1 trillion cubic feet of natural gas.) For comparison, solar energy use grew by 0.3 EJ, and wind energy increased by 0.4 EJ, for a total increase of 0.7 EJ. Thus, last year, US oil use grew four times faster than the growth seen in wind and solar combined. Meanwhile, coal use jumped by 1.4 exajoules, or twice the growth in wind and solar. Even with a slight decline in natural gas use, the BP numbers show that US hydrocarbon use increased by 4 EJ last year, that's more than five times the growth seen in wind and solar.

Year change in primary energy consumption by United States, 2019 to 2021

try



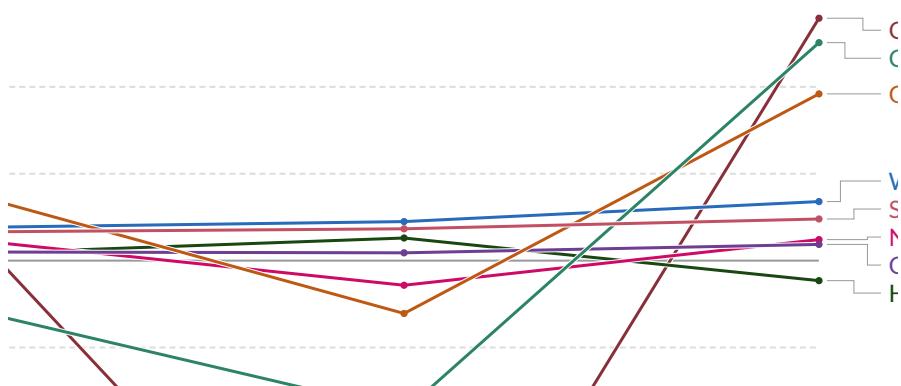
An almost identical trend can be seen in the global data. Last year, the use of oil, gas, and coal grew by 10.5, 7.7, and 8.7 EJ respectively, resulting in a total one-year increase in hydrocarbon consumption of 26.9 EJ. Meanwhile, in 2021, wind and solar grew by 3.4 and 2.1 EJ, respectively, for a total of 5.5 EJ.

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global hydrocarbon use grew nearly five times faster than the growth in wind and solar combined.

Year change in primary energy consumption by world, 2019 to 2021

Country

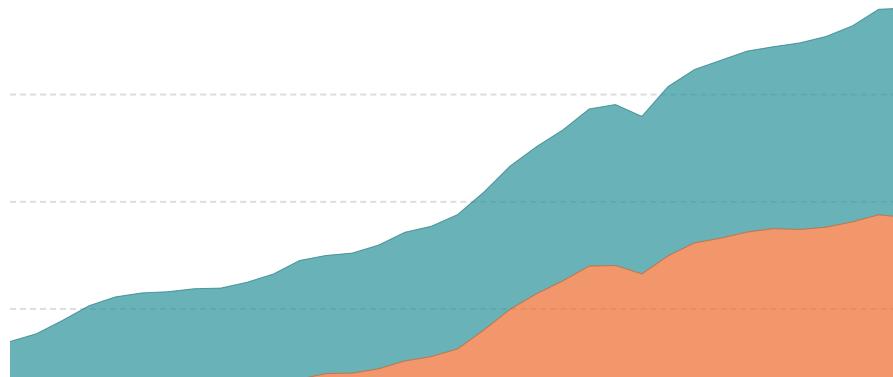


Here's another way to think about those numbers: Last year, just the increase in global hydrocarbon use—which as I mentioned above totaled 26.9 EJ—was roughly equal to the output of all of the wind and solar projects on Earth. Last year, global wind output was 17.5 EJ and solar contributed 9.7 EJ—for a total of 27.2 EJ. If you think last year was an anomaly, think again. The same trends can be seen in data going back to the mid-1980s. Between 1985 and 2021, global hydrocarbon use jumped by 224 EJ, that's more than eight times the increase seen in wind and solar, which as I mentioned above, now provide about 27.2 EJ to the global energy mix.

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Fossil fuel consumption

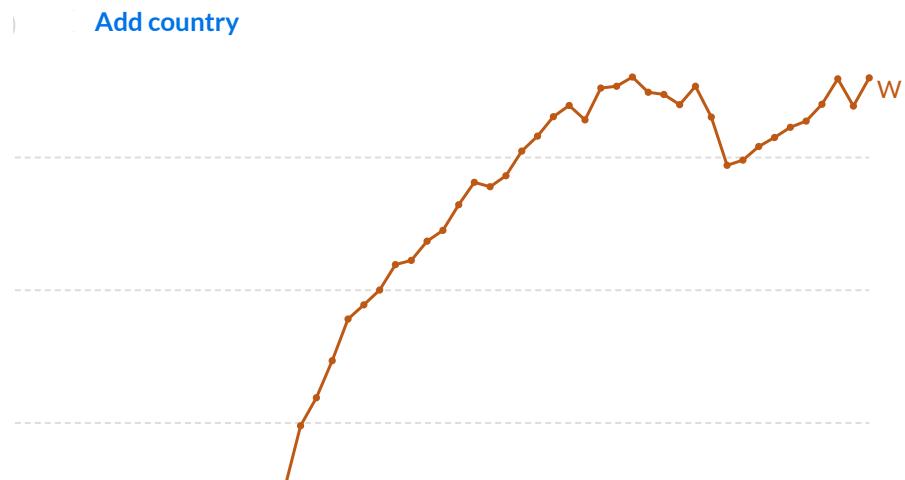
Energy consumption by fossil fuel source, measured in terawatt-hours (TWh).



Looking for some good news? There were some positive trends in the nuclear sector last year, or at least there were on the global scene. In the US, nuclear energy continues its unfortunate decline, with output falling by about 1.5 percent. Globally, nuclear grew by 0.9 EJ, with nearly half of that growth happening in China.

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To be clear, I'm not claiming that the global energy mix won't ever change. What I am saying is that energy transitions—as author and polymath Vaclav Smil wrote in 2014, "are inherently protracted affairs. The unfolding shift from fossil fuels" he declared, "will be no exception."

Indeed, the undeniable takeaway from the BP numbers is that wind and solar energy are not displacing hydrocarbons. Instead, they are being added to our existing energy mix. Why aren't they making more headway? The reasons are readily apparent: wind and solar simply cannot provide the staggering scale of energy the world needs at prices consumers can afford. Furthermore, large-scale wind and solar projects are being rejected all around the world. As I have documented in the Renewable Rejection Database, since 2015, many communities across the US have rejected or restricted wind projects.

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than 90 have rejected solar projects. Over the last year alone, about 40 townships in Ohio have banned the construction of wind and solar projects.

If policymakers are concerned about climate change and emissions, the way forward is obvious: We need concentrated and sustained investment in nuclear energy development, regulation, and deployment so that it can help reduce the growth in global emissions. And over the past few months, the nuclear sector has gained significant momentum. In July, Oregon-based NuScale Power got design certification from the Nuclear Regulatory Commission (NRC) that will allow it to build its small modular reactor (SMR). It is the first, and so far, only, company to get SMR certification from the NRC. In Europe, several countries, including Poland, Romania, and Britain have said they are going to build SMRs. Another positive sign: in August, Dow, the chemical giant, announced plans to build an SMR at one of its petrochemical plants on the US Gulf Coast. The company is working with X-energy, which is developing an 80-megawatt SMR. Furthermore, over the past few weeks, legislators in California voted to extend the life of the 2,250-megawatt Diablo Canyon nuclear plant, and Ontario Power Generation reversed course and announced plans to extend the lives of the reactors at the 3,100-megawatt Pickering Nuclear Generating Station, which sits about 45 kilometers east of Toronto.

In addition, the Biden administration is getting more vocal in its support of nuclear energy. Last month, Energy Secretary Jennifer Granholm said the US is committed to re-establishing itself "as a leader in nuclear energy, non-proliferation, and climate action."

Again, that's welcome news. But I'll end with another quote from Smil, the distinguished professor at the University of Manitoba who has written more than 40 books about energy and other topics and has frequently warned about the difficulty of quitting hydrocarbons. In 2016, he wrote, "There is no evidence that the global primary energy transition has been accelerating during the recent decades." He continued, "Even the fastest conceivable adoption o

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energies will fall far short from eliminating fossil fuel combustion by the middle of the 21st century."

What was true six years ago is still true now. There's a superabundance of talk about the energy transition. But the BP numbers show that—so far—the energy transition is still more hype than reality.

[energy](#)[Nuclear Energy](#)[renewables](#)**Robert Bryce**

Robert Bryce is the host of the Power Hungry Podcast, and the author of six books, most recently, *A Question of Power: Electricity and the Wealth of Nations*.

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Member discussion

4 comments

**Curious Mayhem**

2 days ago

Energy "transition" to solar and wind *at scale* is and probably always will be imaginary. The only transition is from coal and oil to a much larger mix of natural gas and nuclear. Even the Wall Street Journal (in its reporting, not the editorial page) uses euphemisms and circumlocutions, instead of reporting the plain facts.

2

**David Foster**

2 days ago

The 'renewable' sources are very capital-intensive. A gas combined-cycle plant costs about \$958/kw, whereas solar and onshore wind are estimated at \$1313 and \$1265, respectively...BUT, if you apply relevant capacity factors...say, 70%, 15%, and 35%...then you get capacity-adjusted costs of \$1368, 8753, and 3614 respectively...almost 3X higher for wind. You save on fuel costs, of course, but you still need to finance the up-front costs. The economics of wind & solar is very dependent on interest rates, and if implemented at sufficient scale will drive interest rates upwards.

Nuclear (SMRs) is estimated at \$6191 in the EIA report (done by Sargent & Lundy) which I am using for reference, which at 90% capacity factor would come out to \$6869 capacity-adjusted. However, SMR manufacturers NuScale and GE-Hitachi are citing costs around \$3000/kw given sufficient production volumes, that would yield a respectable \$3333 cap-adjusted costs...with the advantage over wind & solar that their output is predictable rather than intermittent.

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**Christopher Eastman-Nagle**

Cultural commentator · 2 days ago · Edited

The only hype in this article is the nuke spruke from yet another energy snake oil salesman who wants us to keep expanding that throughput unlimited guzzling machine which is Indulgence Capitalism, as if we can keep looting what is left of the biosphere on an asymptotic growth path without end.....even though we are in the middle of the biggest life form crash since the end of the dinosaurs.

(https://en.wikipedia.org/wiki/Holocene_extinction).

China in particular and the rest of Asia in general is what is driving the spike and everyone is buying its resultant output as if there were no tomorrow, which there won't be if we keep doing what we are doing.

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What is clear to both myself and the author here, is that there is not the slightest chance that we can maintain the current growth trajectories by simply replacing fossil fuels.

But it is equally and plainly unlikely that nuclear energy, with its terrible propensity to take forever to get up (there isn't much time), its huge capital needs (swallows capital for alternative strategies) that always overrun by orders of magnitude, its production (when it eventually does come on stream) of relatively expensive and delivery inflexible energy and its ongoing safety, waste storage problems and decommissioning costs (\$100 billion approx for Fukushima), and the now inevitable accompaniment of chimeric references to 'advanced' small modular reactors that will appear one day (<https://www.ewg.org/news-insights/news/why-small-modular-nuclear-reactors-wont-help-counter-climate-crisis>) like carbon capture and sequestration is supposed to <https://www.foodandwaterwatch.org/2021/07/20/top-5-reasons-carbon-capture-and-storage-ccs-is-bogus/>, will like the cavalry, save the day.

It very likely won't, and betting the house on it might be as foolish as playing Russian roulette, if 'it doesn't work out'.

The conversion of war production run by military machines into production war run by marketing machines looked a very cool idea as it was being rolled out, but 70-80 years later, we have a sustainability problem which is not going to go away by waving a magic nuclear wand, which only serves to keep us pressing on towards our Stalingrad moment, when we run out of strategic capital, lose the initiative and have to fall back under increasing pressure and adversity.

For me as a small c conservative, this means we need to stop and retreat to defensible boundaries across all regime platforms that we have some hope of managing through what I think is going to be a very difficult period. We are going to need a really massive civil defense capacity in the face of a much less benign global ecosystem. Food production and centralized supply systems cannot be taken for granted as safe and reliable. And we need to make room for a massive recapitalization and repair effort with our all but destroyed social infrastructure and the existential security it is supposed to produce, which is evaporating in front of us.

We need to retreat from fantasy-based production and consumption-without-limits back to a more traditional, disciplined and rationally allocated hierarchy of needs and wants.

The Woke social administrator Looney Toons are not the only people in the open asylum that is late Indulgence Capitalism, where any fantasy can matter how thoroughly nutso it really is,



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D**DW**

One day ago · Edited

The bulk of the evidence provided in this article deals with a massive increase in consumption of coal and oil between 2020 and 2021. But isn't that largely an artifact of the world emerging from covid lockdowns? In 2020 people were far less active across the board than in 2021. So this evidence is a bit weak. The chart 2/3 of the way down, titled "Global fossil fuel consumption", shows relatively flat levels between, say 2018 and 2021, with the exception of the covid dip in 2020.

The general theme that we're not really transitioning, globally, rings true to me. I just don't think the 2021 vs 2020 data tell the story.

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Equal opportunity, not equal outcome, should be the goal of a free society. What the National Health and Medical Research Council is now doing, by capitulating to an leftist group of petitioners, is quite the opposite.

LAWRENCE M. KRAUSS



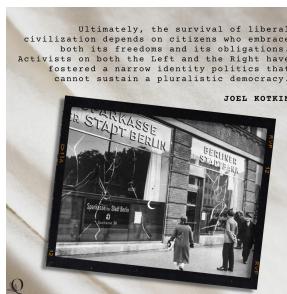
The evolution of internet illness perception, particularly on sites like TikTok and YouTube, is inseparable from liberal culture's subcultures that emphasize disability.

LUCY CROSS WALLACE



It's ironic that Smaker and her film stand accused of peddling Islamophobia, because the effect of watching *The UnRedacted* is precisely the opposite...one tends to see the men on screen as fully human.

M. POLLINO



Ultimately, the survival of liberal civilization depends on citizens who embrace both its freedoms and its obligations. Activists on both the Left and the Right have fostered a narrow identity politics that cannot sustain a pluralistic democracy.

JOEL KOTKIN



Changing sex ratios in academia



Sex and the Academy

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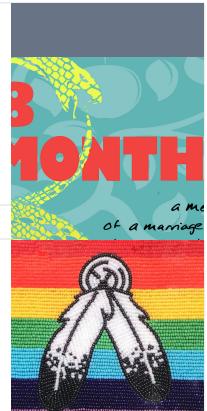
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