

Some of my favorite talking points on energy, environment, and climate

Talking points on: the benefits of fossil fuels; myths about fossil fuels; climate; extreme weather; solar



[Alex Epstein](#)

10 hr ago

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For over 2 years now, I've been creating Energy Talking Points—concise, powerful, well-referenced talking points on energy, environmental, and climate issues.

Here are some of my favorites.

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Benefits of Fossil Fuels

- *Undeniable energy fact 1: Cost-effective energy is essential to human flourishing*

Cost-effective energy—**affordable, reliable, versatile, scalable energy**—is essential to human flourishing because **gives us the ability to use machines to become productive and prosperous.**

- *Undeniable energy fact 2: The world needs much more energy*

Billions of people lack the cost-effective energy they need to flourish. **3 billion use less electricity than a typical American refrigerator. 1/3 of the world uses wood/dung for heating/cooking. Much more energy is needed.**

[1](#)

- *Undeniable energy fact 3: Fossil fuels are uniquely cost-effective*

Despite 100+ years of aggressive competition, **fossil fuels provide 80%+ of the world's energy and they are still growing**—especially in the countries most concerned with cost-effective energy. E.g., China.

[2](#)

- *Undeniable energy fact 4: Unreliable solar/wind are failing to replace fossil fuels*

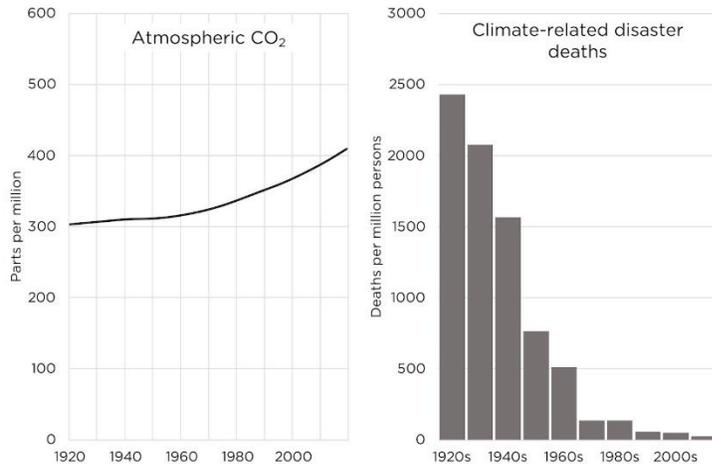
Despite claims that solar + wind are rapidly replacing fossil fuels, they provide **< 5% of world energy**—only electricity, $\frac{1}{5}$ of energy—and even that **depends on huge subsidies and reliable (mostly fossil-fueled) power plants.**

[3](#)

- *Undeniable energy fact 5: Fossil fuel energy gives us an incredible climate mastery ability*

Fossil fuels have helped drive down climate disaster deaths by 98% over the last century by powering the amazing machines that protect us against storms, extreme temperatures, and drought.

[4](#)



Myths about fossil fuels

- *Myth: The TX winter blackouts were a failure of fossil fuels, especially natural gas.*

Truth: Fossil fuels perform beautifully in far worse winter weather than Texas had in February 2021. TX blackouts were caused by **defunding reliable/resilient power** in favor of unreliable solar/wind.

[5](#)

- *Myth: Replacing fossil fuels with solar/wind will make us more secure because we'll depend less on hostile countries.*

Truth: Not only are solar/wind incapable of replacing fossil fuels, but **the control of their supply by China dwarfs any nation's influence over fossil fuels.**

[6](#)

- *Myth: Continued CO₂ emissions will cause “irreversible” climate change.*

Truth: At some point **future technologies** will enable us to **reverse the rise in CO2 levels if we want**. But **nothing can reverse mass-death caused by trying to rapidly eliminate CO2 emissions**.

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- *Myth: Fossil fuels “kill” millions of people a year via air pollution.*

Truth: This claim

1. Ignores how **fossil fuels extend every life on Earth**
2. Uses **pseudoscientific speculation** about pollution deaths.
3. Ignores the fact that **fossil fuels can be burned very cleanly**.

[8](#)

- *Myth: The anti-fossil-fuel movement is leading to better sources of energy.*

Truth: Anti-fossil-fuel activists are **responsible for artificially restricting the supply of fossil fuels and thereby causing a deadly, worsening global energy crisis**.

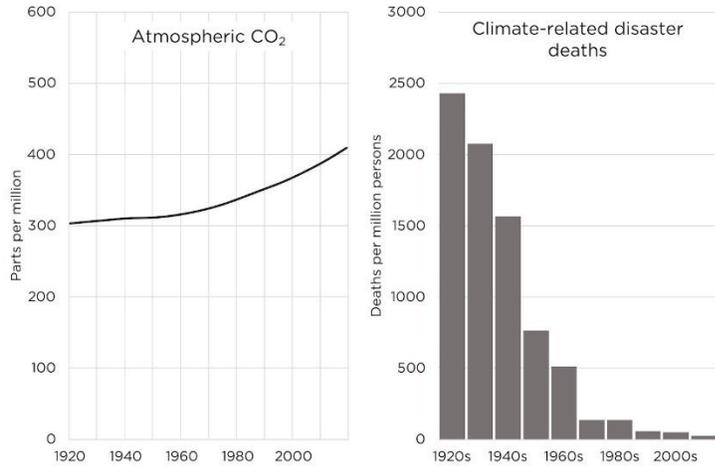
[9](#)

Big-picture facts about energy and climate

- *Fossil fuel energy gives us an incredible climate mastery ability*

Fossil fuels have helped drive down climate disaster deaths by 98% over the last century by powering the amazing machines that protect us against storms, extreme temperatures, and drought.

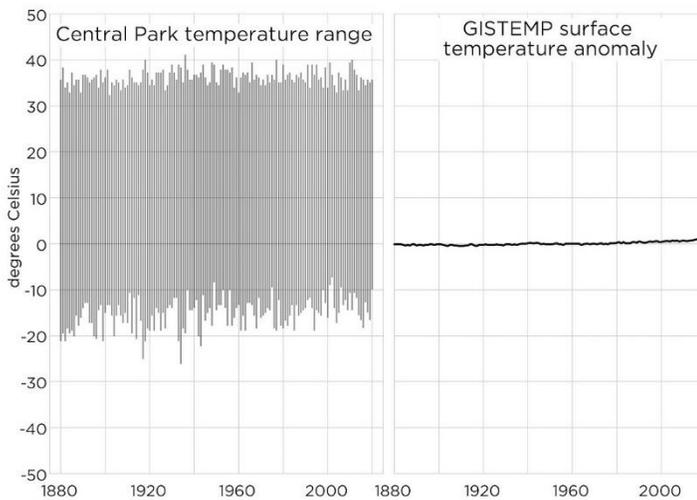
[10](#)

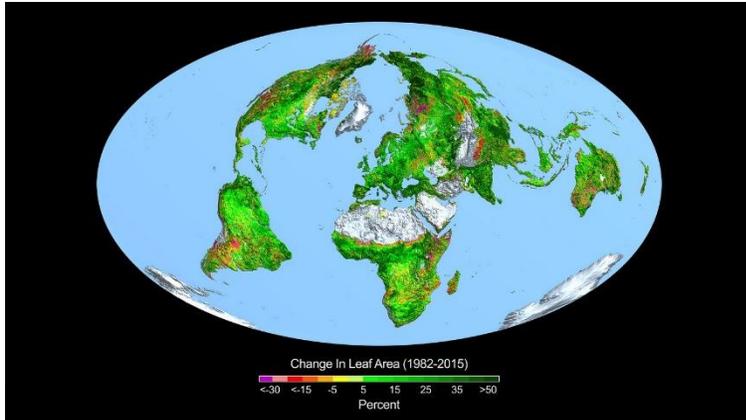


- *Undeniable climate fact: CO₂ emissions correlate with 1°C warming, + greening*

Fossil fuels' CO₂ emissions have contributed to the warming of the last 170 years, but that **warming has been mild and manageable—1° C**. Here's what **that looks like compared to normal temp changes**.

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- *Undeniable climate fact: Deaths from cold far exceed deaths from heat*

While leading institutions portray a world as increasingly riddled with heat-related death, the fact is that even though Earth has gotten 1°C warmer far more people die from cold than heat (even in India!).

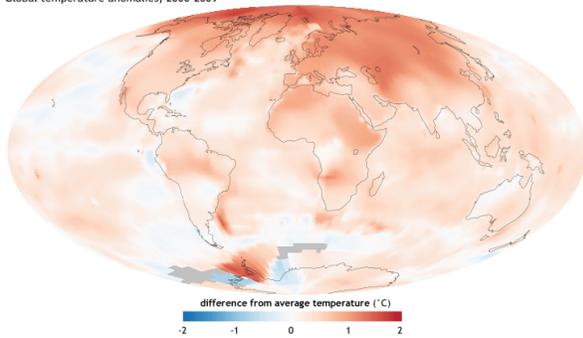
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- *Undeniable climate fact: Warming from CO₂ occurs more in colder places*

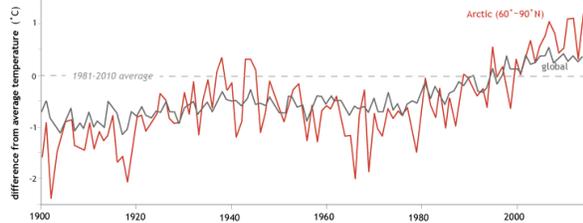
The mainstream view in climate science is that **more warming will be concentrated in colder places (Northern latitudes) and at colder times (nighttime) and during colder seasons (winter)**. This is good news.

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Global temperature anomalies, 2000-2009



Arctic versus global temperatures anomalies, 1900-2014



- *Undeniable climate fact: Rising CO₂ leads to diminishing warming*

Mainstream climate science is unanimous about a conclusion that the public is, shamefully, not made aware of: the “greenhouse effect” of CO₂ is a *diminishing* effect, with additional CO₂ leading to less warming.

The truth about alternatives

- *Myth: We can rapidly reduce fossil fuels at very low cost.*

Truth: Fossil fuels are a **uniquely cost-effective** form of energy, which is why they are 80% of global energy and still growing. **Rapidly reducing fossil fuels, in a world that needs far more energy, is catastrophic.**

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- *Myth: Solar and wind are cheap.*

Truth: Solar and wind are **unreliable, parasitical sources of energy that add costs to the grid.**

Claims of “cheapness” are based on **ignoring the full costs of solar + wind**—above all the cost of a reliable grid that gives them 24/7 life support.

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- *Myth: Solar/wind is cheaper than fossil fuels because Lazard’s “Levelized Cost of Energy” (LCOE) is lower for solar/wind.*

Truth: LCOE, by Lazard’s own admission, doesn’t include many costs of solar/wind—above all the **cost of a reliable grid needed for 24/7 life support**.

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- *Myth: Solar and wind are “winning in the marketplace,” outcompeting fossil fuels and nuclear with superior economics.*

Truth: Unreliable, parasitical solar and wind are only “**winning**” when **given massive preferences**—mandates, subsidies, and no penalty for unreliability.

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- *Myth: Nuclear is too expensive, so we should use solar/wind instead.*

Truth: **Solar/wind can’t provide reliable energy; nuclear can.** And **nuclear is only expensive** because it has, with the help of many “green” activists, been **falsely labeled unsafe and effectively criminalized**.

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Solar myths

- **Myth: Just a small area of solar panels plus storage can power the world.**

Truth: Storing just 3 days of global energy would cost \$590 trillion at Elon Musk’s current prices. And the panels would take up more space than all the world’s cities, towns, and villages combined.

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- Musk says that “to power the whole Earth” we need just solar panels and “some batteries.”

What is “some batteries”?

To store a mere 3 days of world energy, to be prepared for weeks (let alone seasons) with lower-than-usual sunlight, takes >1,350 terawatt-hours in batteries.

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- The world uses over 165k TWh of energy annually, or ~1.36 billion MWh in 3 days. **1000 Tesla Megapacks (3916 MWh of storage) have a price over >\$1.7 billion. This would mean 3 days of storage using Tesla batteries would cost >\$590 trillion. That's 6X world GDP!**

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TESLA

3 days of world energy: ~1.36B MWh
 → \$590 trillion in Tesla Megapacks



Select Megapack

Megapack enables low-cost, high-density commercial and utility projects at large scale. It ships ready to install with fully assembled battery modules, inverters and thermal systems. [View Product Details](#)

969.6 MW 3916 MWh

Megapack Quantity: 1000

Megapack Duration: 2 hr 4 hr

Include Installation: Yes No

Site Location: California

Desired Delivery Date: Q4 2024

Estimated Price: \$1,700,580,010
Subject to change, taxes not included

Est. Annual Maintenance: \$4,825,480
Price increases at 2% per year

Get Today: \$1,000
Not available for purchase directly

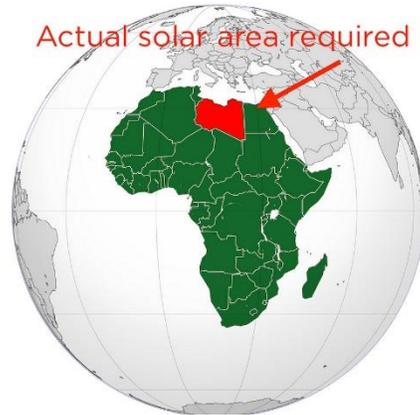
- **Arguing that solar panels and batteries can provide energy to 8 billion people using modest space is like arguing that Rolls-Royces can transport 8 billion people using modest space.**

Yes, there's **space** for 8 billion Rolls-Royces—but the **human time it would take to produce them is cost-prohibitive.**

- The main lie of “Just a small area of solar panels can power the world” is that it ignores the insane cost of the necessary batteries.

But it also **drastically underestimates how much space solar panels require.**

For example, this viral Twitter post underestimates the area by some 25 times.



- If 1.8 million square km of solar panels doesn't seem like much, note that it is **more than all cities, towns, villages, and human infrastructure combined** (~1.5 million sq km).

And this excludes the **huge footprints of solar and battery mining, manufacturing, and transmission.**

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Myth: We can be like other countries who have 80% “clean electricity”

- The most persuasive argument for the Biden Administration’s radical policy of 80% “clean electricity” by 2030 is that other countries are already at 80%. But this is BS because those countries, unlike us, can use huge amounts of 1) nuclear, 2) hydro, or 3) imported power.
- In response to worries that the reconciliation bill's policy of 80% “clean electricity” by 2030—from 30% today—will cause reliability problems, a group of prominent green electricity advocates recently claimed in an [open letter](#) that “reliability can be preserved and enhanced.”

Dear Leader Schumer, Speaker Pelosi, Chairman Manchin, Senator Barrasso, Chairman Pallone, and Representative McMorris Rodgers:

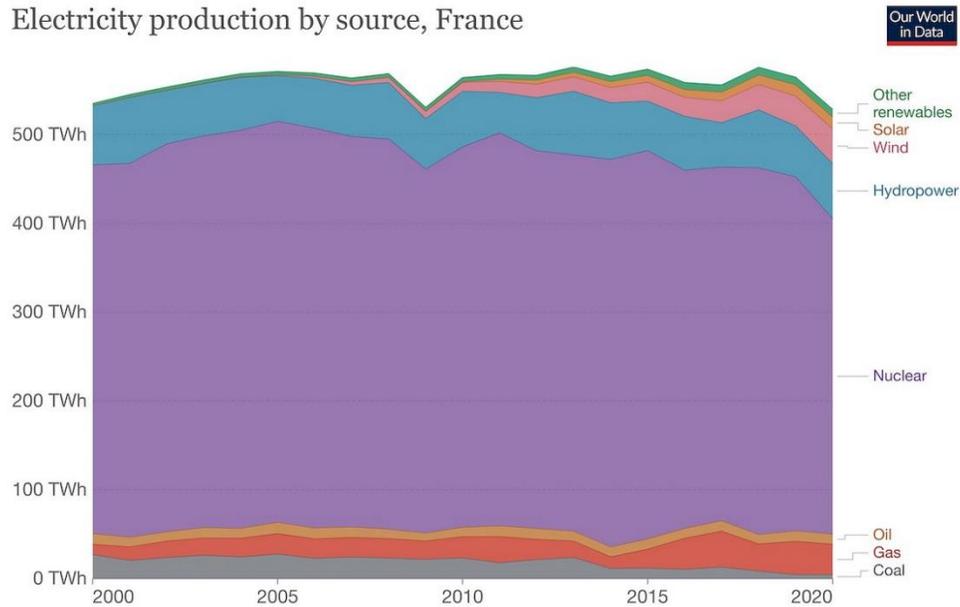
We are writing to express our confidence that our nation's power system reliability can be preserved and enhanced with the Clean Electricity Performance Program (CEPP) in the legislative package now under consideration in Congress. As experts in the electricity industry, we believe that this sector must continue to lead the country in achieving both climate mitigation objectives and a reliable, resilient, secure, and affordable energy system. Climate change is

- The most compelling argument given for reliable 80% clean electricity by 2030 is that other places, such as France and Ontario, have already achieved this. But this is a deeply dishonest comparison because those places can, unlike us, use huge amounts of nuclear and hydro.

does not require that every individual system or utility meet the target. The electric sector has already reduced its carbon emissions from its peak by more than one-third. Growing experience with highly decarbonized power systems around the world confirms that a wide variety of power systems can achieve this target with full reliability. The power systems of France, Ontario, Canada, and two Scandinavian countries already run on 80% or higher levels of clean power with reliability as good as ours. Four U.S. states and many dozens of U.S. utilities providing service in other states have already set targets of net zero electric sector emissions by 2040, which is consistent with the CEPP 2030 goal. Many more states and utilities have committed to

- **France gets 2/3 of its electricity from reliable nuclear power. Ontario gets a combined 80% of its electricity from nuclear power and hydropower. By contrast, the US gets 20% of electricity from nuclear and <7% from hydro--neither of which can meaningfully increase by 2030.**

Electricity production by source, France



Source: Our World in Data based on BP Statistical Review of World Energy & Ember (2021)
Note: 'Other renewables' includes biomass and waste, geothermal, wave and tidal.

OurWorldInData.org/energy • CC BY

- **There is no place in the world that gets a large share of its electricity from solar and wind without huge imports from its neighbors' reliable--not solar+wind--power plants. And yet the US, which cannot import most of its needed electricity, is considering 50%+ solar and wind!**

ESG

- The preposterous **financial pretense** of “ESG investing” is that the promoters of it have so accurately identified universal norms of long-term value creation--Environmental norms, Social norms, and Governance norms—that imposing those norms on every company is justified.
- In reality, ESG was **a movement cooked up at the UN**—not exactly a leading expert in profitable investment—to **impose moral and political agendas, largely left-wing ones**, on institutions that would not adopt them if left to their own devices.

- The number one **practical policy** advocated by the ESG movement today is: **divest from fossil fuels in every way possible**, and associate yourself with “renewable” solar and wind in every way possible. This policy is helping destroy energy production around the world.
- The most egregious immorality of the ESG movement, led by Larry Fink's Blackrock, is its effort to destroy vital fossil fuel projects in poor places that desperately need them. This effort is guaranteed to perpetuate poverty.

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Who they think they are starving



Whom they are really starving



- Example of ESG poverty perpetuation: South Korea canceled new coal plants in South Africa and the Philippines after “Global investors including Blackrock...warned the South Korean utility to drop coal power projects.”

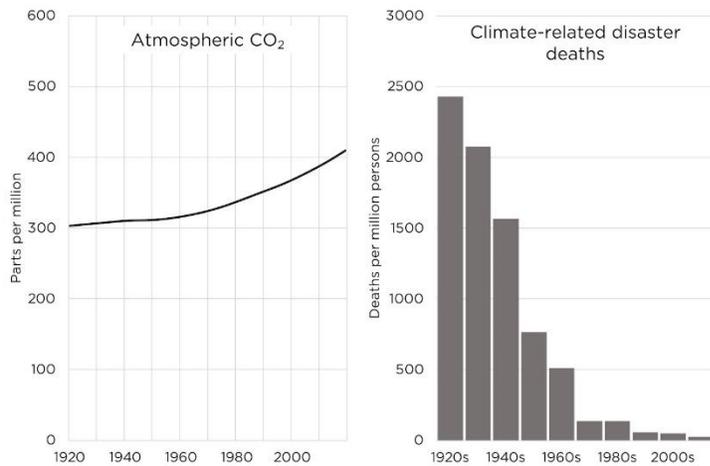
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Extreme weather

- **Myth:** The world is **experiencing unprecedented danger from extreme weather thanks to fossil fuels.**

Truth: The world is **experiencing unprecedented safety from extreme weather thanks to fossil fuels**—because fossil fuels' **climate mastery benefits** overwhelm any negative climate side-effects.

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- **Myth:** We don't need fossil fuels to protect ourselves from extreme weather—we can **just use alternatives**.

Truth: As Europe is illustrating, there is **no near-term replacement for fossil fuels** for the 1/4 of the world that uses abundant energy—let alone the 3/4 of the world that doesn't.

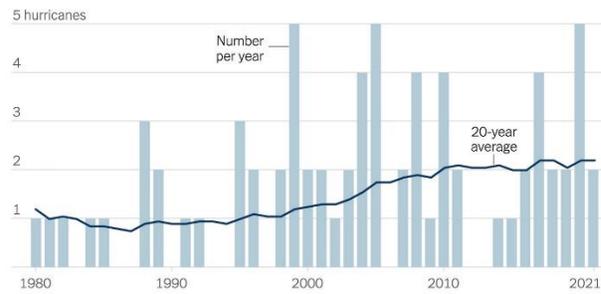
[29](#)

- **Myth:** Media claims about increasing hurricane frequency are **accurate**.

Truth: Leading media outlets have **deliberately misrepresented the flat long-term hurricane trend**. E.g., the New York Times **cherry-picking a starting point—the low point of 1980—to make a flat trend seem upward**.

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Category 4 and 5 Atlantic hurricanes since 1980



Source: NOAA · By The New York Times

Changes in Atlantic major hurricane frequency since the late-19th century

Gabriel A. Vecchi¹, Christopher Landsea, Wei Zhao, Gabriele Villarini & Thomas Knutson

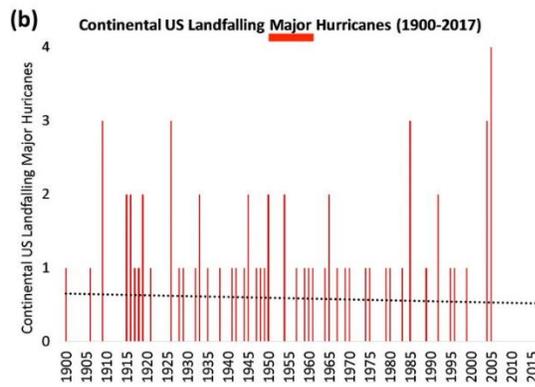
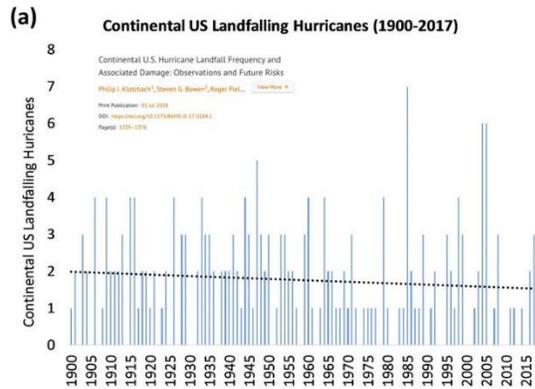
Nature Communications 12, Article number: 4054 (2021) | Cite this article

20k Accesses | 12 Citations | 1105 Altmetric | Metrics

Abstract

Atlantic hurricanes are a major hazard to life and property, and a topic of intense scientific interest. Historical changes in observing practices limit the utility of century-scale records of Atlantic major hurricane frequency. To evaluate past changes in frequency, we have here developed a homogenization method for Atlantic hurricane and major hurricane frequency over 1851–2019. We find that recorded century-scale increases in Atlantic hurricane and major hurricane frequency, and associated decrease in USA hurricanes strike fraction, are consistent with changes in observing practices and not likely a true climate trend. After homogenization, increases in basin-wide hurricane and major hurricane activity since the 1970s are not part of a century-scale increase, but a recovery from a deep minimum in the 1960s–1980s. We suggest internal (e.g., Atlantic multidecadal) climate variability and aerosol-induced mid-to-late-20th century major hurricane frequency reductions have probably masked century-scale greenhouse-gas warming contributions to North Atlantic major hurricane frequency.

- Here's recent US data for landfalling hurricanes, both overall and major. Again, consuming the New York Times and other trusted sources would you have any idea that the data looked like this?



- **Myth: Hurricane intensity is expected to get catastrophically higher** as temperatures rise.

Truth: Mainstream estimates say hurricanes will be less frequent and between 1-10% more intense. This is not at all catastrophic if we continue our fossil-fueled climate mastery.

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- **Sea level rise** – which human activity has very likely been the main driver of since at least 1971 according to IPCC AR6 – should be causing **higher coastal inundation levels** for tropical cyclones that do occur, all else assumed equal.
- **Tropical cyclone rainfall rates are projected to increase** in the future (*medium to high confidence*) due to anthropogenic warming and accompanying increase in atmospheric moisture content. Modeling studies on average project an increase on the order of 10-15% for rainfall rates averaged within about 100 km of the storm for a 2 degree Celsius global warming scenario.
- **Tropical cyclone intensities globally are projected to increase** (*medium to high confidence*) on average (by 1 to 10% according to model projections for a 2 degree Celsius global warming). This change would imply an even larger percentage increase in the destructive potential per storm, assuming no reduction in storm size. Storm size responses to anthropogenic warming are uncertain.
- The global *proportion* of tropical cyclones that reach very intense (Category 4 and 5) levels is projected to increase (*medium to high confidence*) due to anthropogenic warming over the 21st century. There is less confidence in future projections of the global number of Category 4 and 5 storms, since most modeling studies project a decrease (or little change) in the global frequency of all tropical cyclones combined.

Likelihood Statements

The terminology here for likelihood statements follows these conventions for the assessed likelihood of an outcome or result:

- Very Likely: > 90%,
- Likely: > 66%
- More Likely Than Not (or Better Than Even Odds) > 50%

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For every million people on earth, annual deaths from climate-related causes (extreme temperature, drought, flood, storms, wildfires) declined 98%--from an average of 247 per year during the 1920s to 2.5 in per year during the 2010s.

Data on disaster deaths come from EM-DAT, CRED / UCLouvain, Brussels, Belgium – www.emdat.be (D. Guha-Sapir).

Population estimates for the 1920s from the [Maddison Database 2010](#) come from the Groningen Growth and Development Centre, Faculty of Economics and Business at University of Groningen. For years not shown population is assumed to have grown at a steady rate.

Population estimates for the 2010s come from [World Bank Data](#).

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[Dessler on The Joe Rogan Experience](#), from 12:39-14:36.

[Epstein's unrefuted explanation to Dessler](#), from 15:44-16:24.

[Alex Epstein - Talking Points on the Texas Electricity Crisis](#)

[Alex Epstein - Talking Points on Resilience](#)

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[Dessler on The Joe Rogan Experience](#), from 1:19:07-1:19:52.

[Epstein's unrefuted explanation to Dessler](#), from 39:45-40:49.

[Alex Epstein - How the Biden Administration threatens energy security](#)

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[Dessler on The Joe Rogan Experience](#), from 1:28:40-1:29:23.

[Epstein's unrefuted explanation to Dessler](#), from 24:23-24:54.

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[Dessler on The Joe Rogan Experience](#), from 1:04:07-1:10:14.

[Alex Epstein - Talking Points on the dangerous falsehood that "Climate change is a public health issue"](#)

[Alex Epstein - The "fossil fuels cause 1 in 5 deaths" myth](#)

[9](#)

[Dessler on The Joe Rogan Experience](#), from 6:18-8:11.

[Epstein's unrefuted explanation to Dessler](#), from 15:44-16:24.

[Alex Epstein - Testimony: "How the Biden Administration and the Global Anti-Fossil-Fuel Movement Caused an Energy Crisis and Inflated Our Cost of Living"](#)

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Population estimates for the 2010s come from [World Bank Data](#).

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[NASA - GISS Surface Temperature Analysis](#)

[NOAA National Centers for Environmental Information - Daily Summaries Station Details, NY, Central Park](#)

[12](#)

[Zhao et al. \(2021\)](#)

[13](#)

[NOAA - Climate change rule of thumb: cold "things" warming faster than warm things](#)

[14](#)

[Dessler on The Joe Rogan Experience](#), from 48:34-48:57.

[Epstein's unrefuted explanation to Dessler](#), from 15:24-16:24.

[BP - Statistical Review of World Energy](#)

[Alex Epstein - Testimony: "How the Biden Administration and the Global Anti-Fossil-Fuel Movement Caused an Energy Crisis and Inflated Our Cost of Living"](#)

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[Dessler on The Joe Rogan Experience](#), from 4:55-5:45.

[Epstein's unrefuted explanation to Dessler](#), from 29:54-31:28.

[Alex Epstein - Talking Points on the reconciliation bill, part 2: the 10-year extension of solar and wind subsidies](#)

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[Dessler on The Joe Rogan Experience](#), from 4:55-5:45.

[Epstein's unrefuted explanation to Dessler](#), from 29:54-31:28.

“Other factors would also have a potentially significant effect on the results contained herein, but **have not been examined** in the scope of this current analysis. These additional factors, among others, could include: **capacity value vs. energy value; network upgrades, transmission, congestion or other integration-related costs...**”

“This analysis does not take into account potential social and environmental externalities

or reliability-related considerations”

[Lazard’s Levelized Cost of Energy Analysis — Version 14.0](#)

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[Dessler on The Joe Rogan Experience](#), from 50:00-52:44.

[Epstein’s unrefuted explanation to Dessler](#), from 31:08-31:29.

[Alex Epstein - Talking Points on the reconciliation bill, part 2: the 10-year extension of solar and wind subsidies](#)

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[Dessler on The Joe Rogan Experience](#), from 7:34-8:11.

[Epstein’s unrefuted explanation to Dessler](#), from 25:23-26:44.

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[Elon Musk on Twitter](#)

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[21](#)

[BP - Statistical Review of World Energy](#)

[Tesla - Order Megapack](#)

[World Bank Data - GDP \(Current \\$US\)](#)

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[Elon Musk on Twitter](#)

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The world has a land area of almost 150 million square km. Only about 1% are “built-up” areas like villages, towns, cities, and other human infrastructure.

[Our World in Data - Land Use](#)

[Our World in Data - How urban is the world?](#)

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[Our World in Data - France: Energy Country Profile](#)

[Ontario Energy Board - Ontario’s System-Wide Electricity Supply Mix: 2020 Data](#)

[U.S. Energy Information Administration - Electric Power Annual table 3.1.A](#)

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[Betsy Atkins - Demystifying ESG: Its History & Current Status](#)

[UNPRI](#)

[26](#)

[Meme circulating on Twitter](#)

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[Power Engineering International](#)

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Population estimates for the 2010s come from [World Bank Data](#).

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[Alex Epstein - Talking Points on Earth Day truth: Fossil fuels make Earth BETTER](#)

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[New York Time - Ian Moves North](#)

[Vecchi et al. \(2021\) - Changes in Atlantic major hurricane frequency since the late-19th century](#)

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[Klotzbach et al. \(2018\) - Continental U.S. Hurricane Landfall Frequency and Associated Damage: Observations and Future Risks](#)

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1 Comment



Terry Oldberg

[10 hr ago](#)

Focusing on the logicity of the argument that is made by an IPCC climate model is essential to debunking the EPA's claim that emissions of carbon dioxide into Earth's

climate system is an "endangerment" to mankind for it is revealed that this argument is logically flawed.

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