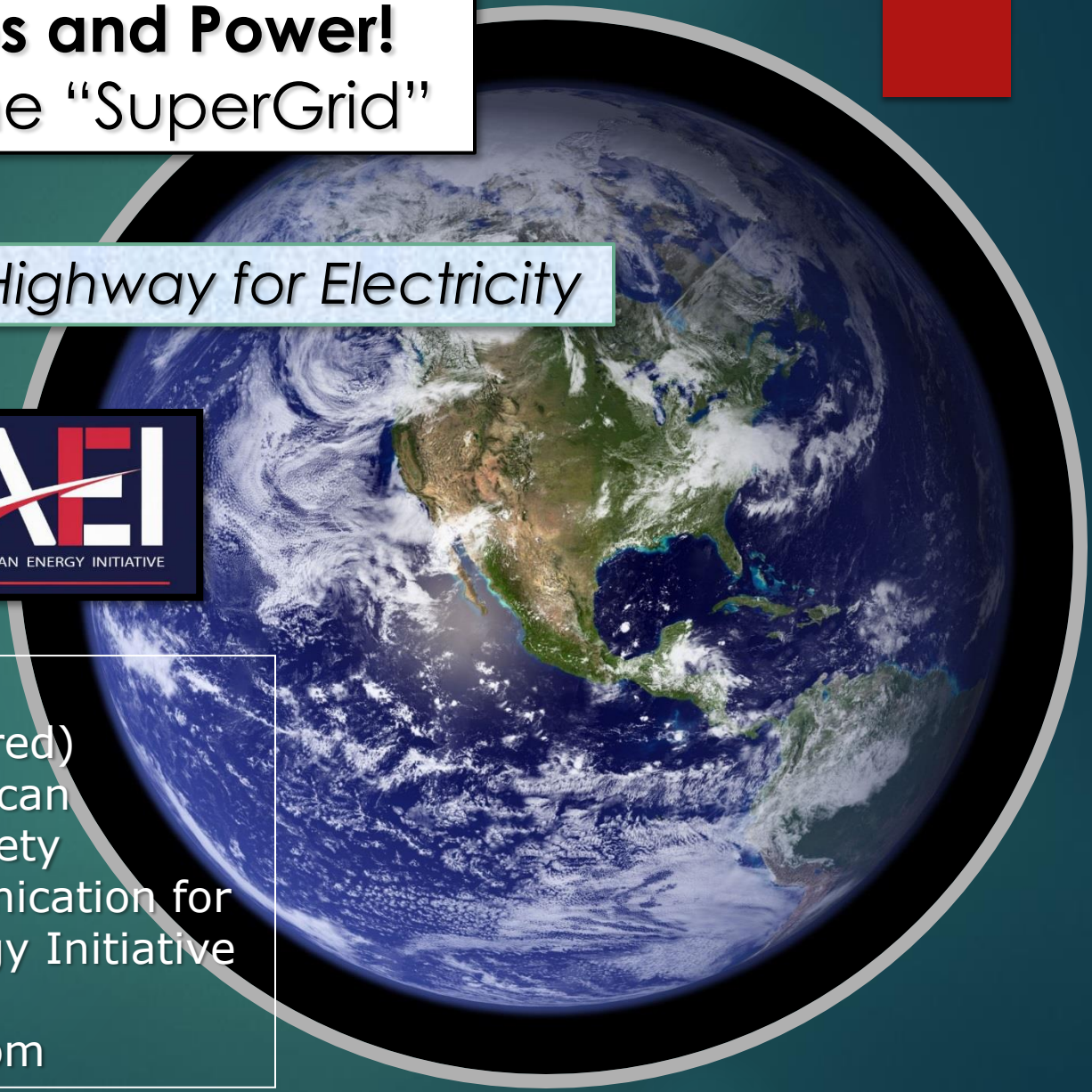
Money, Jobs and Power!
A Case for the "SuperGrid"

The Interstate Highway for Electricity

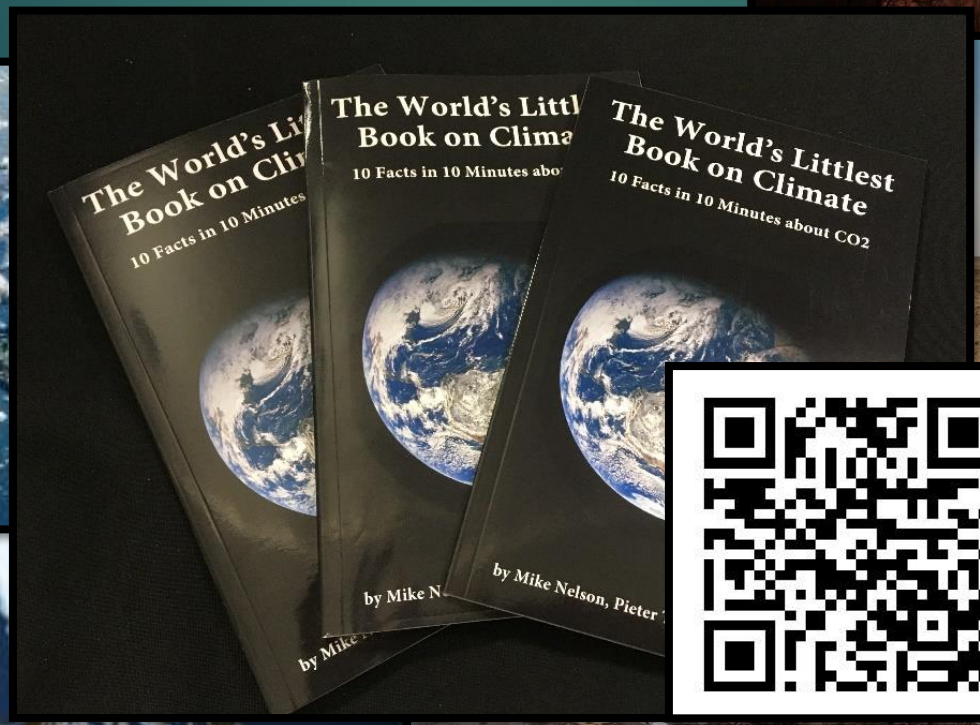


Mike Nelson
Meteorologist (Retired)
Fellow of the American Meteorological Society
Director of Communication for the American Energy Initiative

nelsonwx@gmail.com

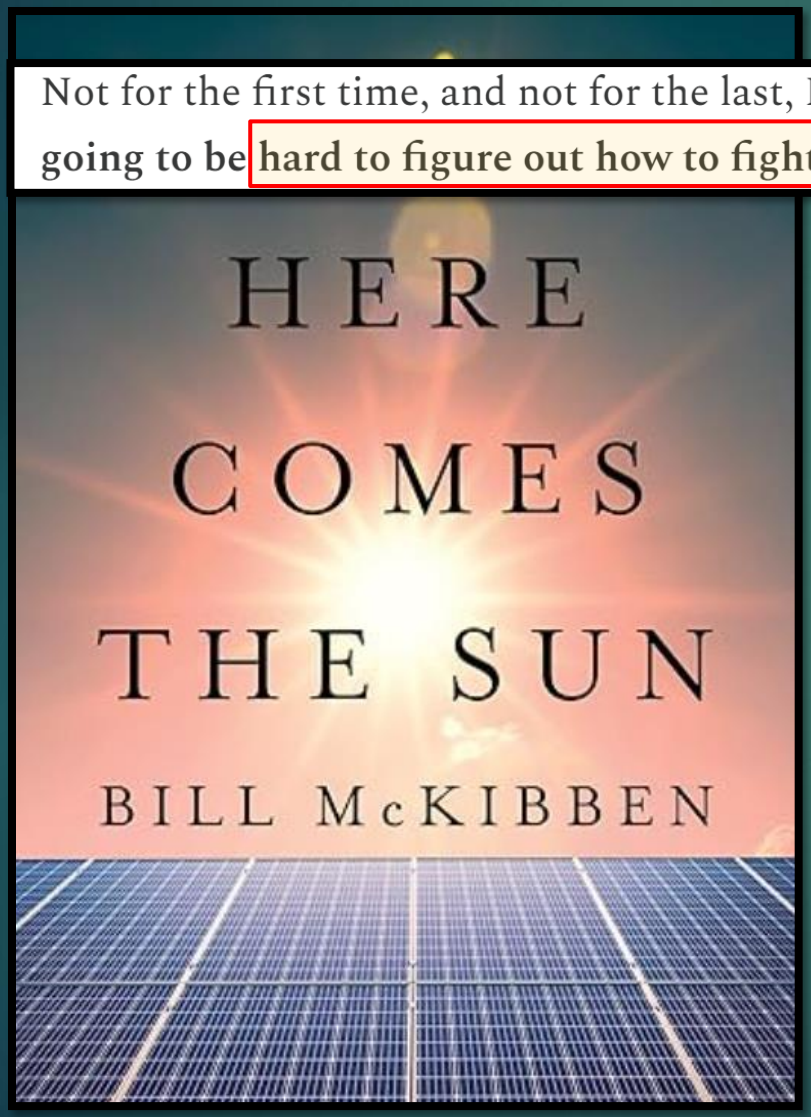
The World's Littlest Book on Climate

https://dl.bookfunnel.com/9jwg0av7vu



Free Download

Here Comes The Sun



Not for the first time, and not for the last, I'm going to make the observation that it's going to be hard to figure out how to fight wars over sunshine. McKibben -1/3/2026

An acre of corn will produce enough ethanol to drive a Ford F-150 (gas powered) **for 25,000 miles**

An acre of solar will produce enough electricity to drive a Ford F-150 (Lightning) **for 700,000 miles!**

Some Perspective on Mike Nelson

From my final newscast – 12/12/24

Some Perspective on the Earth

- The Earth is **4.6** billion years old
- Let's scale that to **46** years…
- **8** months ago, dinosaurs lived…
- Human beings have only been here for **four** hours!
- **One** hour ago, agriculture began
- The Industrial Revolution began just **one** minute ago!
- In that minute, we have increased the Carbon Dioxide from **280** ppm to over **425** ppm
- The rapid increase in **CO2** traps heat that would otherwise escape into outer space

Some Perspective in General

The Earth seen from 3.7 billion miles away! Taken by the Voyager 1 Spacecraft - Feb. 14, 1990

8 track tape drive for memory!

Computer power that today would be the equivalent of the key fob for your car!

State of the art technology in the mid-1970s…

Still delivering scientific data from interstellar space!

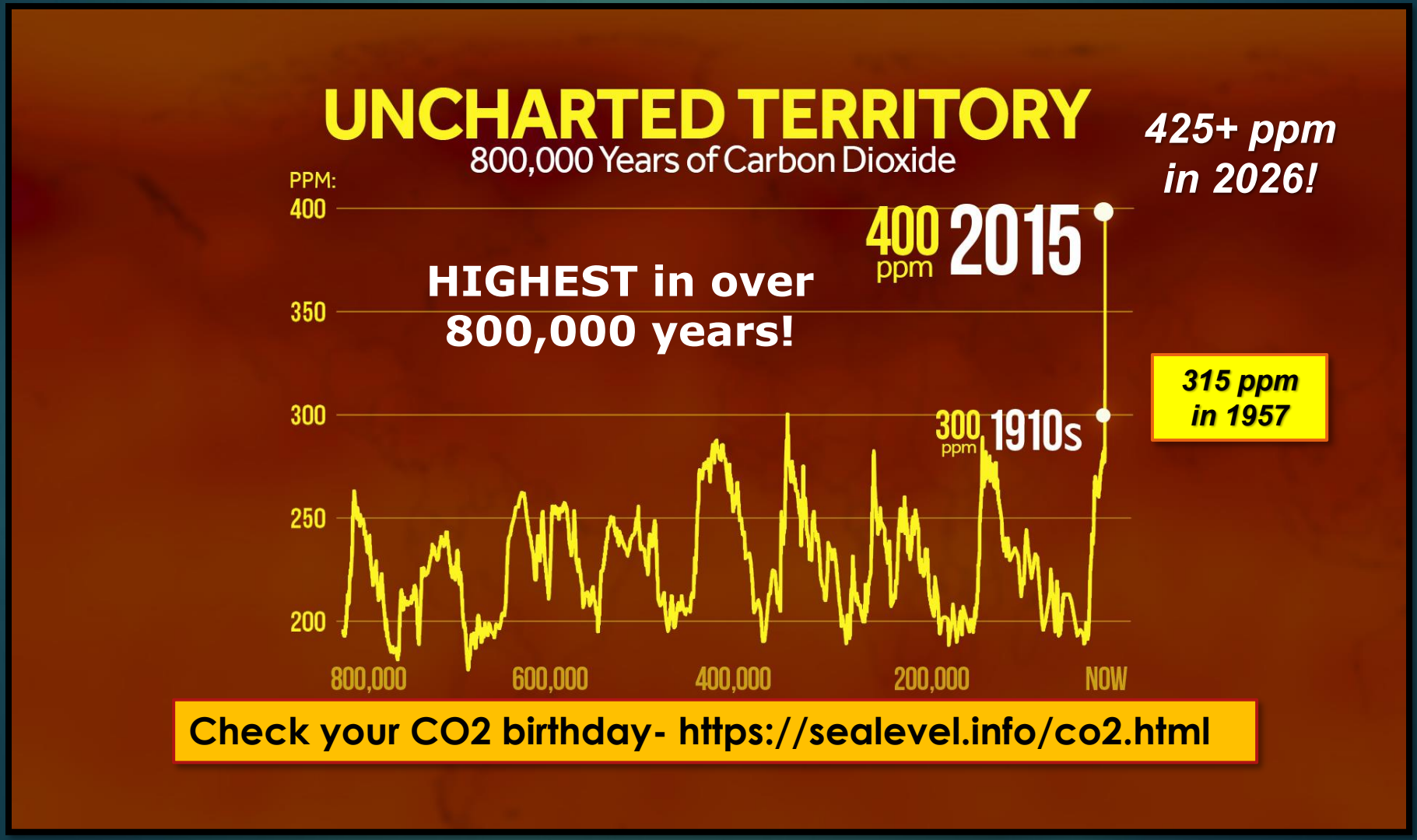
Climate is What You Expect - Weather is What You Get

Global HEAT balance is even more straight-forward!
Like the basic rules of the game!

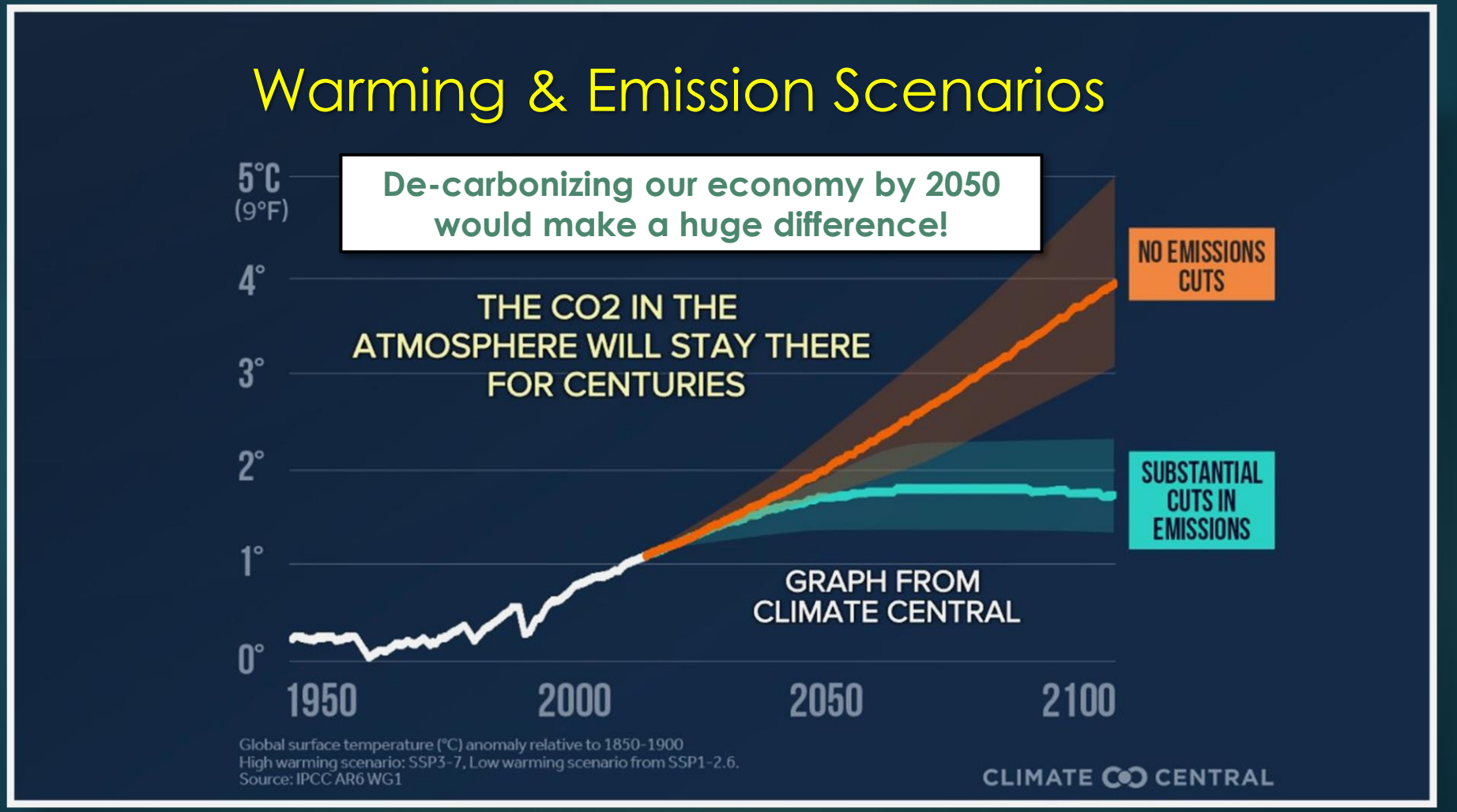
HEAT IN vs HEAT OUT!

Add HEAT = get WARMER!

Carbon Dioxide is Increasing Fast!



Much of the Warming is "Baked In, but We Can Stop Making it Worse!



The Myth of Sequestration

Carbon Sequestration is very expensive and requires a lot of energy

Scrubbing the carbon dioxide from a coal or gas fired power plant requires a plant at least 30% bigger – not very efficient.

The technology has not proven scalable

We add 100 million tons of CO2 every day

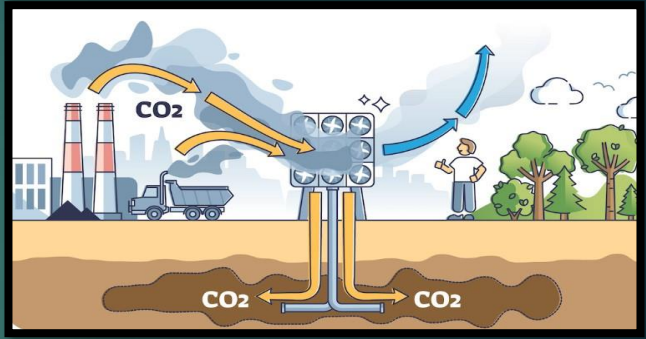
100 million tons X $1,000/ton = $100 Billion

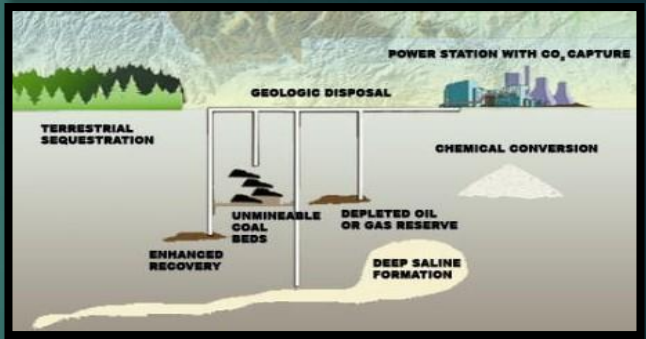
$100 Billion a day to remove daily CO2

It would cost nearly 37 Trillion Dollars Every. Single. Year. Just to stay even with current global carbon dioxide emissions.

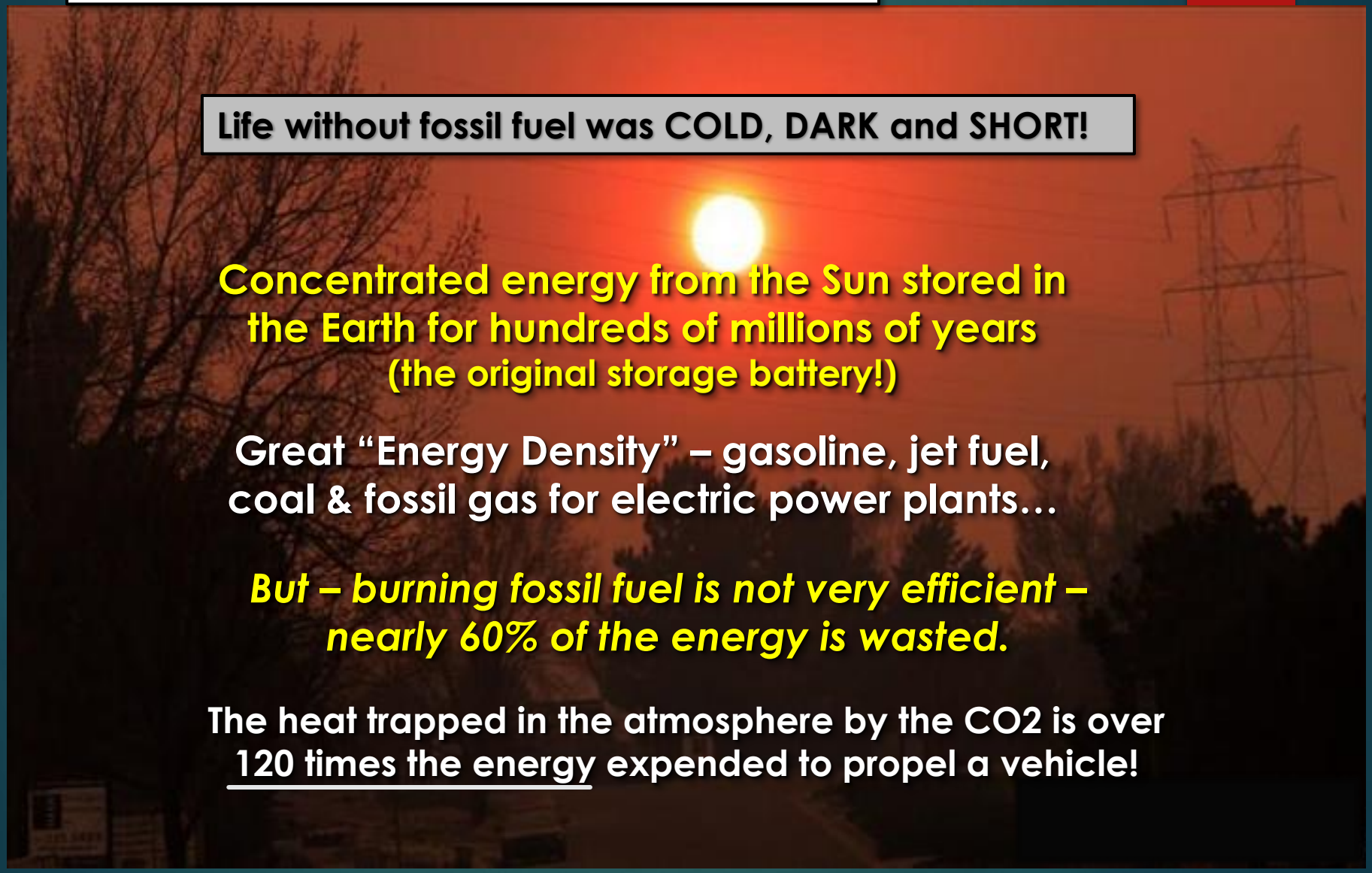
That is 1/3 of the Gross World Product (GWP)!

Very hard to put the Genie back in the bottle!





Fossil Fuel Has Been a Miracle



Life without fossil fuel was COLD, DARK and SHORT!

Concentrated energy from the Sun stored in the Earth for hundreds of millions of years (the original storage battery!)

Great "Energy Density" – gasoline, jet fuel, coal & fossil gas for electric power plants…

But – burning fossil fuel is not very efficient – nearly 60% of the energy is wasted.

The heat trapped in the atmosphere by the CO2 is over 120 times the energy expended to propel a vehicle!

A HUGE increase in the need for Electricity

Crypto, AI, Data Centers & High-Speed Computing

After many years of staying fairly level, the demand for power is rapidly increasing.

Current predictions call for an increase of 100 Gigawatts in the next 5 years.

One Gigawatt is equivalent to a nuclear reactor - We must develop new power resources!

Using primarily fossil fuel for this power will greatly increase global warming!

The Growing Energy Gap!

The first solar cell was invented in 1954 at Bell Labs in New Jersey

The United States led the world in the development of solar energy until 2000.

Global solar installations rise 64% to 380 GW in first half of 2025

China led the pack in solar installations, adding 256 GW – more than twice as much solar capacity as the rest of the world combined.

Published Sept. 4, 2025

UTILITY DIVE

China racing to be 1st "Electro-State"

The nation that "electrifies" their economy will be the most powerful by 2050 .

We are losing the race & running out of time!

Energy from all Sources!

We will need all forms of energy to meet the needs of America

Electric power from many different sources

More options = lower cost for consumers

We must protect our country's power system from terrorism & severe weather

Modernize the grid – improve efficiency

Provide the power needed for the future

America is currently falling far behind China in developing dependable, low-cost energy and a modern transmission system!

National security, global competition and lower energy costs, we must improve the electric transmission system – quickly!

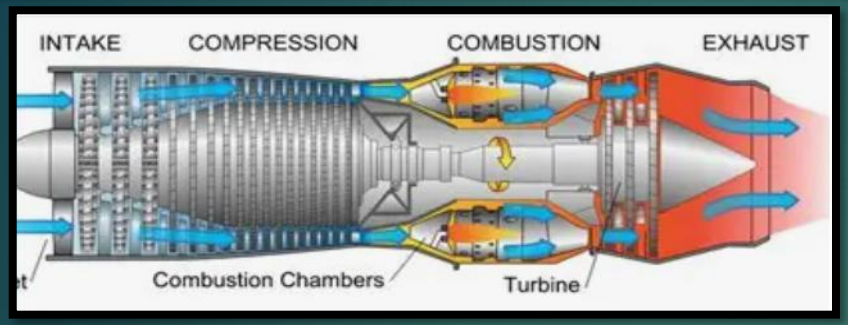
Electricity from Gas Turbines

Electricity from Nuclear

Hydro and Geo-thermal

Renewable Energy

Gas Turbine Generation



Jet Engine to make electricity

GE Vernova expects to end 2025 with an 80-GW gas turbine backlog that stretches into 2029

CEO Scott Strazik said he expects gas turbine reservations to be sold out through 2030 by the end of 2026.

UTILITY DIVE

Published Dec. 11, 2025

Enhanced Geothermal

FORGE = "**F**rontier **O**bservatory for **R**esearch in **G**eothermal **E**nergy" – Project is in Utah

FERVO = 400-Megawatt **Cape Station Project**

Use techniques developed for FRACKING

Creating small fissures in extremely HOT ROCKS – enhancing the creation of steam

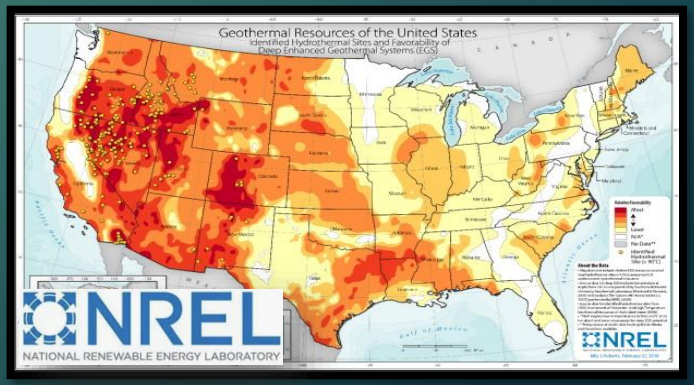
Geothermal Energy is always available

Temperatures of 440° F create high pressure steam that can be used to spin generators

Great resources in the Western U.S.

Estimates are that this technology could provide up to 90 GW of generating capacity!

Enough energy for 65 million homes



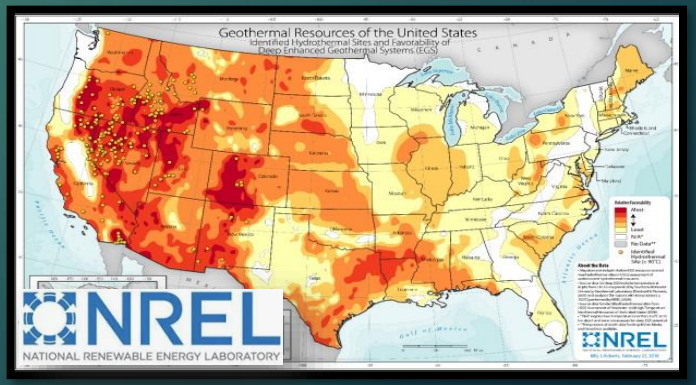
Enhanced Geothermal

Advantages

- Always available
- No carbon emissions
- Skilled workers are available
- Good resources in the West
- Favored by Dept. of Energy

Disadvantages

- Fracking chemical concerns
- Water availability in the West
- Few resources in the East
- Technology must be up-scaled
- Must improve transmission



Battery Storage

LG: Lithium Iron Phosphate Batteries

Manufactured in Michigan – perfect for energy storage

TERRA-GEN: 4,600-acre SOLAR / BATTERY facility

Located on north side of Edwards AFB in California

Joint Private-Public and DOD project

Lithium-Ion batteries provide up to 4 hours of power

HYDRO-STORE: Compressed Air Energy Storage

Renewable energy compresses air which is stored - underground for future power generation

System can store energy from hours to several days

FORM ENERGY: Air / Iron Battery storage system

Battery uses oxidation (rust) to create electricity

Heavy, but perfect for utility-scale storage facilities

Can store energy up to 100 hours = over 4 days!

Plus, IRON and AIR are certainly not rare!

Battery Storage

Advantages

- Available immediately
- Supports overall grid stability
- Technology is improving
- Can be deployed anywhere
- Favored by Dept. of Energy

Disadvantages

- Lithium-Ion good for just 4 hours
- New technologies need to scale
- Much of the supply from China
- Concerns about battery fires
- Transmission needs to improve

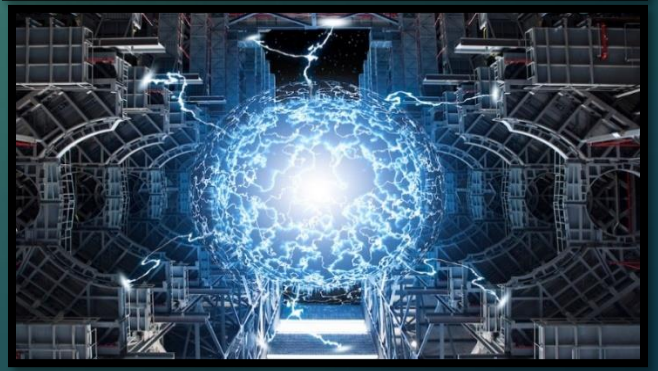
Renewables and Nuclear

Advantages

- No carbon dioxide emissions
- Nuclear provides base-load
- Renewables need no fueling
- New technologies are coming
- Nuclear favored by D.O.E.

Disadvantages

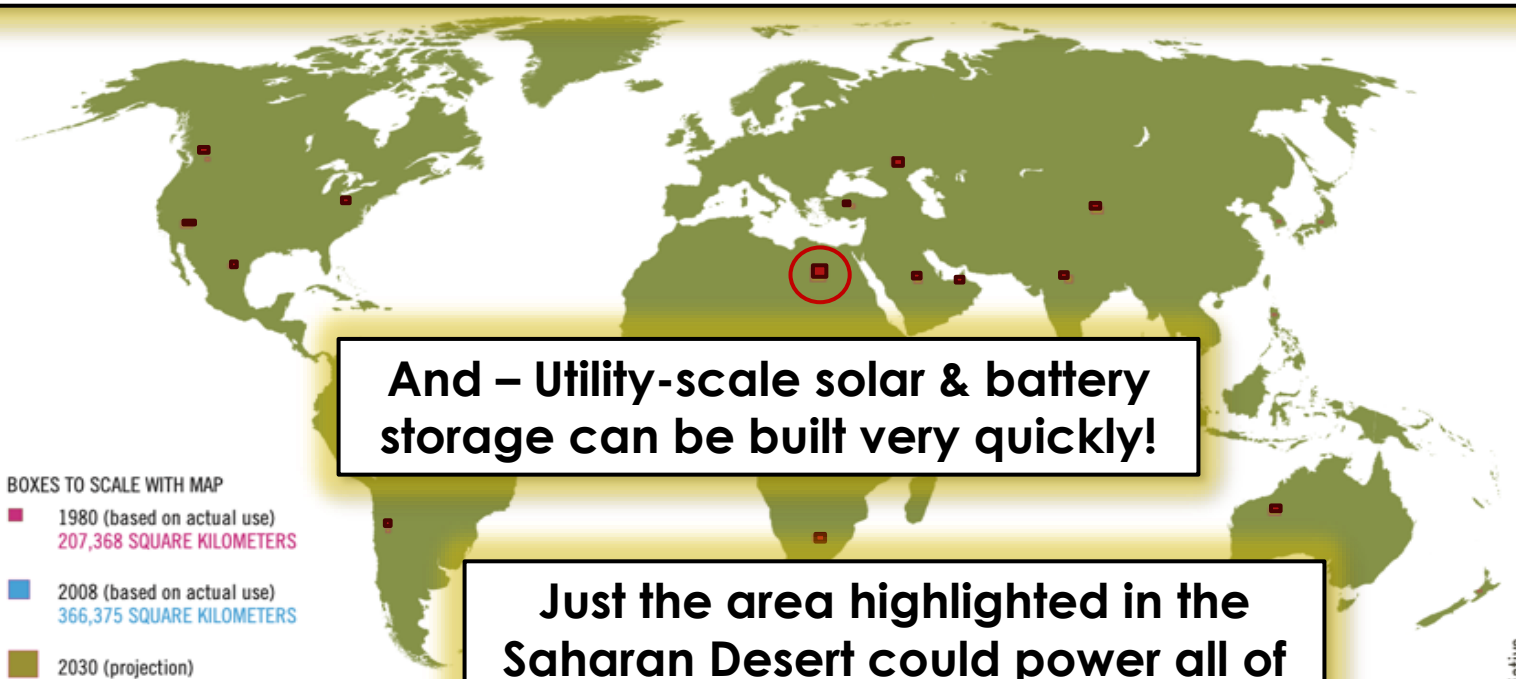
- Nuclear is very expensive
- Little domestic uranium mining
- Much of the supply from Russia
- Who wants to live near a nuke?
- Concerns about waste & safety
- Renewables are intermittent & current administration not a fan



Renewables and Nuclear

Combination of **renewable** resources and advances in **nuclear** power

Surface Area Required to Power the World



And – Utility-scale solar & battery storage can be built very quickly!

Just the area highlighted in the Saharan Desert could power all of Europe and North Africa! It is 1/20th of the entire area of the desert.

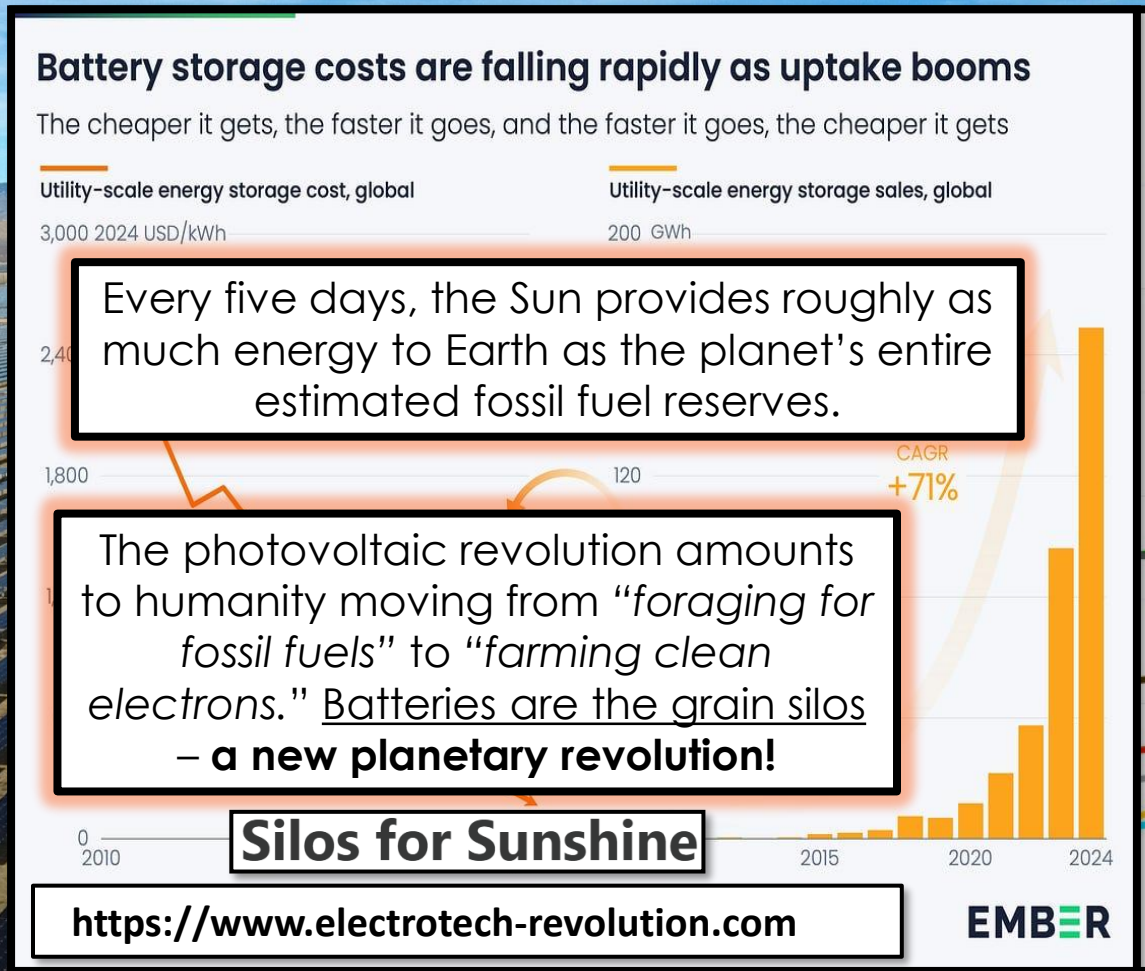
Renewables and Nuclear

Combination of **renewable** resources and advances in **nuclear** power

Maximo AI Powered Solar Robot

We can build **Gigawatts** of solar energy & battery storage in just **12-18 months!**

Renewable Energy Costs have Tumbled

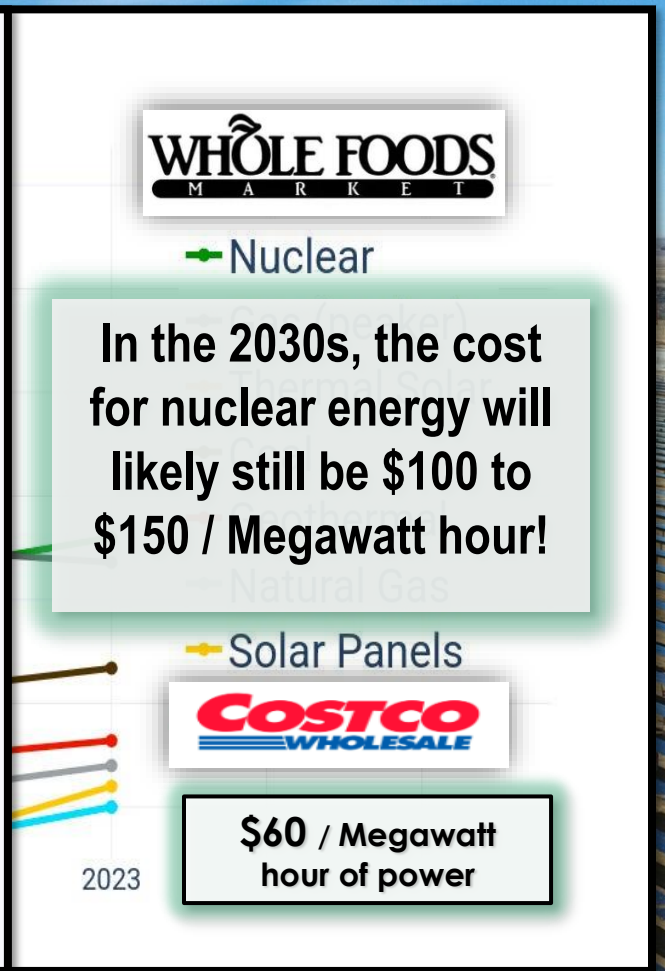


Every five days, the Sun provides roughly as much energy to Earth as the planet's entire estimated fossil fuel reserves.

The photovoltaic revolution amounts to humanity moving from "*foraging for fossil fuels*" to "*farming clean electrons.*" Batteries are the grain silos – **a new planetary revolution!**

Silos for Sunshine

https://www.electrotech-revolution.com



Direct-Current SuperGrid!

A Modern High-Voltage Electric Transmission System

Much more efficient – less line loss

Can use existing "Right of Ways"

Bury the cable – much less "NIMBY" or "BANANA"

Grid protected from Solar Flares or Nuclear EMP

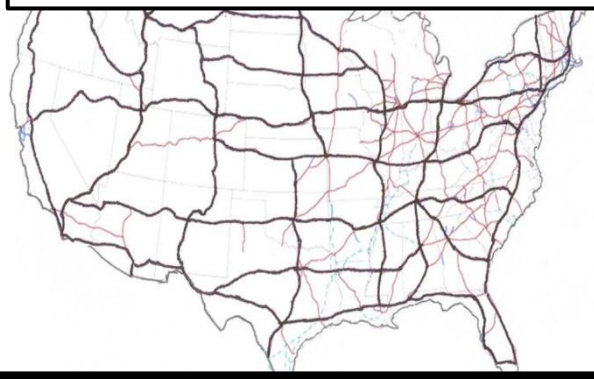
On a BIG SCALE, it is always **SUNNY** or **WINDY!**

Two Trillion-dollar investment in infrastructure – with a ROI of 10 to 15 trillion!

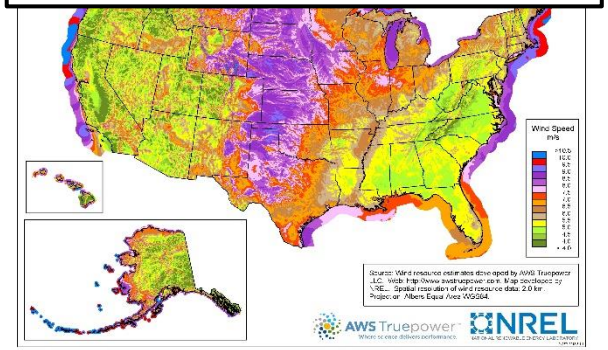
America will be safer, cleaner, a leader in a new energy economy - model for the world!

A "win-win-win" for the economy, national security and the environment!

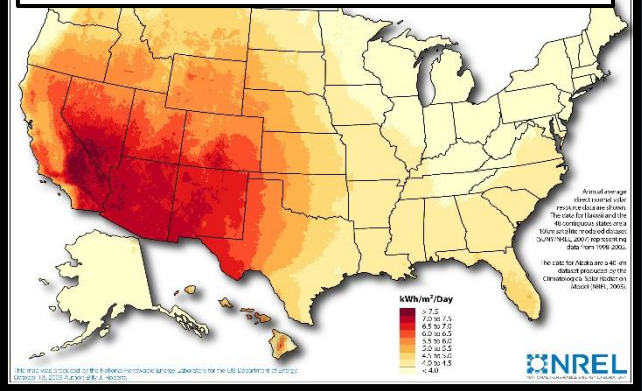
Super-Highway for Electricity!



Wind Resources in Midwest

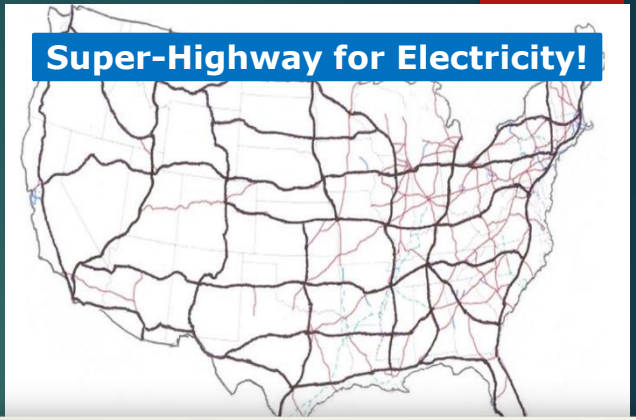


Solar Resources in Southwest



Direct-Current SuperGrid!

Much of the New Transmission System would be Underground



Imagine if all those pipes were 6 feet above the ground!

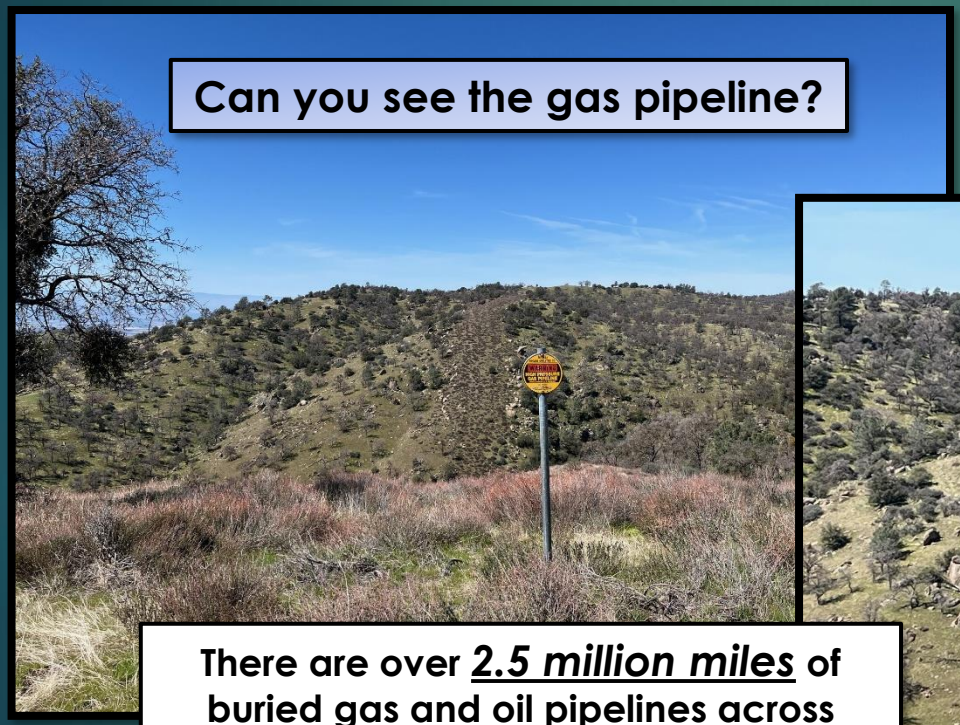
There are over ***2.5 million miles*** of buried gas and oil pipelines across America, but you cannot SEE them!

An underground electric grid would greatly lessen the visual impact!

Direct-Current SuperGrid!

Underground – Less Pushback from Land-Owners / Fewer Delays from Lawsuits

Can you see the power line?



Can you see the gas pipeline?

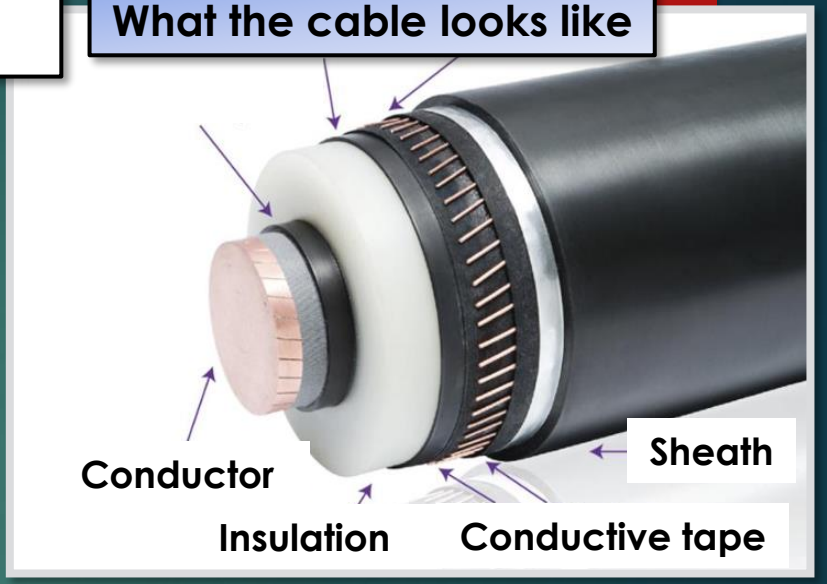
There are over ***2.5 million miles*** of buried gas and oil pipelines across America, but you cannot SEE them!

Out of sight, out of mind!

Underground Advantage

Underground – Less Pushback from Land-Owners / Fewer Delays from Lawsuits

What the cable looks like

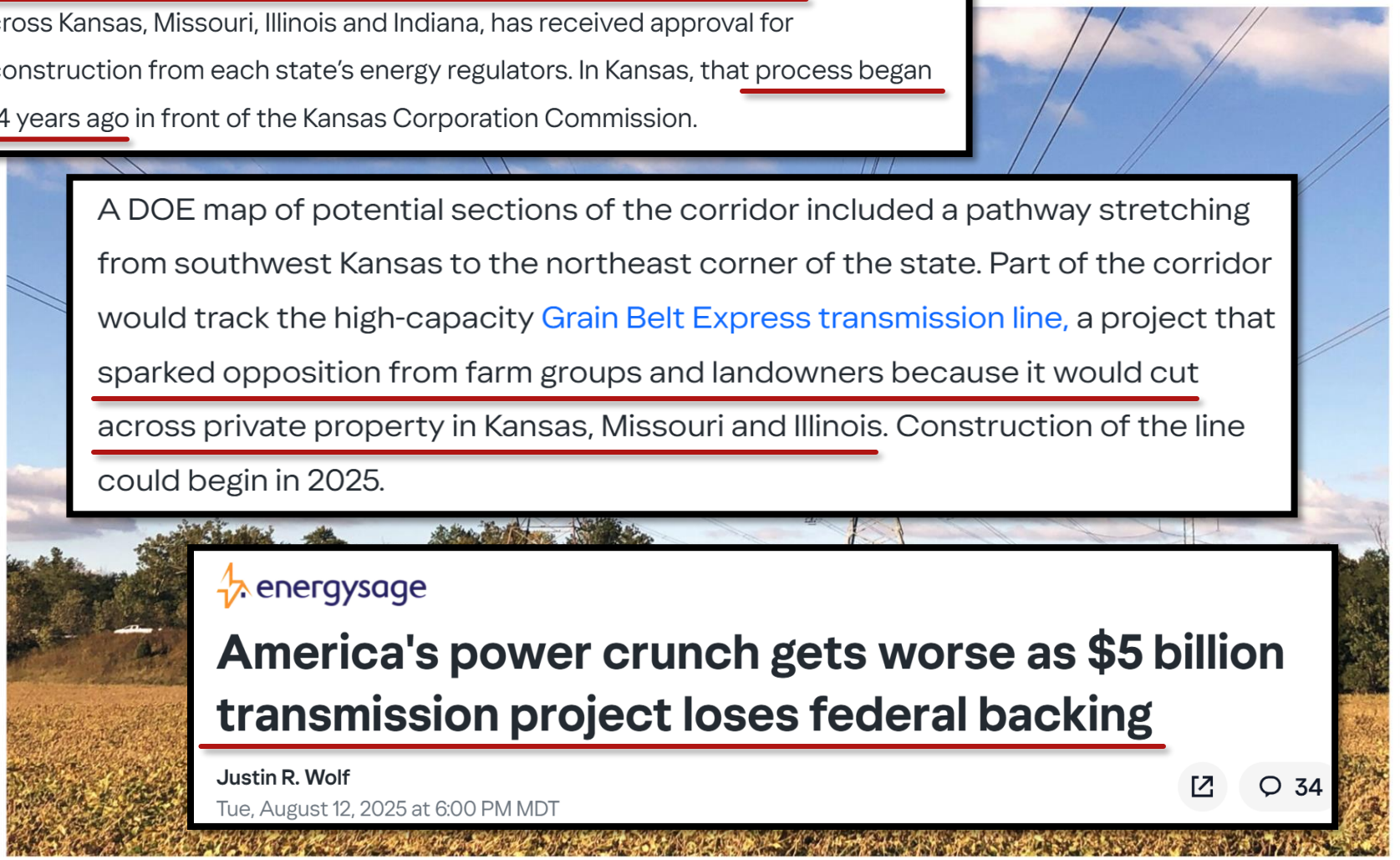


Putting most of the modern transmission system underground and underwater would save money & delays from lawsuits!

Transmission Troubles

The Grain Belt Express, an 800-mile, 5,000-megawatt transmission line that will cross Kansas, Missouri, Illinois and Indiana, has received approval for construction from each state's energy regulators. In Kansas, that process began 14 years ago in front of the Kansas Corporation Commission.

A DOE map of potential sections of the corridor included a pathway stretching from southwest Kansas to the northeast corner of the state. Part of the corridor would track the high-capacity Grain Belt Express transmission line, a project that sparked opposition from farm groups and landowners because it would cut across private property in Kansas, Missouri and Illinois. Construction of the line could begin in 2025.



energysage

America's power crunch gets worse as $5 billion transmission project loses federal backing

Justin R. Wolf
Tue, August 12, 2025 at 6:00 PM MDT

34

Railroads Could be the Key!

Railroads are losing their main source of revenue from hauling coal

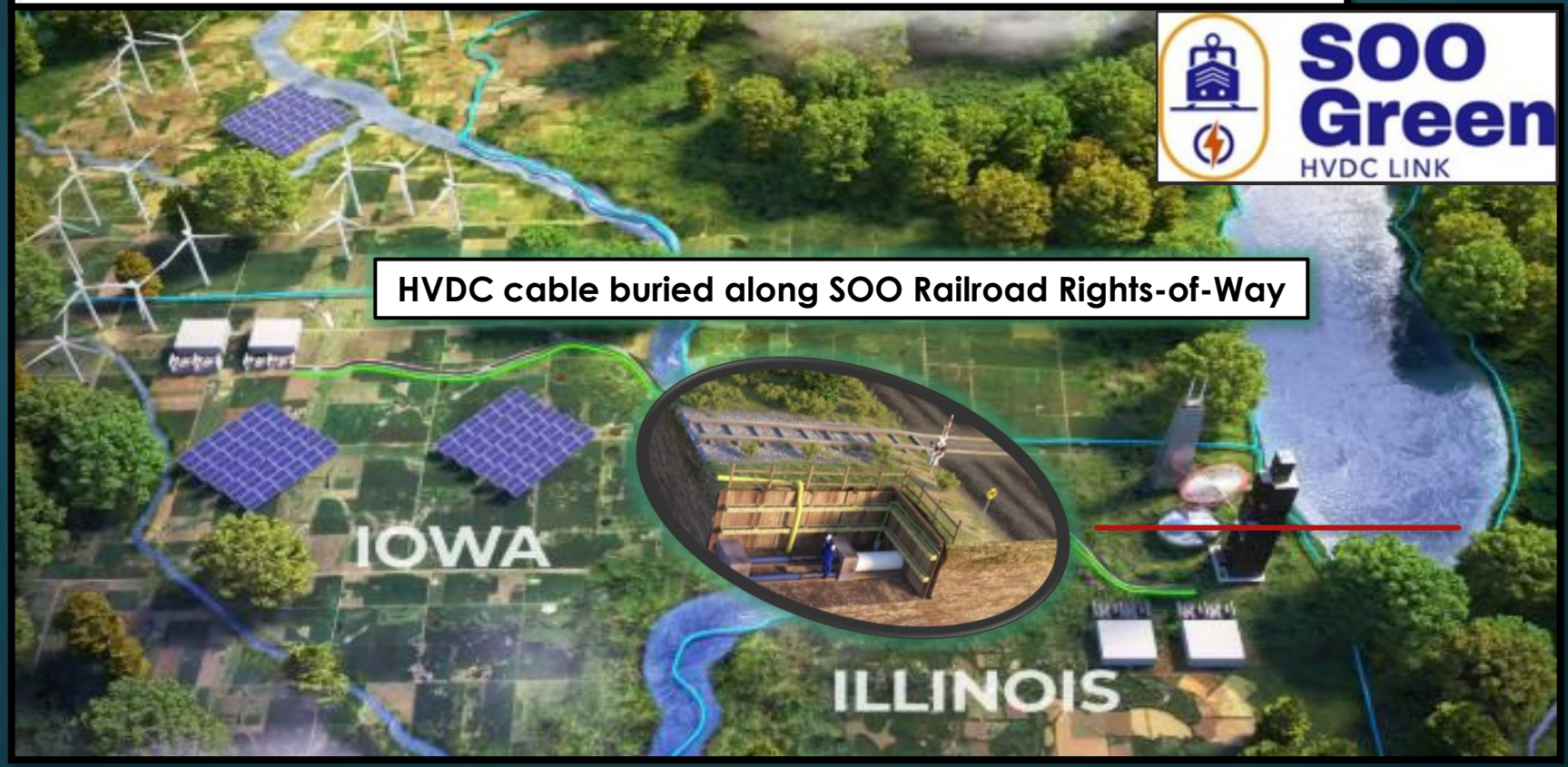
Using their rights-of-way will create a new source of revenue!

Railroads will also be able to power their trains with electricity

Railroads Could be the Key!

SOO Green Wins Final Iowa Approval, Clearing Path for $3.2B Underground Transmission Line

Published on Sep 25, 2025 *by Peter Mwaniki* **Constructionreview**



Underground Advantage

National Security Advantages

A Massive Solar Flare could be catastrophic!!

"The Carrington Event" in 1859

Telegraph lines caught fire from the induced current

Electricity would be off for many months!

Nuclear EMP could also shut down our power grid

Our lifestyle would go back 150 years

But few of us know how to live like the pioneers!

Virtually all commerce would shut down

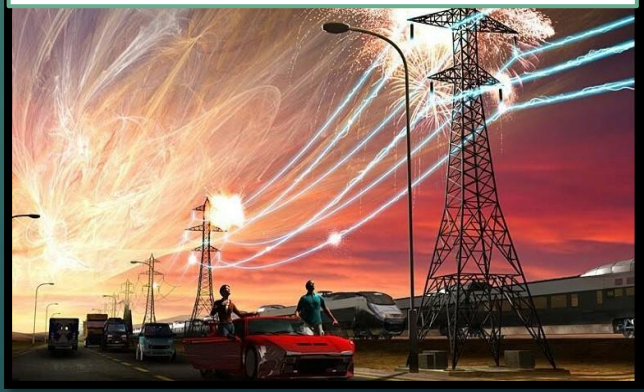
Banking, healthcare, food supply threatened

A shielded underground transmission grid would protect us from the worst effects of a Massive Solar Flare or an Electro-Magnetic Pulse!

Massive Solar Flare

The Carrington Event in 1859

Event today would shut down economy



Underground Advantage

Severe Weather Grid Protection

Grid would be better protected from hurricanes, tornadoes and winter storms.

Fewer power outages from lightning or wildfires

Undergrounding our transmission system will lessen the risk of power outages caused by ice or heavy snow accumulating on overhead wires

Cost savings in the life of the transmission system

Strengthening our electric grid and our resilience - improving our national security!

Next great American Infrastructure Project!

Strong Wind Events

Lightning and Wildfires

Ice Storms & Heavy Snow

Texas Can Be The Example

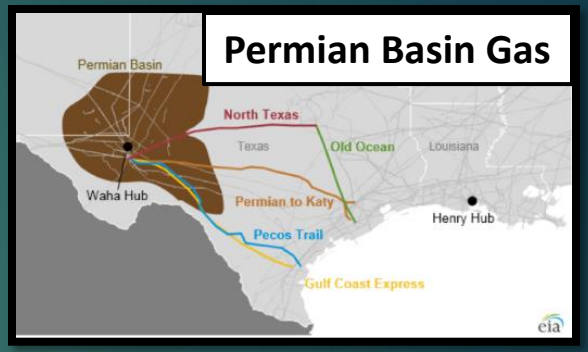
Vast resources of energy in western Texas – natural gas, wind and solar.

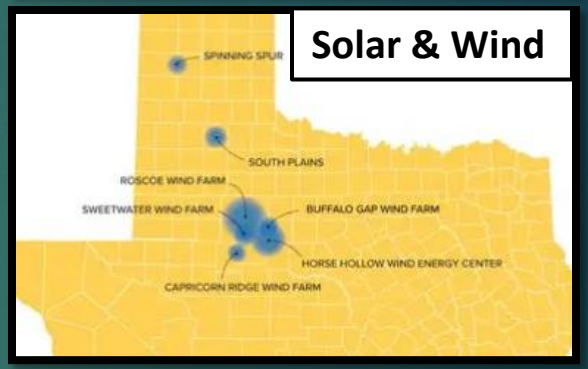
Great need for energy in eastern Texas – 90% of the population and major businesses based in the central and eastern areas

Despite being a “Red State”, Texas is currently adding more wind and solar than any state.

The huge increase in demand for electricity will have a great impact on the citizens of Texas .

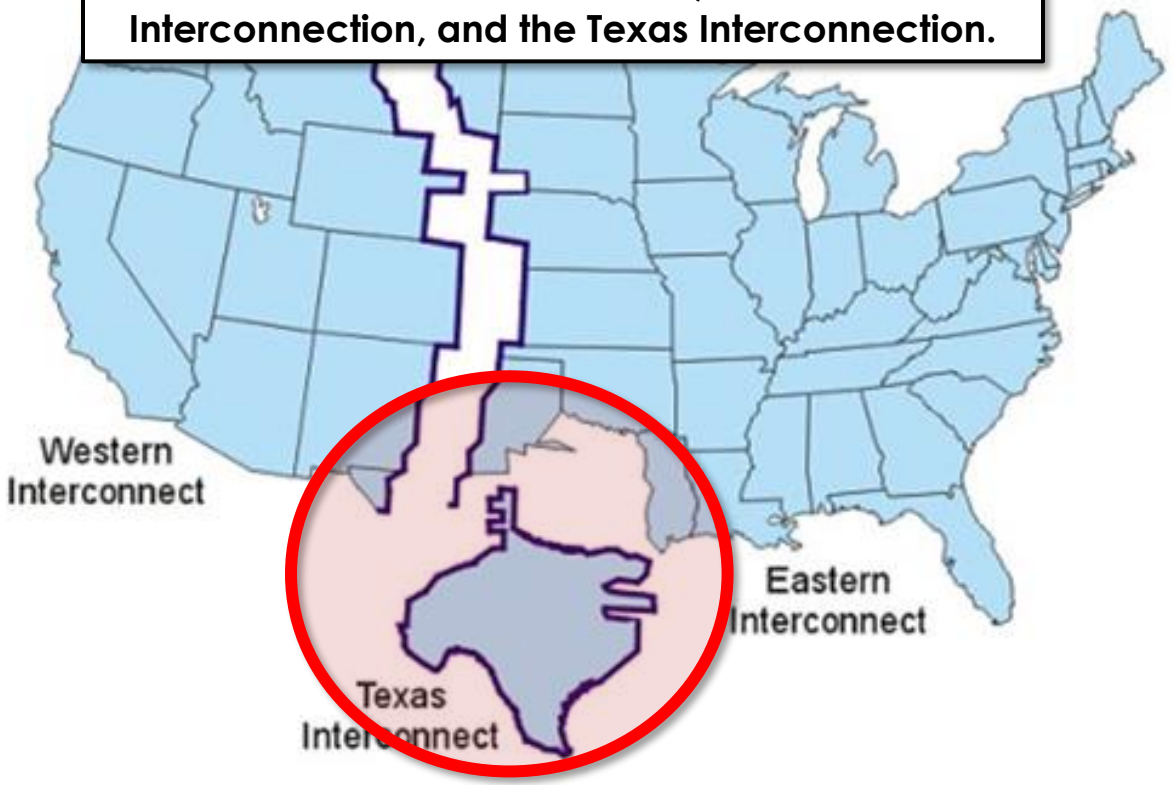
Texas takes great pride in being an “energy state” – electricity is “agnostic” as to how it is produced, but vital to grow the economy





Texas Can Be The Example

Three Americas, Three Grids: The U.S. is powered by three separate, asynchronous electrical grids: the Eastern Interconnection, the Western Interconnection, and the Texas Interconnection.



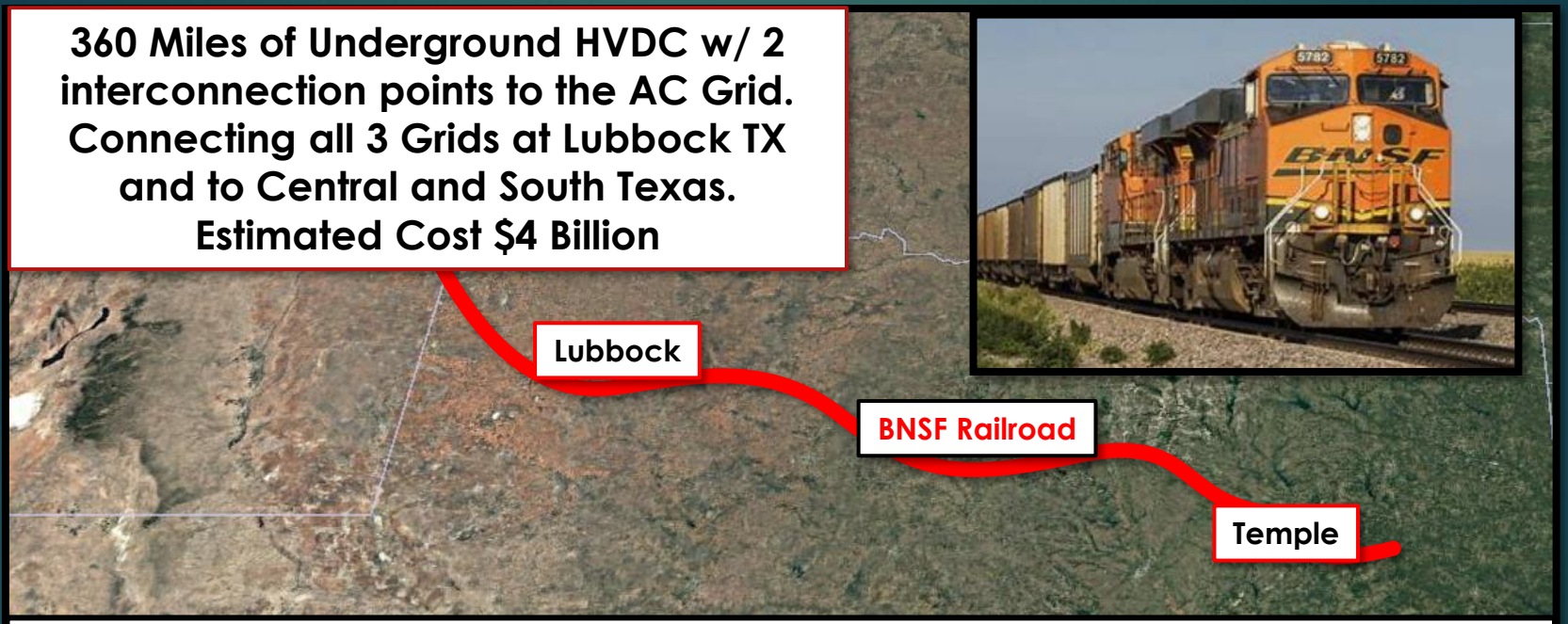
- **Vulnerability: This separation creates critical vulnerabilities. A major outage in one grid cannot be easily supported by another, leaving millions at risk during extreme weather events or other crises.**

- **Opportunity: Texas is the only state that has a portion of all three of these grids. It is the perfect place to develop an example of the Super-Grid! Eventually connecting the nation to meet the growing demand for reliable, low-cost electric power**

- **Grid Growth: Without capacity growth <u>we will not be</u> the world leader in Energy and Artificial Intelligence.**

SuperGrid – Lubbock to Temple

360 Miles of Underground HVDC w/ 2 interconnection points to the AC Grid. Connecting all 3 Grids at Lubbock TX and to Central and South Texas. Estimated Cost $4 Billion



The Project: Phase 1

- **Focus:** Connecting the Western, Eastern and Texas Interconnections.
- **Route:** A proposed route along **BNSF ROW** from Lubbock, Texas to Temple, Texas, as the prototype to connect the three grids providing power for the accelerating AI & consumer electrical demands of central and south Texas.
- **Impact:** This initial phase will demonstrate the viability of the technology, provide immediate grid stability benefits, and deliver lower cost energy to businesses and millions of Americans.

SuperGrid – Permian Basin to Dallas

Amarillo

Lubbock

I-20 ROW

Dallas

INTERSTATE TEXAS 20

Midland

330 Miles of Underground HVDC w/ 2 interconnection points to the AC Grid. Connecting all 3 Grids near Lubbock TX and to Central and South Texas. Estimated Cost $4 Billion

The Project: Phase 2

- **Focus:** Connecting the Western, Eastern and Texas Interconnections.
- **Route:** A proposed route along **Interstate 20** from the west Texas Permian Basin energy resources to Dallas, Texas, as the prototype to connect the three grids providing power for the accelerating AI & consumer electrical demands of central and south Texas.
- **Impact:** This initial phase will demonstrate the viability of the technology, provide immediate grid stability benefits, and deliver lower cost energy to businesses and millions of Americans.

Texas – Politics are Surprising!

Texas Senate passes anti-solar, wind bill

The bill exclusively places permit restrictions, fees and new regulatory requirements for solar and wind projects.

APRIL 16, 2025 RYAN KENNEDY

pv magazine

Rural Texans Speak Against Senate Bill 819

Here are some highlights of the testimony against SB 819 from Texans who traveled a long way to let the Senate know why the bill would hurt them and their communities.

DOUG LEWIN AND NATHAN PEAVEY
APR 10, 2025

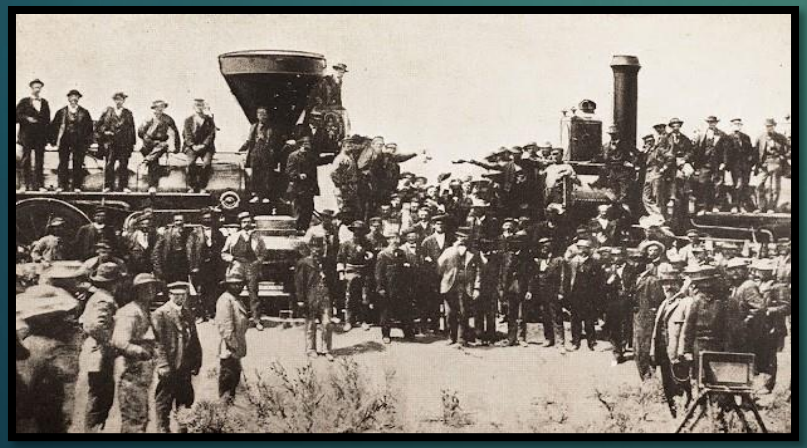
The witnesses included ranchers, veterans, landowners, farmers, and local Chamber of Commerce leaders. These are people who live where these projects are actually built and they don't, as one of the witnesses put it, want Austin to tell them what they can and can't do with their land.

Take Armstrong County, a rural region with fewer than 2,000 people. Over the life of its two wind farms and new projects, more than **$100 million in revenue** will flow to local landowners and school districts. And 90% of the county voted for Donald Trump.

Great American Infra-structure

1862 Lincoln signs the Transcontinental Railroad Act

1956 Eisenhower signs the Interstate Highway Act



Great American SuperGrid

Project to Design US Low Carbon Energy System

- NOAA laboratory
- Six scientists
- 7 years – 2009 to 2016
- Supercomputer
- 50 trillion wind and sun point estimates
- About 200 full 48 state energy designs

Click here for a link to the study & additional background

nature climate change

Lower average cost of energy = SuperGrid will save money & create jobs!

NOAA Study led by Dr. Alexander MacDonald

Future cost-competitive electricity systems and their impact on US CO_2 emissions

Alexander E. MacDonald[1*†], Christopher T. M. Clack[1,2*†], Anneliese Alexander[1,2], Adam Dunbar[1], James Wilczak[1] and Yuanfu Xie[1]

Great American SuperGrid

The Great American Super-Grid Project will help middle & rural America

Farmers and ranchers could choose to also "grow electricity" – securing the future of their lands

America could be dominant as the World's Greatest Producer of all forms of energy!

Great American SuperGrid

Agrivoltaics – crops can be grown under & between rows of solar panels

Additional source of much needed revenue for farmers and ranchers – animals can graze under panels

The Super-Grid would provide the ability to get their "crop" of electricity to market!

The Impact of Infra-Structure

The Antelope Valley in 2008

60 Miles North of Los Angeles

$3.6 BILLION DOLLARS to build transmission lines!

Agricultural

Barren Ridge Transmission Project
2008-2016 $2.0 Billion dollars

Lancaster

Google Earth

The Impact of Infra-Structure

The Antelope Valley in 2025

60 Miles North of Los Angeles

Over $60 Billion in private investment!

First Solar | Google | EDF renewables | amazon | DUKE ENERGY RENEWABLES | MASDAR

Solar Fields!

Powerlines get the product to market!

This development is continuing regardless of current national politics – it is driven by market forces!

Lancaster

14

Google Earth

Image © 2025 Airbus

The Impact of Infra-Structure

EDF renewables

MASDAR

BigBeau Solar

Every parcel, large & small, was acquired one at a time from individual land-owners or investors

2013 10 acres $20,000

$2,000 / acre

+ 700%

In 7 years

2020 SOLD $160,000

$16,000 / acre

Approx: 2.5 ac. Parcels

This land, all sub-divided and owned, had little value prior to the development of lost-cost solar energy. But it is flat, dry and very sunny!

ZCC 13, CUP 13, CUP 14, CUP 15, GPA 4, Map No. 215
ZCC 44, CUP 41, CUP 42, CUP 43, GPA 32, Map No. 232

Assessor's Parcelization Map

BigBeau Solar, LLC/ EDF Renewables, Inc.

Project Site
Parcel Boundaries

Investments using a 4% "Rule of 72" would take over 50 years to get a 700% return!

Date created: 2/19/2020

0 1,100 2,200 3,300 4,400ft

Kern County Planning & Natural Resources Department

The Impact of Infra-Structure

Property Detail Report
For Property Located At :

Example of a huge increase in land value!

Dec. 30, 2009 **$14,500** ($750 / acre)
Purchase Price

May 28, 2024 **$1,000,000** ($50k / acre)
Sold to Solar Developer

$50,000 per acre!

Bought for **$14,500**
Held for **15** years
Taxes ~ **$2,500** total
(Proposition 13)
$17,000 Investment

95th Street West

20 acres of land

If you would like to learn more about this type of investing, click this QR code

$1,000,000 Payout!!

At **$60 / MWh**, this **20 acres** of land will produce **$1 million dollars** worth of electricity - **Every. Single. Year!**

Barren Ridge Transmission Line

Brownfields – Blighted Areas

Brightfields – Profitable Areas

The RAY – Highway Demonstration

Solar panels along highway rights-of-way to produce electricity

Demonstration Project in Georgia

Highway. Georgia is the third state in the nation to utilize the highway roadsides for renewable energy development. The project on The Ray Highway also uses native, flowering plants as ground cover within the solar array, making Georgia the first in the nation to install pollinator-friendly ROW solar.

Acres of land available nationwide

and endangered species habitat.

- Evaluate solar radiation of the areas by using local or regional and season-specific data.
- Calculate the economic value of the solar energy using local or regional utility data, and produce other beneficial environmental values, such as the equivalencies of the solar energy generation expressed as reductions in CO2 and number of vehicles driven.

Video: Highlig...

The Esri solar tool's ... DOTs and other transportation operators to:

1. Anticipate unintended consequences to nearby communities of installing solar on the roadsides of interstates and highways, such as the

GIS Mapping software from ESRI helps find the best locations along highways

If we built the transmission system to move electricity from source to need, we could utilize these marginal lands.

We could produce vast amounts of electricity, improve land use and generate millions of dollars in annual revenue along U.S. roadways.

Want to Learn More?

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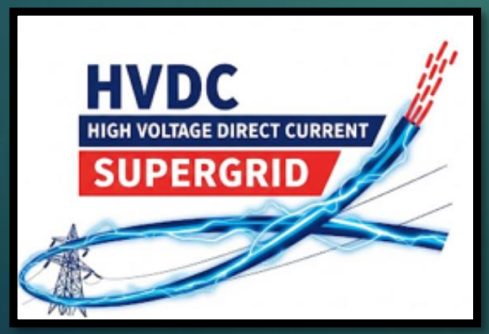
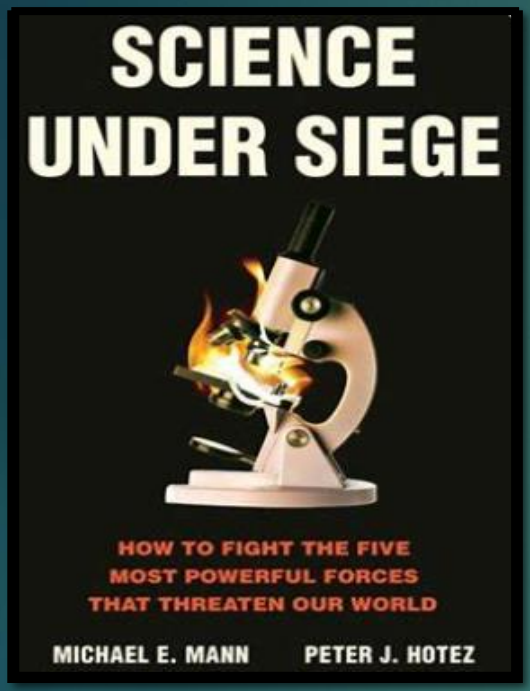
Click here for links, background and much more!

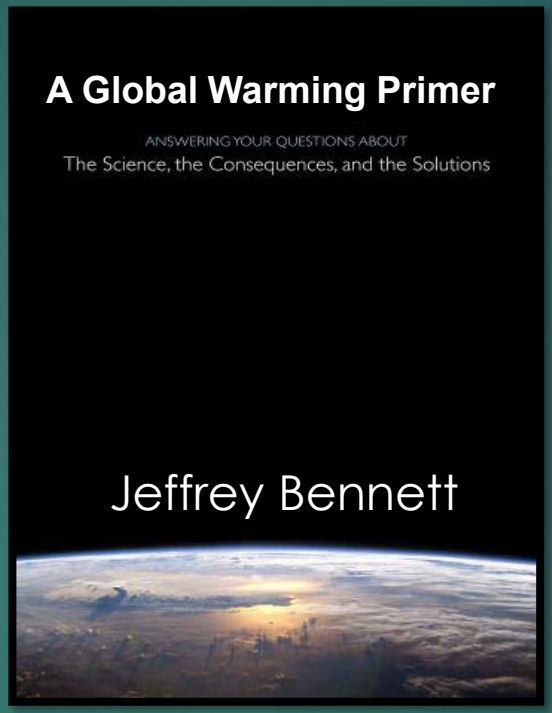


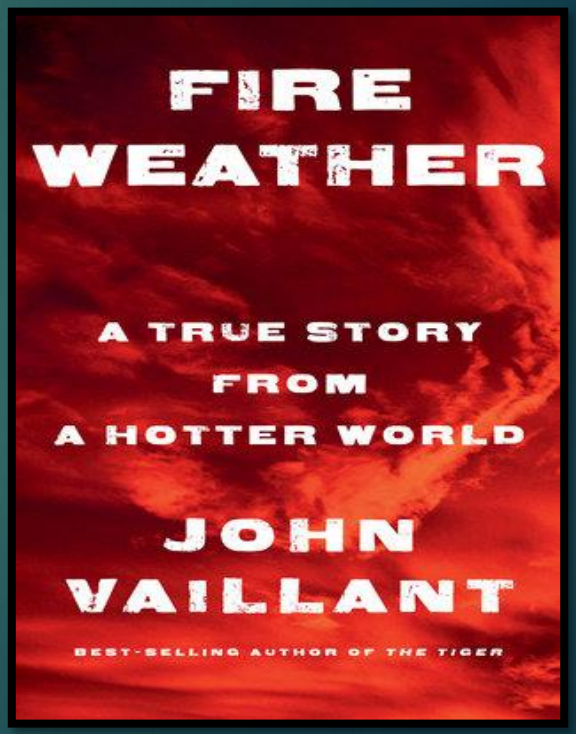
THE RAY

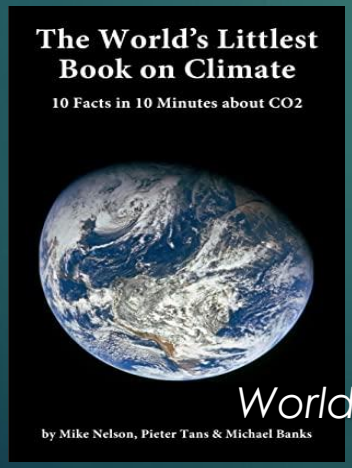
https://theray.org

Some Suggested Reading









World's Littlest Book on Climate