

CLIMATE CHANGE IS HAPPENING BUT YOU CAN MAKE A DIFFERENCE!

What is climate change?

Weather is what is happening on a day-to-day basis.

Climate is long-term averages in weather measured over a long period of time.

Climate change refers to the change in the climate system as a result of the increase in the global average temperature

So what if our temperature rises 1 degree?

What does it really mean? It does not mean the temperature today in Indiana went up one degree; it means the temperature of the entire planet is up one degree. If one degree causes all these effects, imagine what will happen if the temperature goes up 2 or even 3 degrees! And we are warming faster than in the past!



Wherever you look, you can see the effects of climate change. The changes include rising sea levels, warming oceans, rising global temperature, changing migration patterns of birds, growing zone changes, more hurricanes, more frequent droughts, more wildfires, and more extreme & frequent weather events.

What is causing climate change?

99% of climate scientists agree that the observed warming of the Earth over the last century stems primarily from humans burning fossil fuels, which produce heat-trapping gases. Natural cycles **CANNOT** explain the rapid climate change we are seeing today.



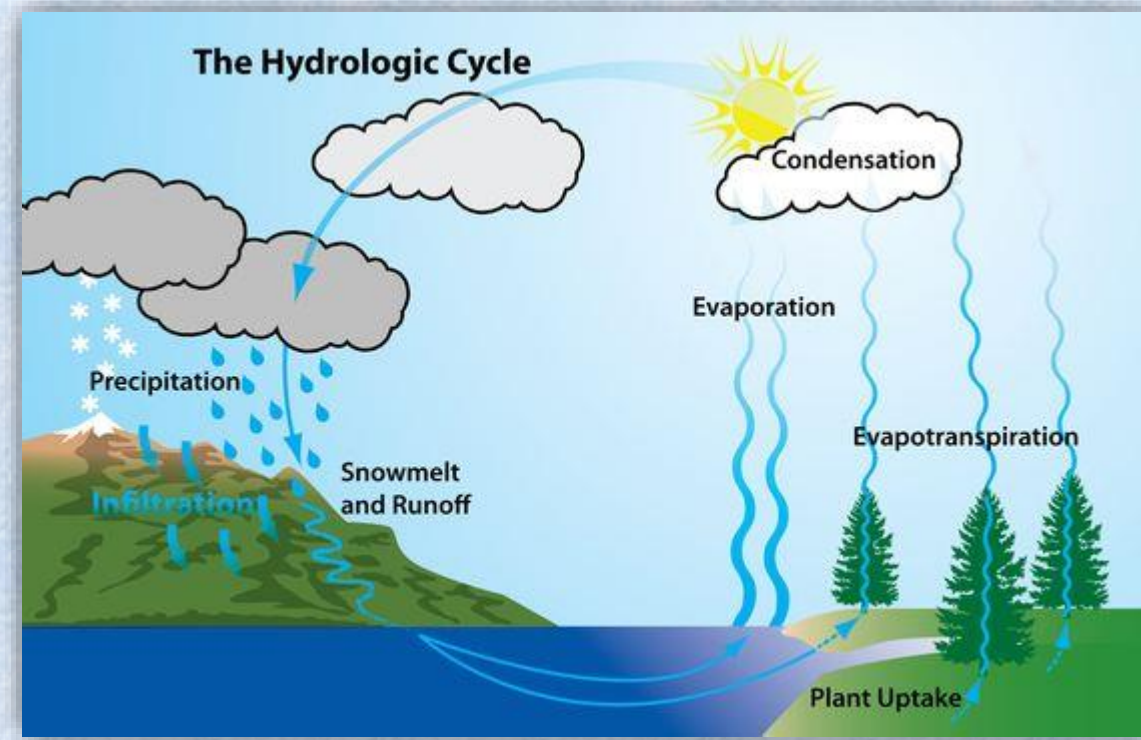
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climate issues

Some Questions to Ponder

- ❖ What kind of energy sources do you see here? Have you noticed them at other places?
- ❖ What are some differences between renewable and fossil fuel energy?
- ❖ With more large and heavy rain events, what would happen here at Tanoma?
- ❖ How do forests/trees help slow down climate change and help prevent flooding?
- ❖ Do your allergies seem to be getting worse?

HAVE YOU HAD PROBLEMS WITH FLOODING?

Warmer air causes more evaporation



...causing flooding in some places



Flooding in Indiana, PA 2017



...and holds more water

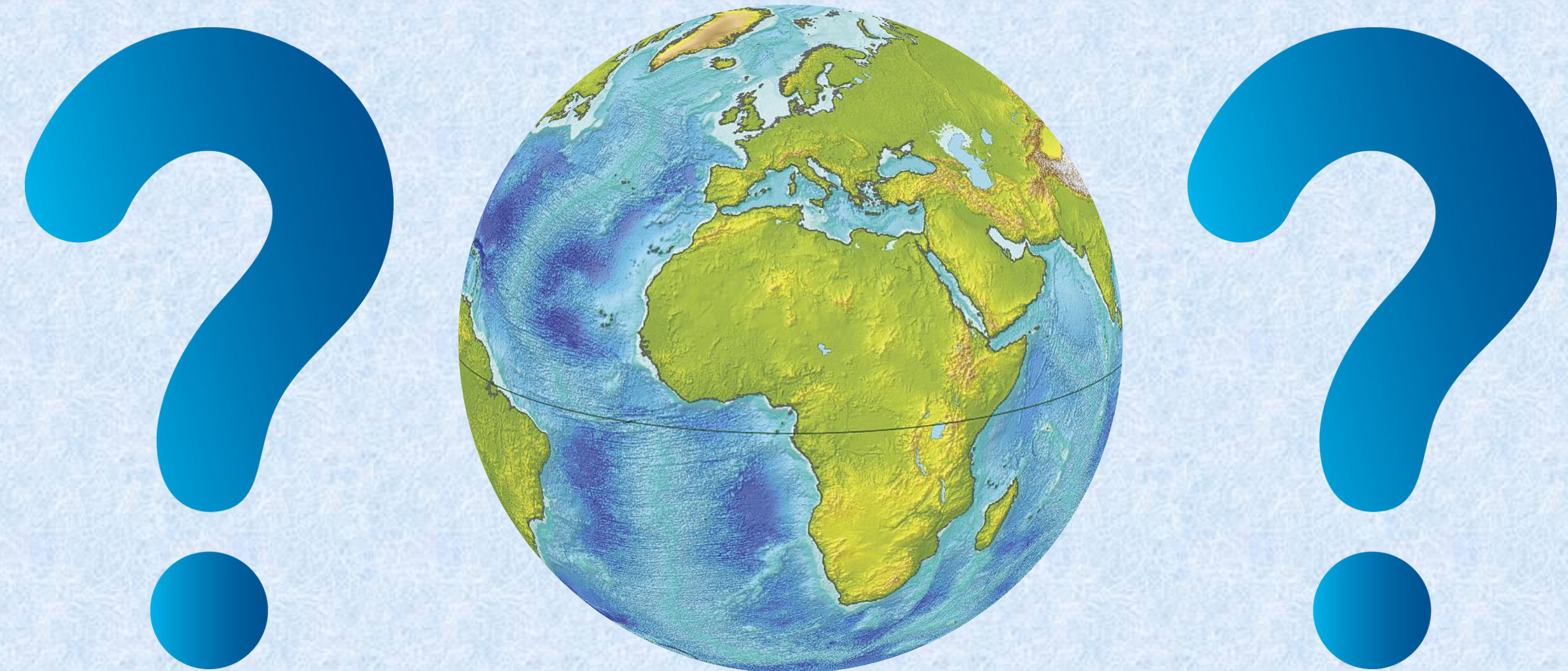
...and drought in others

Everyone lives downstream from someone else!

- ❖ You will be affected by what happens upstream
- ❖ Includes water quality and quantity
- ❖ This site slows down water to clean legacy coal pollution from our local Crooked Creek

When there is high water here at Tanoma

- ❖ Water moves too fast through the system
- ❖ Less iron drops out
- ❖ More pollution heads downstream



LOOK AROUND YOU

What do you see at this site that can help slow climate change?



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CLIMATE CHANGE AFFECTS OUR FARMERS!



- ❖ Extreme, unpredictable weather
- ❖ Crucial events happening too early or too late
- ❖ Equipment unusable under unfavorable conditions
- ❖ Extra costs associated with mitigations
- ❖ Less nighttime relief from high temperatures
- ❖ Changes in calving times for livestock
- ❖ Need to shear lambs more frequently
- ❖ More parasitic infestations in hooved animals



A carbon footprint is the total amount of greenhouse gases (including carbon dioxide and methane) that are generated by our actions.

Look for ways here at Tanoma that help us reduce our Carbon Footprint

CLIMATE CHANGE AFFECTS OUR WILDLIFE TOO!

Research at Powdermill Reserve has shown that birds like the wood thrush, cat bird and cedar waxwing are coming in and nesting up to 16 days earlier than in 1960. Breeding times are also changing. <https://powdermillarc.org/>

What do these birds feed their babies?
How does earlier nesting time affect what is available?



Achoo! Do your allergies seem to be worse?

- ❖ Longer allergy season - 20 days longer
- ❖ Higher pollen levels - 20% higher
- ❖ More and larger plants - longer growing period

Is there anything YOU can do to reduce the potential future devastation of climate change?



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SUSTAINABLE PRACTICES THAT MITIGATE CLIMATE CHANGE



Reforestation

- ❖ Sequesters carbon
- ❖ Supports wildlife
- ❖ Protects soil from erosion
- ❖ Provides shade that cools local micro-climate



Wind & Solar Power

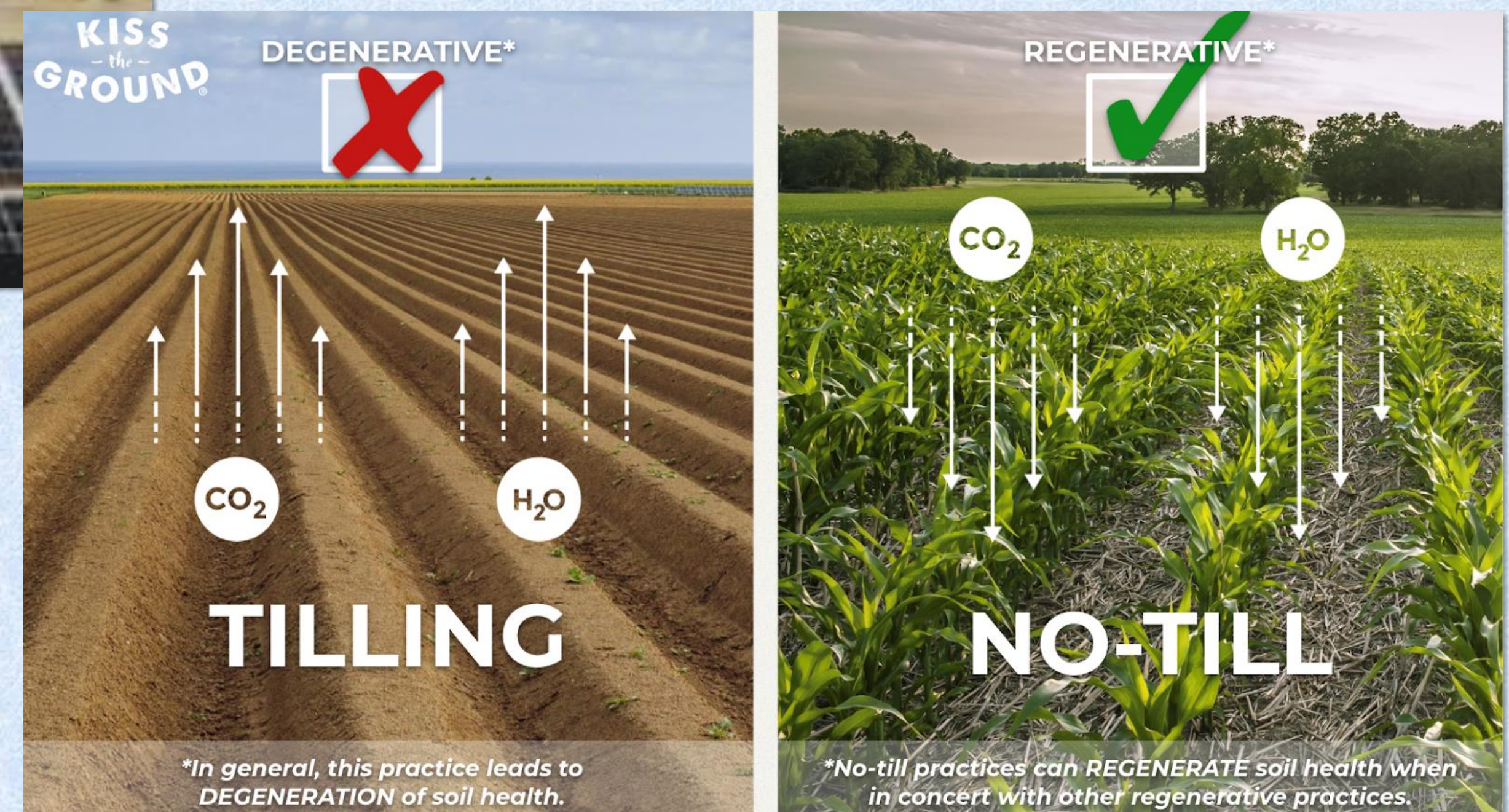
- ❖ Emissions-Free
- ❖ Renewable



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No-Till Farming & Cover Cropping

- ❖ Sequesters carbon
- ❖ Builds soil
- ❖ Reduces chemical and fossil fuel use



**In general, this practice leads to DEGENERATION of soil health.*

**No-till practices can REGENERATE soil health when in concert with other regenerative practices.*

YOU CAN MAKE A DIFFERENCE!!

TRY ANY OR ALL OF THESE ACTIONS!



Eat Food Grown Locally

- ❖ Supports local farmers
- ❖ Reduces fossil fuels used in transport



Eat Less Meat

- ❖ Fossil fuels are heavily used in the production and transport of livestock



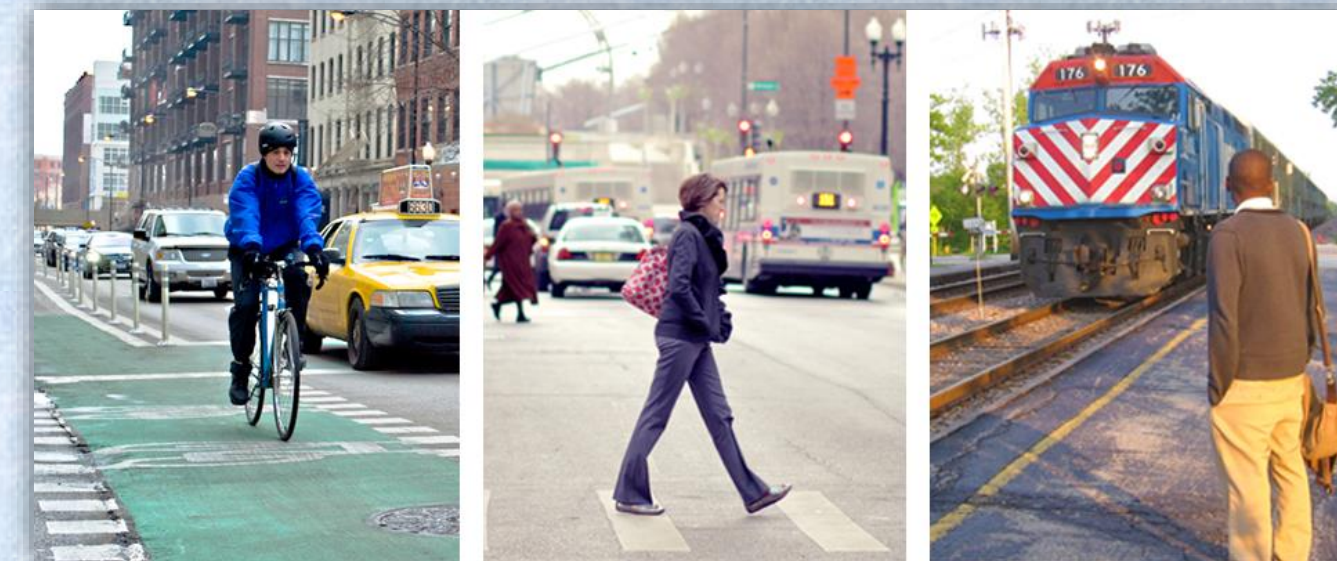
Compost

- ❖ Reduces waste
- ❖ Returns valuable nutrients to the soil



Plant Trees & Native Plants

- ❖ Helps native birds & insects
- ❖ Removes carbon from atmosphere



Walk, Bike, Bus, Train, Carpool

- ❖ Reduces carbon emissions
- ❖ Good for your health



Turn Your Heat Down

- ❖ 1° lower in winter
- ❖ Huge impact when everyone does it!



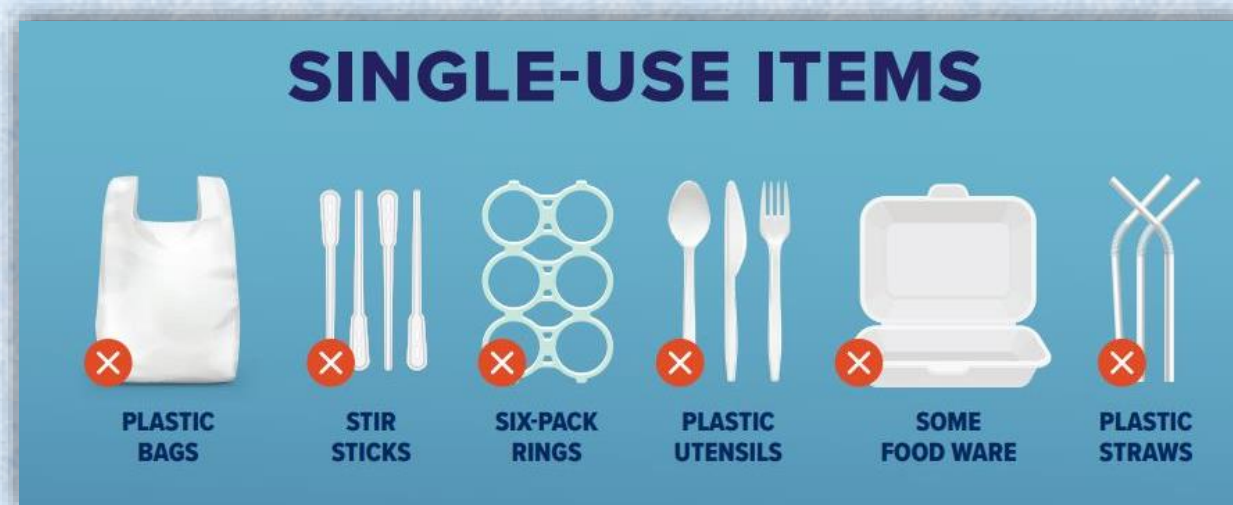
Buy Less Stuff

- ❖ Do you really need it?
- ❖ What about second-hand?
- ❖ Think about where it was made



VOTE

- ❖ Advocate for climate policy
- ❖ Champion renewable energies



Avoid Single Use Plastic

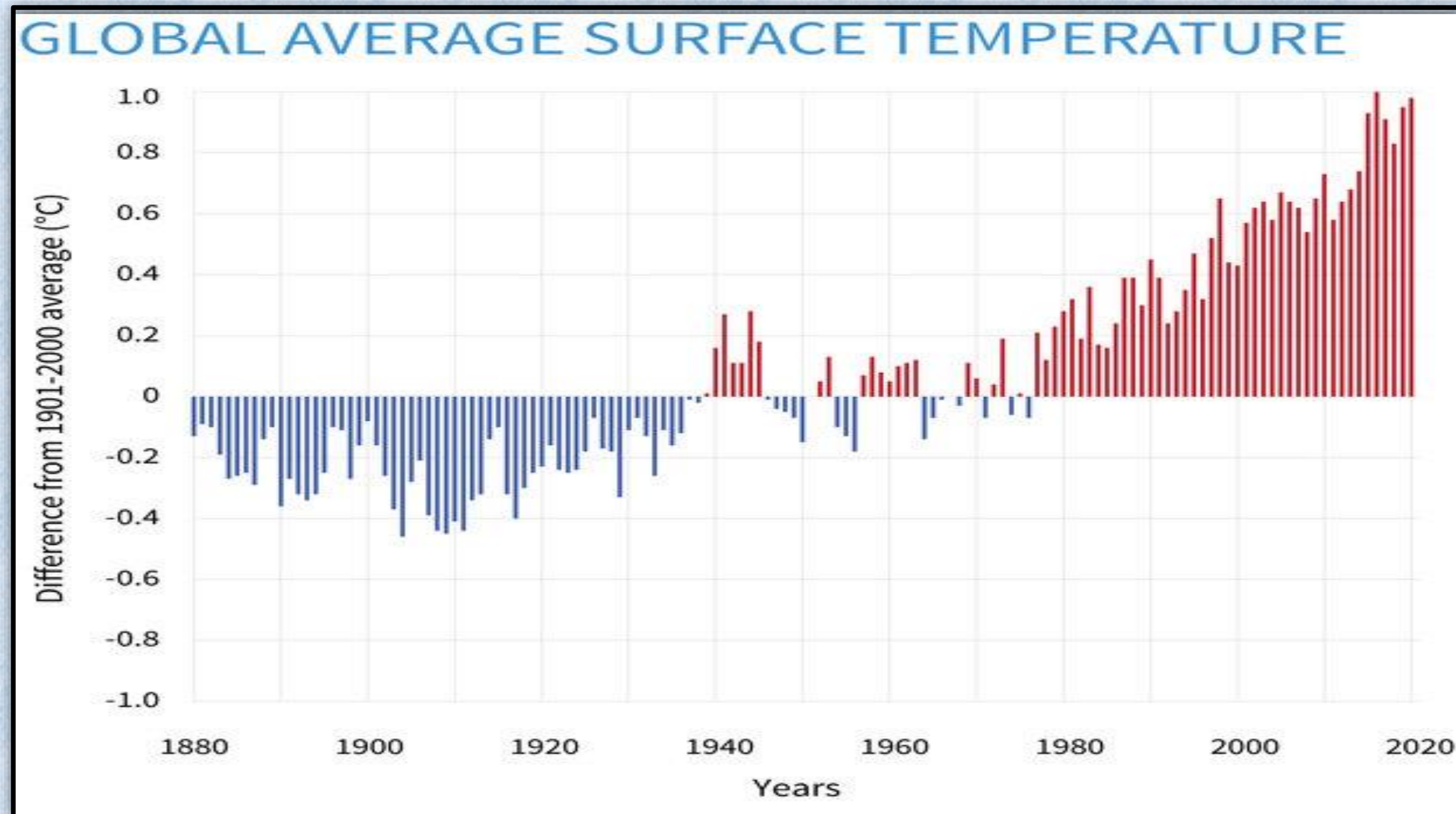
- ❖ Made from fossil fuels
- ❖ End up in landfills, oceans and EVERYWHERE



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Not only will all these ideas help our environment and reduce our carbon footprint, but they will also save you MONEY!

WARMER TEMPERATURES! WHAT DOES THAT MEAN?



Were winters colder when you were a kid?

- ❖ 4 of the 5 warmest winters in PA have occurred since 1990
- ❖ 5 to 7 degrees above normal measured across land and water, day and night
- ❖ February 2022 was the 5th warmest globally since 1880.

How are warmer winters affecting our local ski resorts and other winter recreation?



Global Average Surface Temperatures

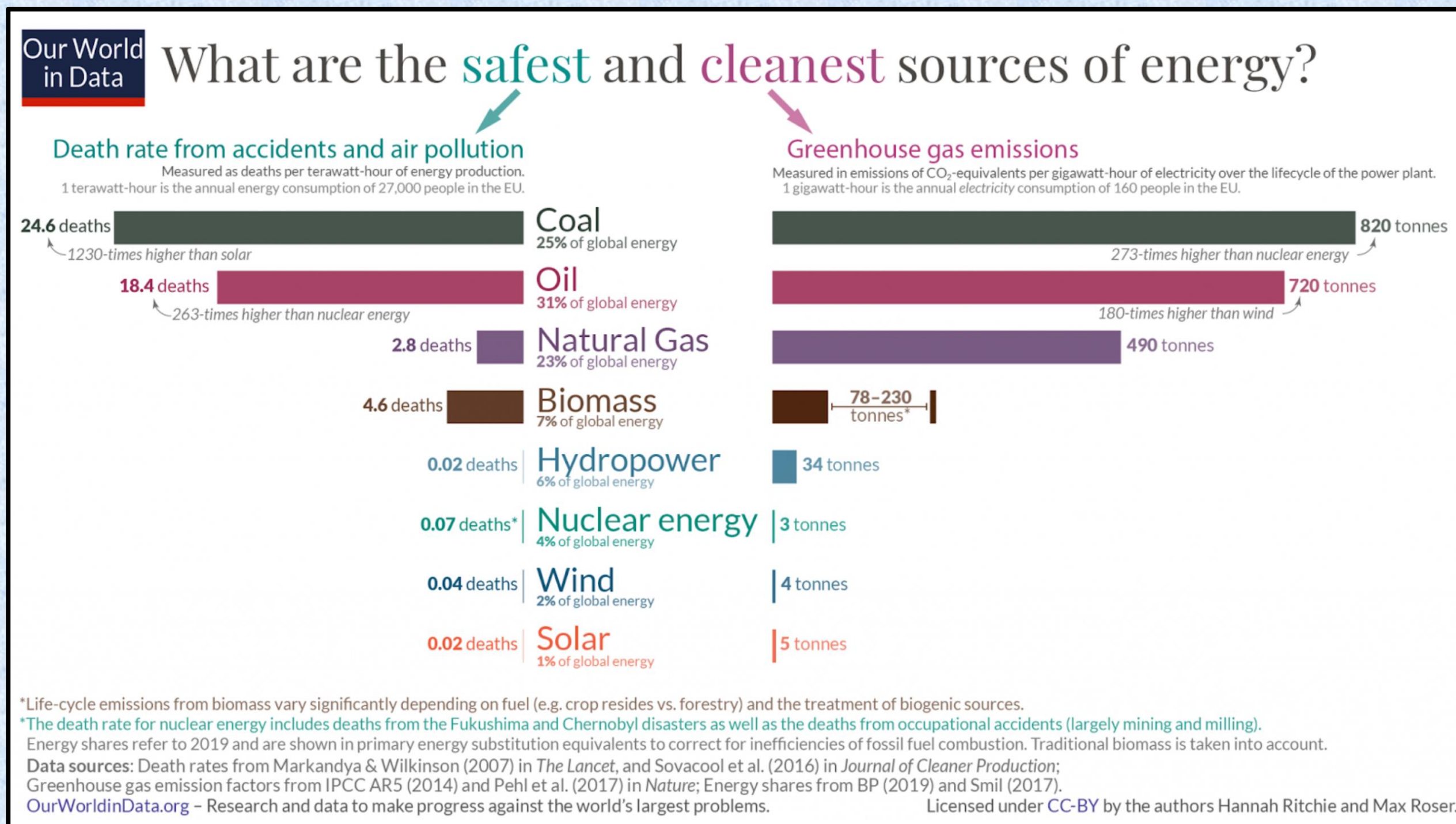
- ❖ The rate of warming per decade since 1980 is more than twice the rate between 1880 and 1980.
- ❖ 2020 was the second-warmest year on record based on NOAA's temperature data, and land areas were the warmest on record.
- ❖ Averaged across land and ocean, the 2020 surface temperature was 1.76° F (0.98° Celsius) warmer than the twentieth-century average of 57.0°F (13.9°C) and 2.14°F (1.19°C) warmer than the pre-industrial period (1880-1900).
- ❖ The 10 warmest years on record have occurred since 2005.

<https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>

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ALTERNATIVE ENERGY CAN MAKE A DIFFERENCE!!

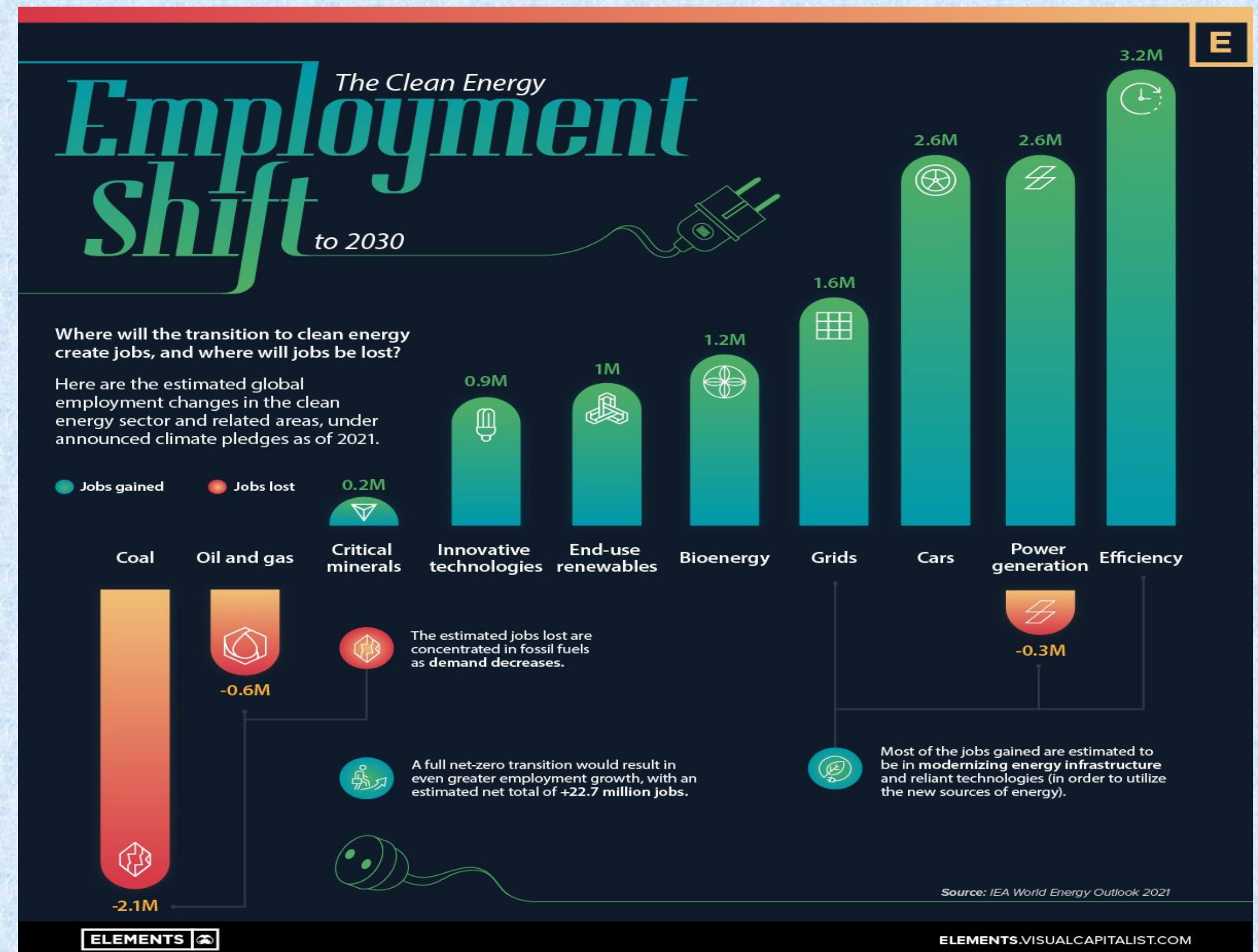


Low-Impact Multi-Use Solar Energy Installation Sites

- ❖ Grow native plants to create pollinator and insect habitat
- ❖ Retain stormwater
- ❖ Improve soil health
- ❖ Reduce maintenance
- ❖ Grazing and shelter from the elements for livestock
- ❖ Reduce carbon emissions



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What about Wind and Water Turbines?

Concerns over bird and bat injuries and death with wind turbines have led to newer designs which are much less harmful and more environmentally friendly. Water is an underused renewable resource - even small backyard turbines can help reduce home energy needs.



SOLAR POWER



Indiana County residence

These panels provide electricity for the entire home, an electric car, an electric bike, and a hot tub, with excess electricity sold to the electric company!

Aren't there problems with Solar Energy electricity generation?

Energy & chemicals are required in manufacturing but:

- ❖ Energy is recouped after two years
- ❖ Emissions lower than fossil fuels
- ❖ Provides a net positive environmental impact because of non-polluting energy production

Solar panels at Tanoma power:

- ❖ Pavilion lights & outlets
- ❖ Generator to aerate the ponds
 - ❖ Electric mower
- ❖ Electric string trimmer
- ❖ Motion sensor light



Mill 19, Pittsburgh

Benefits of Home Solar

- ❖ Carbon-free energy once carbon "debt" is paid
- ❖ Recoup initial cost in 7-8 years
- ❖ Earn income by feeding electricity *into* the grid
- ❖ Can charge your electric vehicle - no need for gasoline, an expensive fossil fuel
- ❖ Renewable! Solar energy is constant and free!



Benefits of Large-Scale Solar

- ❖ Greenhouse gas emissions 40 times lower than coal per energy equivalent
- ❖ Can be placed on low-value land such as brownfields, reclaimed strip mines, and along transportation and transmission corridors
- ❖ Can be placed on rooftops. Cools building too!
- ❖ Can be placed in parking lots. Protects cars from weather too!
- ❖ Renewable! Solar energy is constant and free!



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