→ **Tej Gidda**
Global Leader – Future Energy

Where is the Babe Ruth of the Energy Transition?

Welcome


YANKEES


JAPAN


OHTANI


ANGELS
17

Order of Operations

Who is Babe Ruth?

What is Energy Transition?

Where do these two things intersect?

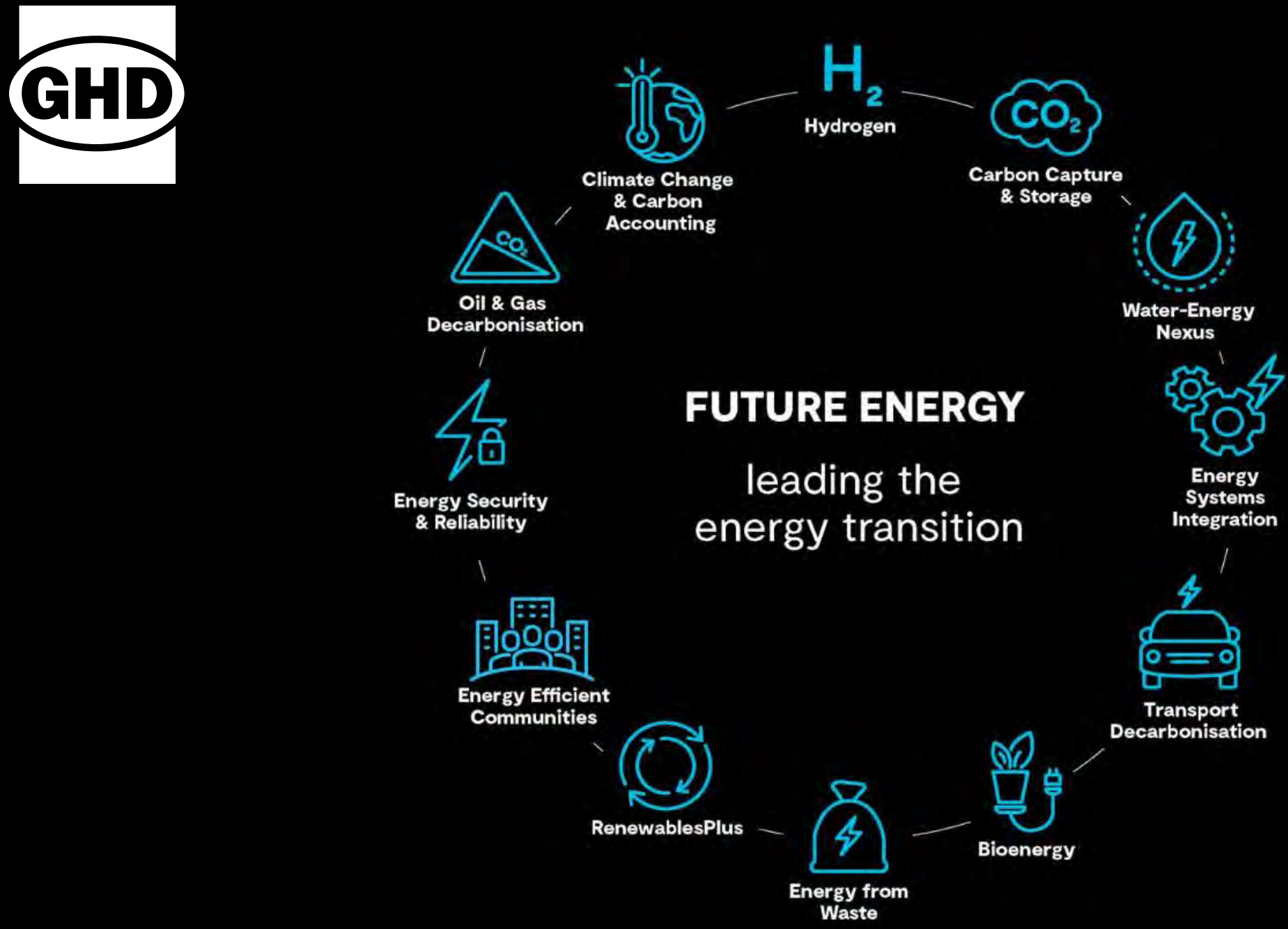

MARK
PARKER
GHD

“GHD supports our clients and communities to lead the transition towards a future of affordable, reliable, secure and low-carbon energy, to achieve lasting global benefit…”

GHD Global

95+ years **in operation**
135+ countries **served**
160+ offices **worldwide**
1.8Ⓑ USD revenue **2023**
5 global markets
11Ⓚ people
45+ service **lines**

↳ **Providing engineering, environmental, advisory, architecture, digital and construction services**


GHD
H_2
Hydrogen
Climate Change & Carbon Accounting
CO_2
Carbon Capture & Storage
CO_2
Oil & Gas Decarbonisation
Water-Energy Nexus
FUTURE ENERGY
leading the energy transition
Energy Security & Reliability
Energy Systems Integration
Energy Efficient Communities
Transport Decarbonisation
RenewablesPlus
Bioenergy
Energy from Waste

Who is Babe Ruth?

→ why are we talking about him?

In 1917, Wally Pipp led the Major Leagues with 9 homeruns.

In 1919, Babe Ruth hit 29 homeruns. The second-place finishers were tied for 10 each.

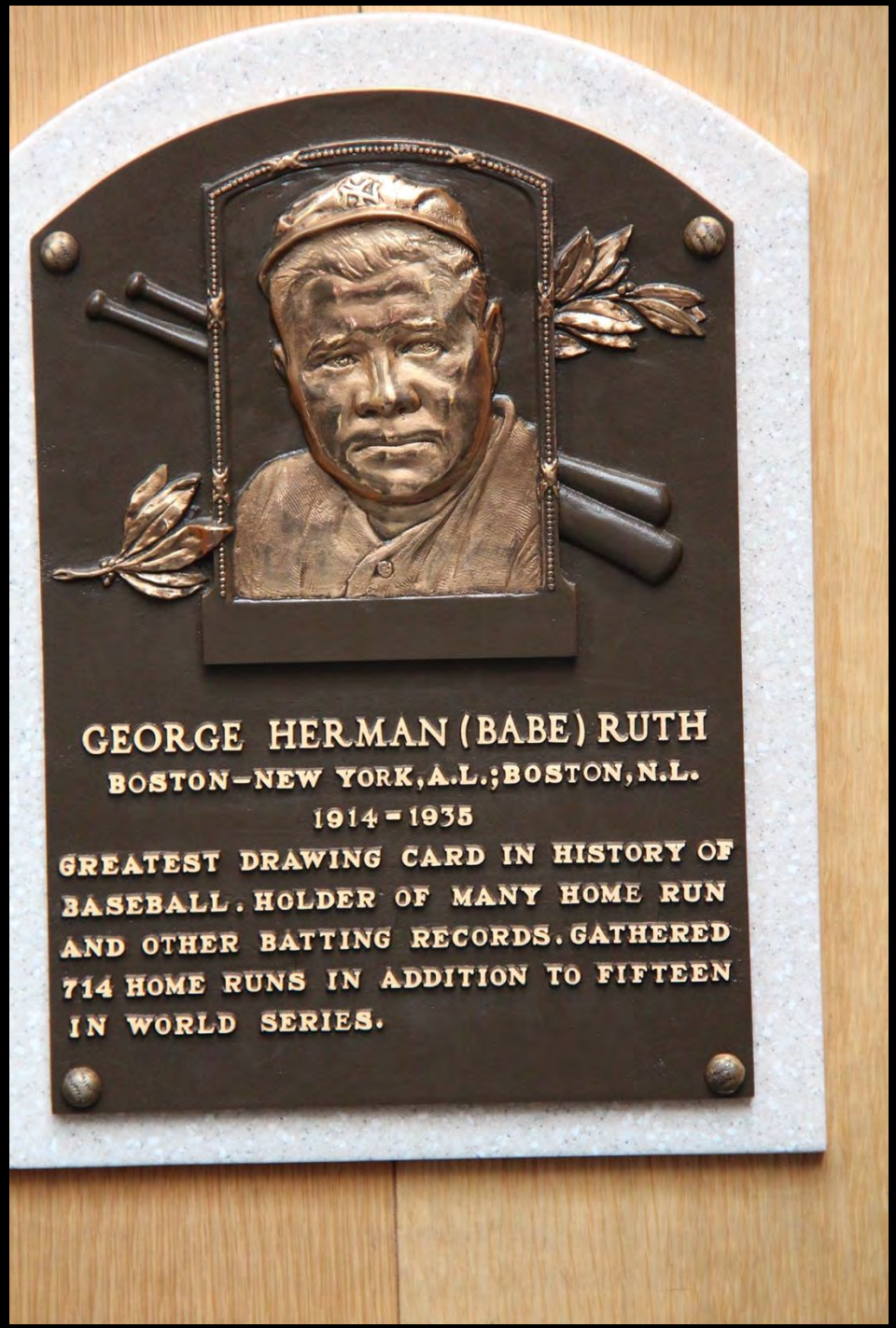
In 1919, Babe Ruth's 29 homeruns were more than 10 of the 15 entire teams in Major League Baseball.

In 1920, his first year with the Yankees, Babe Ruth became the first player ever to hit:

- 30 homeruns in a year
- 40 homeruns in a year
- 50 homeruns in a year

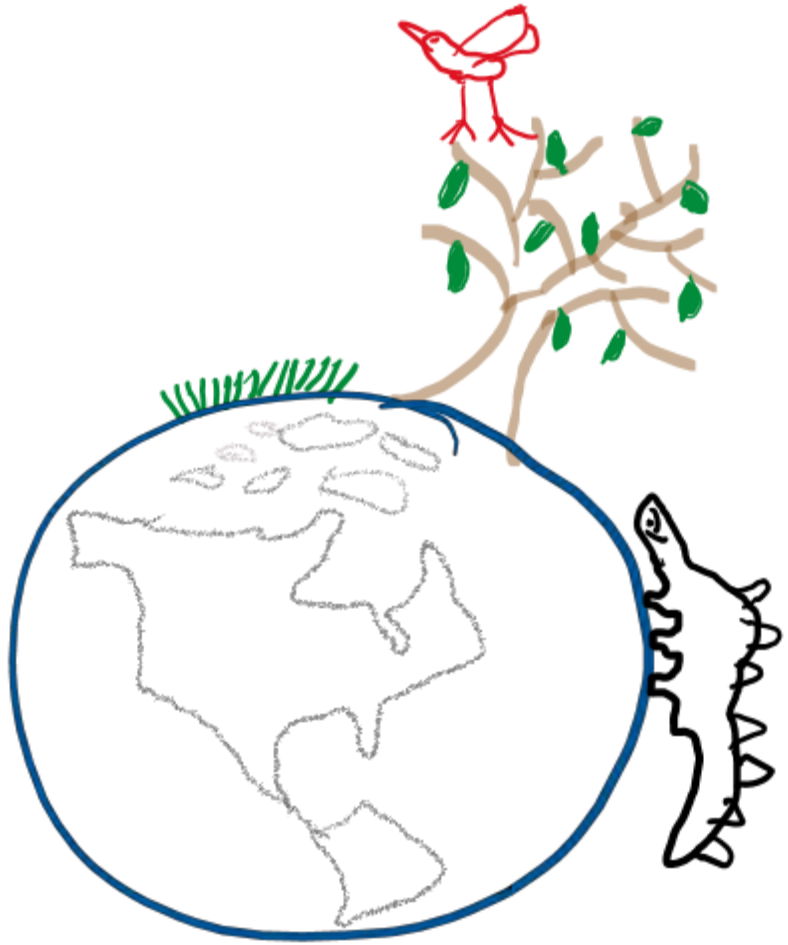
His 54 homeruns in 1920 were were more than what 14 of the 15 teams in baseball hit as an entire team.

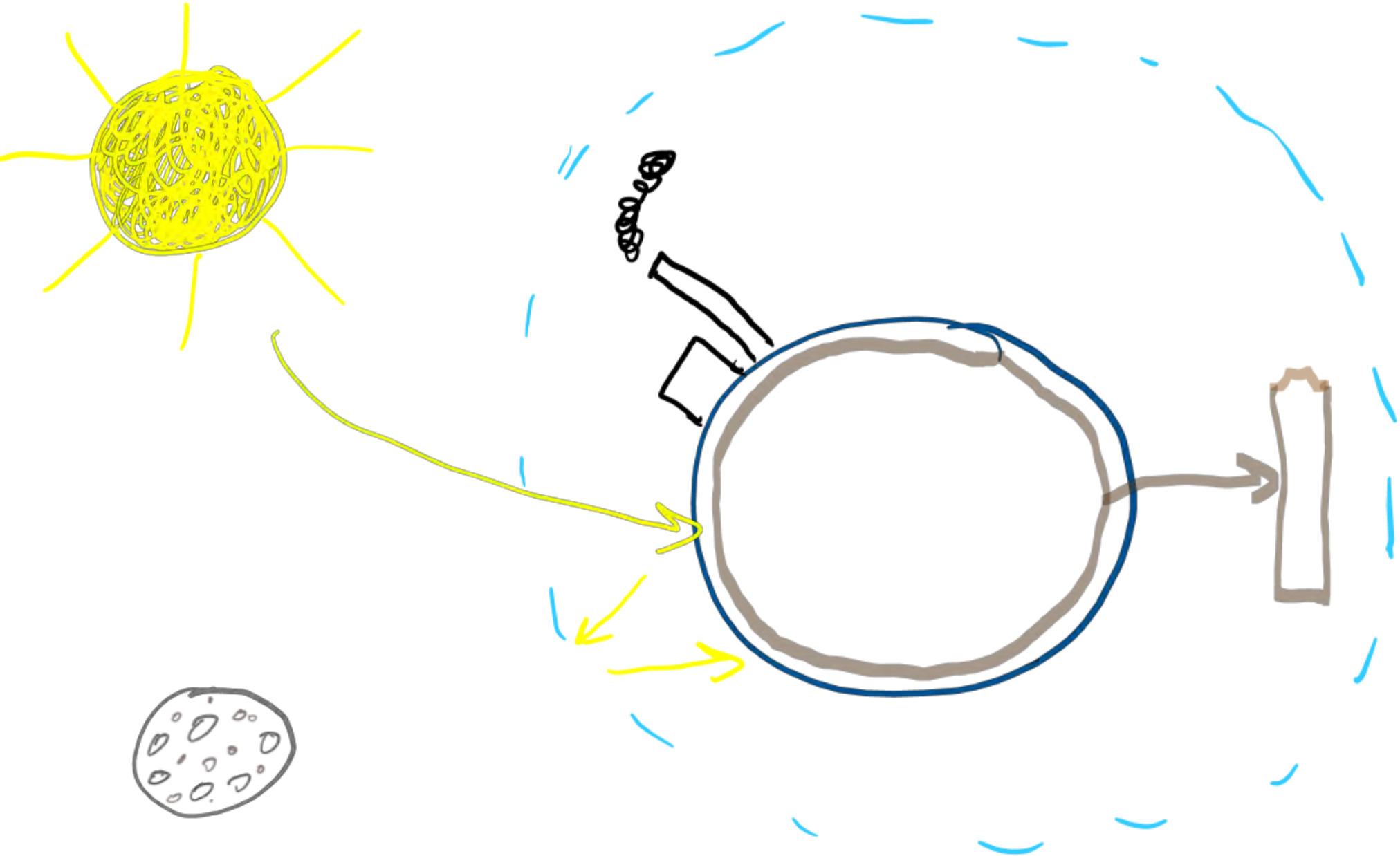
In 1926, he hit 47 homeruns. Runner-up Al Simmons hit 19.

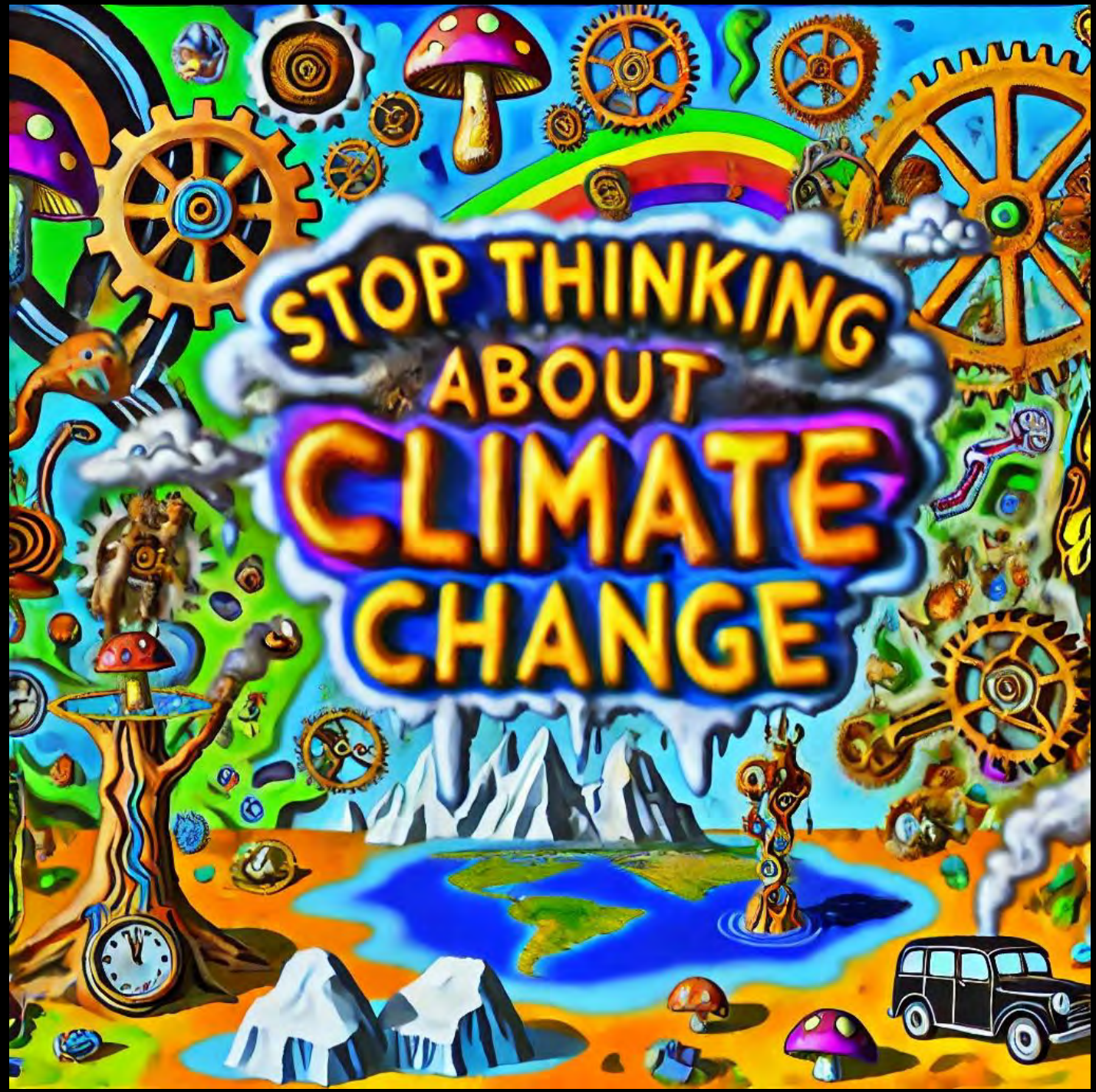

GEORGE HERMAN (BABE) RUTH
BOSTON-NEW YORK, A.L.; BOSTON, N.L.
1914-1935
GREATEST DRAWING CARD IN HISTORY OF BASEBALL. HOLDER OF MANY HOME RUN AND OTHER BATTING RECORDS. GATHERED 714 HOME RUNS IN ADDITION TO FIFTEEN IN WORLD SERIES.

What and Why is Energy Transition?

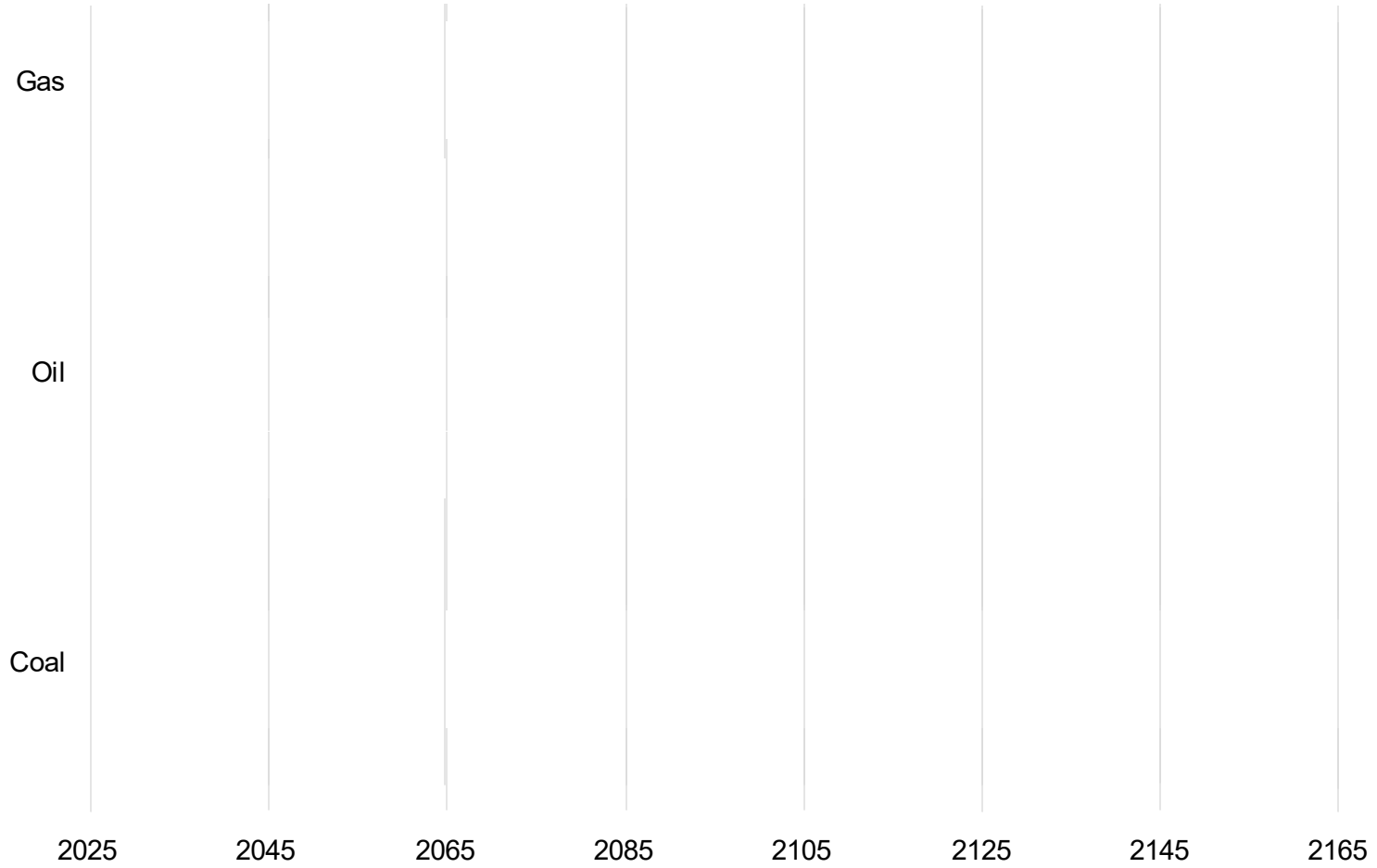
→ why are we talking about it?





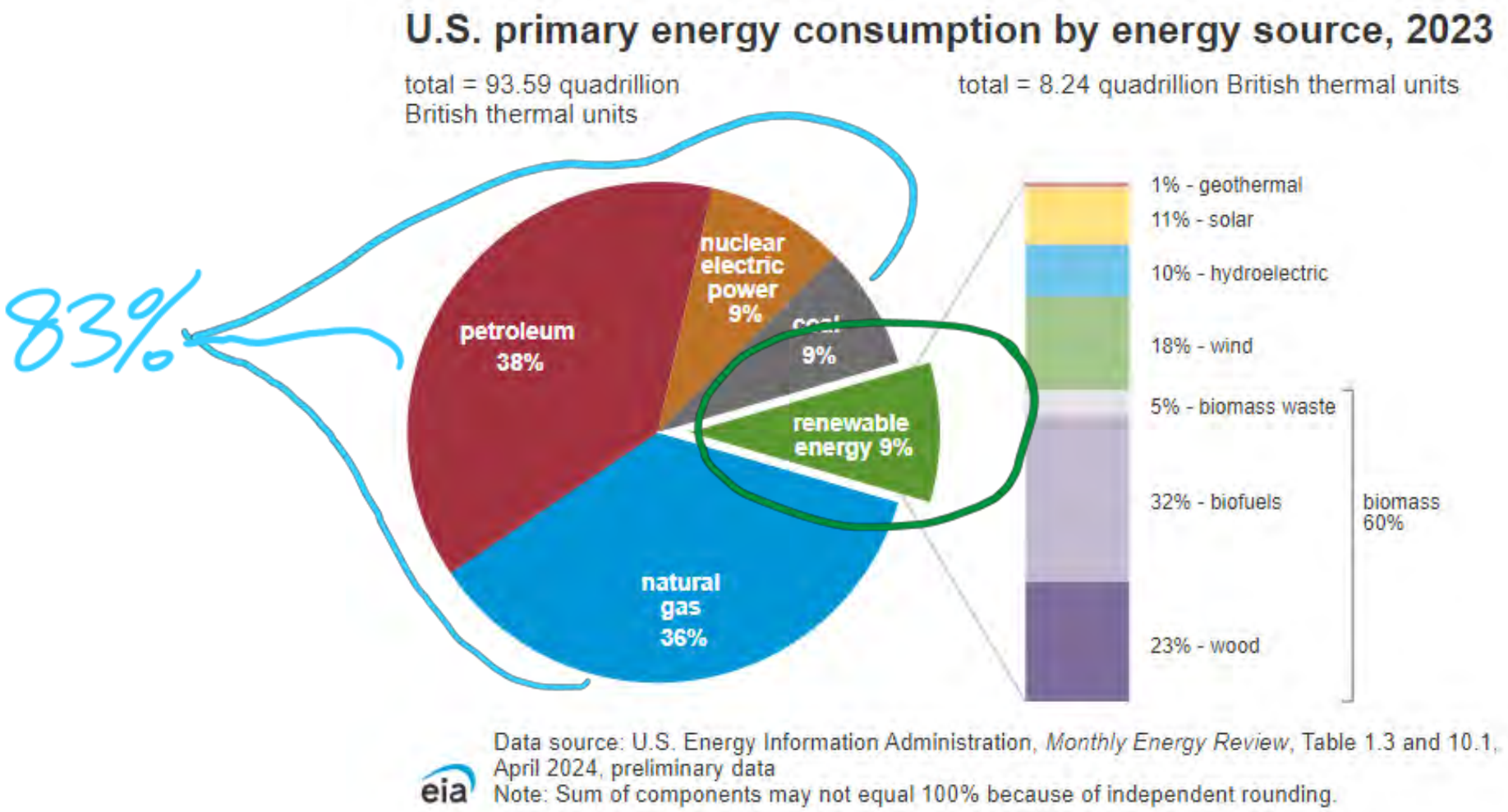

STOP THINKING
ABOUT
CLIMATE
CHANGE

Our Shared Battery



Data Source: Energy Institute – Statistical Review of World Energy (2024)

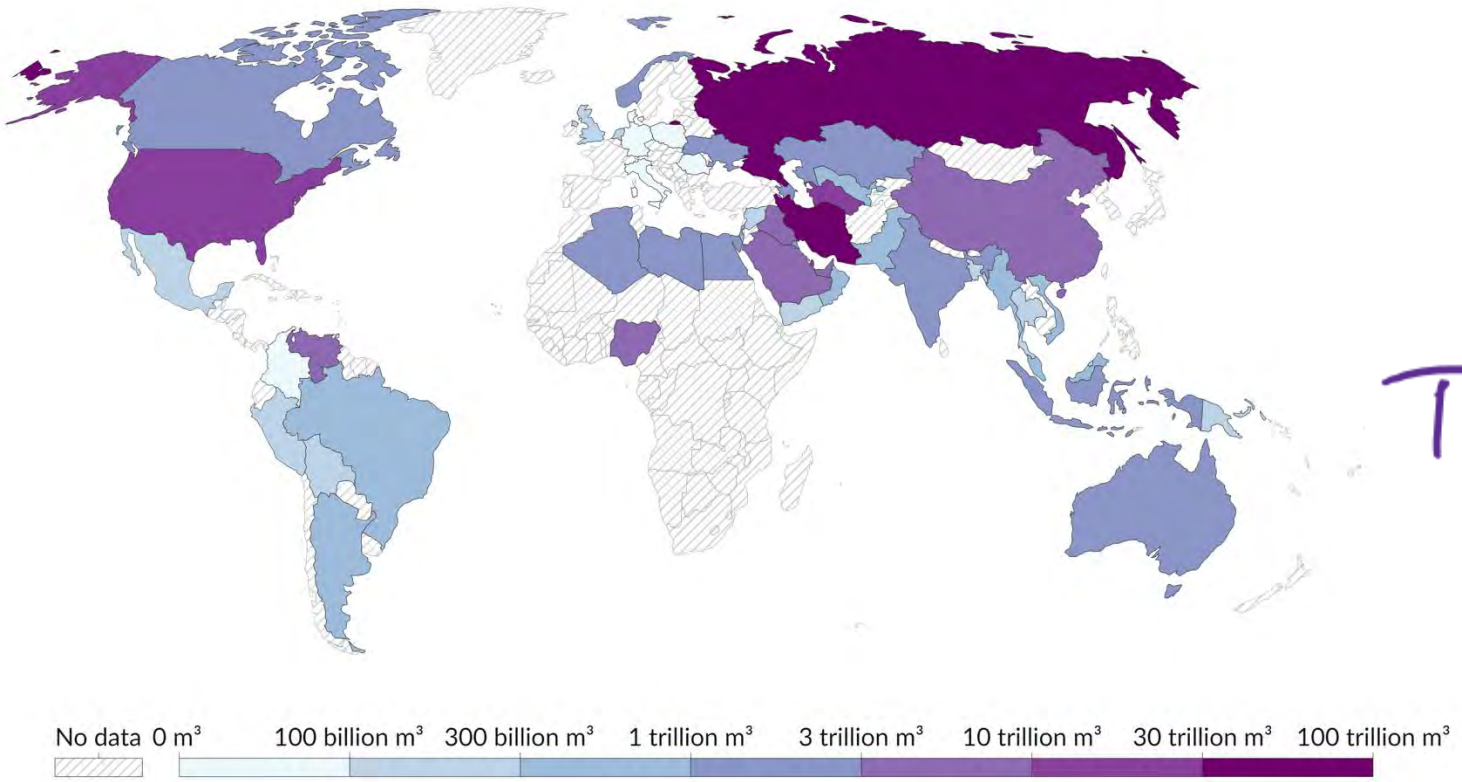
The US Alone…


U.S. primary energy consumption by energy source, 2023
total = 93.59 quadrillion British thermal units
total = 8.24 quadrillion British thermal units
83%
petroleum 38%
nuclear electric power 9%
9%
renewable energy 9%
natural gas 36%
1% - geothermal
11% - solar
10% - hydroelectric
18% - wind
5% - biomass waste
32% - biofuels
23% - wood
biomass 60%
eia
Data source: U.S. Energy Information Administration, Monthly Energy Review, Table 1.3 and 10.1, April 2024, preliminary data
Note: Sum of components may not equal 100% because of independent rounding.

Gas reserves, 2020

Our World in Data

Proved reserves, measured in cubic meters, are generally those quantities that can be recovered in the future from known reservoirs under existing economic and operating conditions, according to geological and engineering information.



Data source: Energy Institute - Statistical Review of World Energy (2024)

OurWorldInData.org/fossil-fuels | CC BY

Russia - 37 Tn m^3

Iran - 32 Tn m^3

Qatar - 25 Tn m^3

Turkmenistan - 13 Tn m^3

US - 12 Tn m^3

China - 8 Tn m^3

The One Single Biggest Problem…

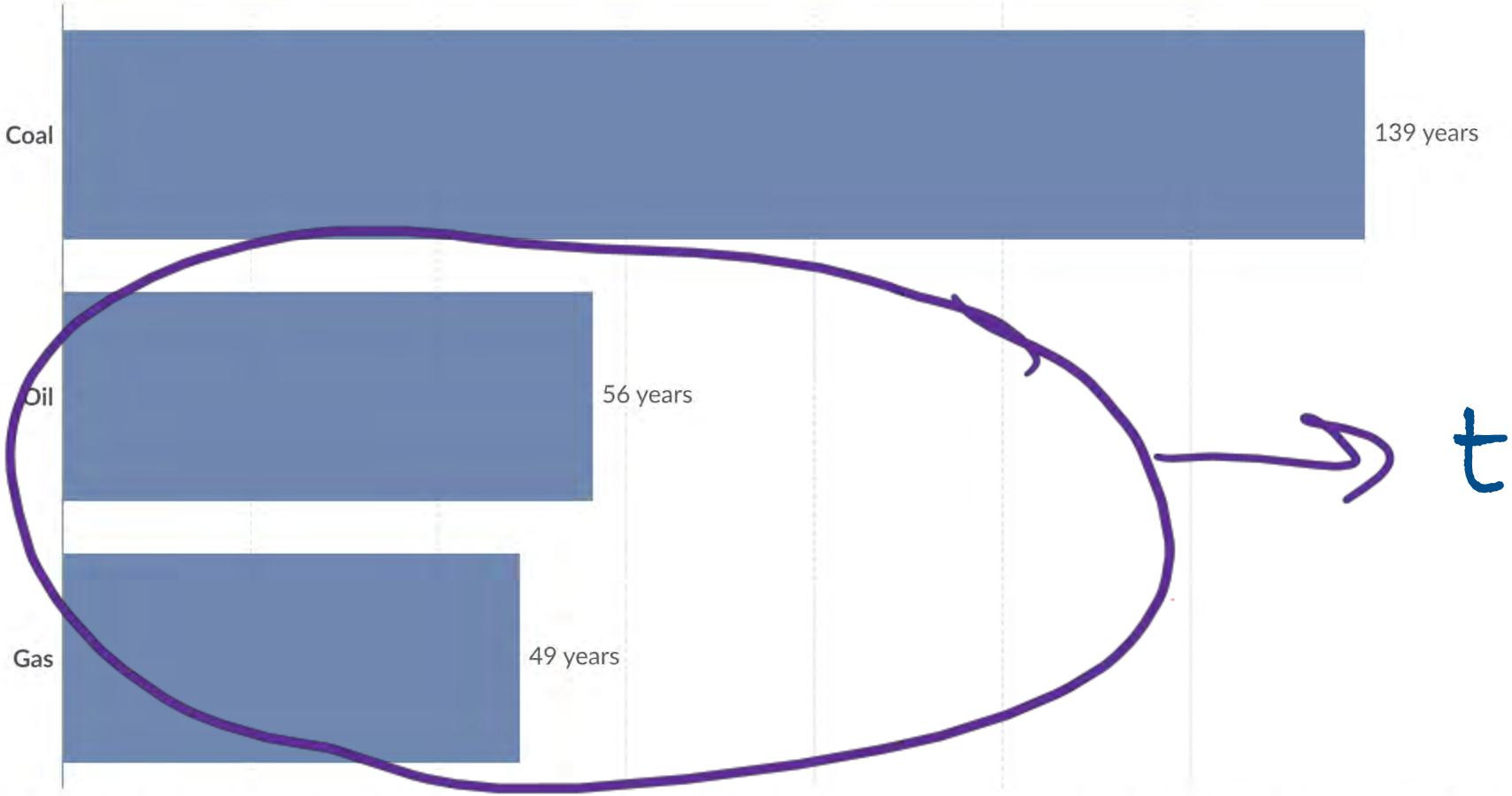
We can't afford this.

Some communities and countries less than others. Seek a just transition.

But we also can't afford not to do it - there's no choice left, because…

Years of fossil fuel reserves left, 2020

Years of global coal, oil and natural gas left, reported as the reserves-to-product (R/P) ratio which measures the number of years of production left based on known reserves and present annual production levels. Note that these values can change with time based on the discovery of new reserves, and changes in annual production.



this is us

Data source: Energy Institute - Statistical Review of World Energy (2024)

OurWorldInData.org/fossil-fuels | CC BY

Where is the intersection of Babe Ruth and the energy transition?

→ please take a guess


St. Lucie West
1-800-344
GIF

The biggest, most important lever we can pull in the energy transition is conserving the amount of energy we use.

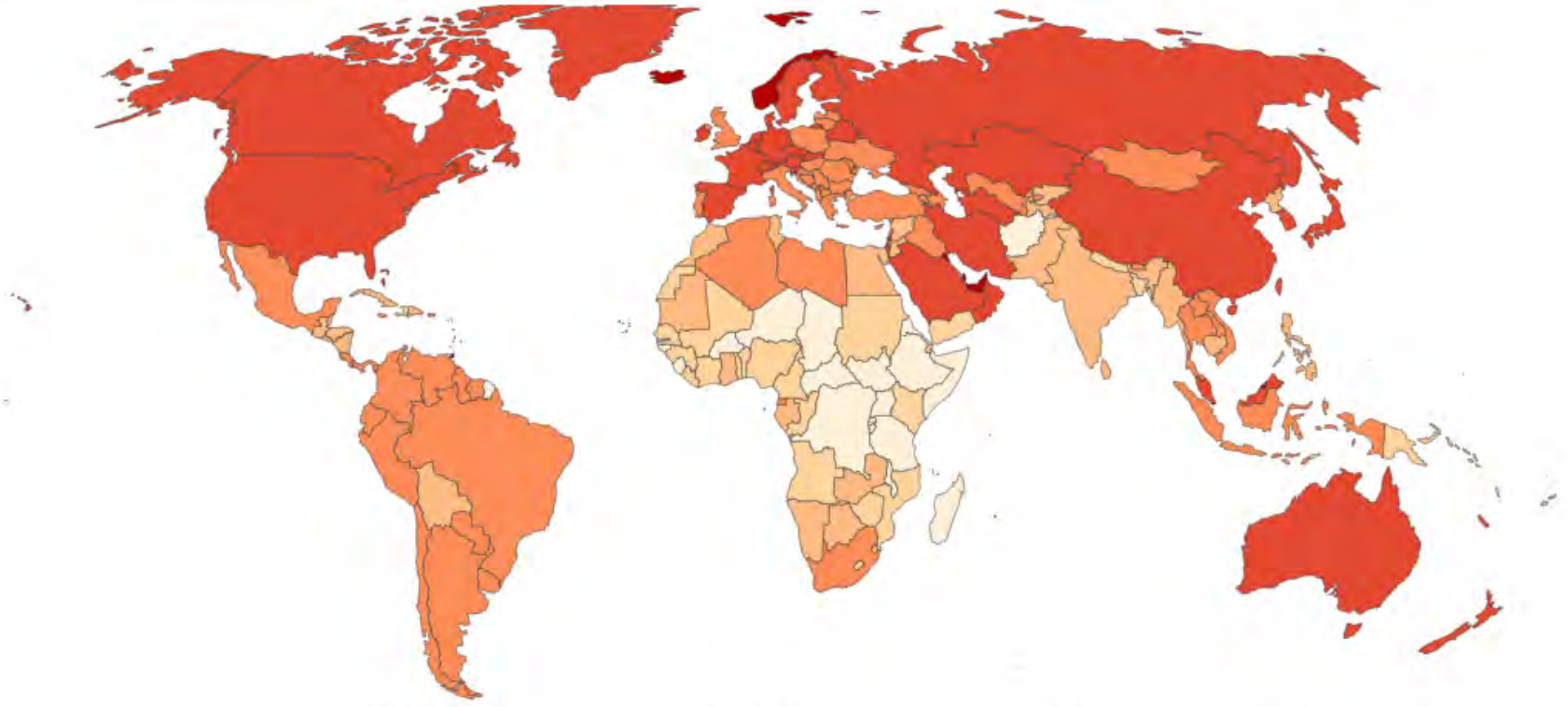
Energy use per person, 2023

Measured in kilowatt-hours per person. Here, energy refers to primary energy using the substitution method.

Our World in Data

Table | Map | Chart

World

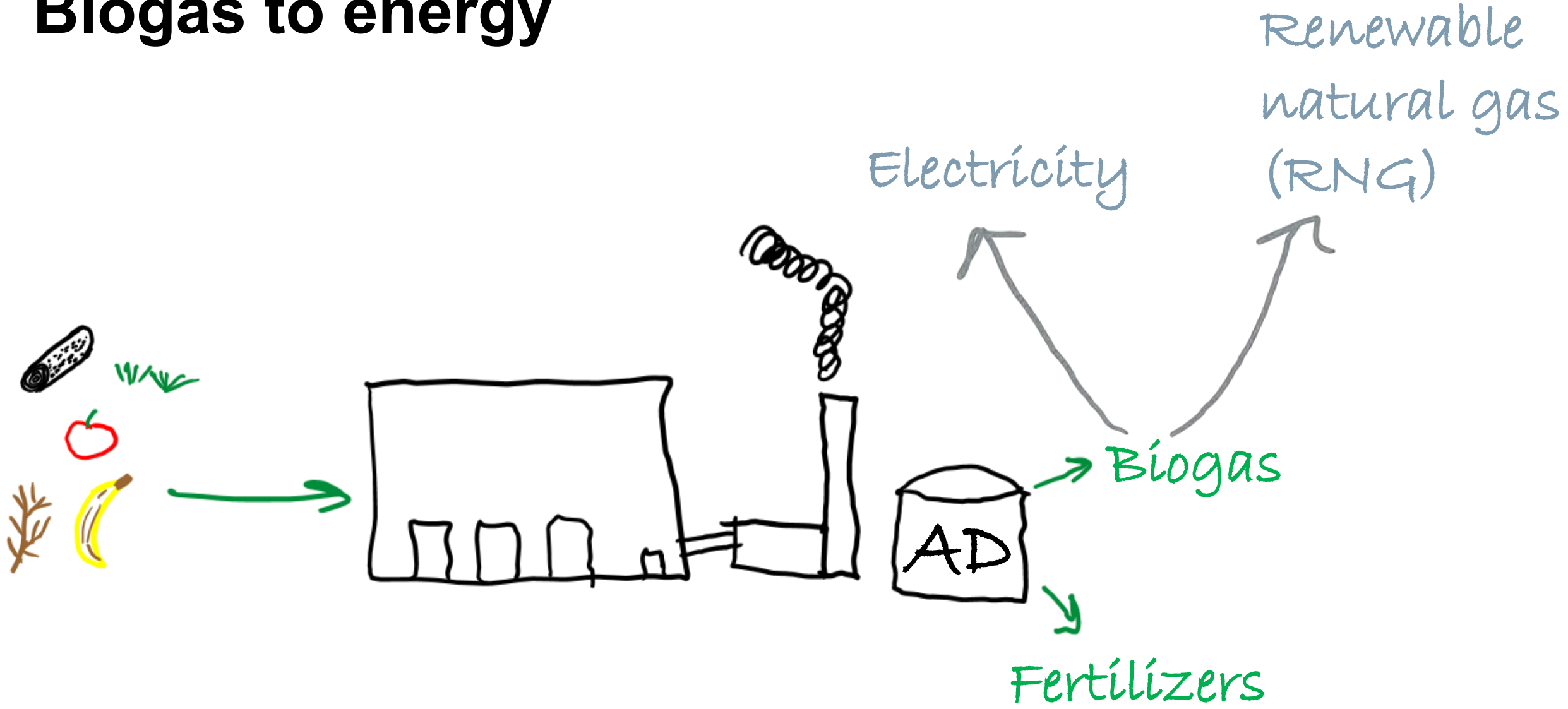


1965 — 2023

Data source: U.S. Energy Information Administration (2023); Energy Institute - Statistical Review of World Energy (2024); Population based on various sources (2023) – Learn more about this data

OurWorldinData.org/energy | CC BY

Biogas to energy



City of Toronto

Disco Road Organics Processing Facility (DROPF) - DBOM

75,000 tonnes SSO per year

Dufferin Organics Processing Facility (DOPF) - DBOM

55,000 tonnes SSO per year

RNG Projects

Babe Ruth?

Renewables

What is this?

Kidston Pumped Hydro

Being developed by Genex Power northwest of Townsville in Queensland, this world-first project will repurpose an abandoned gold mine into a pumped storage facility, using the old mine pits as the upper and lower water reservoirs.

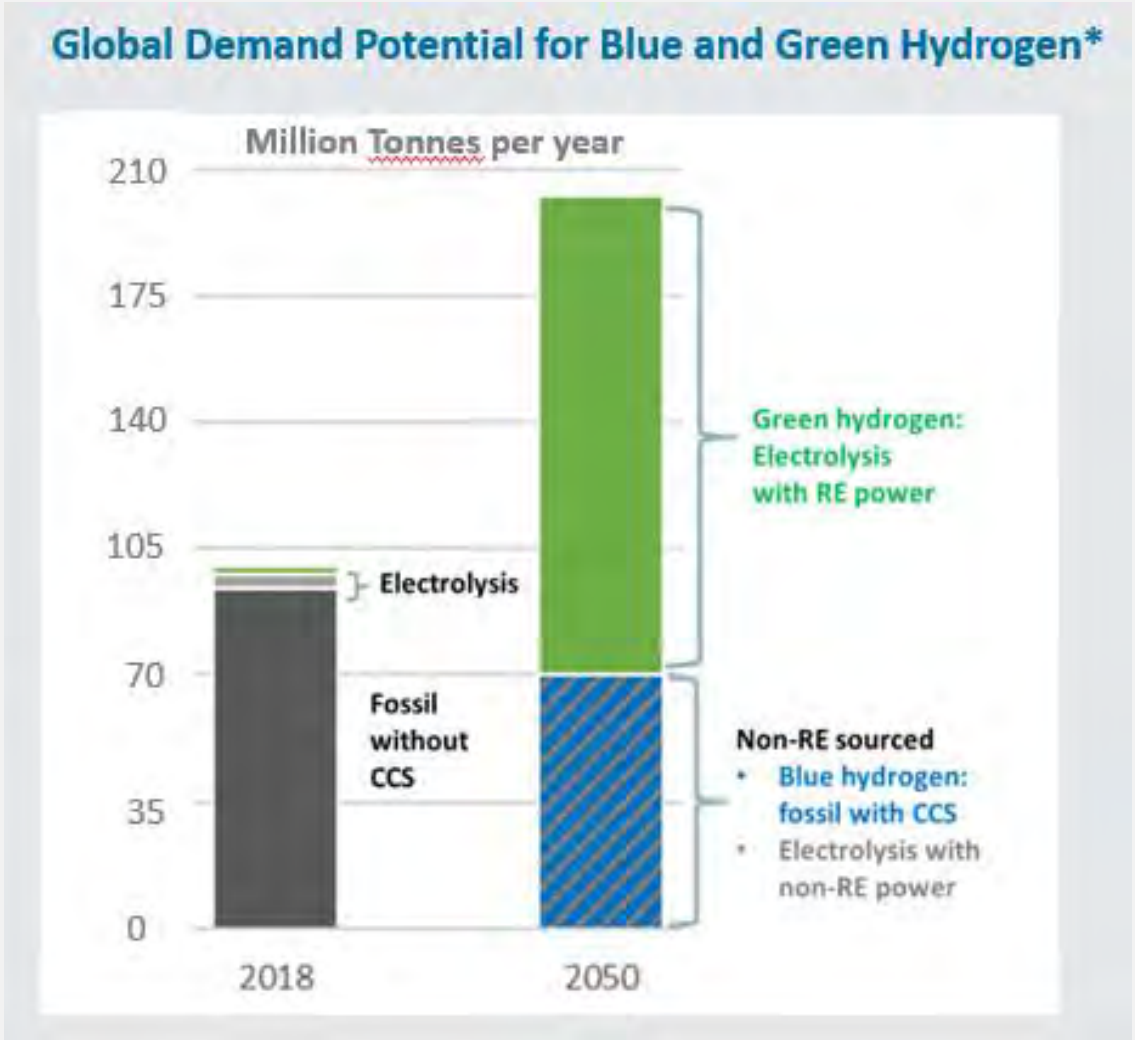
Babe Ruth?

https://www.sciencemag.org/news/2019/07/debate-intensifies-over-speed-expanding-universe

- Most abundant element in the universe
- Most abundant element on Earth
- Energy-rich
- No carbon
- Bridges electrical and gas networks

How to Make Hydrogen

Hydrogen is manufactured almost entirely from coal and natural gas = ~830M tonnes of CO_2 emissions per year, and is an integral part of the modern refining and chemical industry.

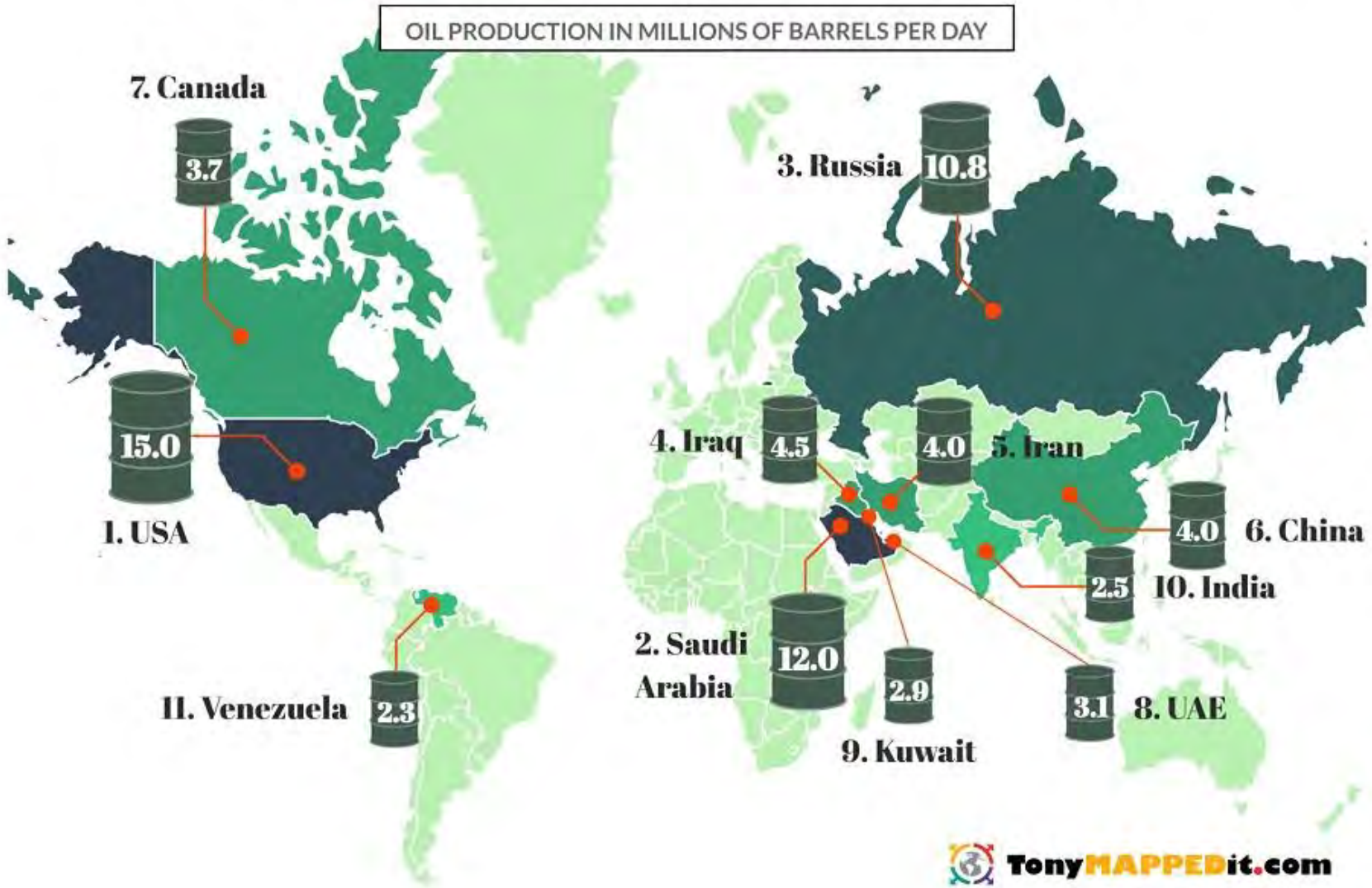


Air Products electrolyzer; for every 1 ton of hydrogen produced, 16 tons of pure oxygen are also produced.

1 kg of hydrogen has the same energy content as 2.6 L of diesel

Grey hydrogen	Blue hydrogen	Green hydrogen
Split natural gas into hydrogen and CO_2	Split natural gas into hydrogen and CO_2	Split water into hydrogen by electrolysis powered by water or wind
CO_2 emitted in the atmosphere	CO_2 stored or reused	No CO_2 emitted

World Oil Production



Babe Ruth?

Ontario set to begin construction of Canada's 1st mini nuclear power plant

Ontario Power Generation wants to build 4 small modular reactors at a total cost of $20.9B

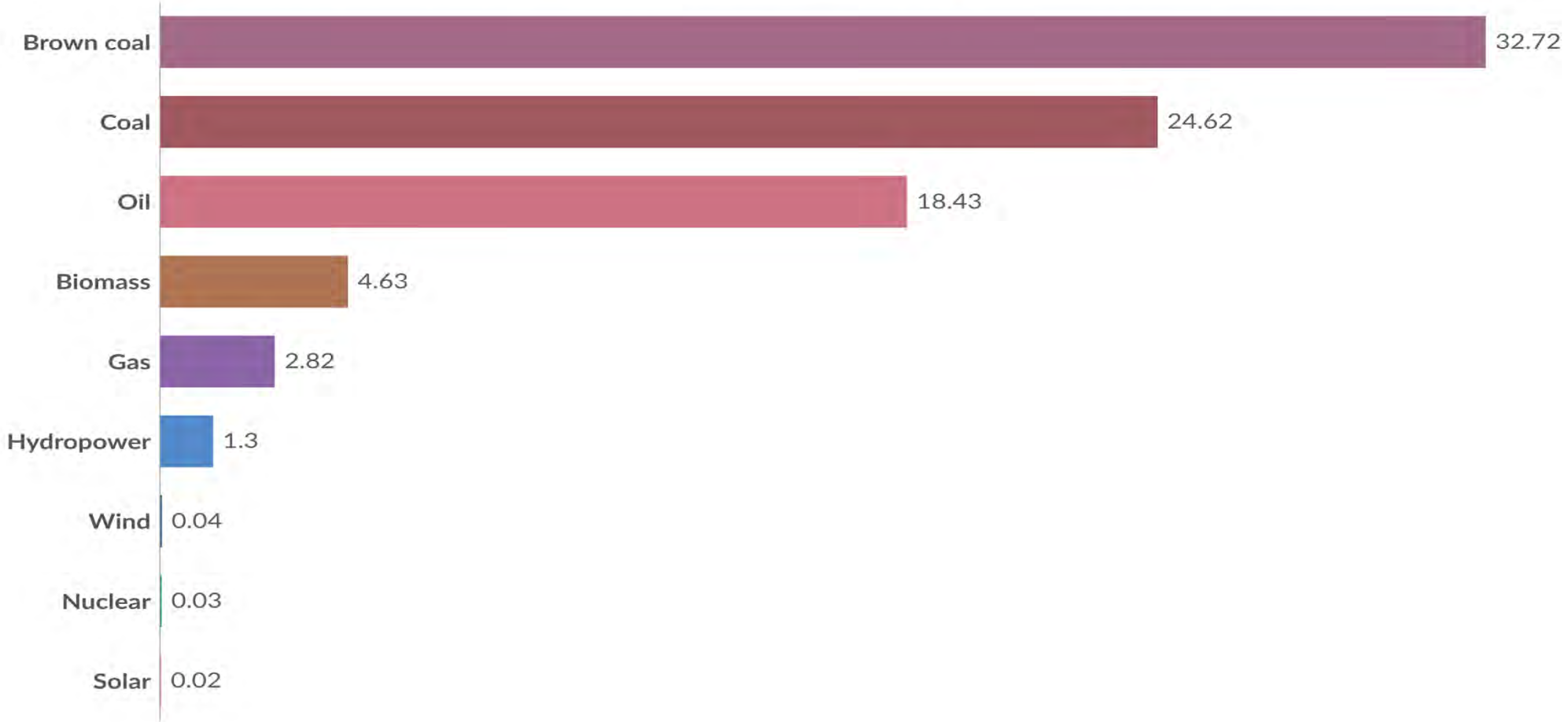
Mike Crawley · CBC News · Posted: May 08, 2025 9:00 AM EDT | Last Updated: May 8

Ontario is giving the green light to build Canada's first small modular reactor. The $20-billion project is set to boost the province's electricity supply.

Death rates per unit of electricity production

Our World in Data

Death rates are measured based on deaths from accidents and air pollution per terawatt-hour[1] of electricity.



Data source: Markandya & Wilkinson (2007); Sovacool et al. (2016); UNSCEAR (2008; & 2018)

OurWorldinData.org/energy | CC BY

1. **Watt-hour** A watt-hour is the energy delivered by one watt of power for one hour. Since one watt is equivalent to one joule per second, a watt-hour is equivalent to 3600 joules of energy.
Metric prefixes are used for multiples of the unit, usually:
- kilowatt-hours (kWh), or a thousand watt-hours.
- Megawatt-hours (MWh), or a million watt-hours.
- Gigawatt-hours (GWh), or a billion watt-hours.
- Terawatt-hours (TWh), or a trillion watt-hours.

Babe Ruth?


C1


WELCOME TO THE MACHINE
The ITER machine: 30 m tall x 30 m wide
Weight 23,000 tonnes
Height ~30 metres
Diameter ~30 metres
Plasma volume 840 m³
Temperature at plasma core 150,000,000°C
Fusion power 500 MW
Central Solenoid
Vacuum Vessel
Toroidal Field Coils
Poloidal Field Coils
Correction Coils
Cooling Systems
Cryostat
Thermal Shield
Heating Systems
Blanket Modules
Divertor Cassettes
*Not all systems (or contributions) could be represented in this illustration.
https://www.iter.org

Babe Ruth?

MAYBE...

* Thank You

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