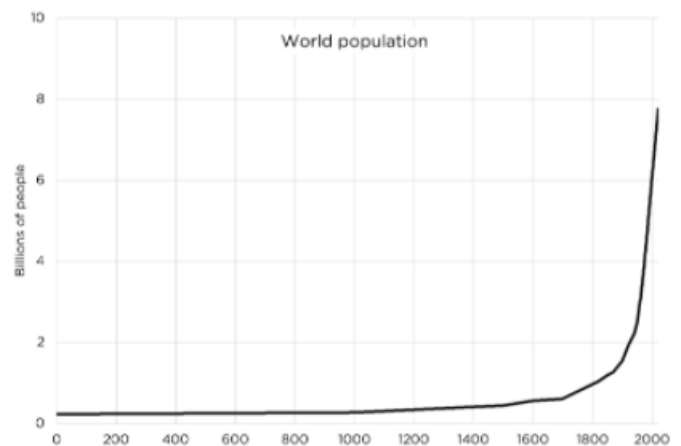
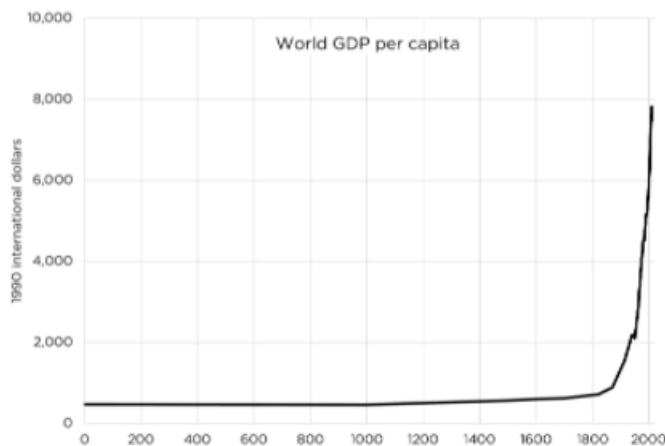
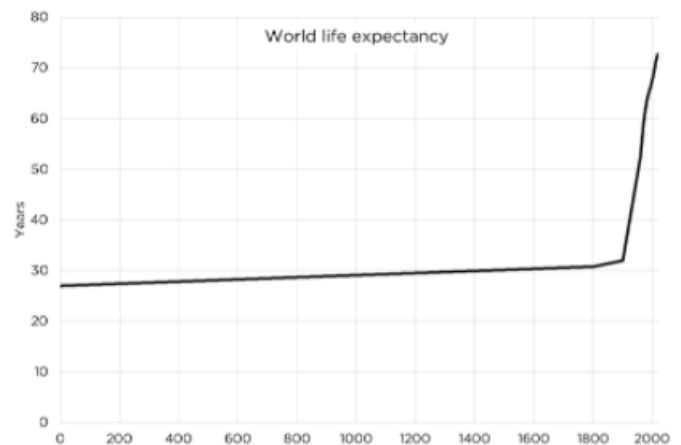
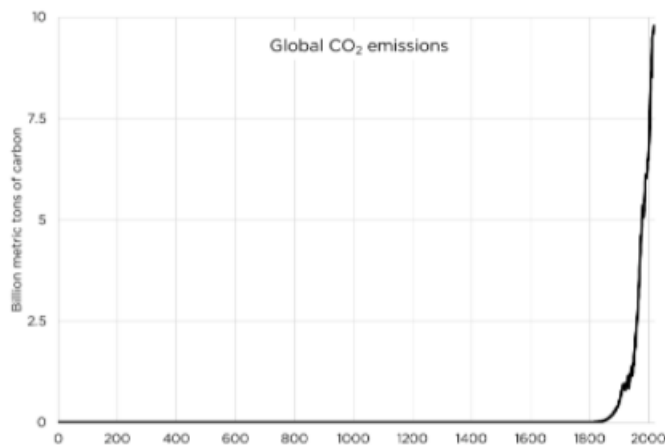


How Fossil Fuels Improve the Human Condition

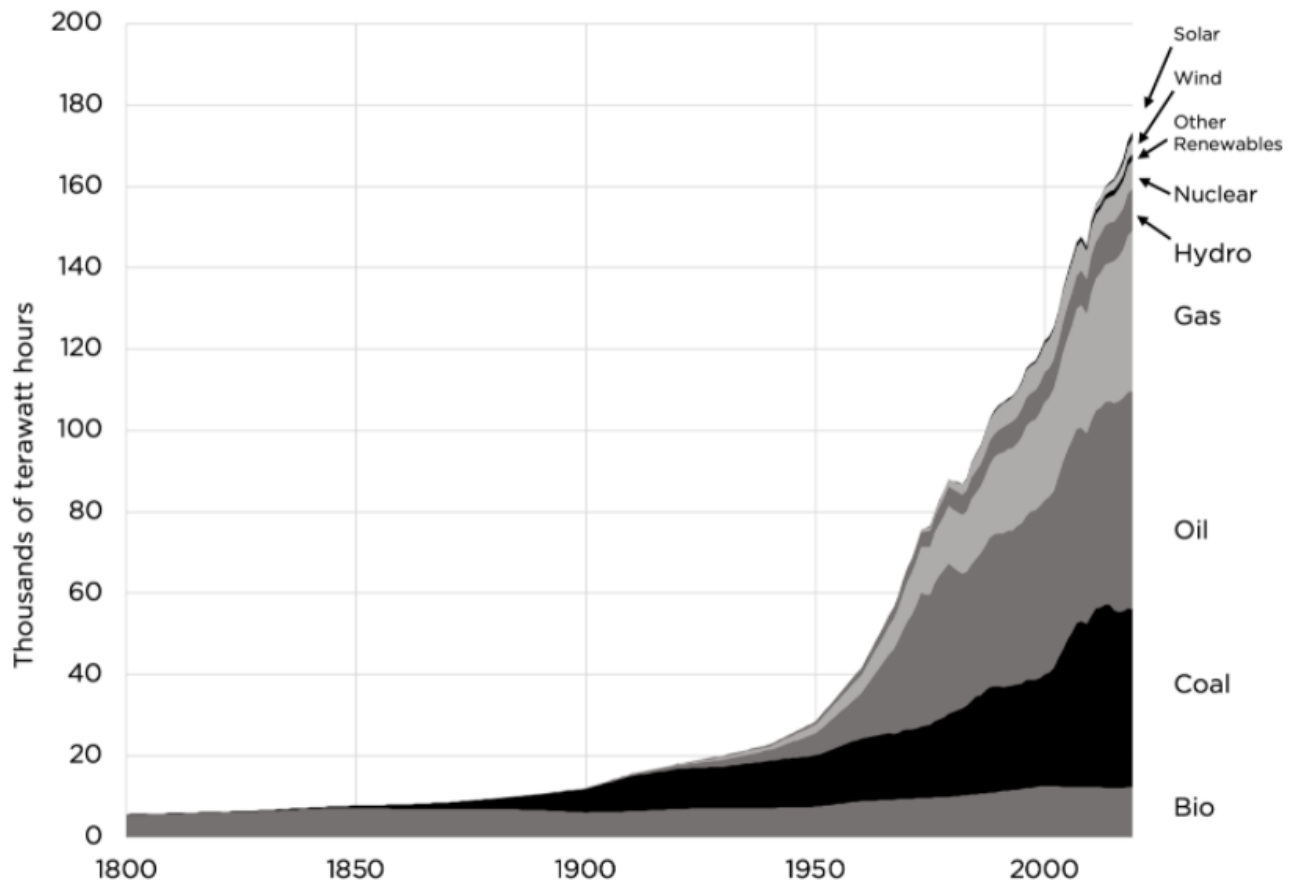
The following graphics and excerpts are courtesy of Alex Epstein
from <https://energytalkingpoints.com/thanksgiving-2021/>

- 1: Contrary to rhetoric that we've "destroyed the planet," the world has never been a better place for human beings to live. Life expectancy and income have been skyrocketing, with extreme poverty (<\$2/day) plummeting from 42% in 1980 to <10% today.¹



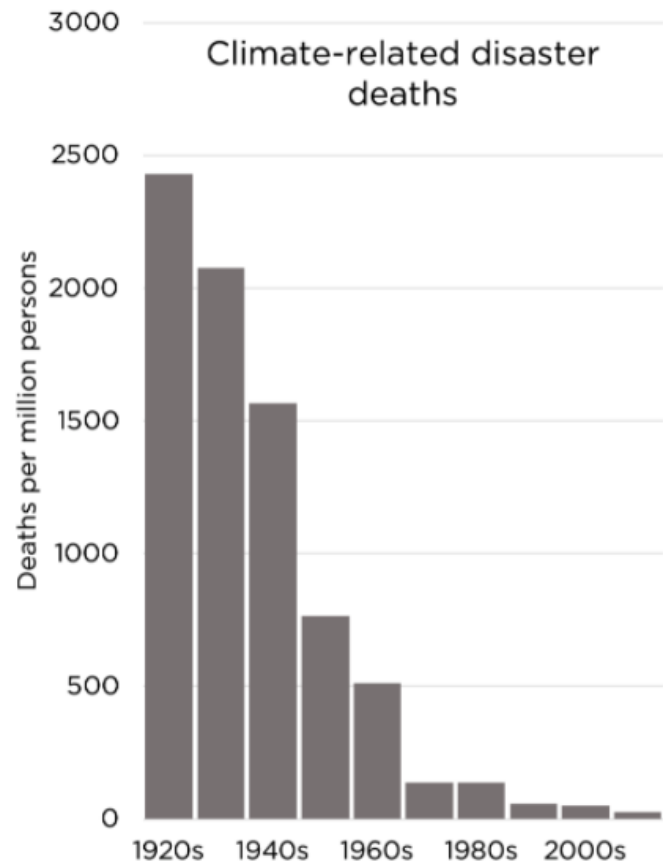
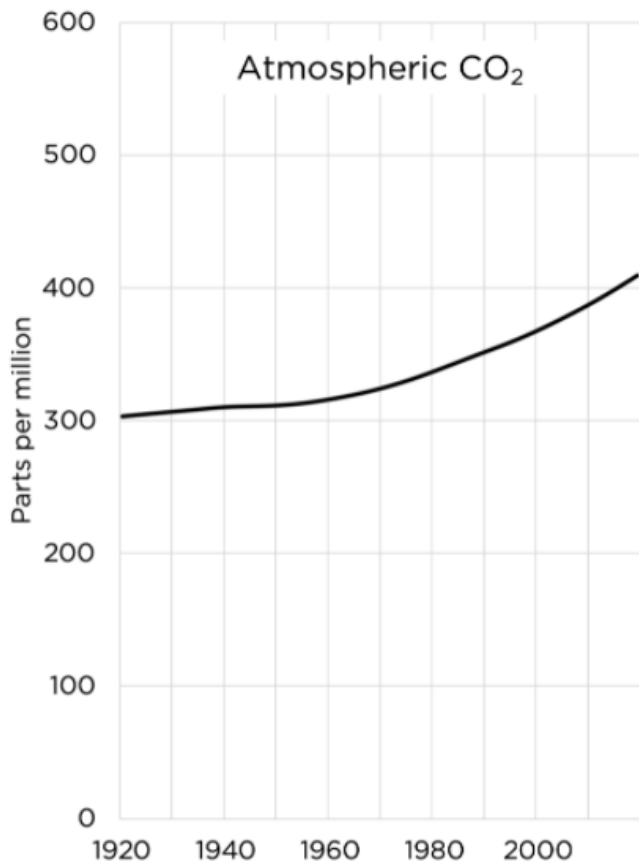
How Fossil Fuels Improve the Human Condition

- 2: A root cause of today's amazingly livable world is fossil fuel. Low-cost, reliable energy enables us to use machines to be productive and prosperous. And only fossil fuels (80% of energy) provide low-cost, reliable energy for all energy needs on a scale of billions of people.²



How Fossil Fuels Improve the Human Condition

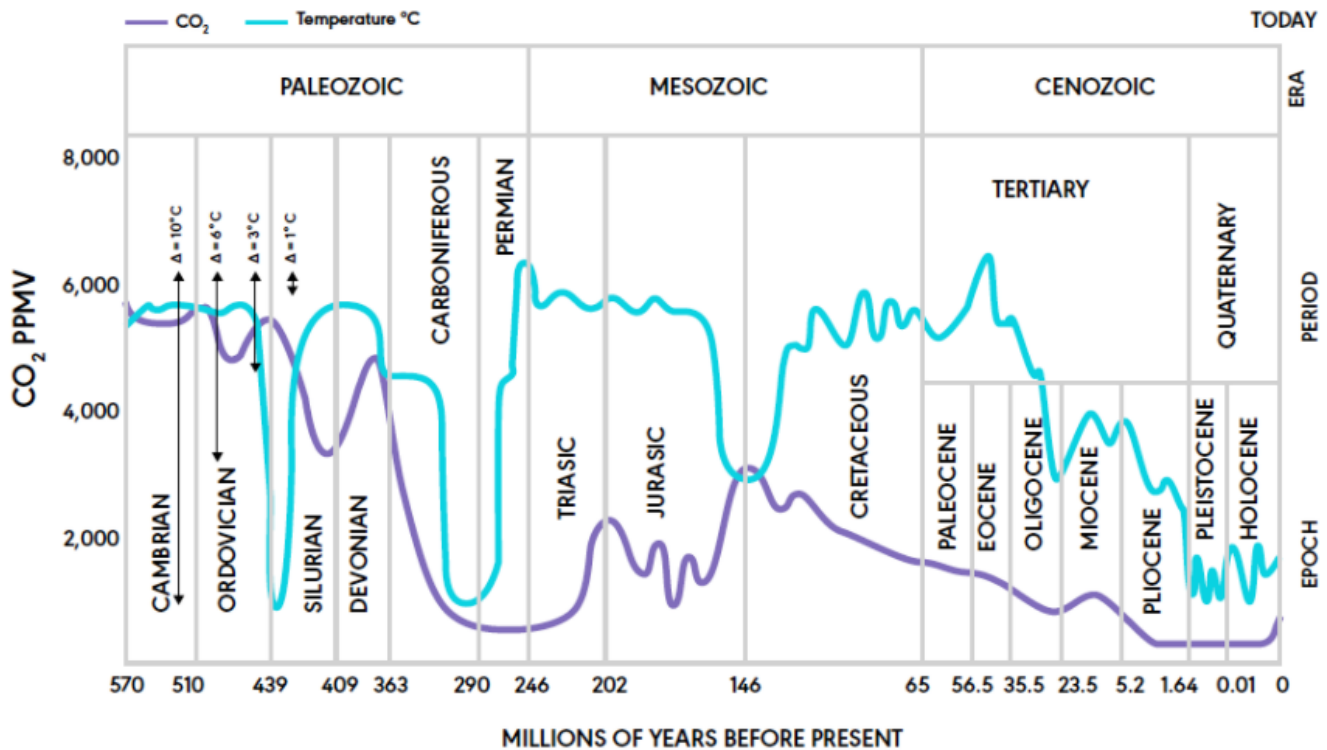
- 3: Fossil fuels have actually made us far safer from climate by providing low-cost energy for the amazing machines that protect us against storms, protect us against extreme temperatures, and alleviate drought. Climate disaster deaths have decreased 98% over the last century.³



How Fossil Fuels Improve the Human Condition

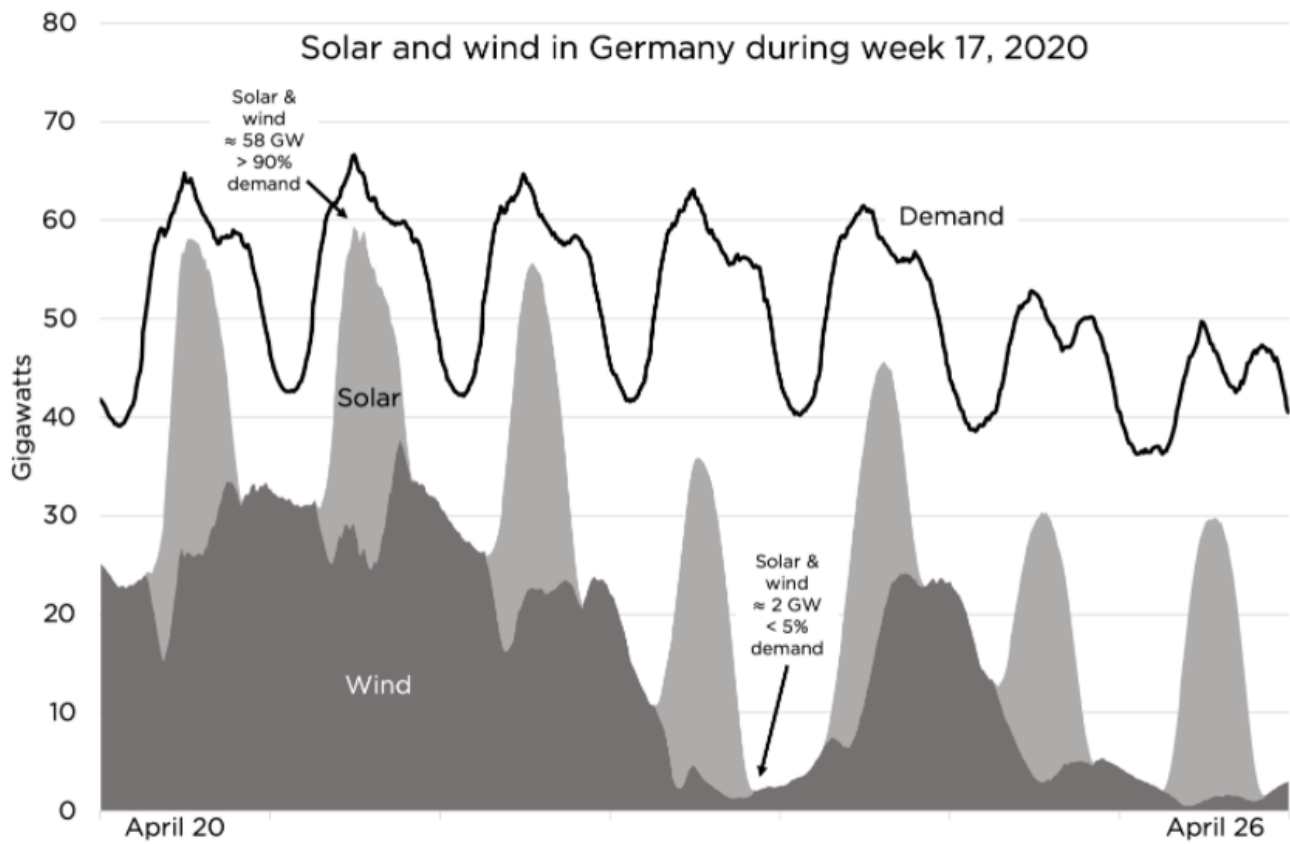
- 4: Fossil fuels' CO₂ emissions have contributed to the warming of the last 170 years, but that warming has been mild and manageable—1° C, mostly in the colder parts of the world. And life on Earth thrived (and was far greener) when CO₂ levels were at least 5X higher than today's.⁴

Geological Timescale: Concentration of CO₂ and Temperature Fluctuations



How Fossil Fuels Improve the Human Condition

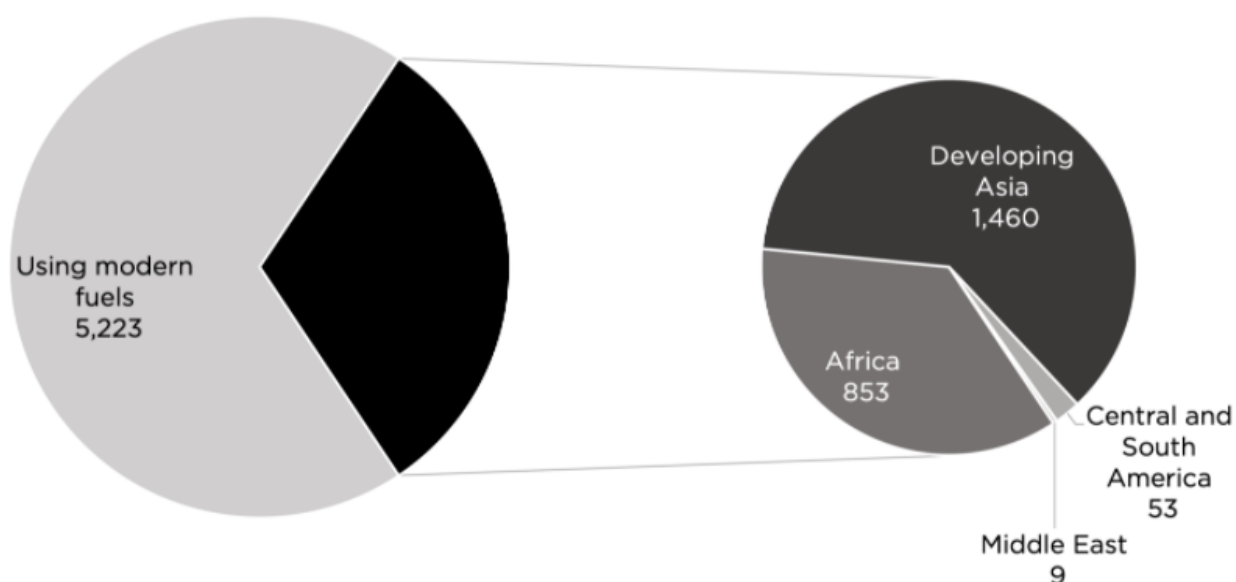
- 5: Solar and wind can't come close to replacing fossil fuels. They only provide electricity (20% of energy use)--and they don't even do that well. Because solar and wind are unreliable, they don't replace reliable power plants--they add to the cost of reliable power plants.⁵



How Fossil Fuels Improve the Human Condition

- 6: Billions of people desperately need low-cost, reliable energy, which for the foreseeable future largely needs to come from fossil fuels. 3 billion people use less electricity than a typical American refrigerator. 1/3 of the world uses wood and dung for heating and cooking.⁶

Usage of traditional biomass
millions of persons



How Fossil Fuels Improve the Human Condition

CONCLUSIONS

- Conclusion, part 1: The world needs to continue and expand its massive use of fossil fuels, while making sure we have the freedom necessary for genuinely cost-effective non-carbon alternatives to emerge. For example, we need to decriminalize reliable, non-carbon nuclear energy.
- Conclusion, part 2: The legislation the US is on the verge of passing, called Build Back Better, should be renamed Destroy American Energy--because, by seeking to rapidly eliminate fossil fuel use, it will make American energy unaffordable and unreliable.

<https://twitter.com/AlexEpstein/status/1451308413137272862>

REFERENCES

1. Maddison Database 2010 at the Groningen Growth and Development Centre, Faculty of Economics and Business at University of Groningen
[World Bank Data](#)
[Scripps Institution of Oceanography - The Keeling Curve](#)
↪
2. Our World in Data - Energy Production and Consumption
↪
3. 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](#).
↪
4. The decadal smoothed data from the UK Met Office HadCRUT4 dataset shows an increase of 0.974°C between 1850 and 2019.
[UK Met Office HadCRUT4 dataset](#)

"The best estimate of CO2 concentration in the global atmosphere 540 million years ago is 7,000 ppm, with a wide margin of error."
[Patrick Moore - THE POSITIVE IMPACT OF HUMAN CO2 EMISSIONS ON THE SURVIVAL OF LIFE ON EARTH](#)
↪
5. Plot data from Bundesnetzagentur - [SMARD](#)

Public generation of electricity was over 488 terawatt-hours in Germany for 2020, solar and wind combined generated over 37%. In 2002 they generated just over 3%.
[Fraunhofer ISE energy-charts.de](#)

German household electricity prices have more than doubled to over 0.3€ per kWh (\$0.35 per kWh depending on currency exchange rate) since 2000 when the modern renewable energy law started to massively incentivize solar and wind capacity on the German grid.
[BDEW Strompreisanalyse Jul 2021 p. 7](#)

The average US household price in 2020 was \$0.1315 per kWh.
[U.S. Energy Information Administration Electric Power Annual table 5a](#)

Increasingly, Germany depends on interconnections with neighboring countries. In 2020 the country experienced a sharp increase in electricity imports, while still massively exporting solar and wind overproduction.
[Reuters - German power export surplus shrank 46.2% in 2020](#)
↪
6. IEA - Access to affordable, reliable, sustainable and modern energy for all