Energy, Climate, Poverty and Prosperity

TIPRO Summer Conference | Aug 20, 2024

Ron Gusek, Liberty Energy

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Key Takeaways

1. Energy is essential to life and the world needs more of it!
2. The modern world today is powered by and made of hydrocarbons.
3. Hydrocarbons are essential to improving the wealth, health, and life opportunities for the less energized seven billion people who aspire to be among the world's lucky one billion.
4. Hydrocarbons supply more than 80% of global energy and thousands of critical materials and products.
5. The American Shale Revolution transformed energy markets, energy security, and geopolitics.

Key Takeaways

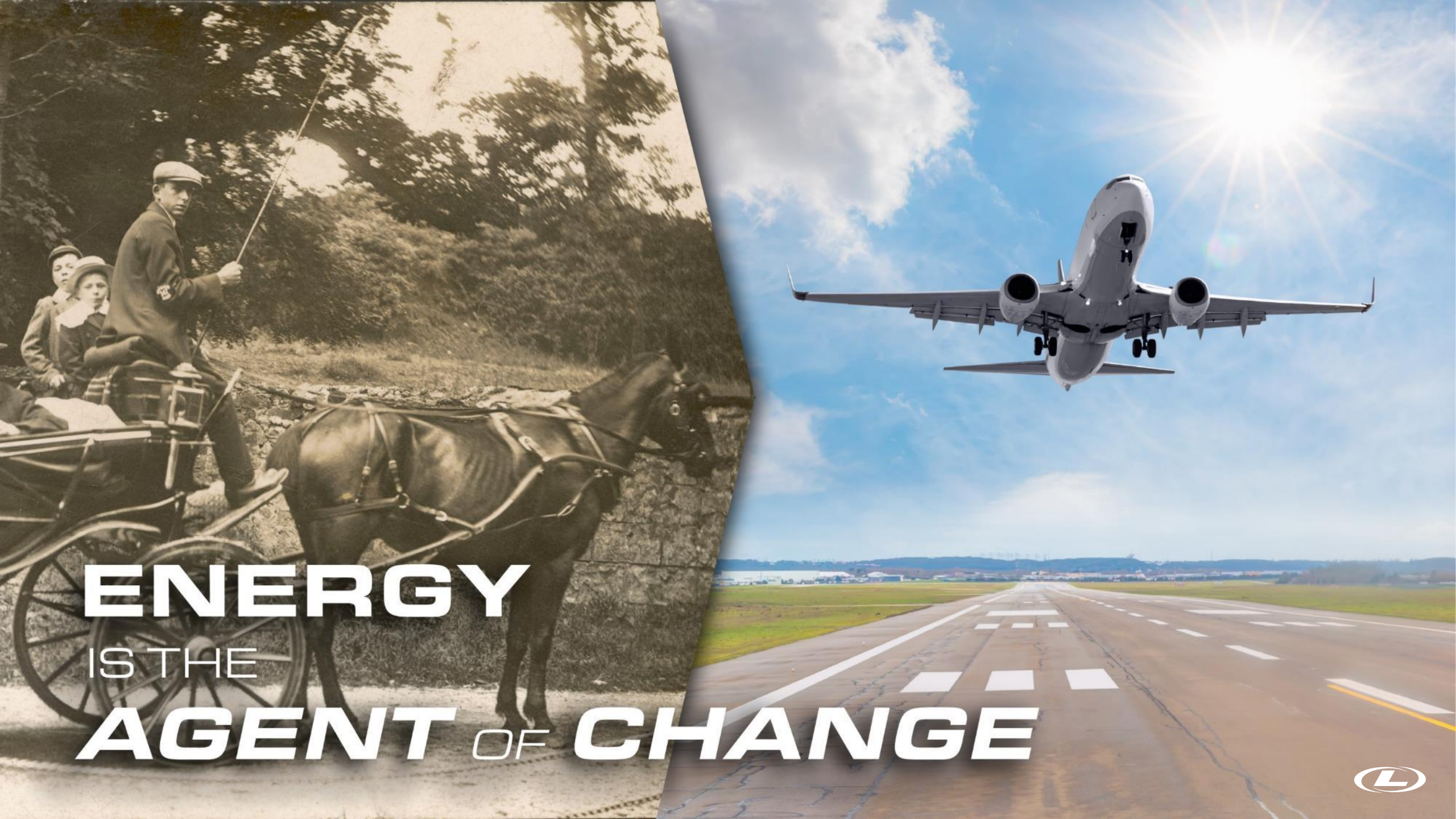
6 Global demand for oil, natural gas, and coal are all at record levels and rising — no energy transition has begun.

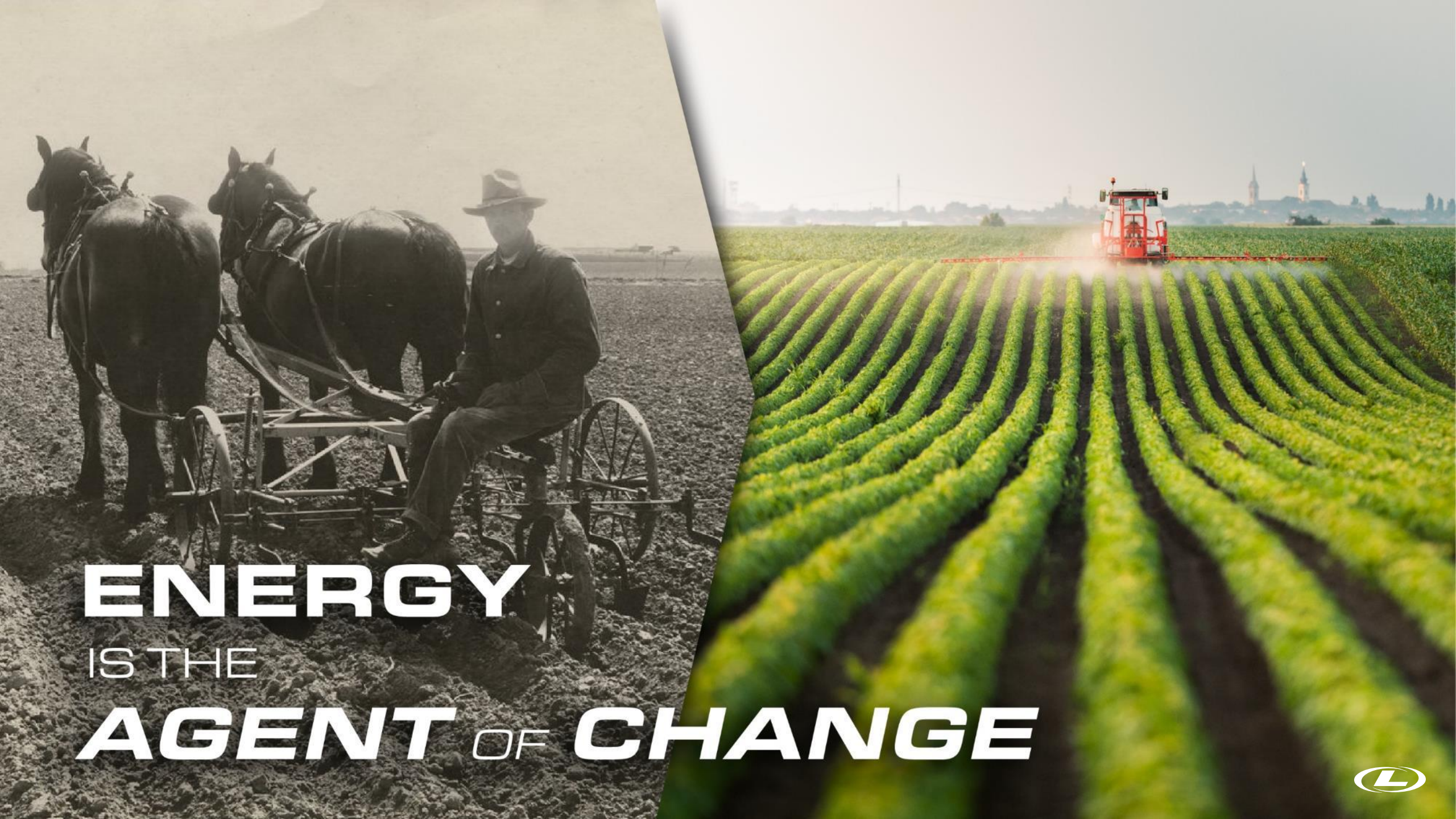
7 Modern alternatives, like solar and wind, provide only a part of electricity demand and do not replace the most critical uses of hydrocarbons. Energy-dense, reliable nuclear could be more impactful.

8 Making energy more expensive or unreliable compromises people, national security, and the environment.

9 Climate change is a global challenge but is far from the world's greatest threat to human life.

10 Zero Energy Poverty by 2050 is a superior goal compared to Net Zero 2050.


ENERGY
IS THE
AGENT OF CHANGE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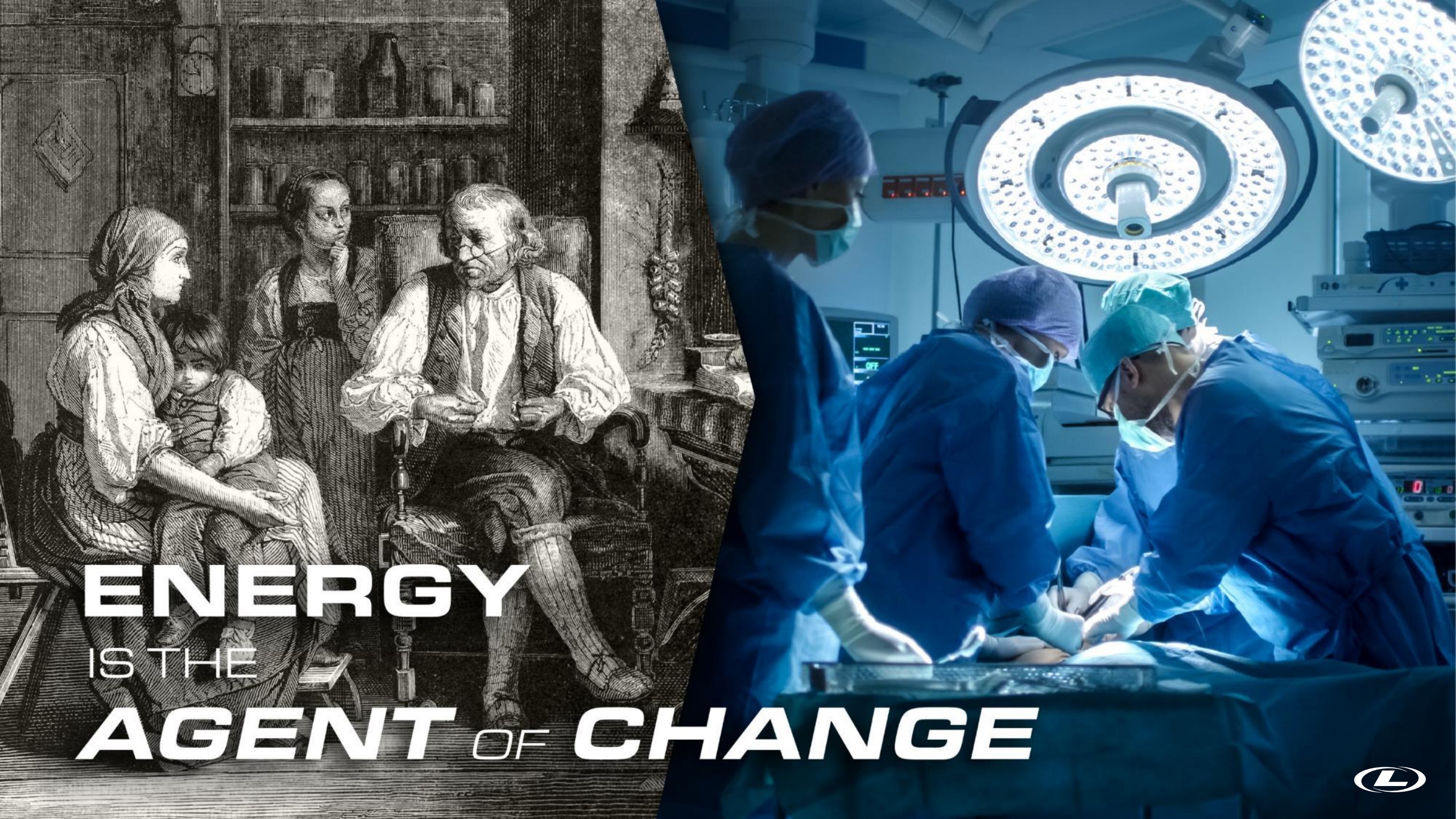
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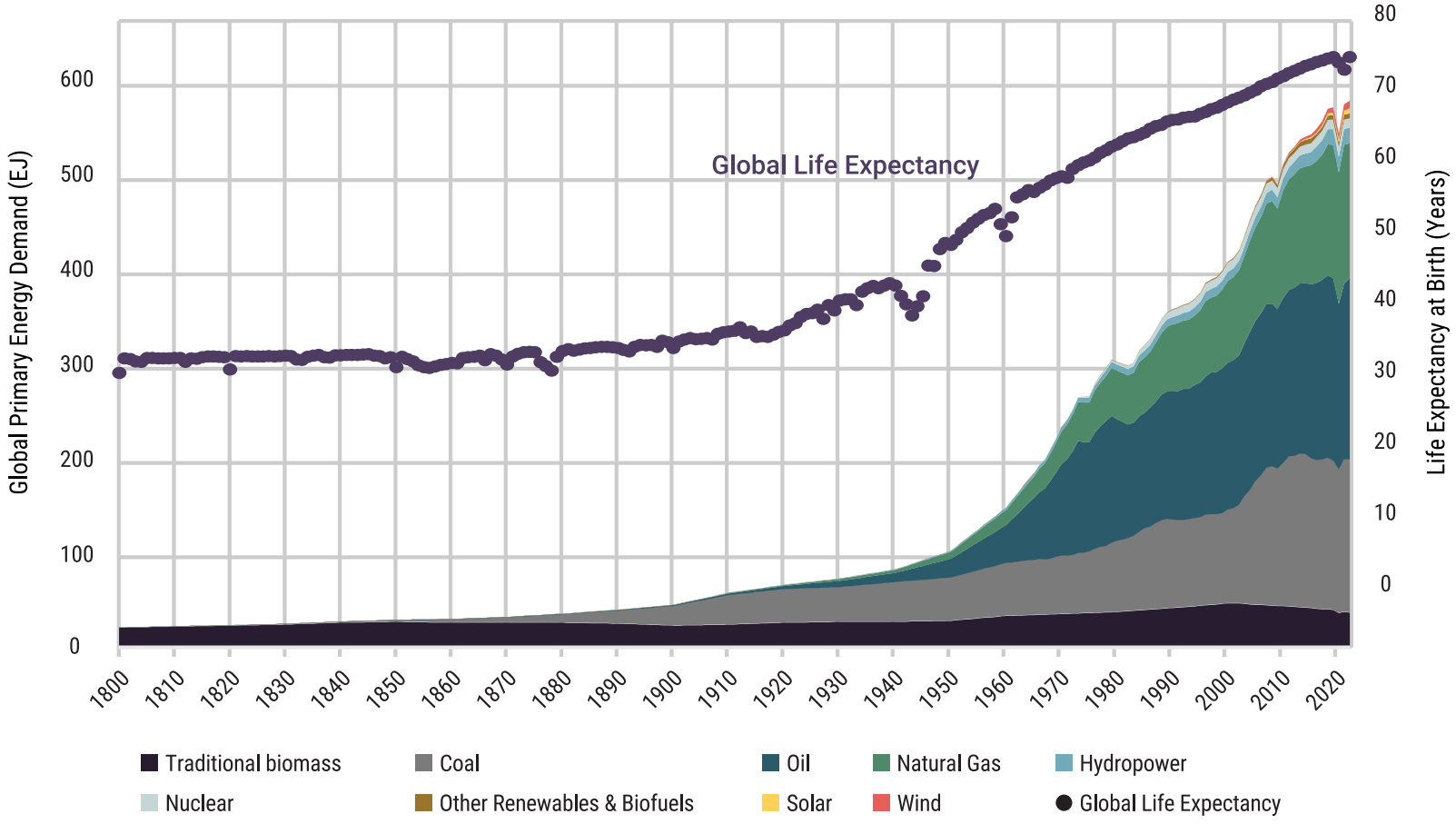
Energy vs. Life Expectancy

Life expectancy experiences a remarkable surge, coinciding with the rapid and overwhelming increase in energy supply upon the arrival of hydrocarbons.

Figure 1.1

Global Primary Energy Demand by Source vs. Life Expectancy 1800–2022



Source: Smil, Vaclav, 2017. Energy Institute - Statistical Review of World Energy (2023), IEA, OWID, Gapminder, and Bijou Insights

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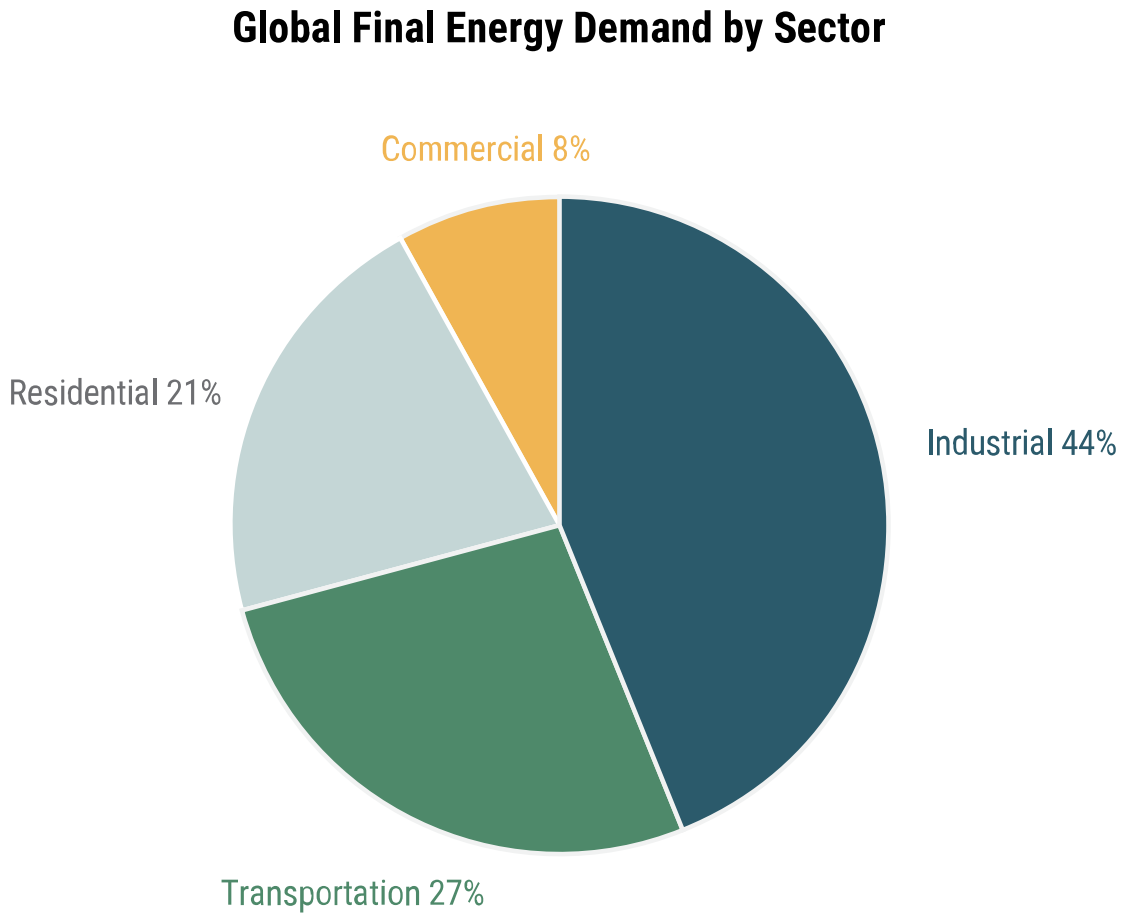
Global Uses of Energy

Only 20% of global energy consumption is in the form of electricity



Source: IEA and Bijou Insights

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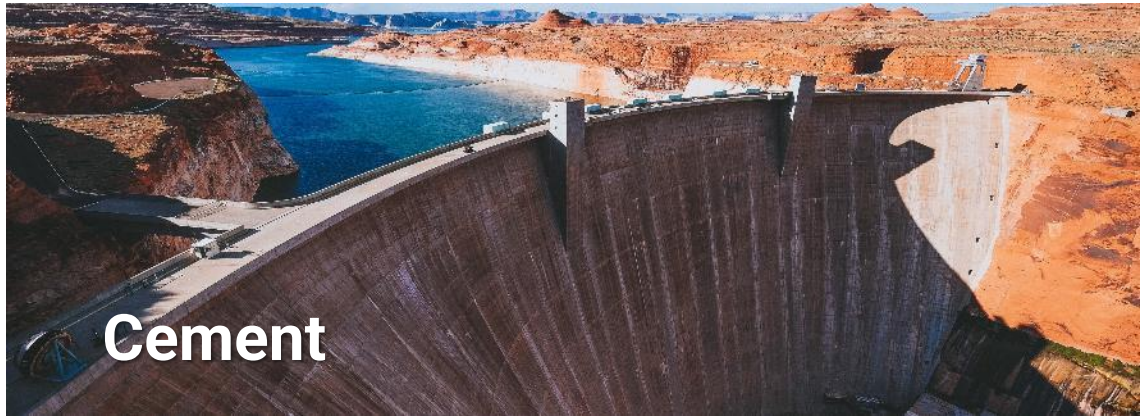
ENERGY & THE MODERN WORLD

Four Pillars of Civilization



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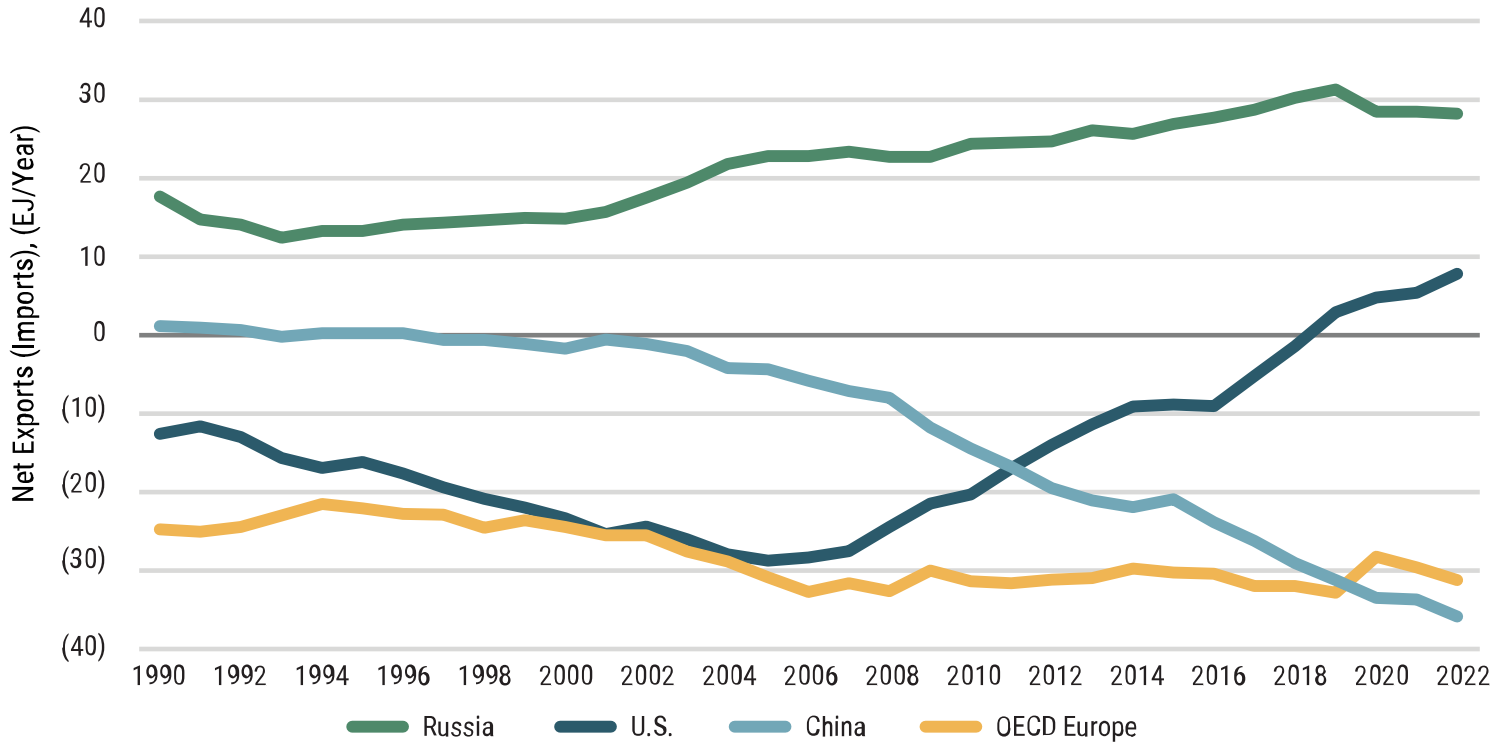
Energy & Geopolitics

Figure A

Energy Independence vs. Energy Dependence: Net Exports (Imports) of Oil, Natural Gas & Coal



Source: Energy Institute - Statistical Review of World Energy (2023), IEA, JP Morgan Annual Energy Paper.

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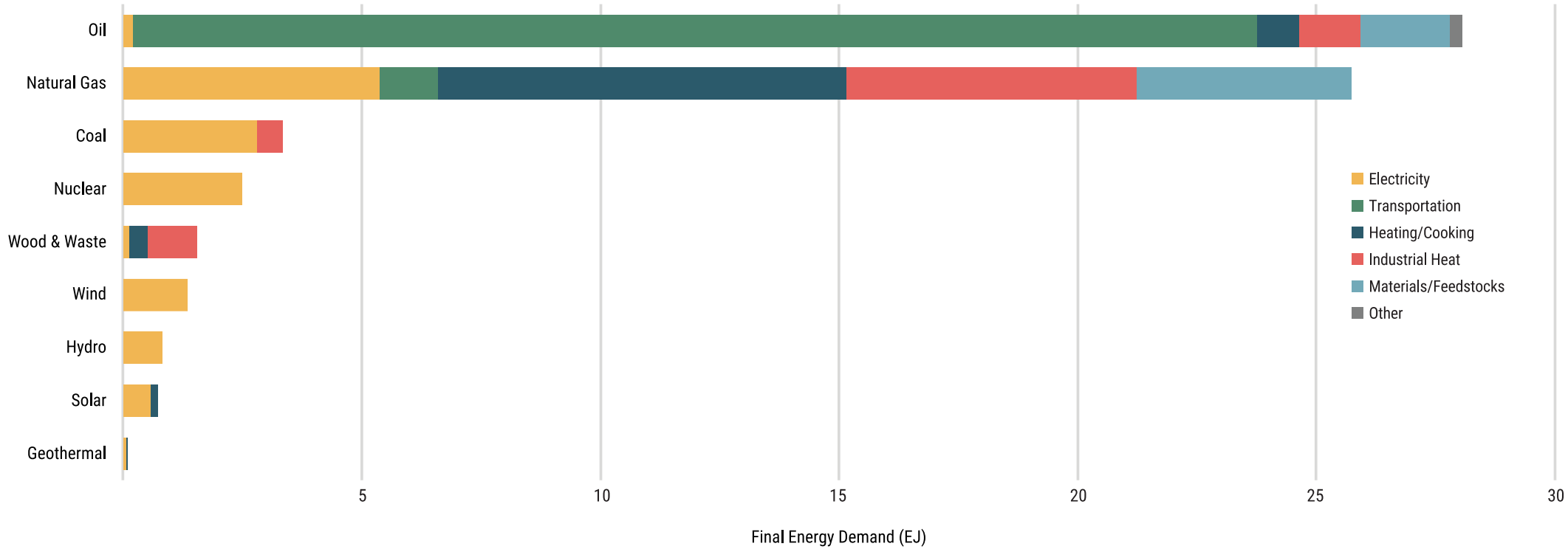
How the U.S. is Energized Today

Figure 1.5

2022 Estimated U.S. Final Energy Demand by Source & Purpose



Source: IEA and Bijou Insights

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Global Oil Demand

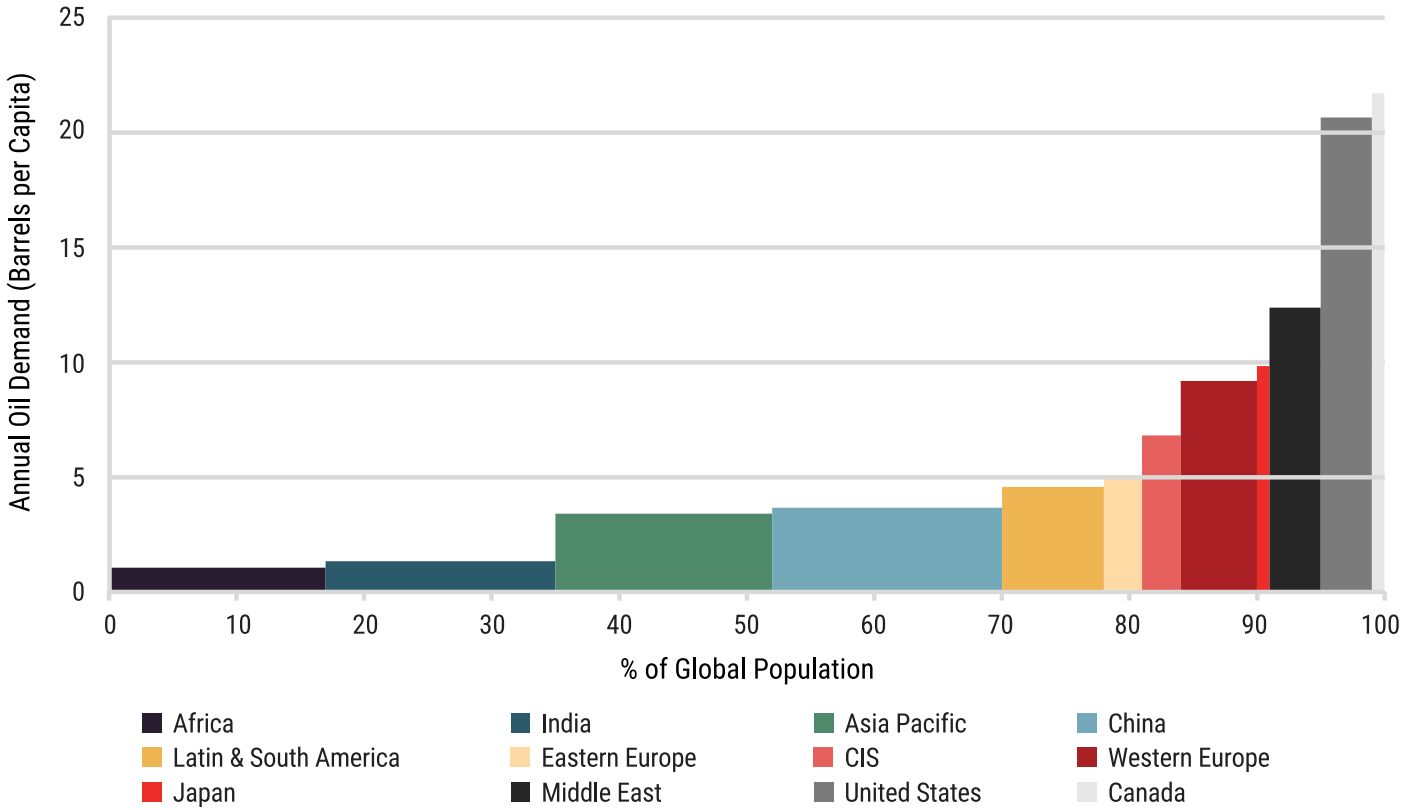
Lucky **one billion** consume **13 barrels of oil per year**.

Other **seven billion** consume **only 3**.

Peak oil?

Figure 3.13

2022 Oil Demand Per Capita



Source: Energy Institute Statistical Review of World Energy, and Bijou insights

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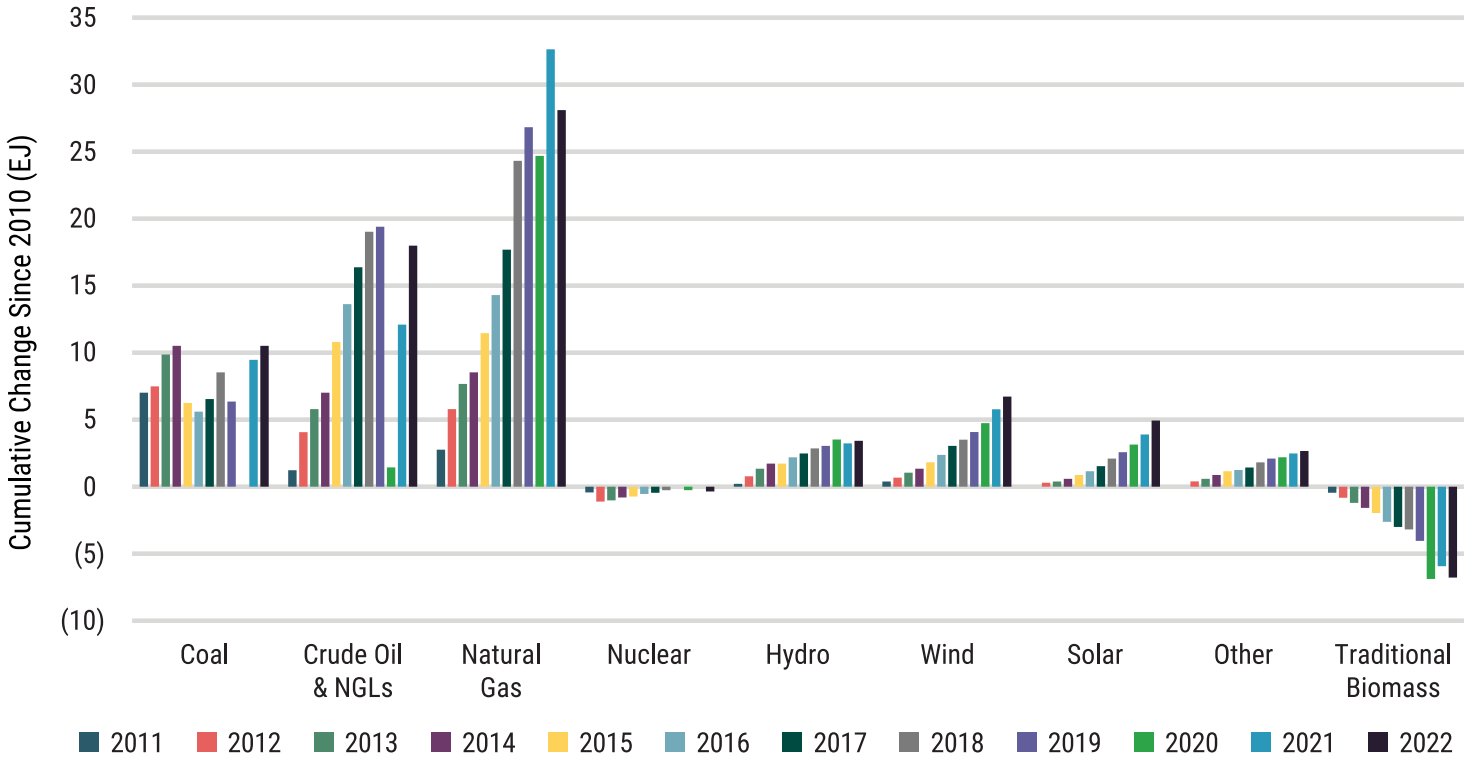
Energy Transition?

In the last 12 years, natural gas, oil, and coal contributed the most additional energy, providing 76% of the growth in energy consumption.

Figure 1.17

World Primary Energy Demand: Cumulative Change by Source



Source: Energy Institute - Statistical Review of World Energy (2023), Vaclav Smil & Bijou Insights

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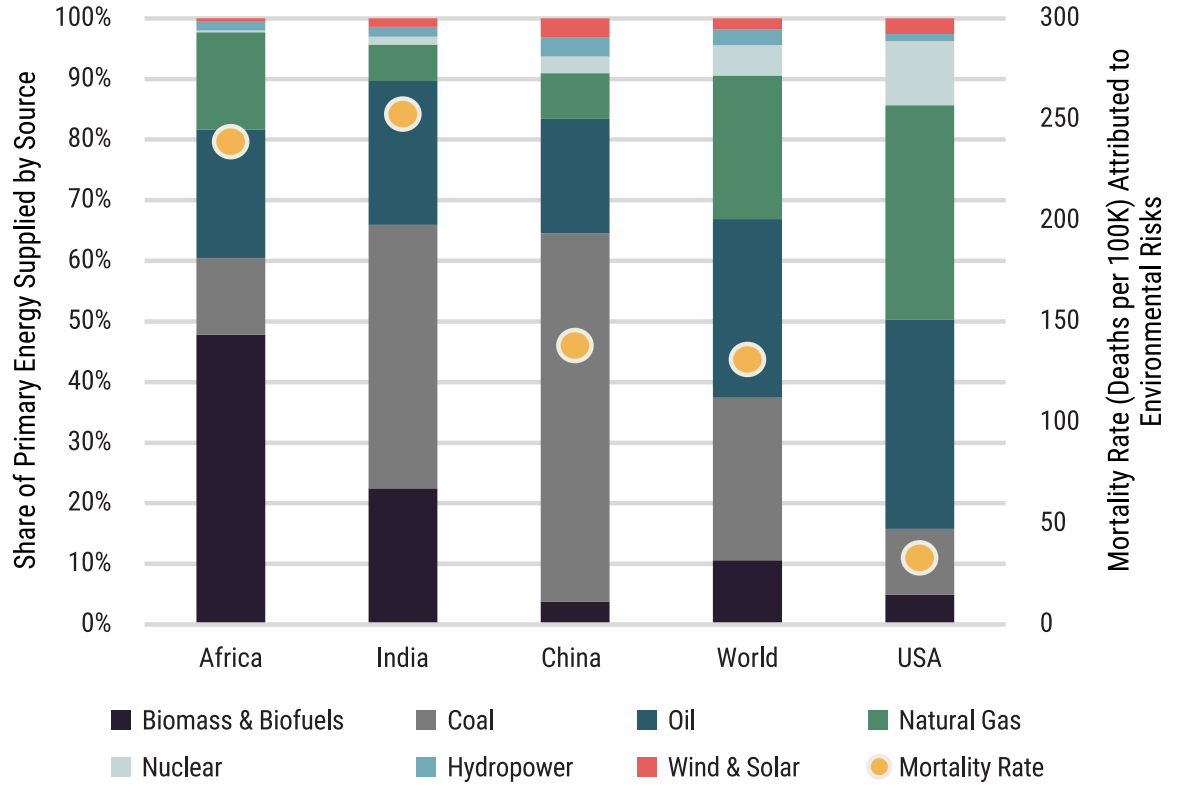
Health & Hydrocarbons

The U.S. energy mix is heavily weighted to the use of oil and gas. Yet, the negative impacts to human health related to environmental risks are among the lowest in the world.

Figure 1.9

Primary Energy Mix vs. Mortality Rate Attributed to Environmental Risks



Source: Bijou Insights analysis based on the most recent data provided by the IEA (World Energy Balances 2022) and IHME (Global Burden of Disease 2019).

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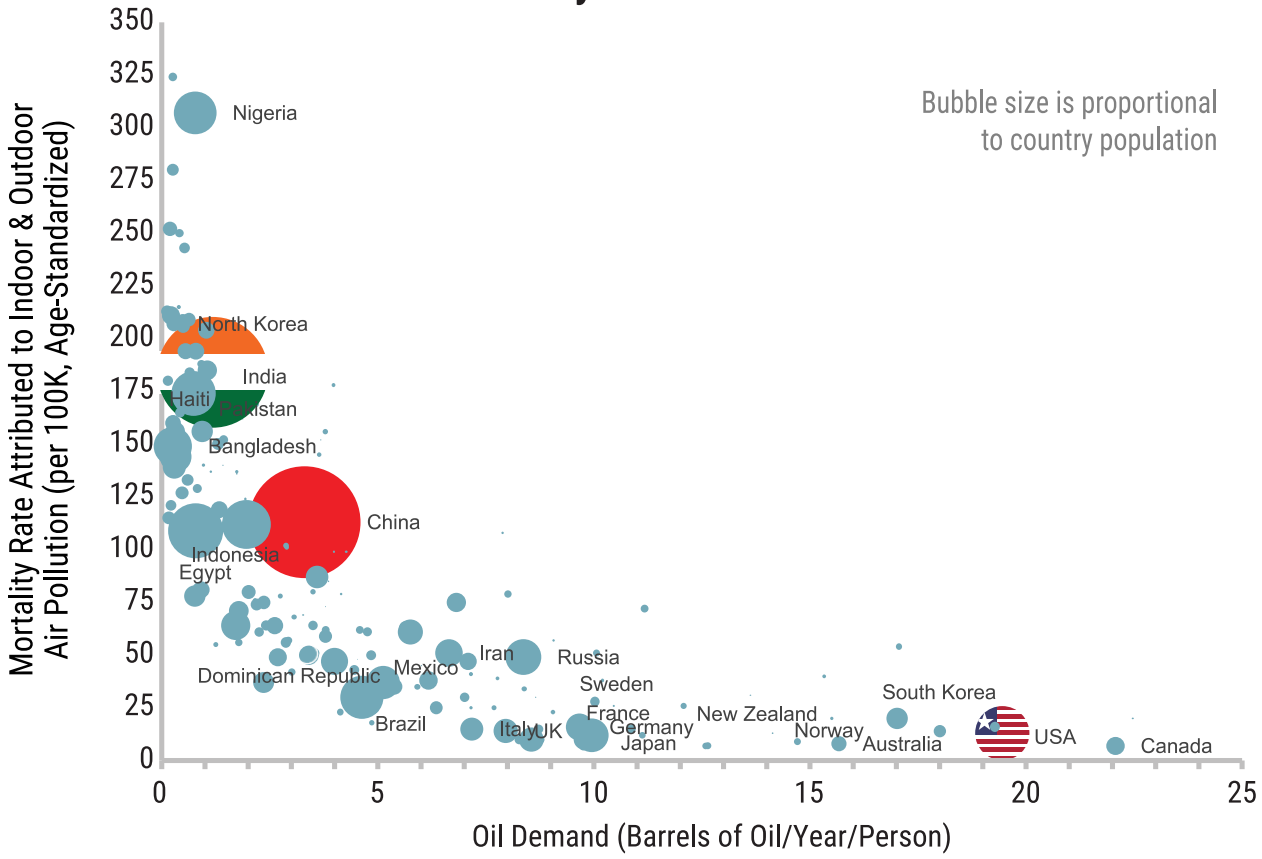
Health & Hydrocarbons

Higher oil and natural gas consumption leads to cleaner air.

Figure 1.10

Oil Demand vs. Mortality Rate Attributed to Air Pollution



Source: Bijou Insights analysis of data from the WHO Global Health Observatory data repository and EIA.

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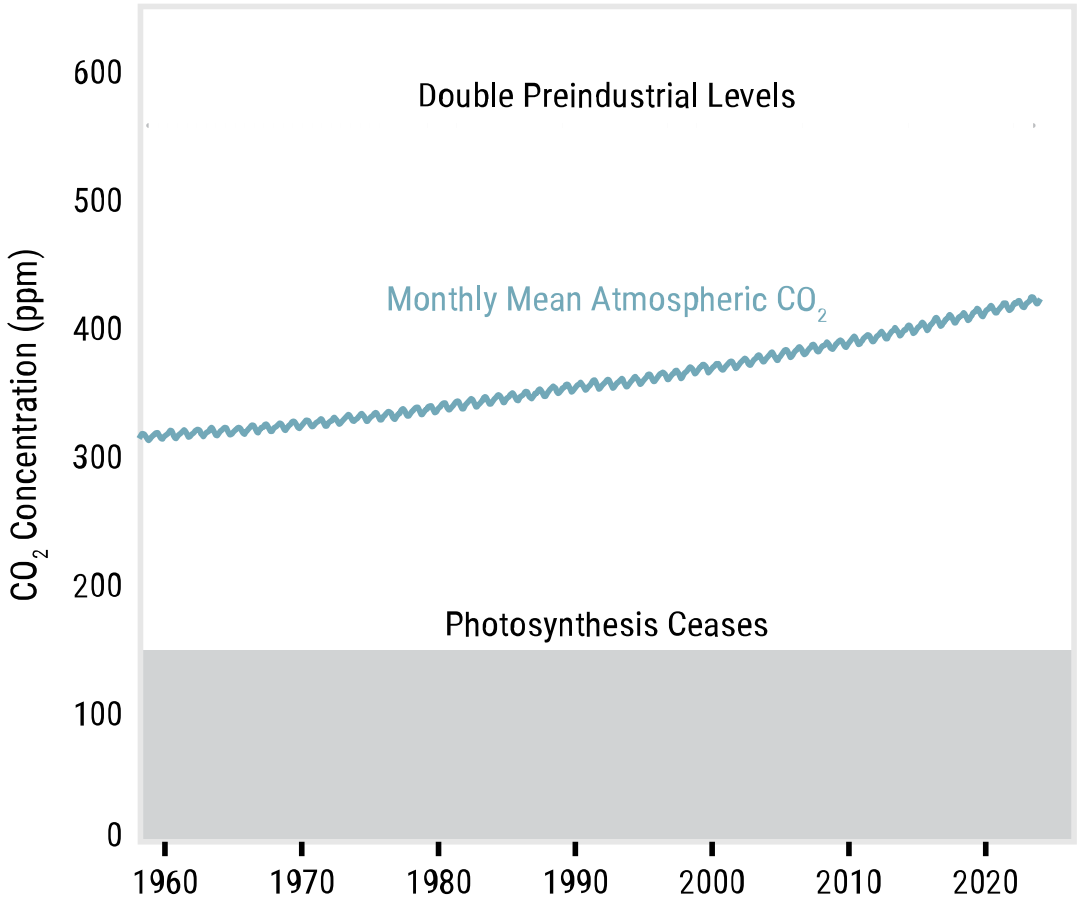
Atmospheric Carbon Dioxide

The hydrocarbon-powered global economic growth since World War II has driven a steady climb in atmospheric CO_2 concentration to slightly above 0.04%.

Figure 4.1

Atmospheric CO_2 at Mauna Loa Observatory



Source: Scripps Institution of Oceanography NOAA Earth System Research Laboratory https://www.e-education.psu.edu/earth103/node/1018

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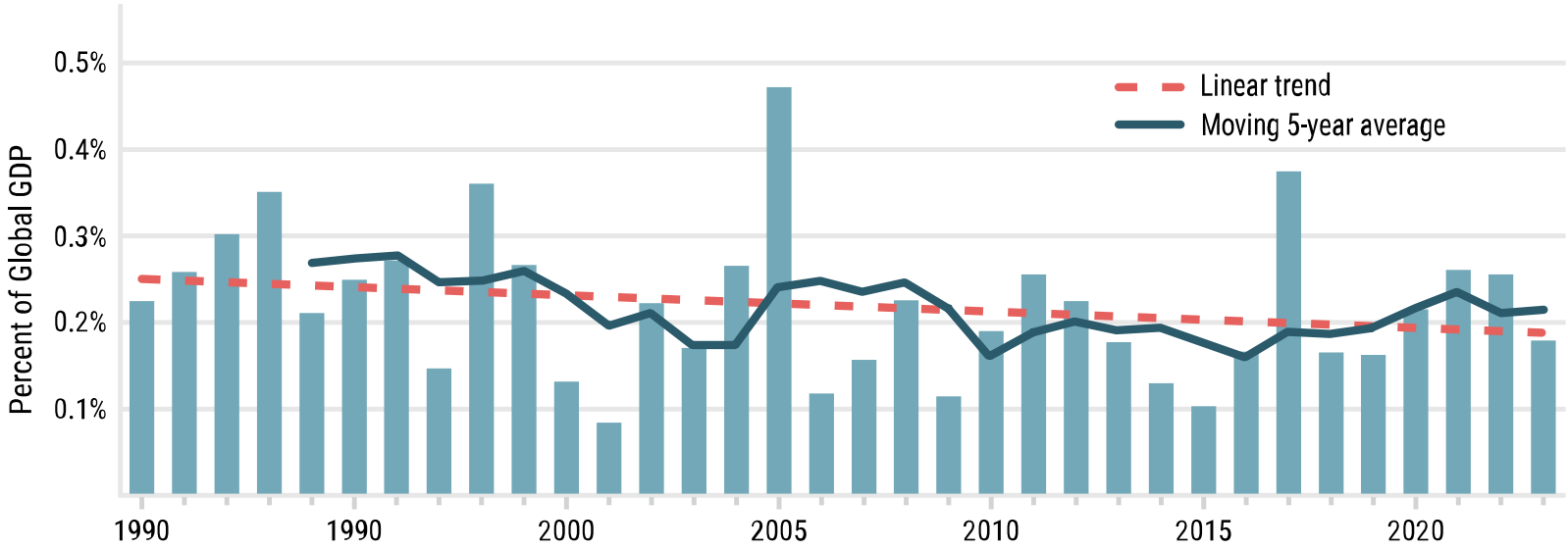
Extreme Weather & Global GDP

Damages from extreme weather events as a percentage of global GDP have declined by roughly 20% over the last three decades.

Figure 4.14

Global Weather Disaster Losses as Percent of Global GDP 1990–2023



Source: Roger Pielke, Jr., Munch RE, 2023, NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2024).

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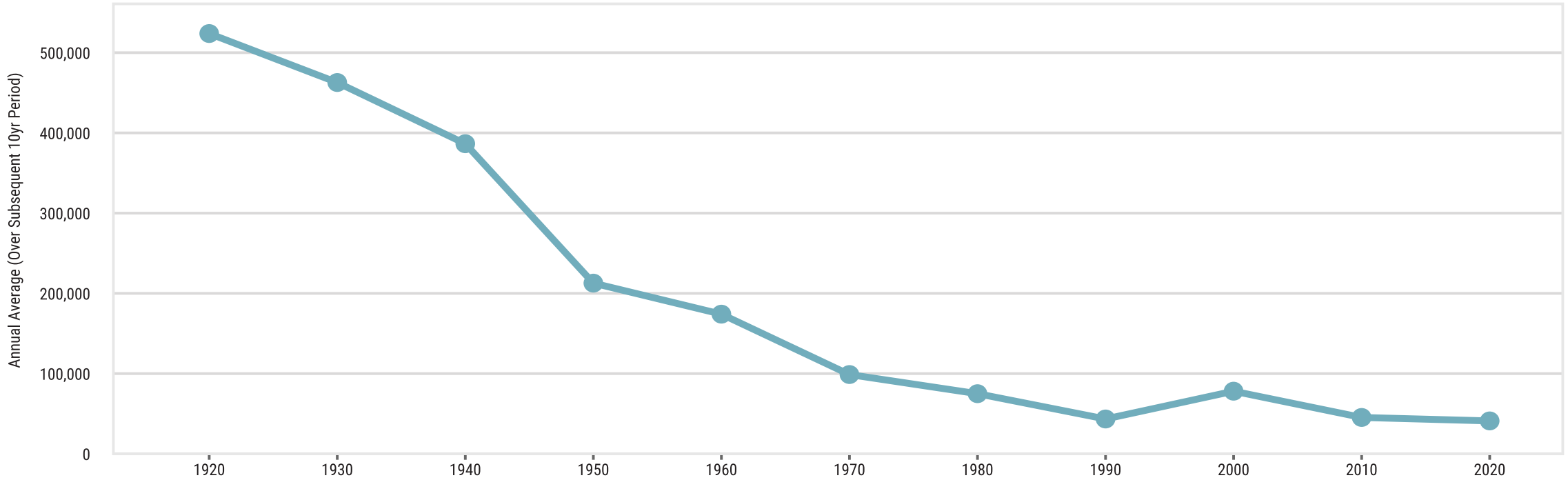
Large Downward Trend of Severe Weather Deaths

Figure 4.16

Global Deaths from Severe Weather 1920–2020



Source: “EM-DAT: The International Disasters Database.” EM-DAT, Centre for Research on the Epidemiology of Disasters (CRED). ; Lomborg, Bjorn. “Welfare in the 21st Century: Increasing Development, Reducing Inequality, the Impact of Climate Change, and the Cost of Climate Policies.” Technological Forecasting and Social Change, North-Holland, 24 Apr. 2020.

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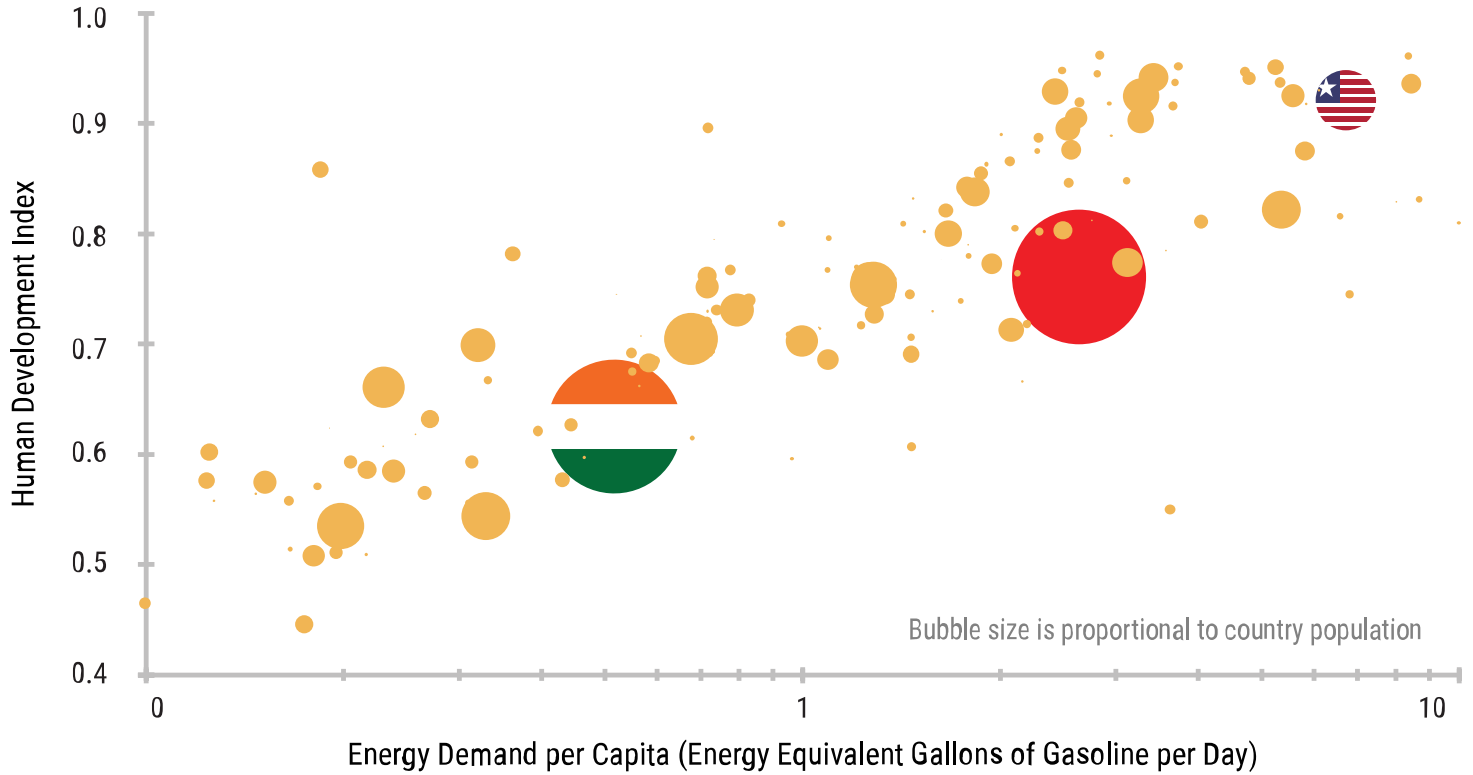
Energy & HDI

Higher HDI scores go hand in hand with higher energy consumption

Figure 3.9

2021 HDI vs. Primary Energy Demand per Capita



Source: United Nations, EIA, and Bijou Insights

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World's Biggest (Fixable) Problems

- Malnutrition
- Basic healthcare
- Indoor air pollution
- Outdoor air pollution
- Universal education
- Rule of law and property rights (human liberty)

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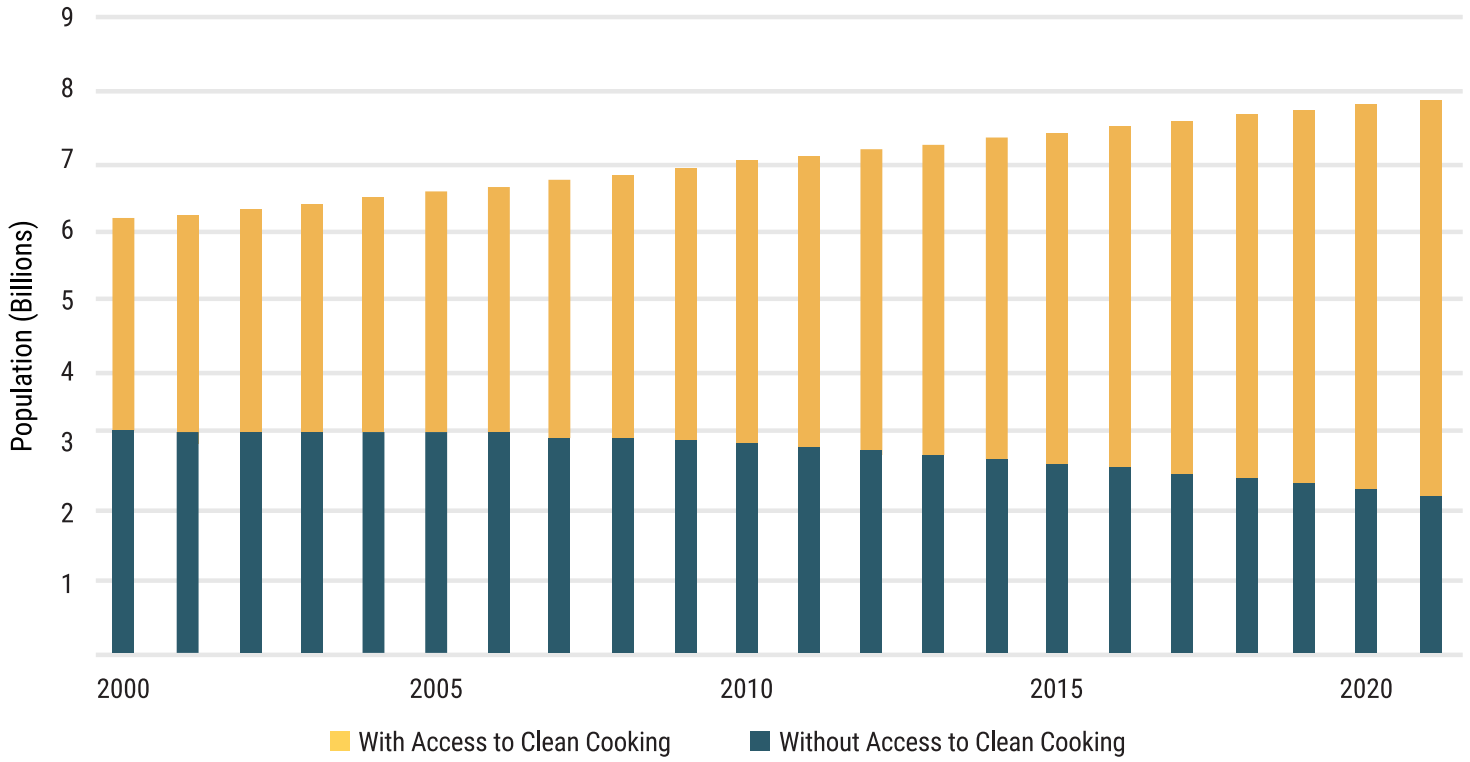
Clean Cooking Access

Almost one-third of humanity still lack access to clean cooking fuel, including 82% in Sub-Saharan Africa and nearly 30% of Indians.

Figure 3.2

People in the World With & Without Access to Clean Cooking 2000–2021

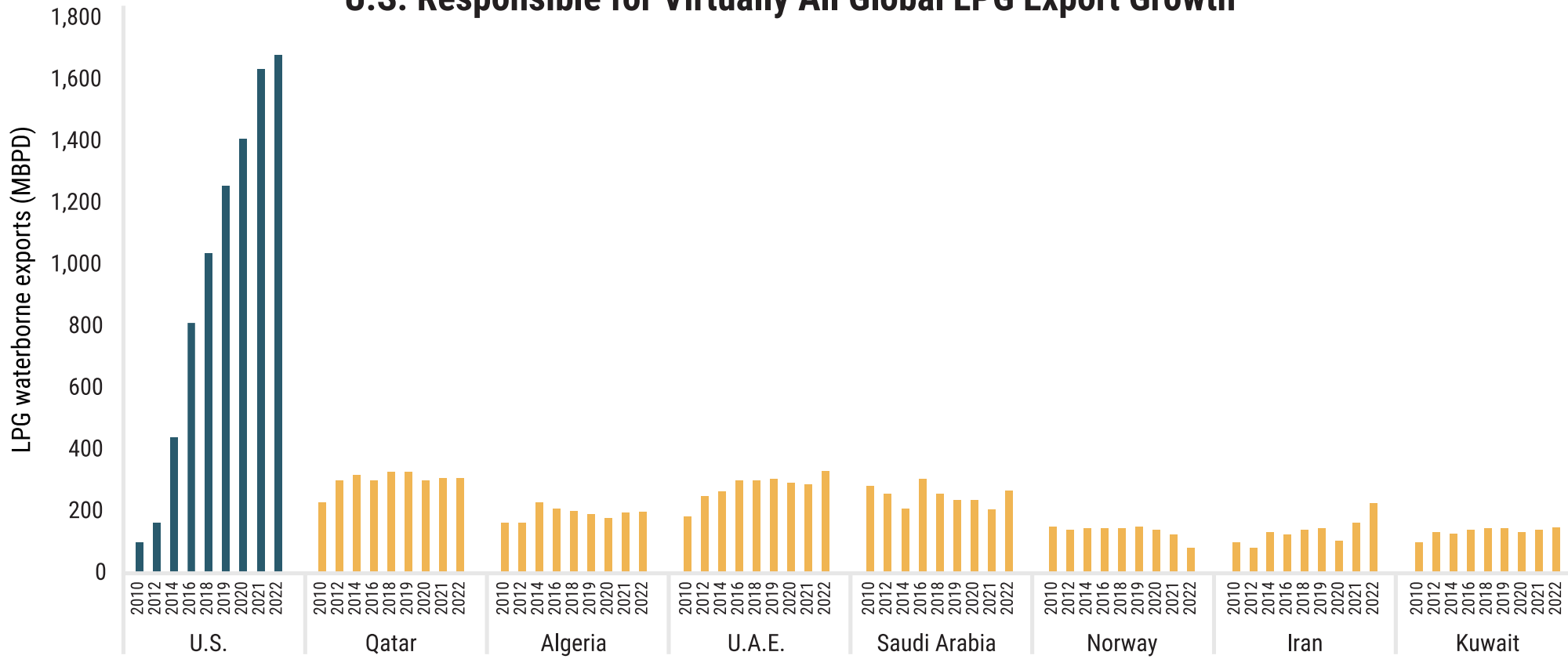


Source: World Bank, United Nations Sustainable Development Goals Report, 2022

Shale Revolution Increasing LPG Production

Figure 3.12

U.S. Responsible for Virtually All Global LPG Export Growth



Source: IEA and IHS Waterborne, Enterprise Product Partners, Investor Deck, December 2023

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Bettering Human Lives
Foundation

One third of humanity – 2.3 billion people – prepare meals over open fires or polluting stoves.

BHLF directly supports local innovators & entrepreneurs to start and grow their businesses.

Together, we are committed to **providing a pathway out of poverty through access to modern energy that betters human lives**.

Read Liberty Energy's 2024
Bettering Human Lives report

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