Gaskins Center: Inaugural Event

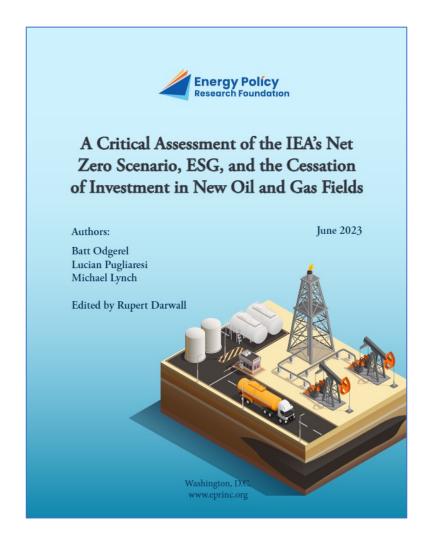
Net Zero and Energy Security, What We Know So Far

Batt Odgerel July 18, 2023





Our New Report



- Examines feasibility of IEA's assumptions behind its Net Zero by 2050 scenario and its implications for oil and gas production, energy prices, and the global economy and development.
- https://eprinc.org/a-critical-assessment-of-the-ieas-net-zero-scenario-esg-and-the-cessation-of-investment-in-new-oil-and-gas-fields/

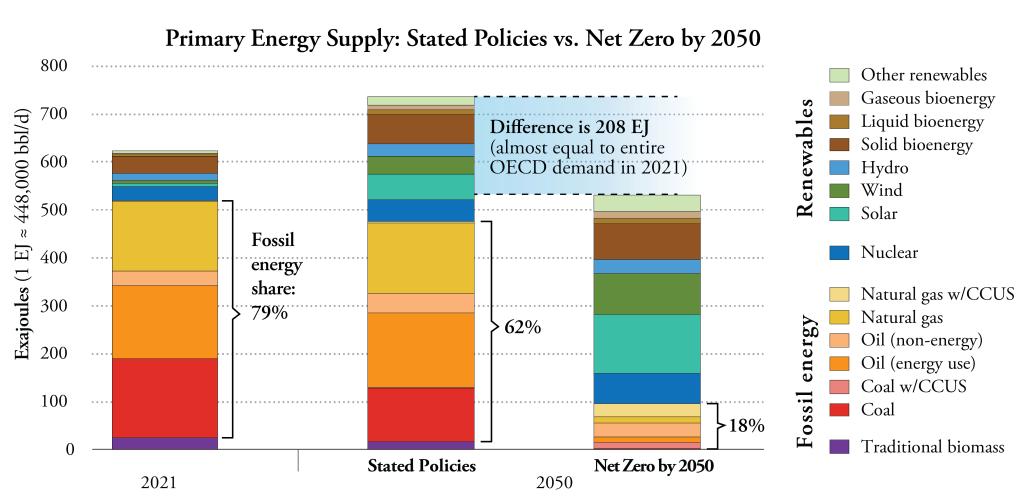


IEA Net Zero Scenario (NZE)

- "Reaching net-zero emissions globally by 2050 is a critical and formidable goal."
 - IEA, Net Zero by 2050 Report: Summary for Policy Makers
- "No fossil fuel exploration is required in the [Net Zero Scenario] as no new oil and natural gas fields are required beyond those that have already been approved for development."
 - IEA, Net Zero by 2050, p. 160



Primary Energy Supply Equal to OECD Demand Must Be Removed by 2050

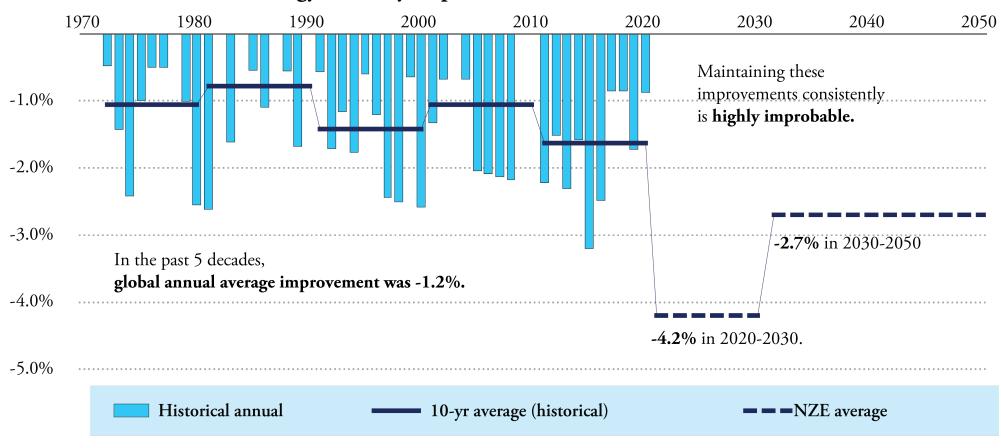


Source: Energy Policy Research, IEA World Energy Outlook 2022



Historical Rate of Annual Energy-Intensity Improvements Must Triple Throughout Next Decade

Global Energy Intensity Improvements: Historical vs. IEA's Net Zero Scenario

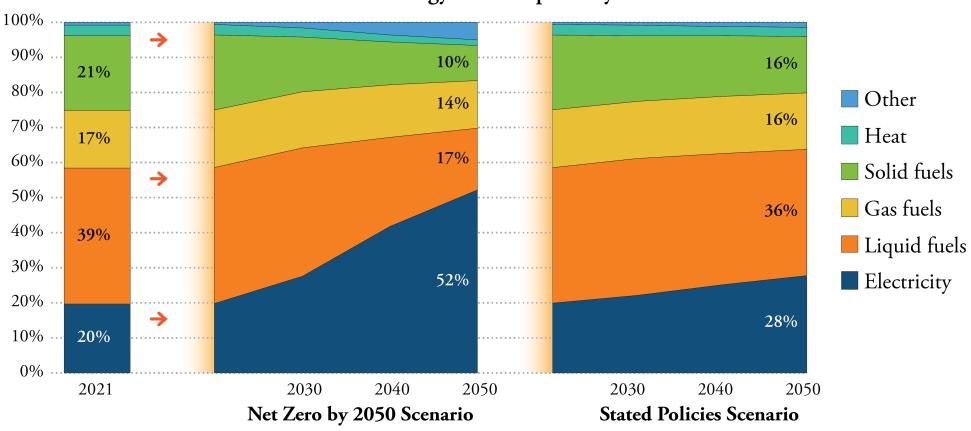


Source: Energy Policy Research, IEA World Energy Balances database Note: Primary energy / GDP (2019 USD PPP) is used for the calculation.



Electricity Share in Global Final Energy Consumption Rises From 20% in 2021 to 50% n 2050

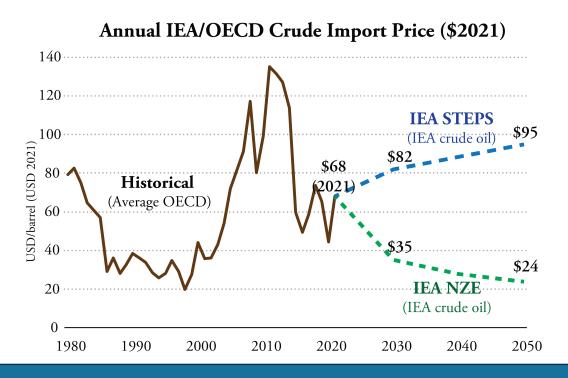
Share of Global Final Energy Consumption by Fuel Form

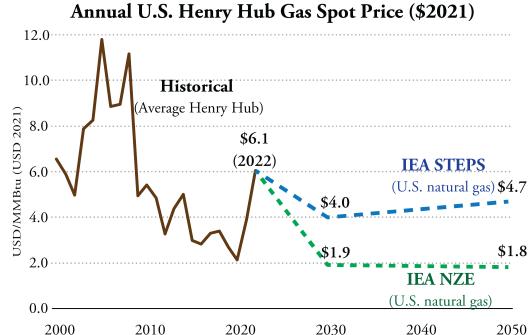


Source: Energy Policy Research, IEA World Energy Outlook 2022



Oil and Gas Prices According to IEA

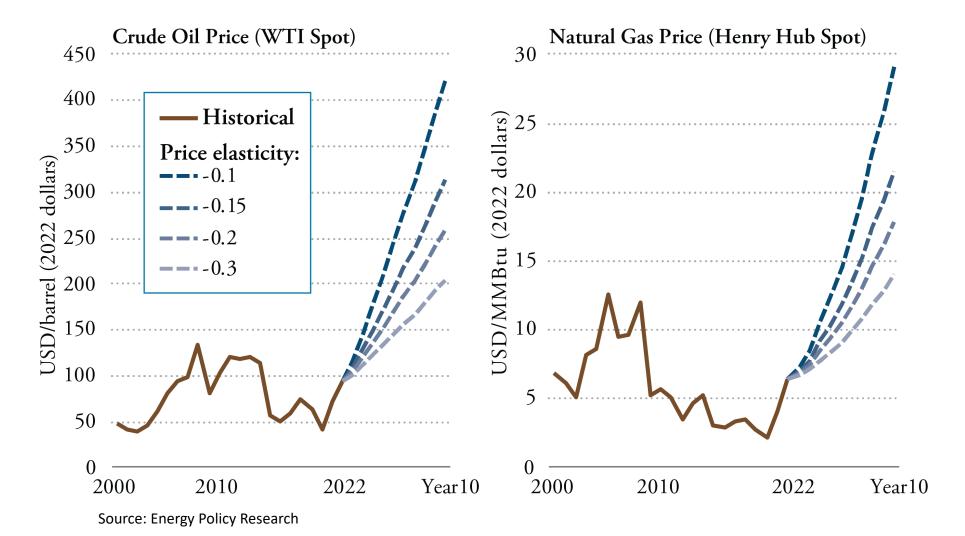




"If supply were to transition faster than demand, with a drop in fossil fuel investment preceding a surge in clean energy technologies, this would lead to much higher prices—possibly for a prolonged period—even if the world moves towards net zero emissions." (IEA, WEO–2022, p. 134)



More Likely NZE Oil and Gas Prices Based on Historical Price Elasticities of Demand

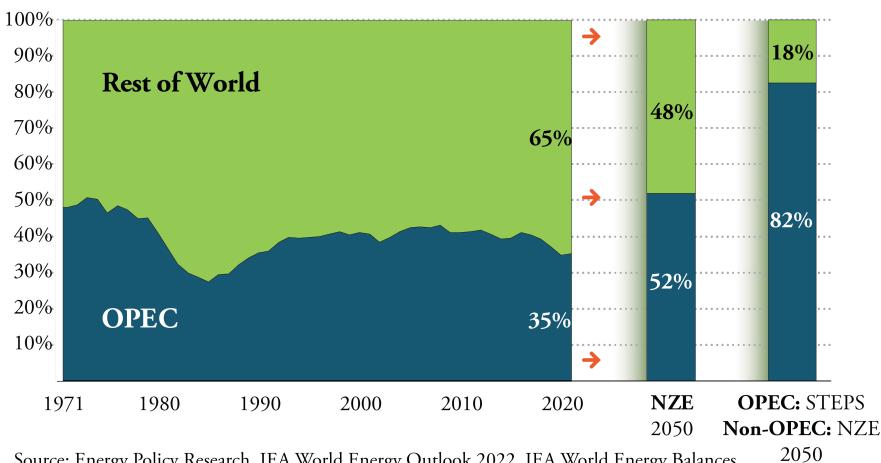


The price elasticity of demand is the ratio of the percentage change in quantity to the percentage change in price. (umn.edu)



Oil Supply Concentration Under Net Zero

OPEC Share of Global Oil Production

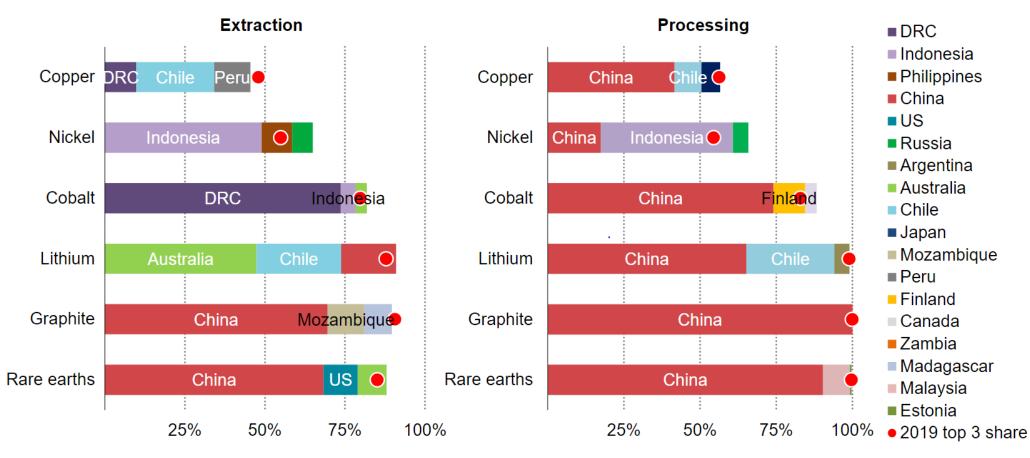


Source: Energy Policy Research, IEA World Energy Outlook 2022, IEA World Energy Balances



Critical Mineral Concentration

Share of Top 3 Countries for Selected Minerals (2022)



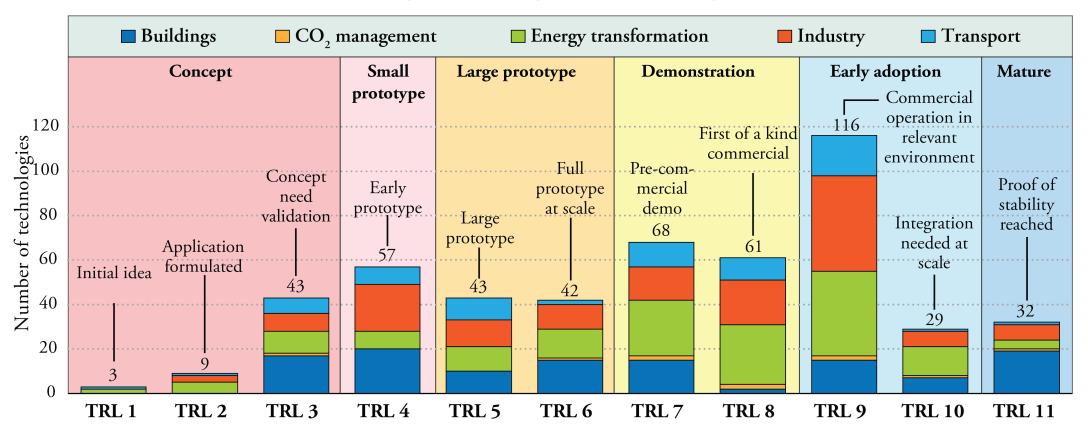
Sources: IEA Report Critical Minerals Market Review 2023

IEA. CC BY 4.0.

IEA: "About half of the emissions reductions in 2050 come from technologies at prototype or demonstration stages today."



500 Clean Energy Technologies by Technology Readiness Level

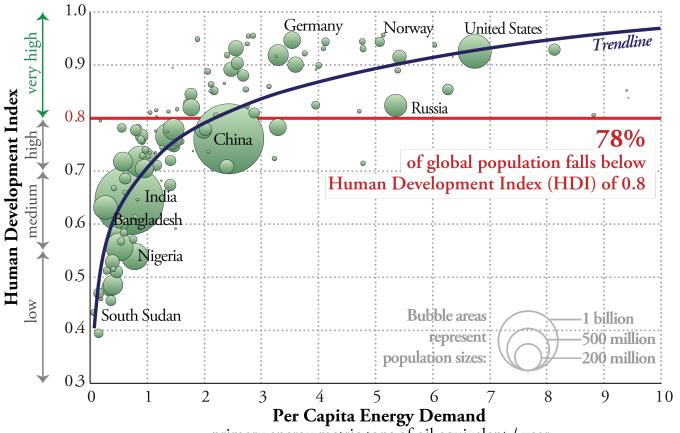


Source: Enery Policy Research, IEA ETP Clean Energy Technology Guide



IEA: "All countries co-operate towards achieving net zero emissions worldwide."

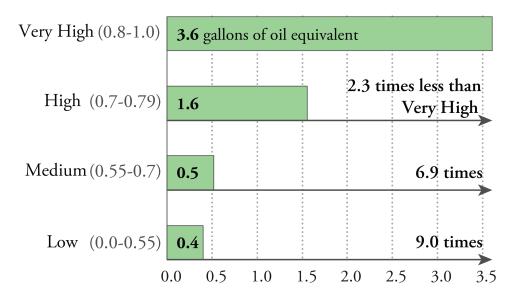
Per Capita Energy Demand and Human Development Index (2019)



primary energy metric tons of oil equivalent / year

Source: Energy Policy Research, IEA, UN

Daily per Capita Energy Demand by HDI (2019)





Do Policy Makers Understand the Consequences of the

Net Zero Energy Transition2

Energy security

- Dependency on few suppliers
- Compromised energy systems with less diversity
- Vulnerability price fluctuations
- Threat to resilience & reliability

Development

- Reduced feedstocks for petrochemicals & fertilizers
- Reduced revenues from oil & gas production
- Increased energy poverty

Macroeconomy

- Prolonged high energy & technology costs
- Inflationary pressures
- Economic slowdown
- Shrinking national wealth
- Job losses at scale

Impacts of Net Zero and No New Investment in Oil & Gas Fields

Oil & gas supply shock

Non-substitutability by renewables

Innovation

- Practically halting innovation in oil & gas (eg, hydraulic fracturing)
- Reductions in energy RD&D by oil & gas companies

Society

- Social disorder
- Economic instability
- Social inequality (greater impact on low-income households)
- Conflicts over land permit with local communities

Environment/health

- No coal-to-gas switching to reduce air pollution
- Chance of reverting back to cheaper priced coal
- Effects of excessive mining of key metals (water, health)
- Destruction of forests

Source: Energy Policy Research