

**Gaskins Center: Inaugural Event**

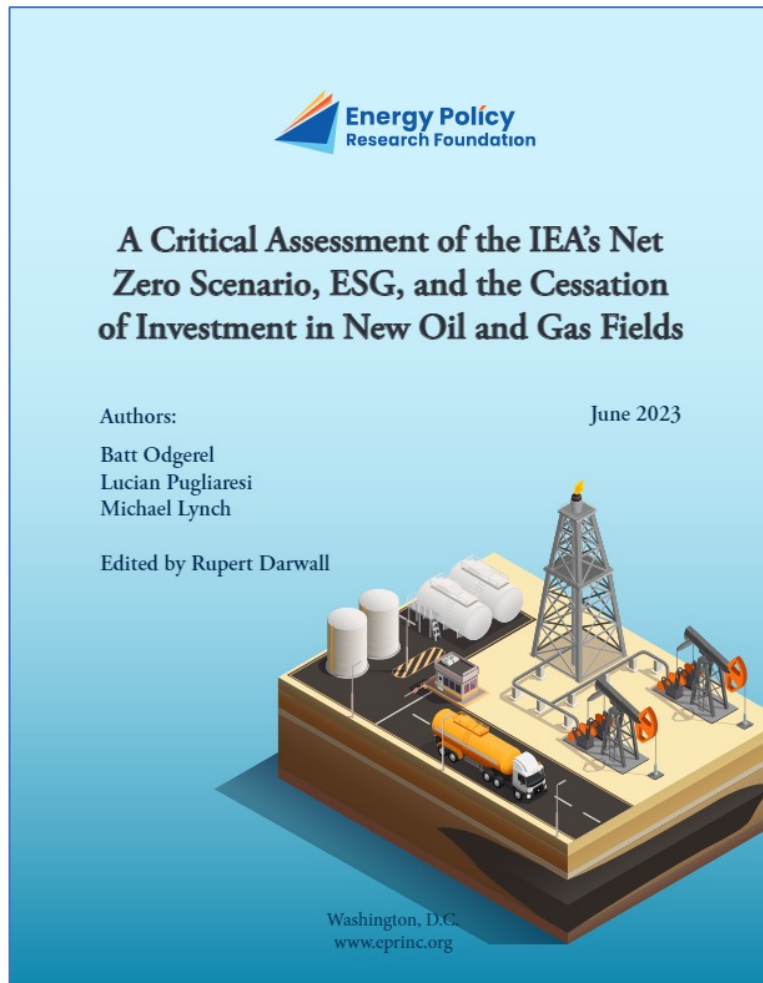
**Net Zero and Energy Security,  
What We Know So Far**

Batt Odgerel

July 18, 2023



# Our New Report



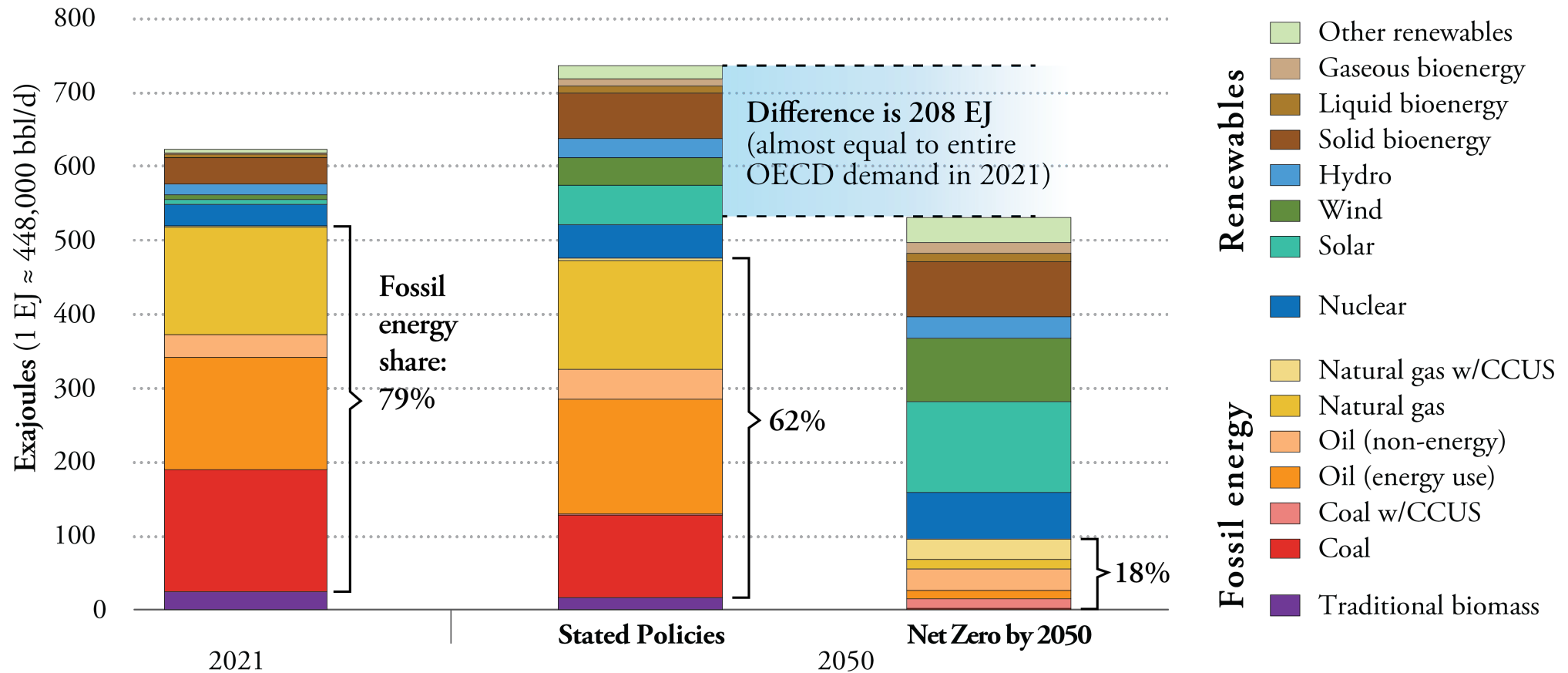
- Examines feasibility of IEA's assumptions behind its Net Zero by 2050 scenario and its implications for oil and gas production, energy prices, and the global economy and development.
- <https://eprinc.org/a-critical-assessment-of-the-ieas-net-zero-scenario-esg-and-the-cessation-of-investment-in-new-oil-and-gas-fields/>

## 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

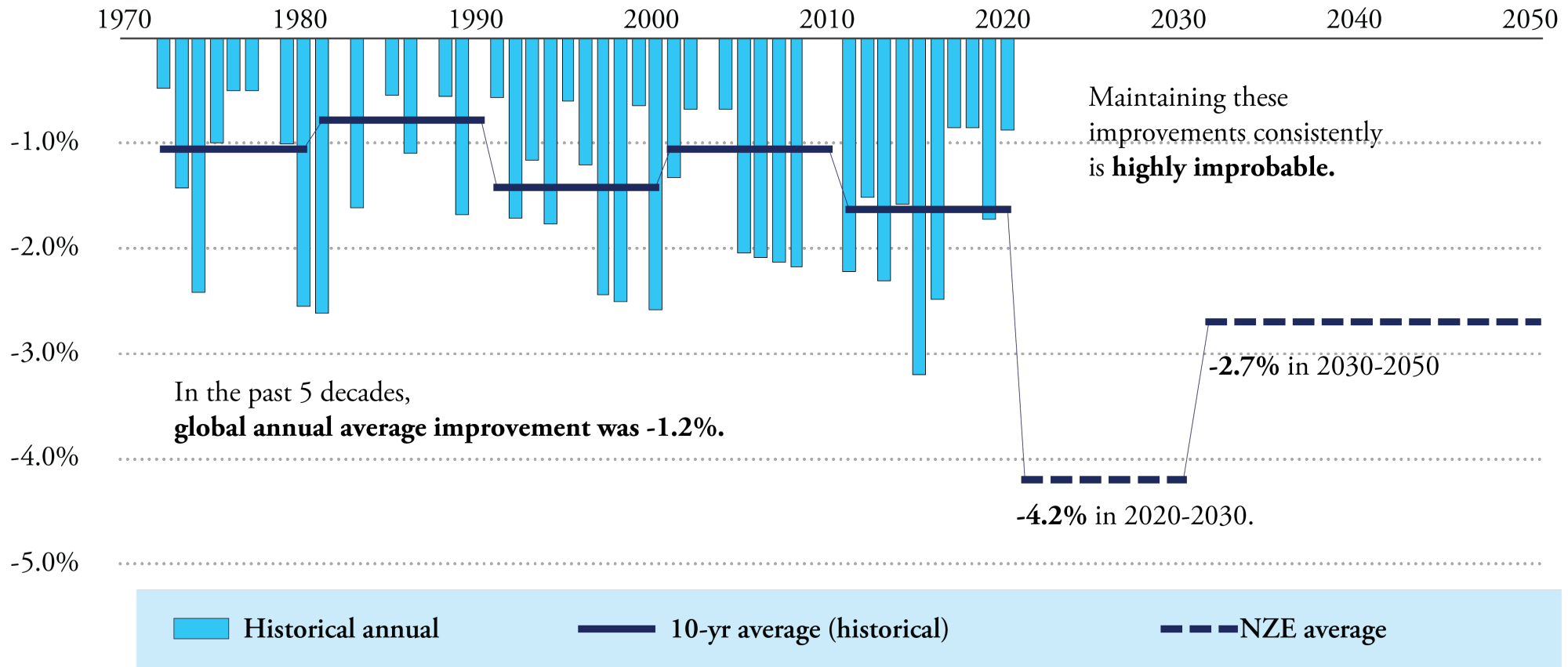
## Primary Energy Supply: Stated Policies vs. Net Zero by 2050



Source: Energy Policy Research, IEA World Energy Outlook 2022

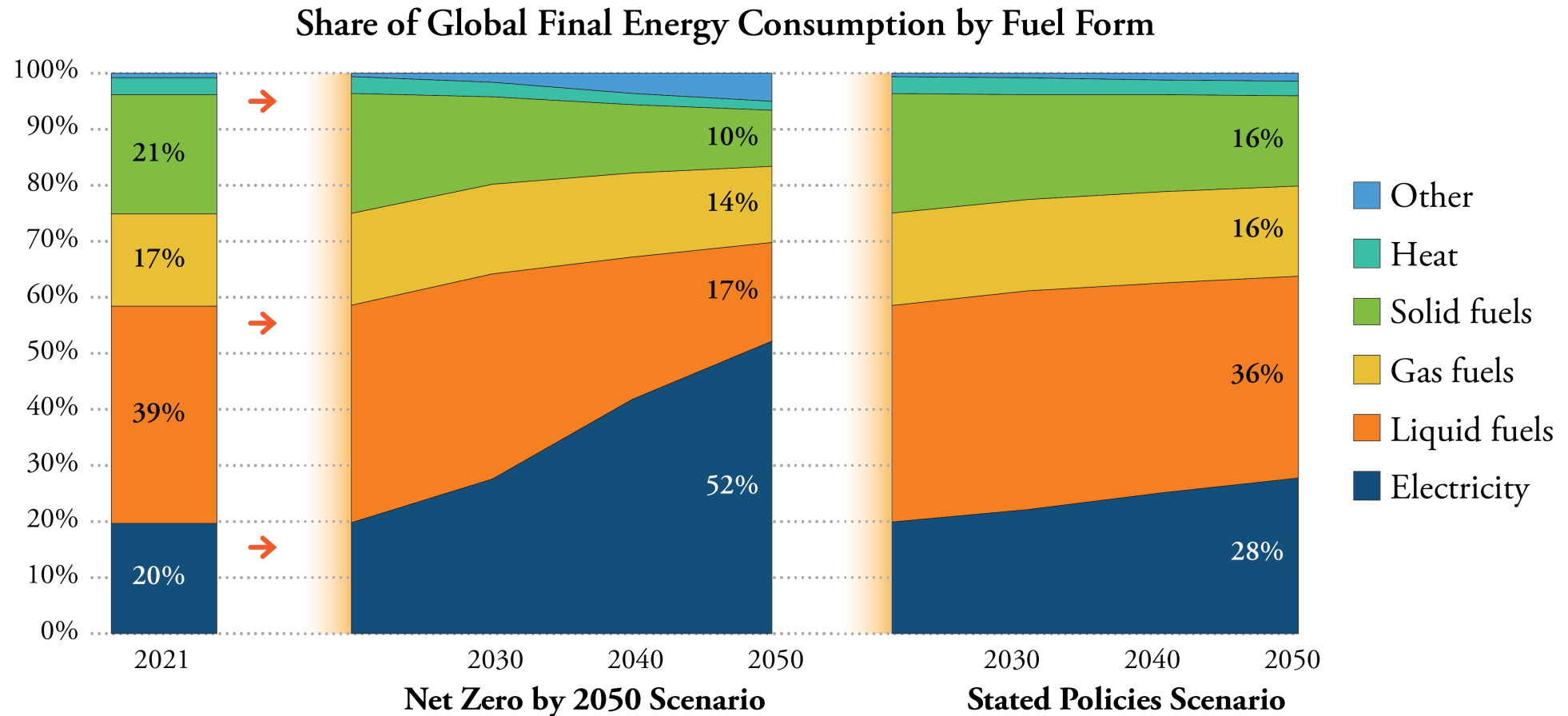
# Historical Rate of Annual Energy-Intensity Improvements Must Triple Throughout Next Decade

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



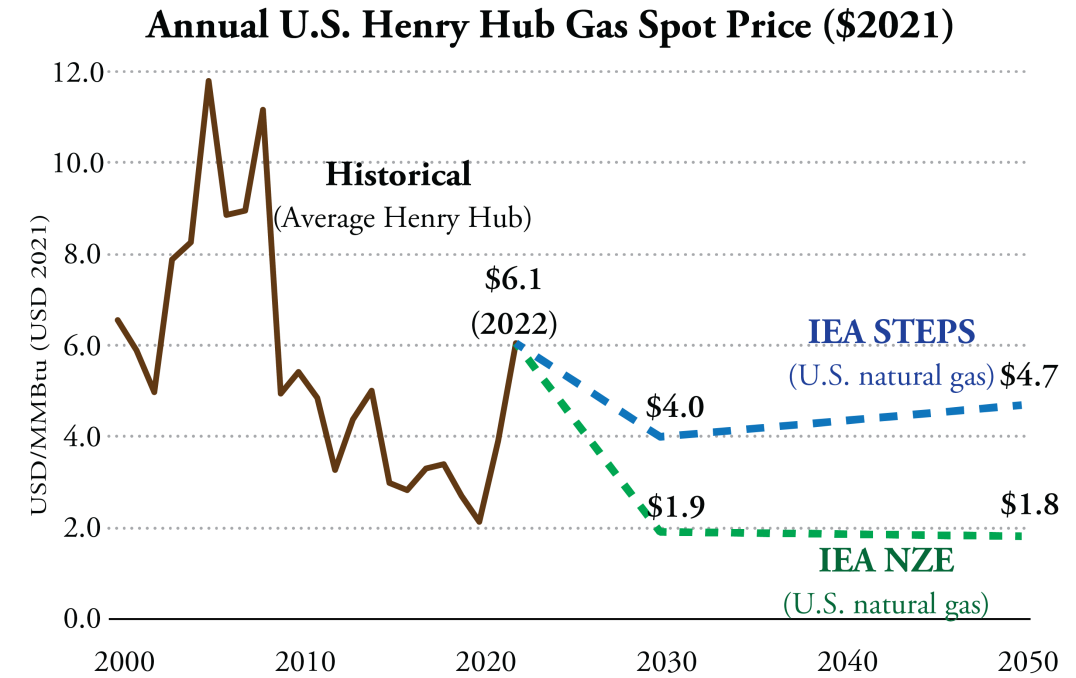
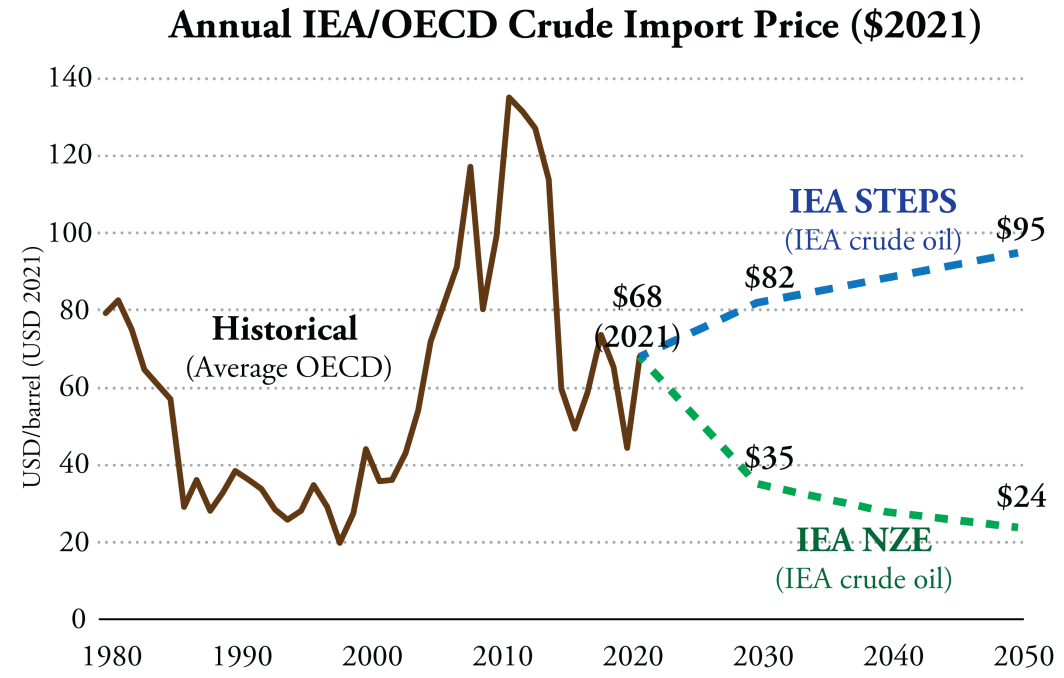
Source: Energy Policy Research, IEA World Energy Balances database  
 Note: Primary energy / GDP (2019 USD PPP) is used for the calculation.

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



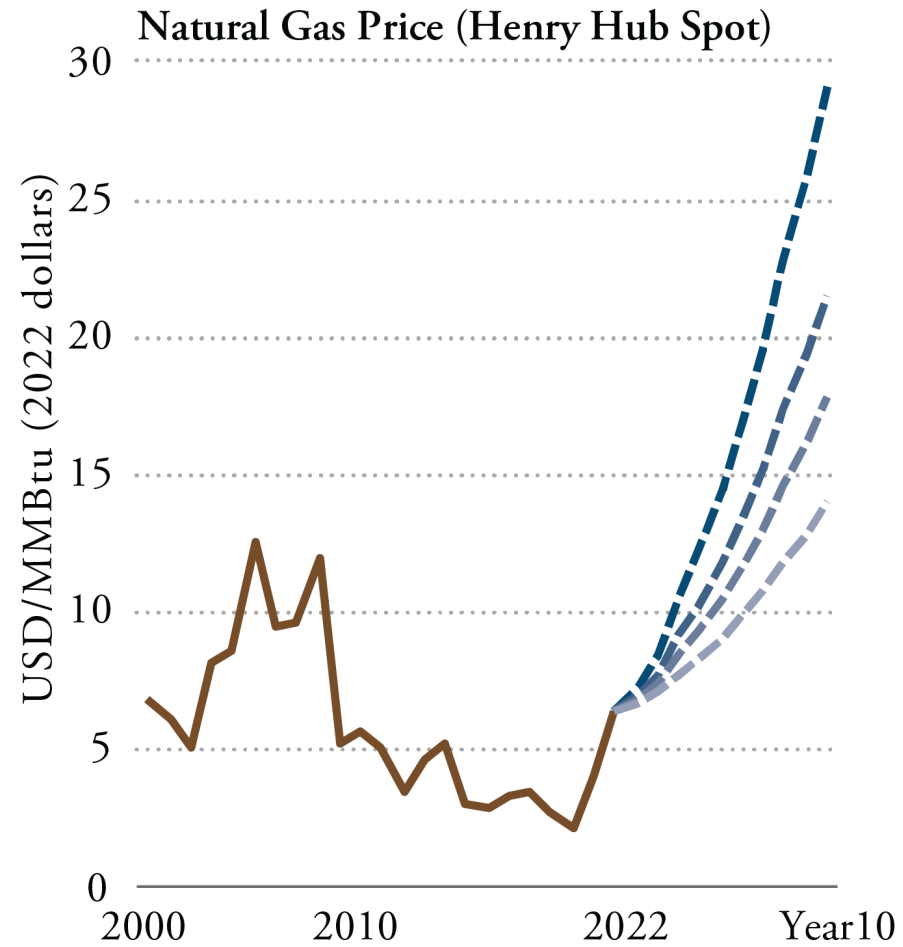
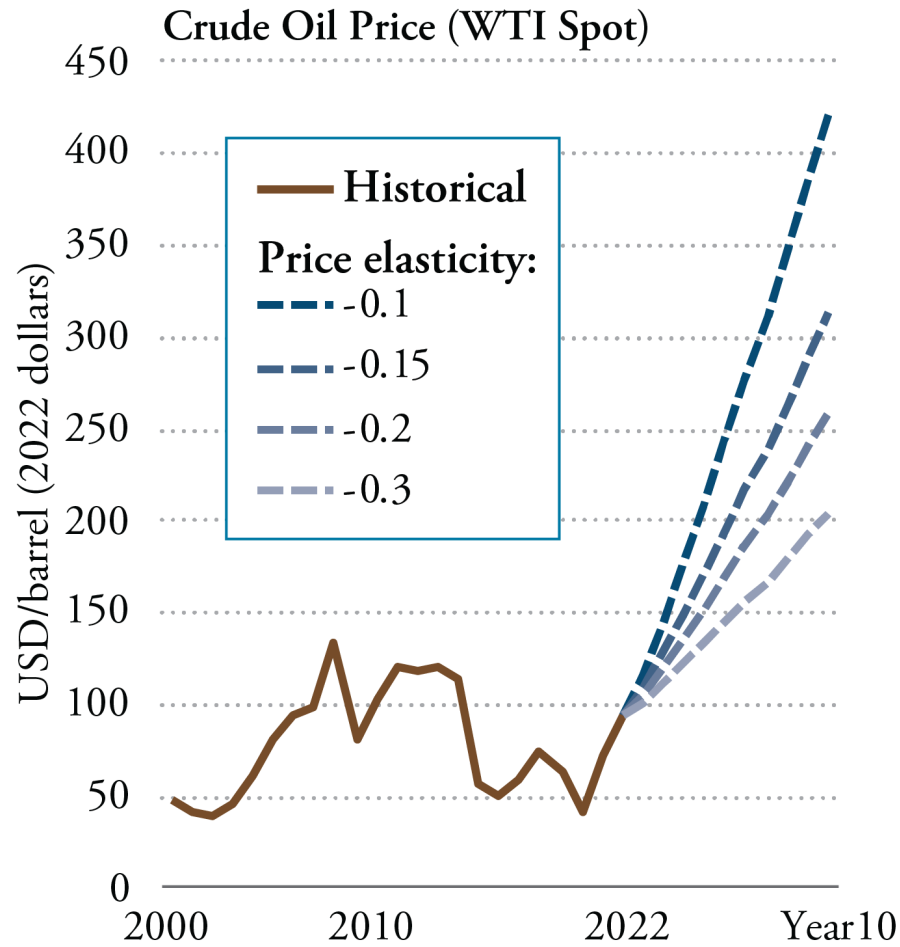
Source: Energy Policy Research, IEA World Energy Outlook 2022

# 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



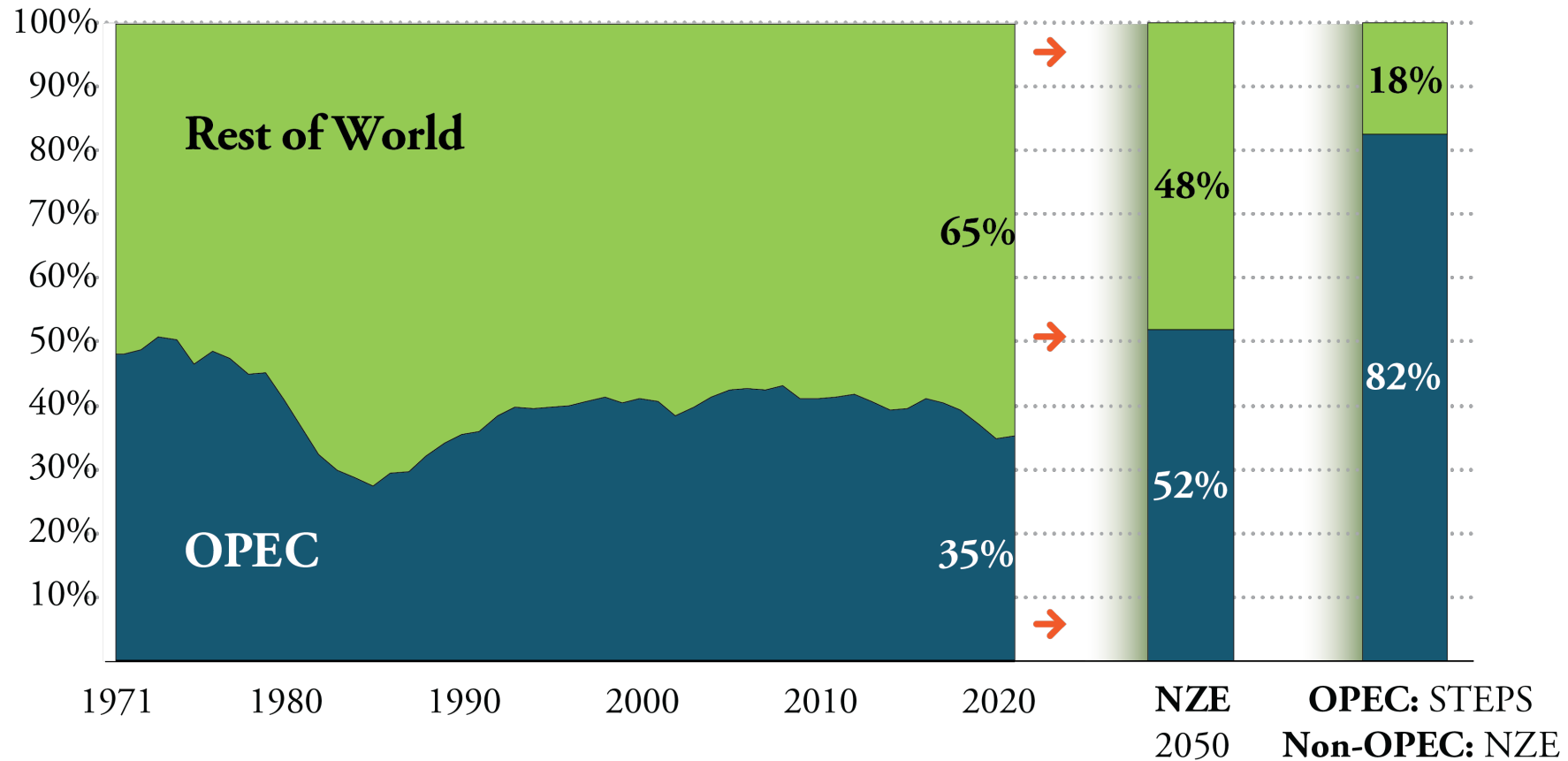
The price elasticity of demand is the ratio of the percentage change in quantity to the percentage change in price. (umn.edu)

Source: Energy Policy Research



# Oil Supply Concentration Under Net Zero

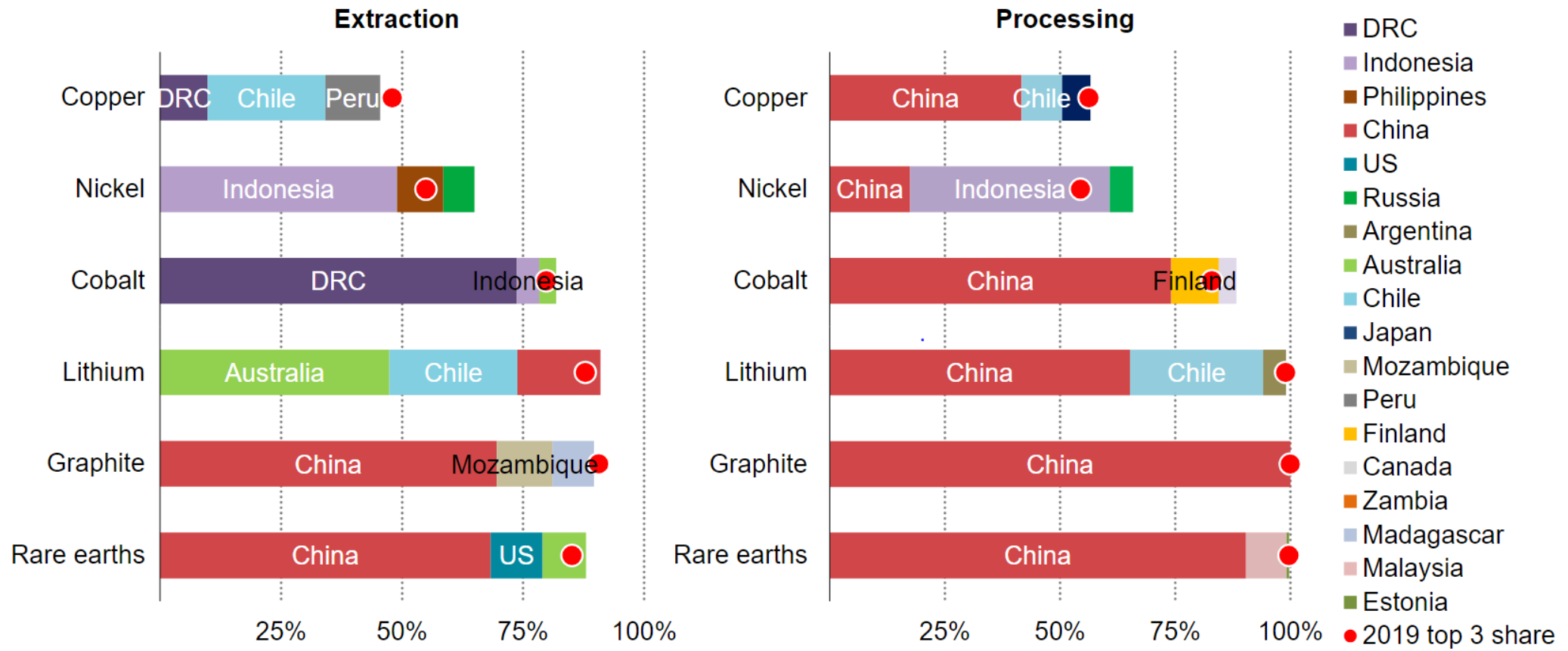
## OPEC Share of Global Oil Production



Source: Energy Policy Research, IEA World Energy Outlook 2022, IEA World Energy Balances 2050

# Critical Mineral Concentration

## Share of Top 3 Countries for Selected Minerals (2022)

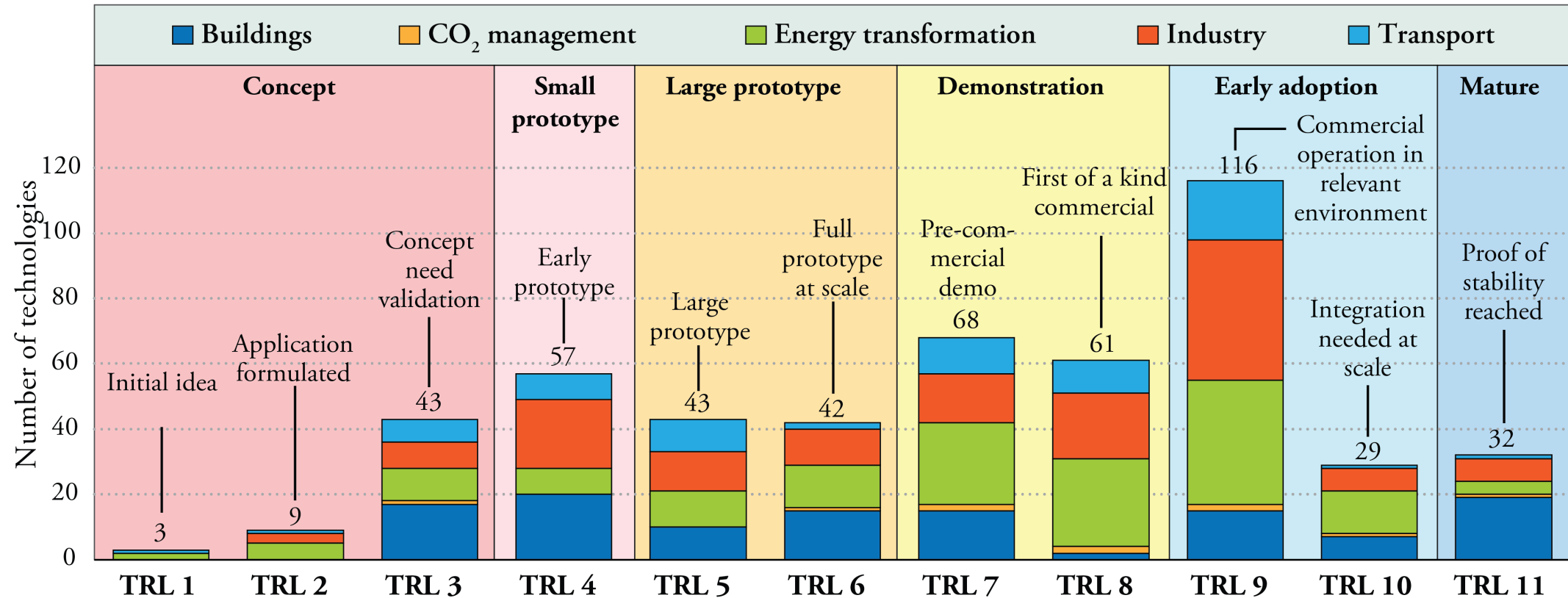


Sources: IEA Report *Critical Minerals Market Review 2023*

IEA. CC BY 4.0.

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

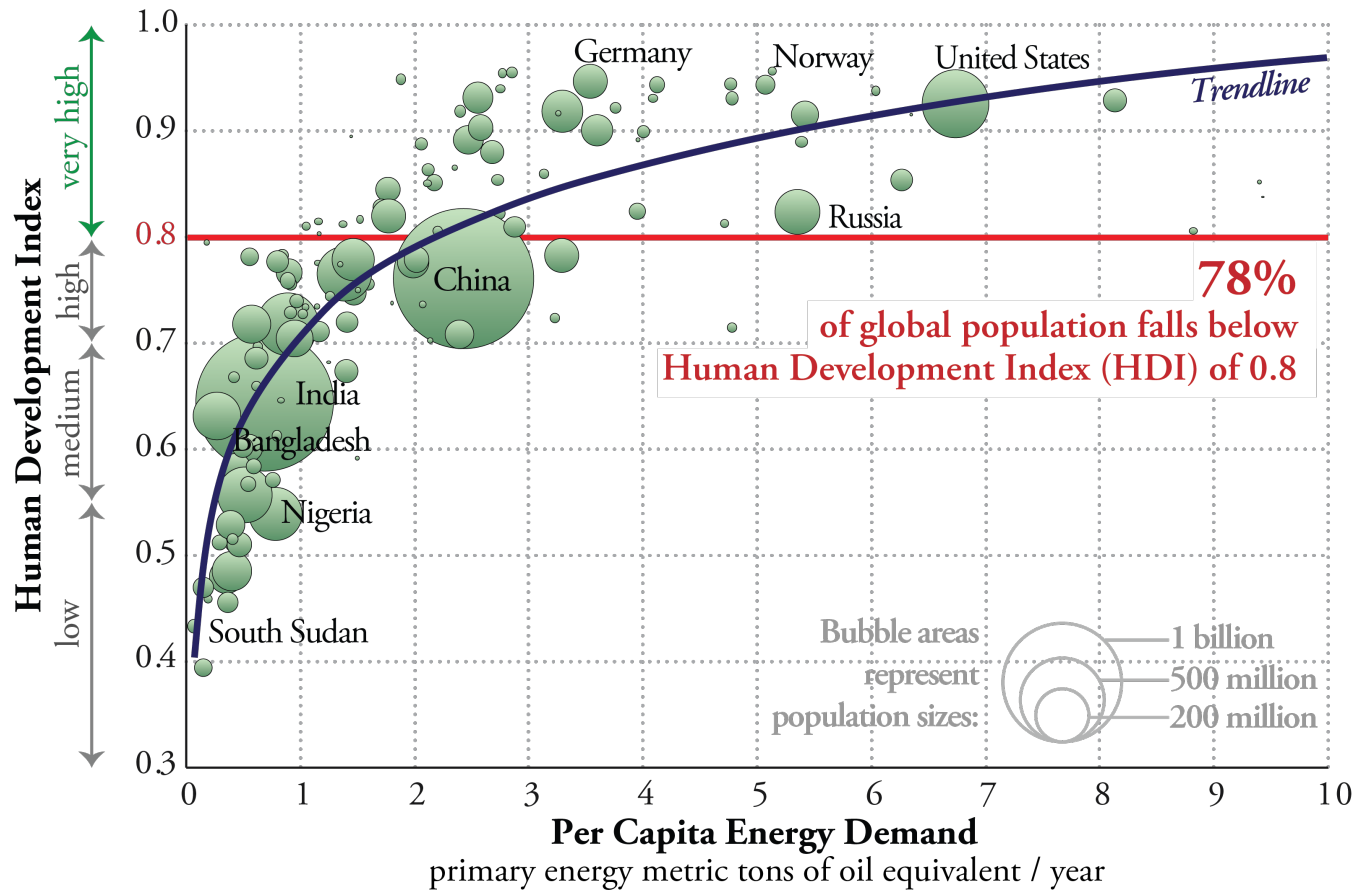
### 500 Clean Energy Technologies by Technology Readiness Level



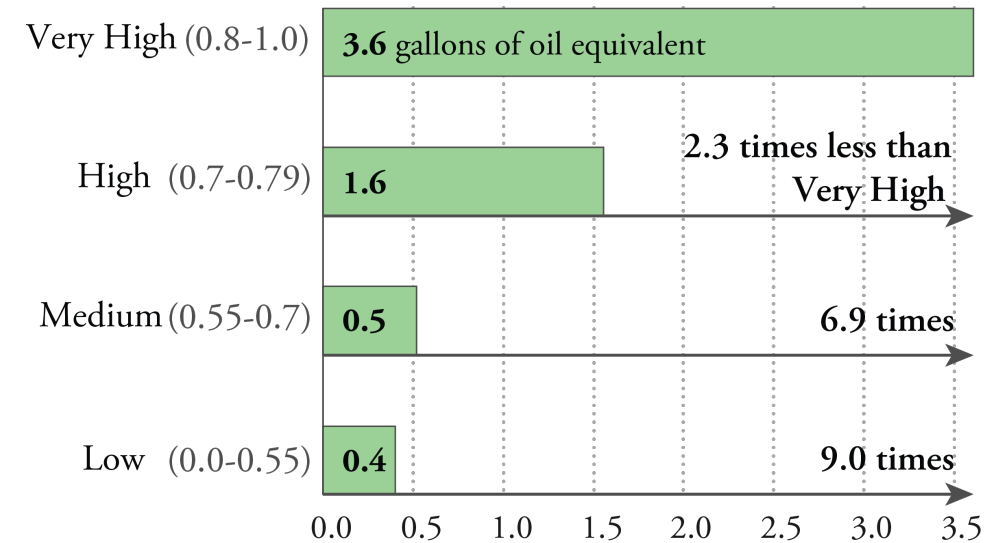
Source: Energy Policy Research, IEA ETP Clean Energy Technology Guide

# IEA: “All countries co-operate towards achieving net zero emissions worldwide.”

Per Capita Energy Demand and Human Development Index (2019)

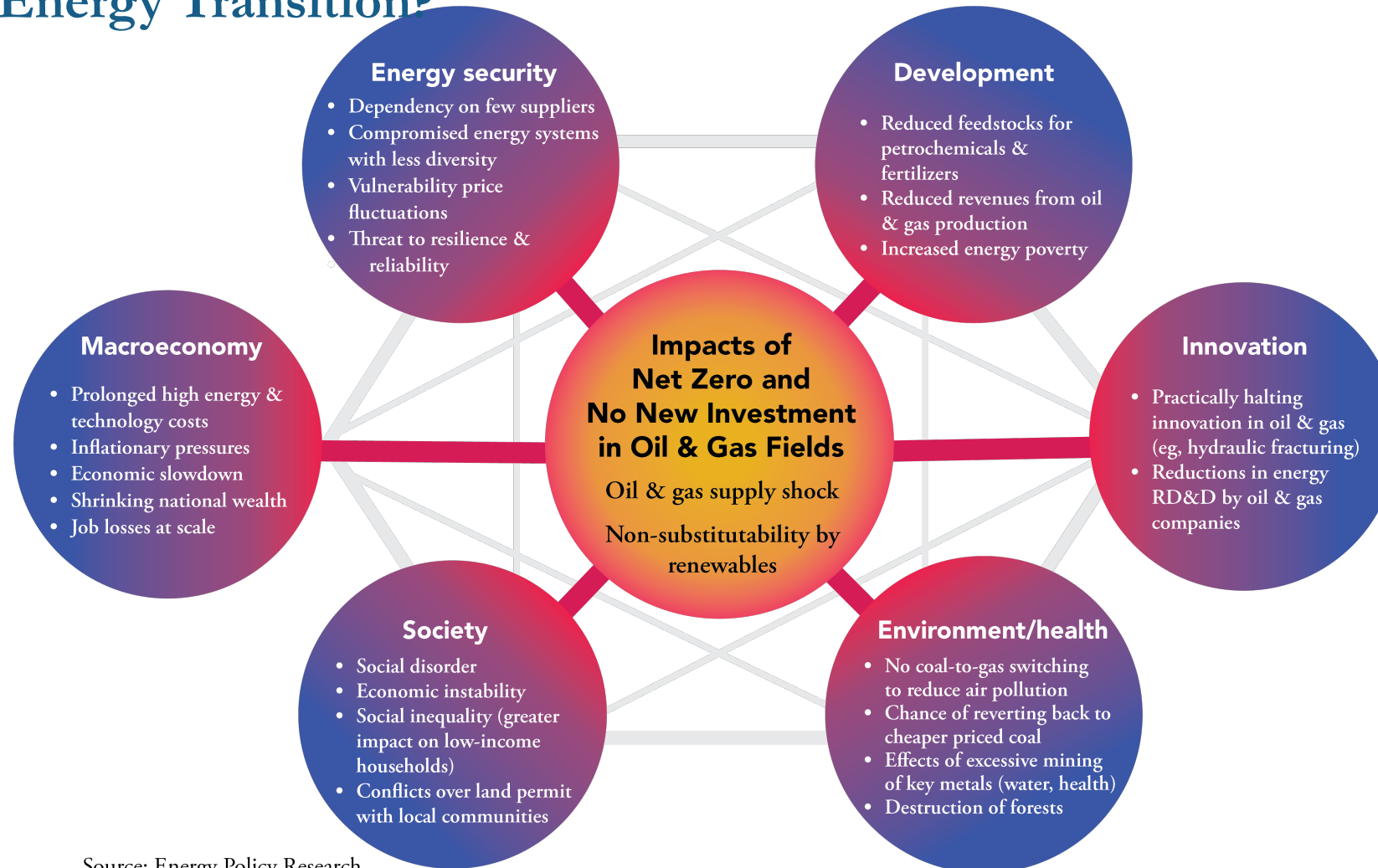


Daily per Capita Energy Demand by HDI (2019)



Source: Energy Policy Research, IEA, UN

# Do Policy Makers Understand the Consequences of the Net Zero Energy Transition?



Source: Energy Policy Research