

IPU's 66th Annual Regulatory Studies Program

Public Utilities Compared: Electricity Sector
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Utility Industries Compared

■ Similarities:

- Regulated for many years in a similar manner to other utilities
- Been undergoing significant changes in recent decades

• Differences:

- Power flows that don't respect state boundaries make jurisdiction very complex and controversial
- Complex power engineering requiring careful balancing to keep lights on



Regulatory Structure

- Economic regulation split between Federal Energy Regulatory Commission (FERC) and other federal agencies and the state commissions
- No jurisdictional "bright line" -- but generally,
 - FERC has jurisdiction of wholesale sales, interstate transmission, & the wholesale markets and transmission organizations (RTOs and ISOs)
 - States have jurisdiction of retail sales, distribution, facilities siting, & retail markets
- Wholesale generation with RTOs in some regions and some states with retail choice
- "Wires" (transmission and distribution) remain regulated



Big Issues for the Electricity Industry

- Fossil-fuel generation scale economies began shrinking in the 1970s
- Large regional wholesale systems with very complex markets cover much of the country— but not all regions
- Changing generation mix, with coal retiring, and more natural gas and renewable energy sources being added
- Wholesale price fluctuations that impact supplier revenue
- What will electric distribution companies look like in the future?
- Future "electrification" and possible ramping up of electricity demand from data centers
- How do we (for real) significantly reduce CO₂ emissions?

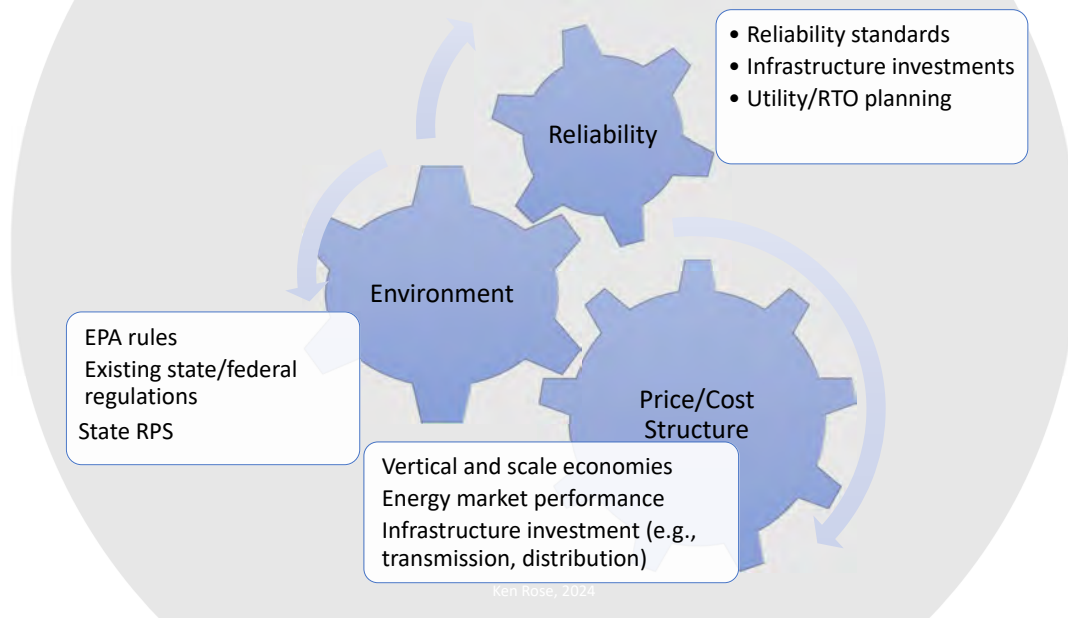
Three Interrelated Industry Themes and Examples

Structure (price and economics)	Reliability (keeping the lights on)	Environment ("clean" as possible)
Industry Restructuring starting in the 1990s	System Security and Adequacy	Emission Limits and Standards
Market Performance (competitiveness)	Reliability Standards	Compliance Planning and Strategies
Regulations	Organizational Responsibility and Oversight	Renewable and Conservation Incentives

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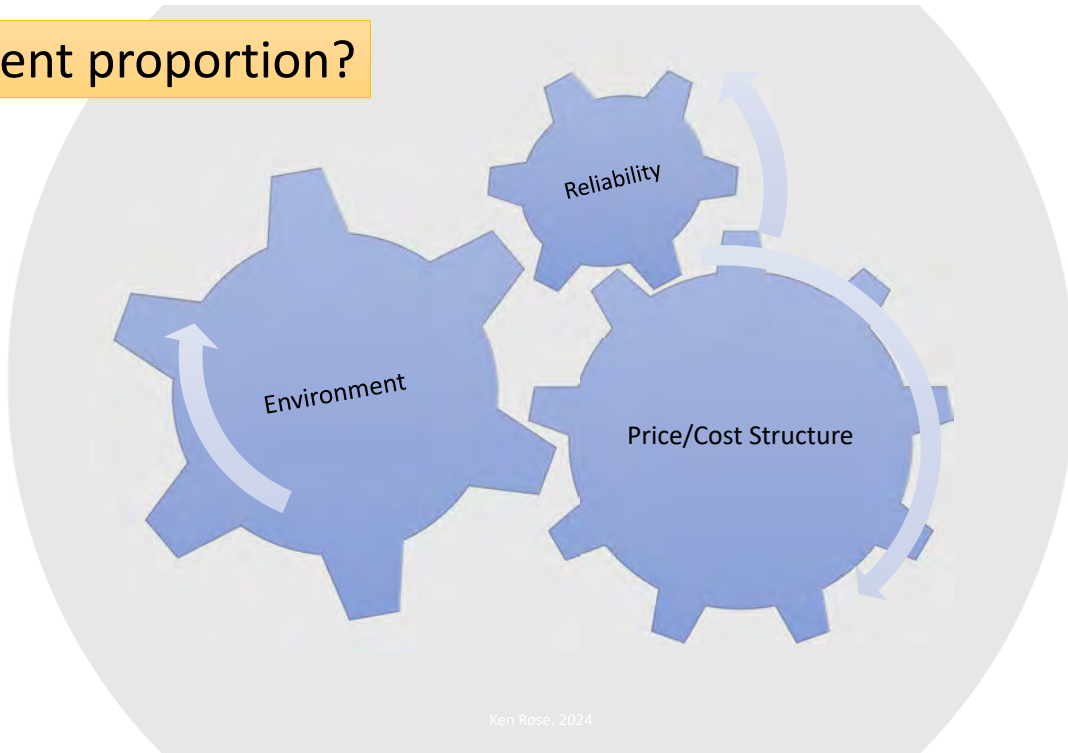
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The Electric Supply Industry Problem: To supply electricity in a *safe and reliable* manner, that *minimizes the damage to the environment*, and provides electric service at an *affordable price* to customers.



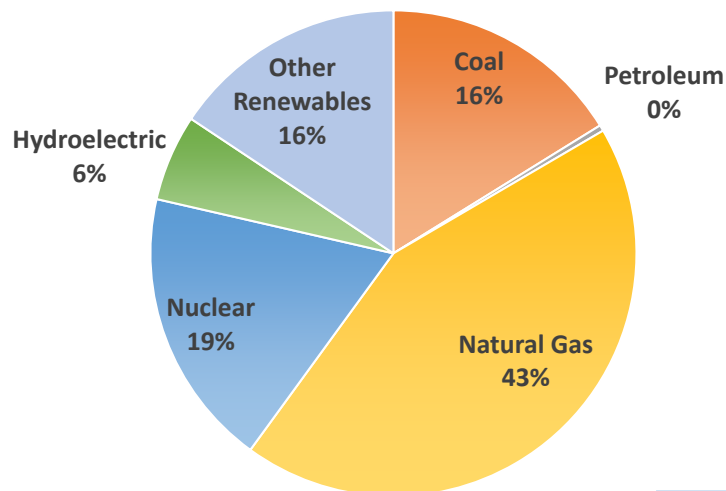
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Current proportion?



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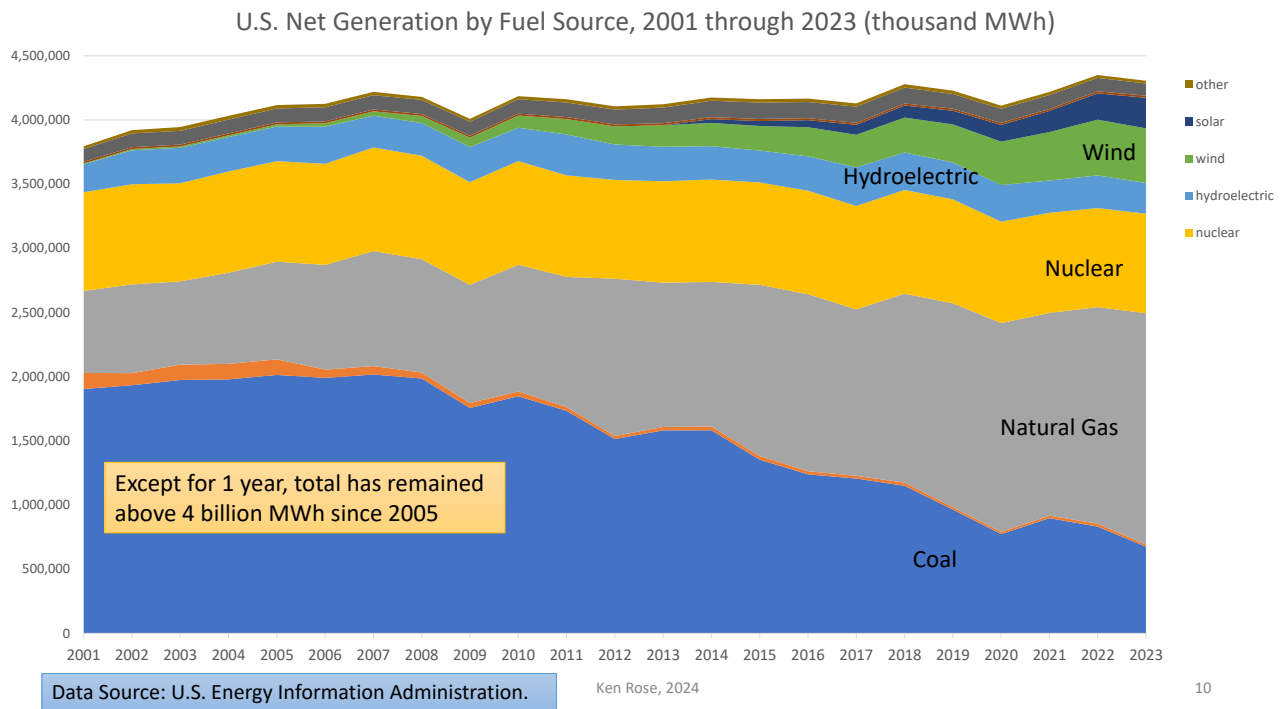
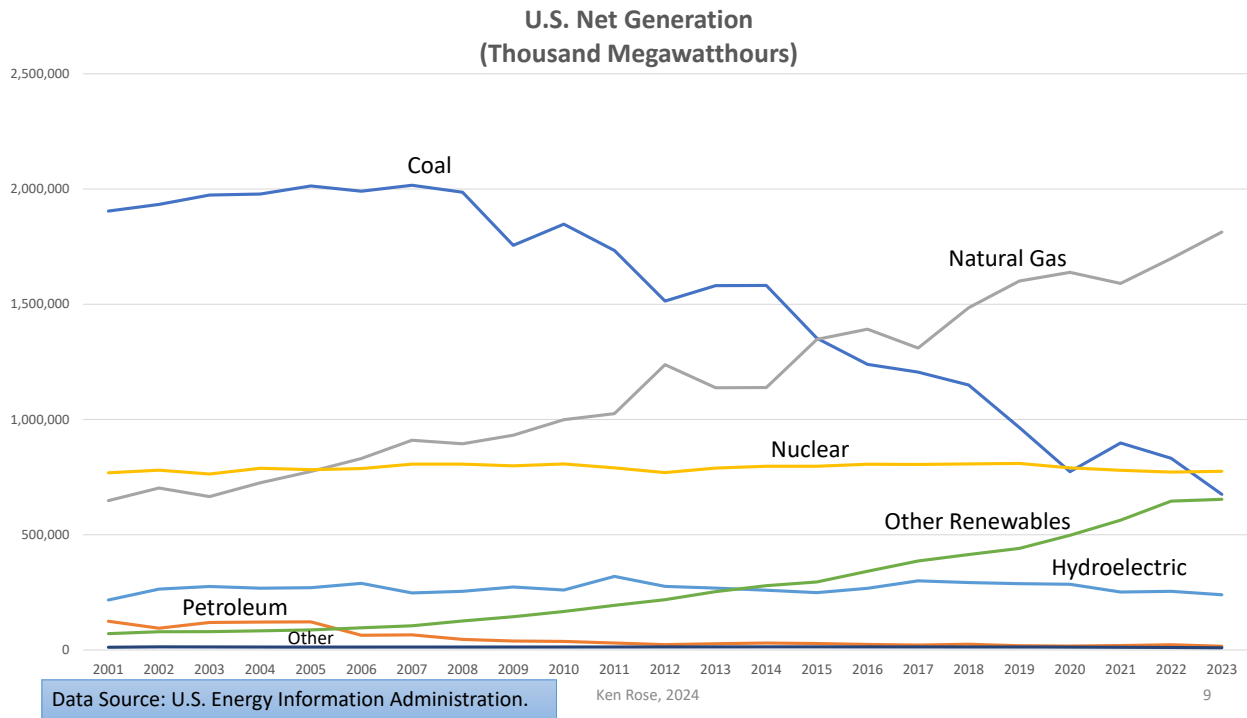
Electricity Generation by Source, Percent of Total, 2023



Data Source: U.S. Energy Information Administration.

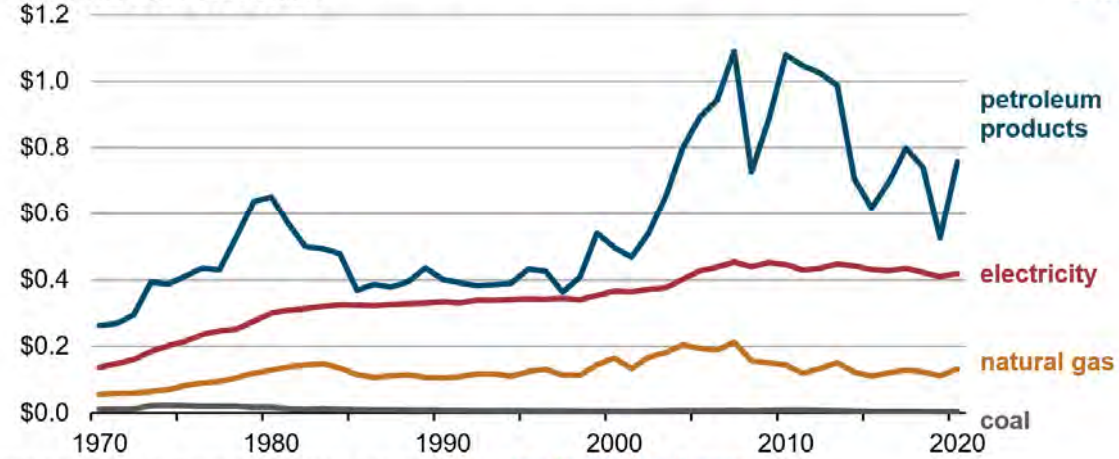
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U.S. end-use energy expenditures by source (1970–2021)

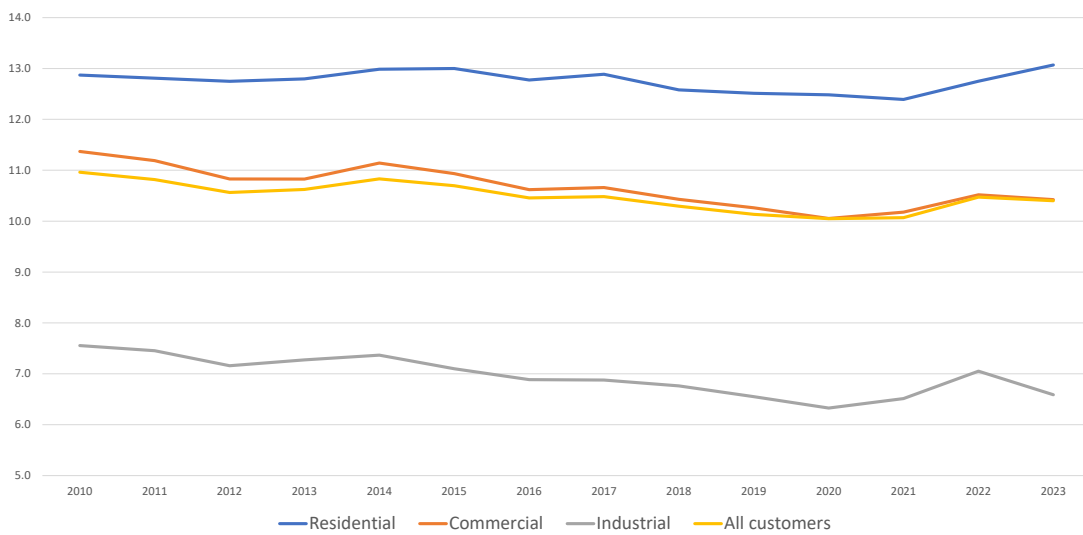
trillion real 2021 U.S. dollars



Data source: U.S. Energy Information Administration, [State Energy Data System](#)

EIA Chart, August 2023

Electricity Prices by Sector (cents/kWh) (Real Prices, Adjusted by GDP Implicit Price Deflator)



Data Sources: EIA electricity price data adjusted by the Bureau of Economic Analysis Implicit Price Deflators for Gross Domestic Product.

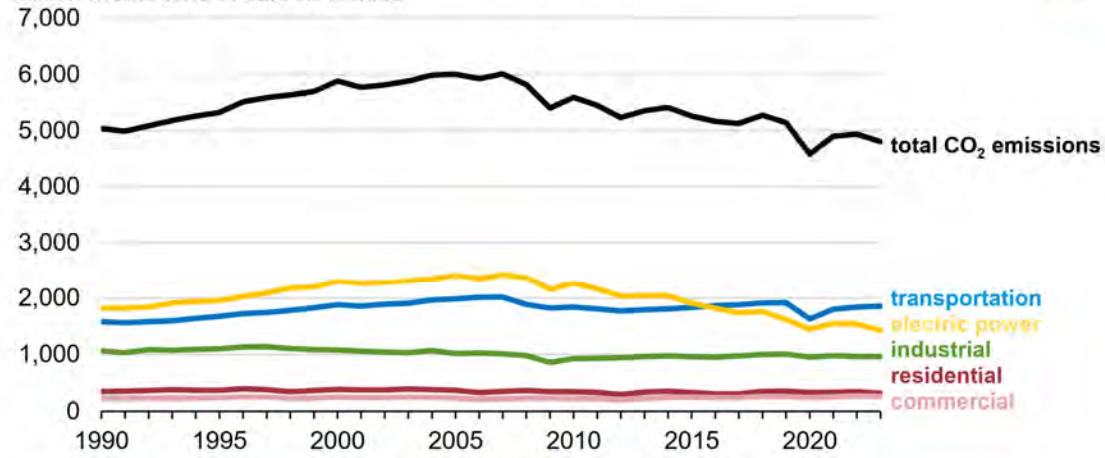
APRIL 29, 2024

U.S. energy-related CO₂ emissions decreased by 3% in 2023



U.S. annual energy-related CO₂ emissions by sector (1990–2023)

million metric tons of carbon dioxide



Data source: U.S. Energy Information Administration, *Monthly Energy Review*, March 2024

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