Destiny or Delusion: The Saga of Small Modular Reactors

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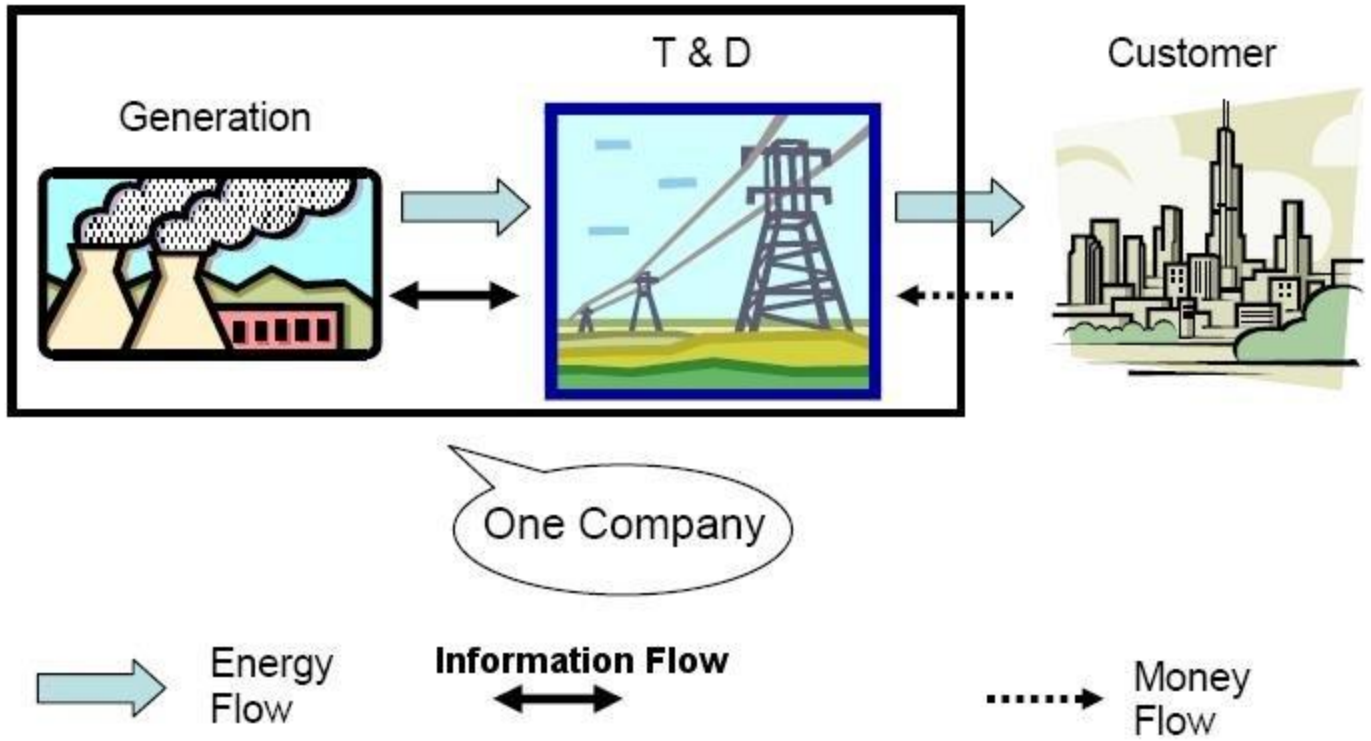
Nuclear Policy

November, 2023

Vertically Integrated Fully Regulated Monopoly Utility – U.S. Standard Pre-1985 – Power Resource Selection All Prophesy, No Competition



1990s Competitive Wholesale Electricity Market Structure

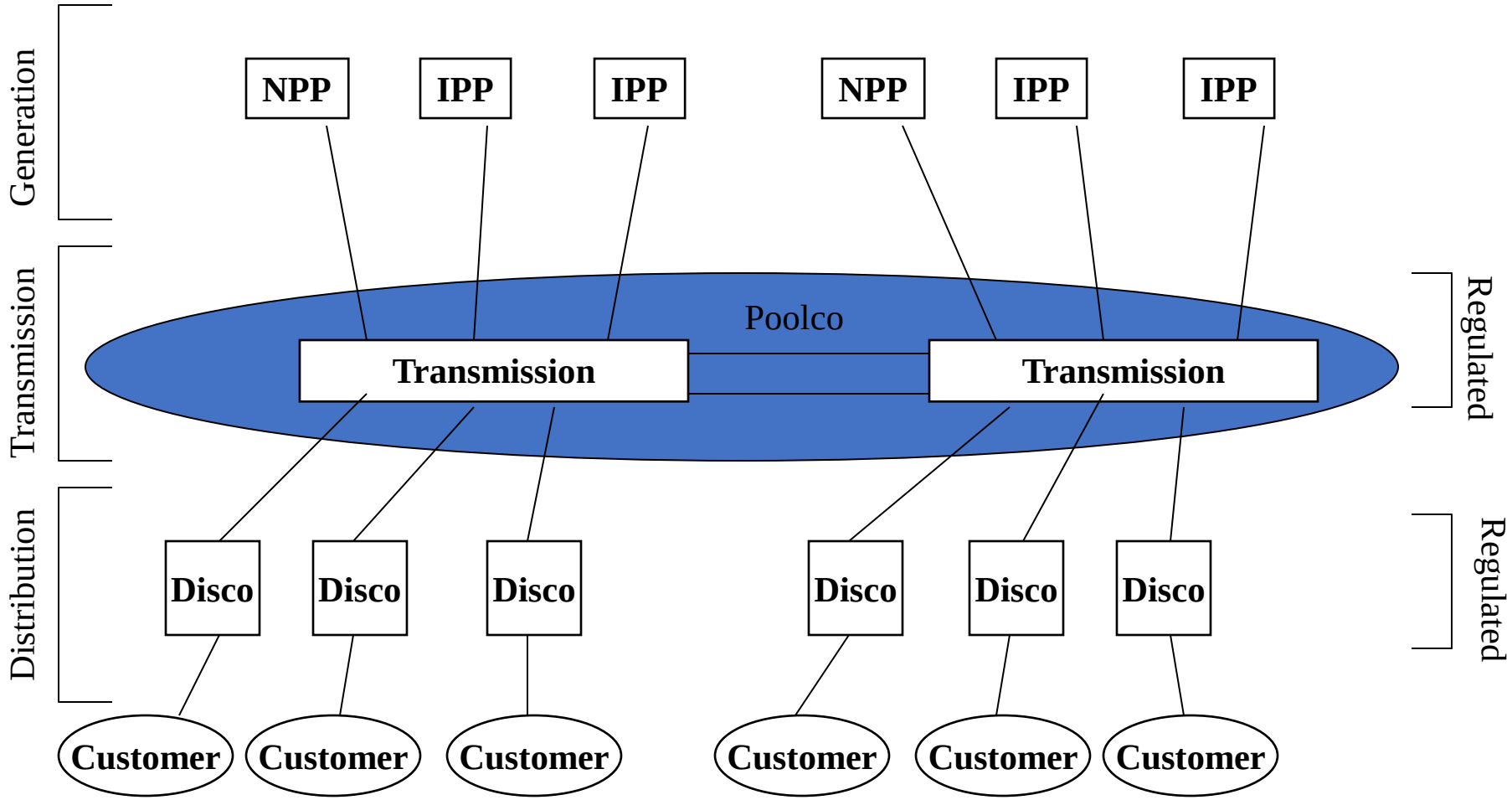
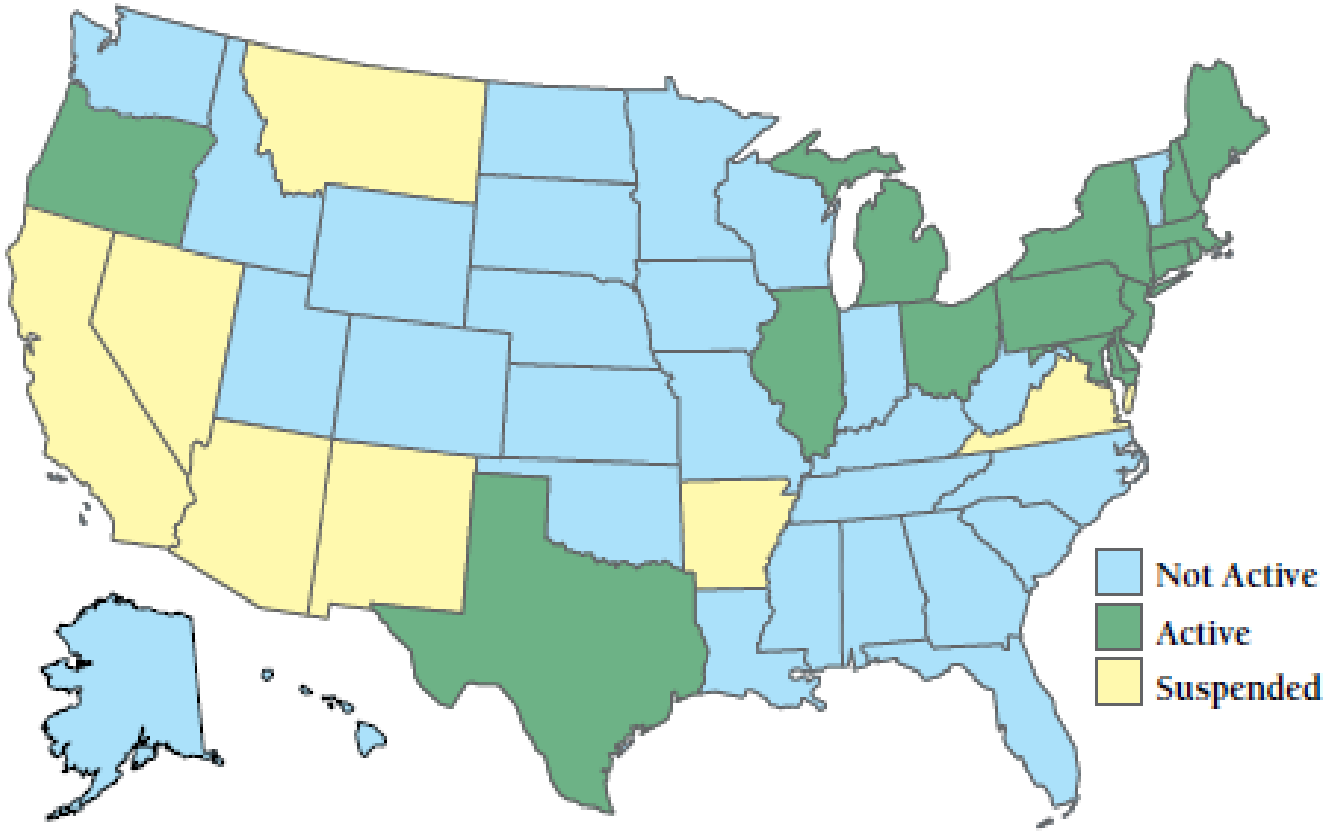


Figure 4-3:

States With Restructuring Activity As of 2010



Source: www.eia.doe.gov/cneaf/electricity/page/restructuring/restructure_elect.html

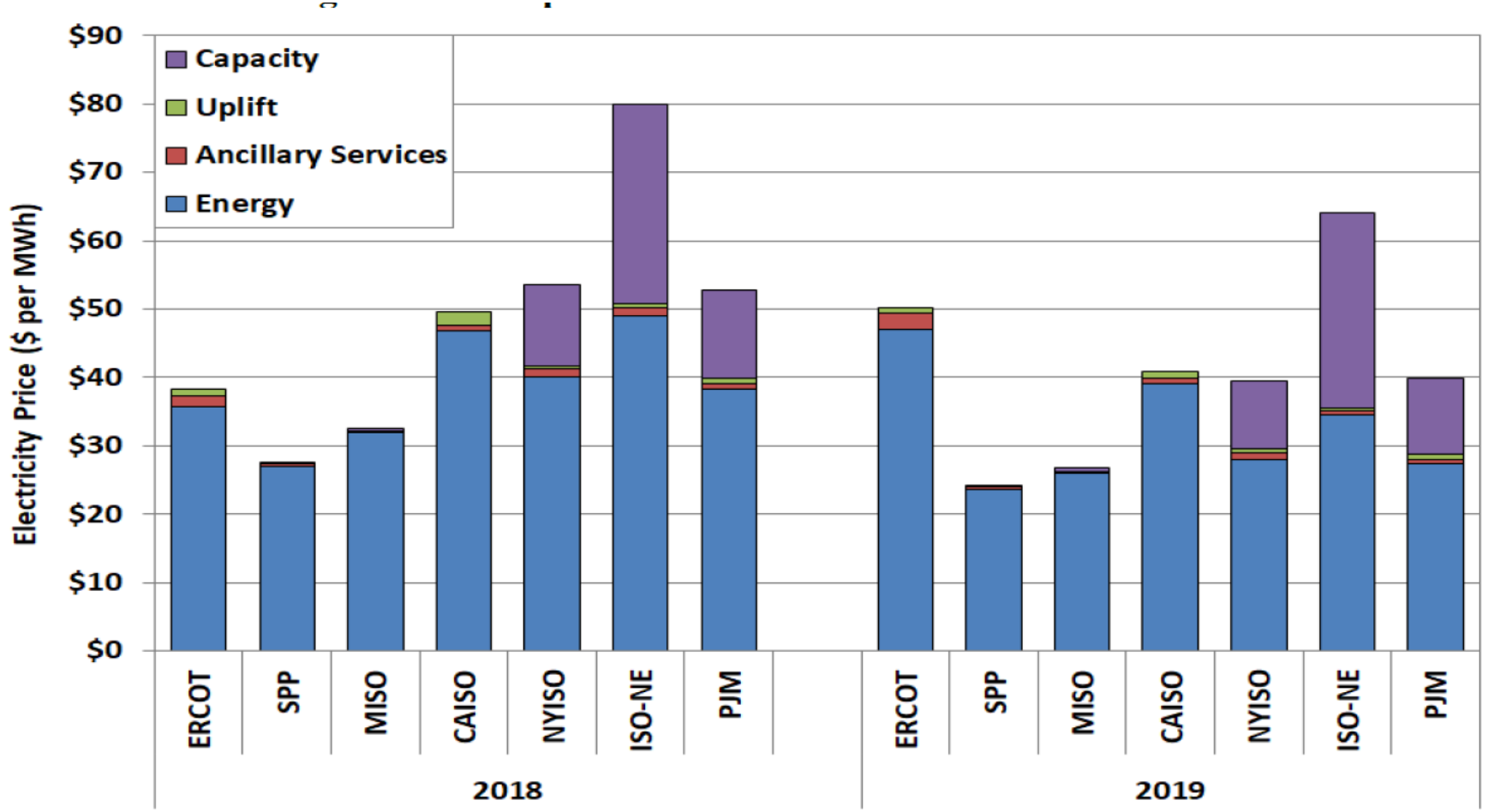
Nuscale board member who favored UAMPS faces his constituents, circa 2027

Recent Developments for Nuscale-UAMPS

- Major construction cost increase from $5.3 to $9.3 billion ($89/mWh)
  - Doesn’t include another $4 billion in subsidies
- Failure to obtain new sign-ups, potential loss of some existing commitments
- Questions as to waste volumes
- Heightened awareness of dangers of SMRs in war zones

2018-19 Power Prices Across All US Markets

ERCOT Market Monitor, p. 6



SMR NuScale Power Corporation

3.124 -0.326

NYSE · USD

Earnings Report Nov 8 Add to Calendar

3M 6M YTD **1Y** 2Y 5Y 10Y

Open	3.530	Vol	1.351M	52W H	1
High	3.560	P/E	–	52W L	3
Low	3.080	Mkt Cap	232.7M	Avg Vol	1.7

Closing the Nuclear Cost and Risk Gaps Through Subsidy

- Outright DOE grants (now approaching $1 billion)
- Loan guarantees
- Production tax credit (1.8¢/kWh for first 6 GW)
- Other forms of political and economic support.
- New federal legislation adds a new wrinkle – 40 year power purchase agreements by US Government entities (i.e. taxpayers) at prices far above competing technologies
- And the old standbys, liability limitation, the federal commitment to pay for (and one day dispose of) the waste fuel and surcharges to support uneconomic operating reactors

New Reactors must

- Be able to deliver electricity at a competitive price and on a predictable schedule.
  - It’s not an accident that all renaissance reactors in power market regions were the first to be cancelled;
- Be able to raise large amounts of private capital without disproportionate subsidy
- Be built by contractors who share the risk of excessive cost
- Be able to compete economically, not just politically.
  - Cannot rely on the proven corruptions of Ohio, Illinois and South Carolina

Power markets (regulated or not) must

- Put a price on carbon and other externalities as science and security require
- Assure that power plant owners are fully compensated for covering externality costs
- Relate profitability to performance
- Relate risk to reward
- Incentivize technological advance
- Withstand pressure from politically well-connected stakeholders to tilt their choices toward favored technologies