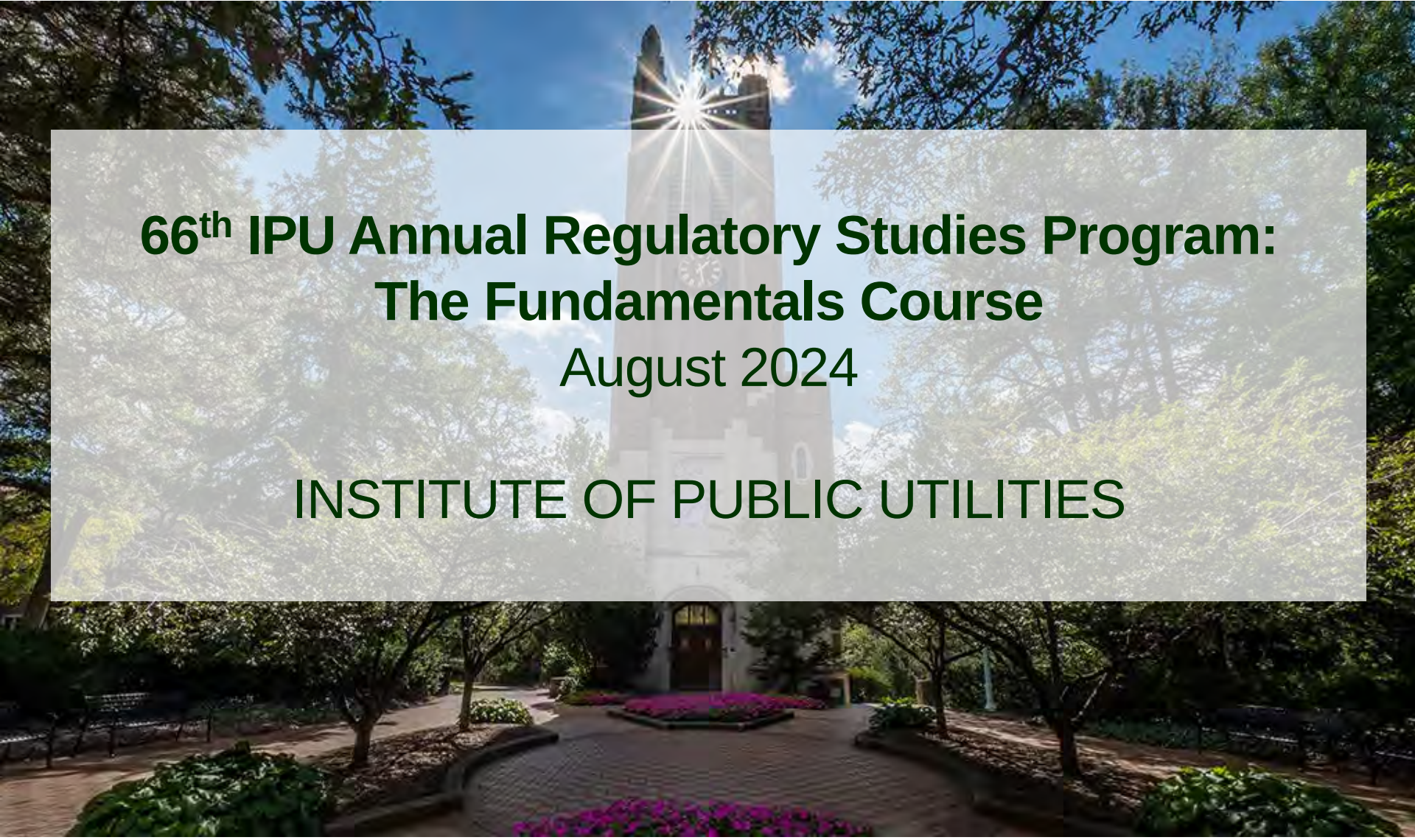

66th IPU Annual Regulatory Studies Program: The Fundamentals Course

August 2024

INSTITUTE OF PUBLIC UTILITIES

MICHIGAN STATE UNIVERSITY

About the IPU-MSU

- Institute of Public Utilities
  - Serving the regulatory policy community since 1965
  - Thousands of domestic and international program alumni
  - A national network of experienced experts in regulation
  - Financially self-sustaining at Michigan State University
- IPU's mission
  - To support informed, effective, and efficient economic regulation of electricity, natural gas, water, and broadband
- Integrative educational programs and research
  - A principled approach to regulatory practice
  - An empirical approach to regulatory analysis
  - A reasoned approach to regulatory reform
- We teach the "ideal" of economic regulation in the public interest
  - Interdisciplinary theory, regulatory institutions and culture, and critical thinking
  - Commitment to lifelong learning and appreciating what we do not know
  - Our purpose is not to formulate answers – but to help form good questions
  - Objective – but not unopinionated

Welcome to the program!

- Welcome to this live online learning experience
  - Thanks for being part of our community and joining us today
  - Closing other screens and turning off notifications is recommended
  - Enjoy the relaxed dress code and remember to stretch, stand, and hydrate!
- We hope to give you a positive and interactive experience
  - Feel free to raise your hand to ask a question (clarifying or otherwise) at any time
  - Use the chat function for questions or comments during the program
  - For help, contact Erin West via the Q&A, erinwest@msu.edu, or 517-355-1876
- A few program notes
  - Accessing course materials
  - Polls and practical exercises
  - Course evaluation forms
  - Certificates of attendance
  - Continuing education credits
  - Opening code word: _____
- Schedule
  - From 10 Noon to 5 pm Eastern Time Zone (except Friday)
  - Four 80-min. modules with lunch from 1-2 pm and 20-min. breaks at 11:20 and 3:20

Program overview

- Monday
  - Why We Regulate: Introduction to Utility Regulation [J. Beecher]
  - Public Utilities Compared [J. Beecher, K. Rose, C. Peterson]
- Tuesday
  - Economic Fundamentals of Regulation [G. Marke]
  - Legal Fundamentals of Regulation [H. Reiter]
- Wednesday
  - Finance Fundamentals of Regulation [S. Kihm and P. Sullivan]
  - Financial Accounting and Reporting [D. Kermode]
  - Market Monitoring and Power [K. Rose]
- Thursday
  - Federal Energy Regulation [L. Greenfield]
  - Environmental Regulation of Utilities [N. Leonard]
  - Regulatory Alternatives [M. Lowry]
  - Regulatory Independence and Ethics [J. Beecher]
- Friday
  - Concurrent sector breakouts (two modules each):
    Electricity [K. Rose], Natural Gas [C. Peterson], Water [D. Schmidt]

Attendee map

Poll: Where do you work?

- State commissions and agencies
- Federal commissions and agencies
- Consumer and environmental advocates
- Public utility providers – investor-owned
- Public utility providers – public or cooperative
- Law and consulting firms
- Universities

Q. Use the **chat** function to introduce yourselves – who and where are you?

Poll: What is your role?

- Commissioner
- Accountant or financial analyst
- Economist or policy analyst
- Engineer or technical analyst
- Attorney or law judge
- Manager
- Advisor
- Consultant
- Educator
- Other

Program learning objectives

- To understand the core theory, principles, and practices of public utility regulation and ratemaking.
- To understand the roles of law, economics, and finance in utility regulation.
- To understand the implications of regulatory modifications and alternatives.
- To understand the relevance of ethics to regulatory institutions.
- To compare and contrast the utility sectors – electricity, gas, and water.

Q. Use the **chat** function to share your objectives?

What are your learning priorities or burning issues?

- A basic understanding of the regulatory process
- A better understanding of regulation of utilities
- An increased understanding of utility regulation
- An overview of the entire regulatory process.
- Foundational regulatory knowledge
- Fundamentals of energy regulation.
- Further knowledge of electric utilities
- Improved regulatory process knowledge
- Learn how the electric industry operates
- Support insights on electric regulatory strategy
- Understand utility electricity regulation
- Understanding of government oversite
- Utility regulation basics & how it applies to law

Q. Use the **chat** function to let us know.

Why we regulate

Introduction to public utility regulation and ratemaking: interdisciplinary theory and practice

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Revised 8/11/2024

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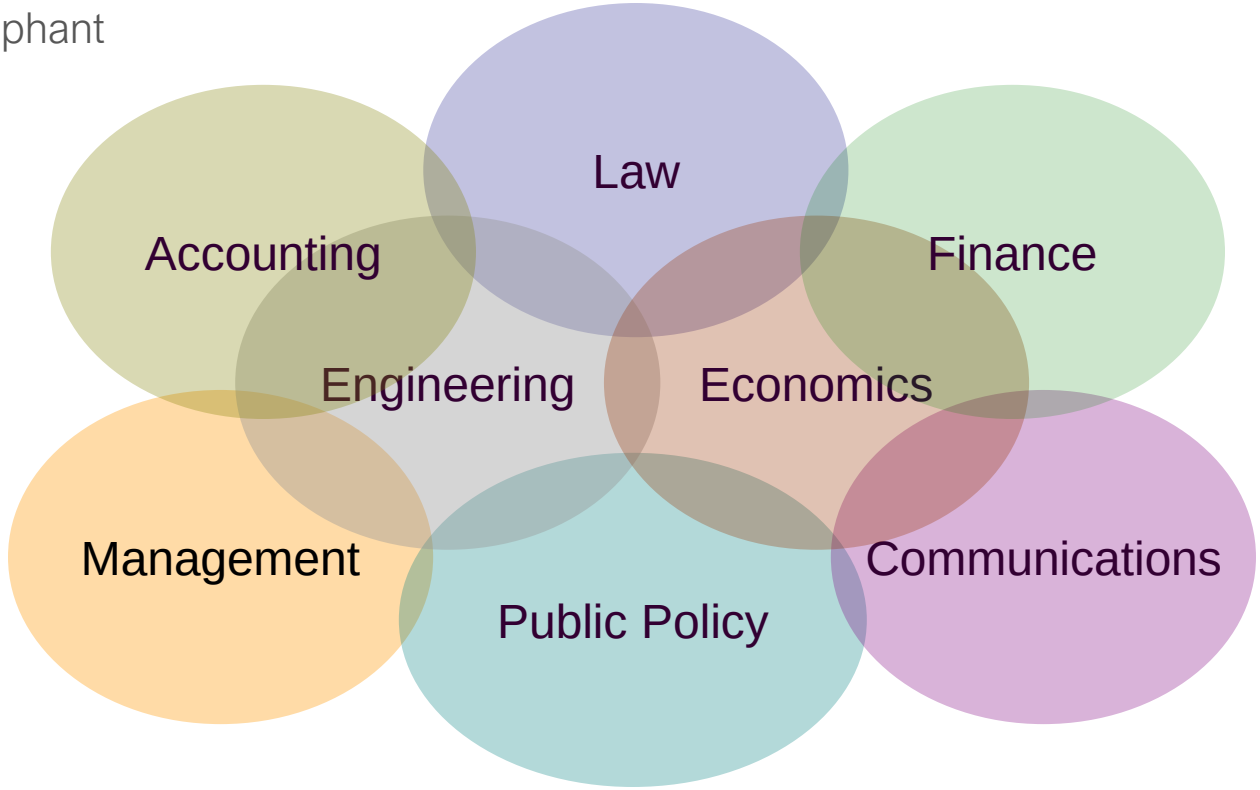
Why we regulate: presentation overview

- Public utilities defined
- Expenditures and prices
- Utilities as infrastructure
- Utilities as monopolies
- Markets and market failure
- Regulatory policy
- Origins of regulation
- Regulatory paradigm
- Regulatory commissions
- Process and principles
- Ratemaking and revenues
- Regulation and incentives
- Evaluation and alternatives
- Restructuring and deregulation

Note: see IPU acronym database.

Disciplines of economic regulation

- Regulation is not just multi-disciplinary but *trans-disciplinary*
  - Unique culture and jargon – "common creole" or *"ingua franca"*
  - Economics dominates but other disciplines are relevant and informative
  - Note the legacy role of "engineering-economics"
- Other modules elaborate
  - Different sides of the elephant



But first… a true/false quiz

- Regulators dislike markets T / F
- Public utilities dislike regulation T / F
- Public utilities are natural monopolies T / F
- Monopoly is always a bad thing T / F
- Regulation was conceived by zealous reformers T / F
- Regulation was designed by capitalists T / F
- Regulators have more information than utilities T / F
- Regulation provides no incentives for performance T / F
- Returns to utility investors are guaranteed T / F
- Competition is a form of regulation T / F
- Markets always progress toward competition T / F
- Regulation never adapts or goes away T / F
- Regulation and markets are incompatible T / F
- Utilities and their investors like uncertainty T / F

Poll 1: Information symmetry

- Do utility regulators have more information than regulated utilities?
  A. Yes
  B. No
  C. Maybe

Poll 2: Investment returns

- Are returns to public utility investors guaranteed?
  A. Yes
  B. No
  C. Maybe

Poll 3: Uncertainty

- Do public utility investors like uncertainty?
  A. Yes
  B. No
  C. Maybe

Public utilities defined

Public utilities defined

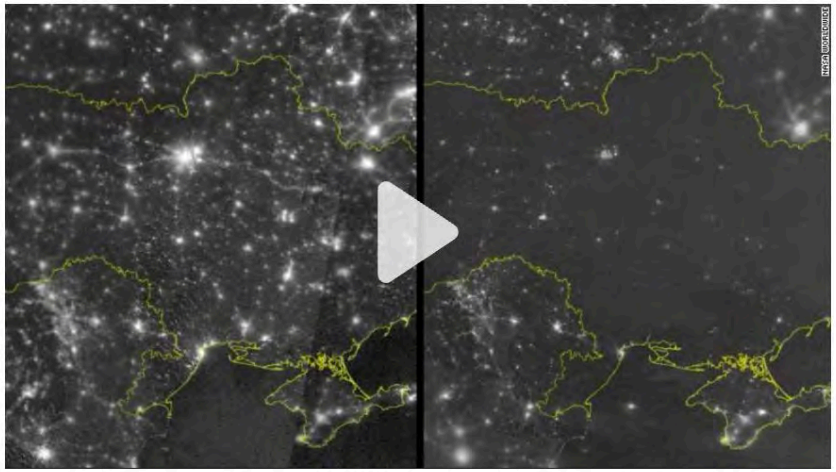
- "A business organization (as an electric company) performing a public service and **subject to special governmental regulation"** (Merriam-Webster)
  - "Utility - a privately, publicly, or cooperatively owned line, facility or system for producing, transmitting, or distributing communications, cable television, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway drainage, or any other similar commodity, including any fire or police signal system or street lighting system, which directly or indirectly serves the public. The term utility shall also mean the utility company inclusive of any wholly owned or controlled subsidiary" (23 CFR 645.105)
- **"If a business is affected with a public interest**, and bears an intimate connection with the processes of transportation and distribution, and is under an obligation to afford its facilities to the public generally, upon demand, at fair and nondiscriminatory rates, and enjoys, in a large measure an independence and freedom from business competition… [it is] a public utility" (Judge Vinson, Dissenting Opinion in Davies Warehouse v. Brown, 1943)
- **"[T]he term public utilities is designed to cover certain industries** which in the course of time have been classified apart from industry in general and… distinguished from governmental services… The basis of the classification is essentially economic and technological, although the meaning of the term is derived from the law" (Martin Glaeser, 1957)

Universal and essential needs

- Mission: "The Ohio Consumers' Counsel advocates and educates to secure for Ohioans affordable, reliable and equitable residential utility *services that are essential to their well-being."*
- Utilities play a unique public service role in political economies worldwide
  - Utilities, regulation, and the public interest are intrinsically related – not just due to monopoly but to the aspiration of universal affordable access to essential services
- Law and policy view "essentiality" as central to understanding of "utilities"
  - See case law, including *Nebbia v. New York (1934)* re milk pricing
  - In Victoria, Australia, the regulator is the *Essential Services Commission*
  - Possibly rise to human rights, including broadband (Costa Rica, Estonia, Finland)
- Crises expose energy, water, and communications insecurity and "divides"
  - Governments ensure access and affordability – utilities provide the service
  - Lack of service has dire consequences for households and societies

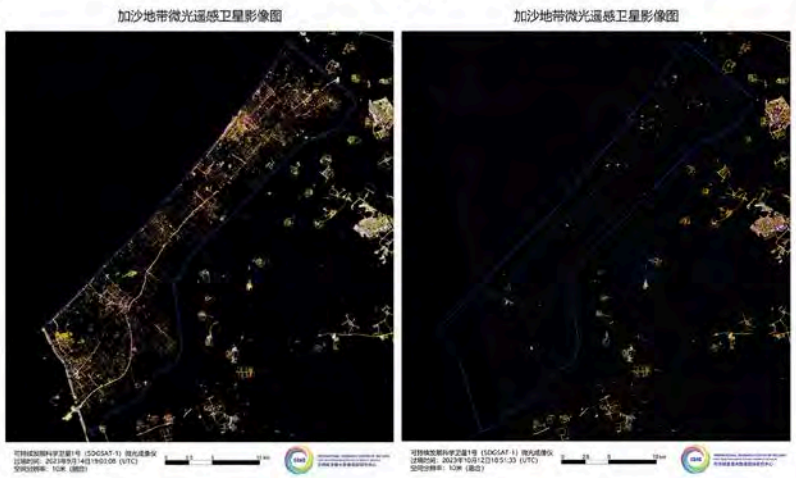
Why North Kansas City pays its residents' internet bills, and your city doesn't pay yours

Geopolitics of power: North Korea, Ukraine, Gaza



Remarkable photos show what blackout in Ukraine looks like from space 01:48

Gaza strip



A typology of goods and services: what "good" are utilities?

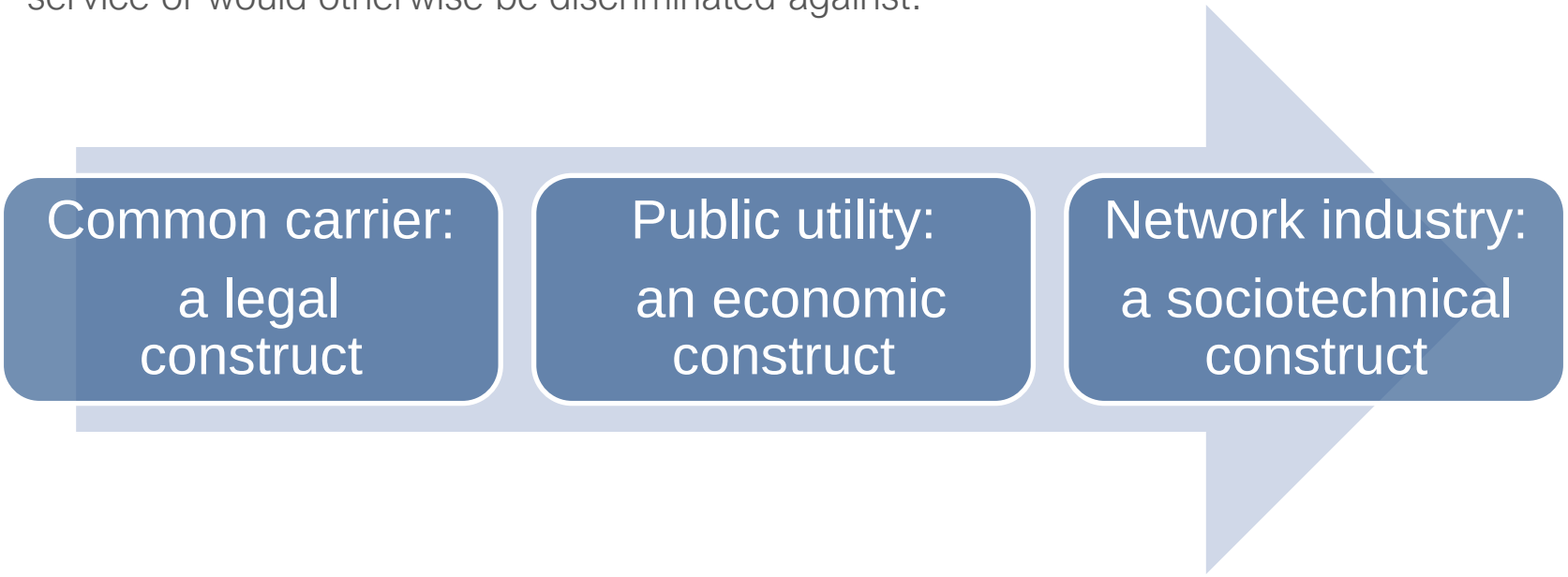
<<< Public institutions: shared services and socialization

Marginal impact [subtractible; exhaustible; fungible]	Allocative feasibility [divisible; excludable; ascribable]	
	Less	More
Less	Public goods: *governance* Ubiquitous goods, services, and knowledge *e.g., ocean waters*	Social goods: *regulation* Toll, club, merit, worthy, community, or "political" goods – utilities & network infrastructure *e.g., piped water*
More	Natural goods: *collective action* Common-pool or common-property resources for common consumption e.g., fresh waters	Private goods: *competition* Economic goods and commodities for individual consumption e.g., bottled water

Market institutions: commodification and individualization >>>

Infrastructure evolution: carriers, utilities, and networks

- All utility infrastructure can be considered *public* infrastructure – regardless of ownership
  - "Toll" goods not because we *must charge* but because *we can charge*
- Prof. Eli Noam (Columbia University,1994)
  - "For centuries, common carriage principles have played an important role in the infrastructure services of transportation and communications.
  - They intended to guarantee that no customer seeking service upon reasonable demand, *willing and able to pay the established price,* however set, would be denied lawful use of the service or would otherwise be discriminated against."

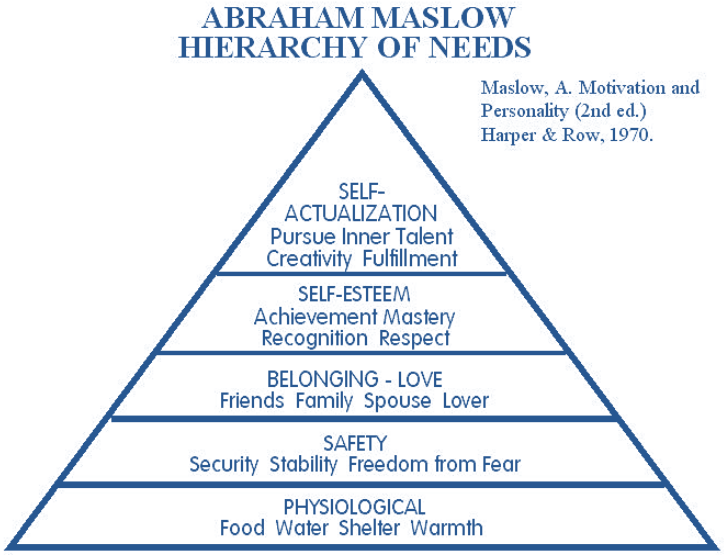


What are the “public utilities”?

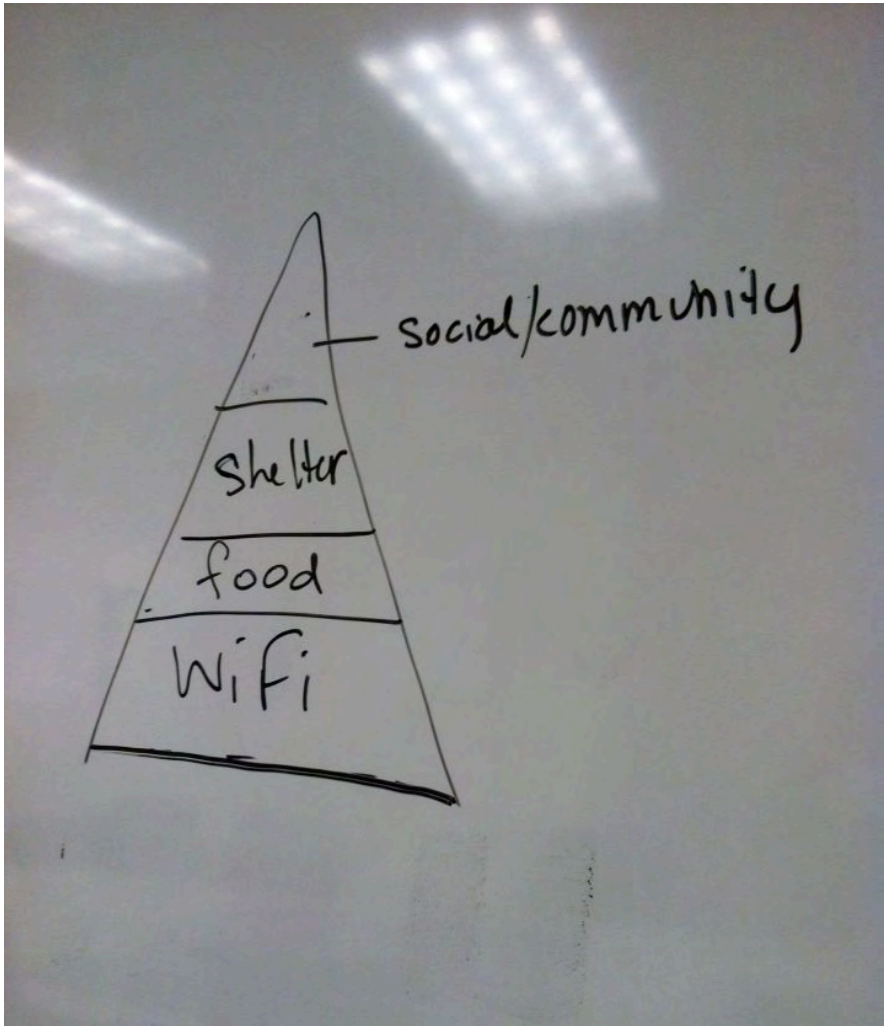
- “Public”
  - Public infrastructure – *it’s all public*
  - Public or private ownership
  - Publicly traded companies & private equity
  - Public funding and financing
  - Public works
  - Public service
  - Public convenience
  - Public trust
  - Public interest
  - Public value
- “Utilities”
  - Postal service (1775)
  - Water (late 1700s to early 1800s)
  - Transportation (early 1800s to1980)
  - Natural gas (mid-1800s)
  - Electricity (T. Edison, late 1800s)
  - Telecommunications (A.G. Bell, late 1800s)
- Expanding the concept
  - Broadband – universal and affordable service
  - Ride and room sharing – licensure and insurance
  - Pharmaceutical companies and hospitals – cost control and access

What do public utilities provide?

- Services and products
- Resources and commodities
- Information and data
- Common carriage (neutrality)
- Built environment or infrastructure
- Grids and networks (connectivity)
- Access (to multiplier providers)
- Foundations for development and civil society
- Engines for technological advancement and prosperity
- Strategic targets and threats in conflicts (cybersecurity, terrorism, war)
- Everyday needs, comfort, and convenience (heating, cooling, light, safe water)
- Basic human rights – framed in terms of equal protection, security of person, freedom from want, dignified existence, and social inclusion



New hierarchy of needs?

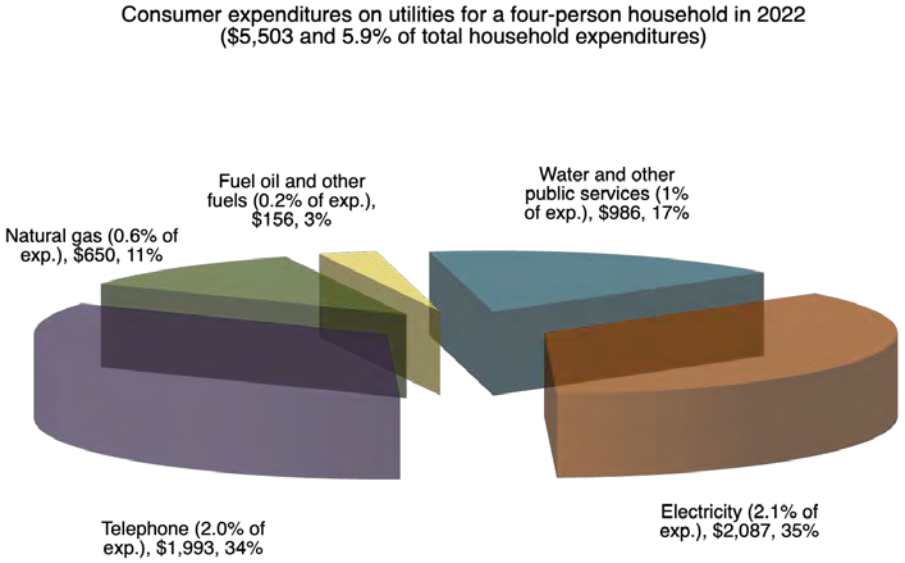


Expenditures and prices

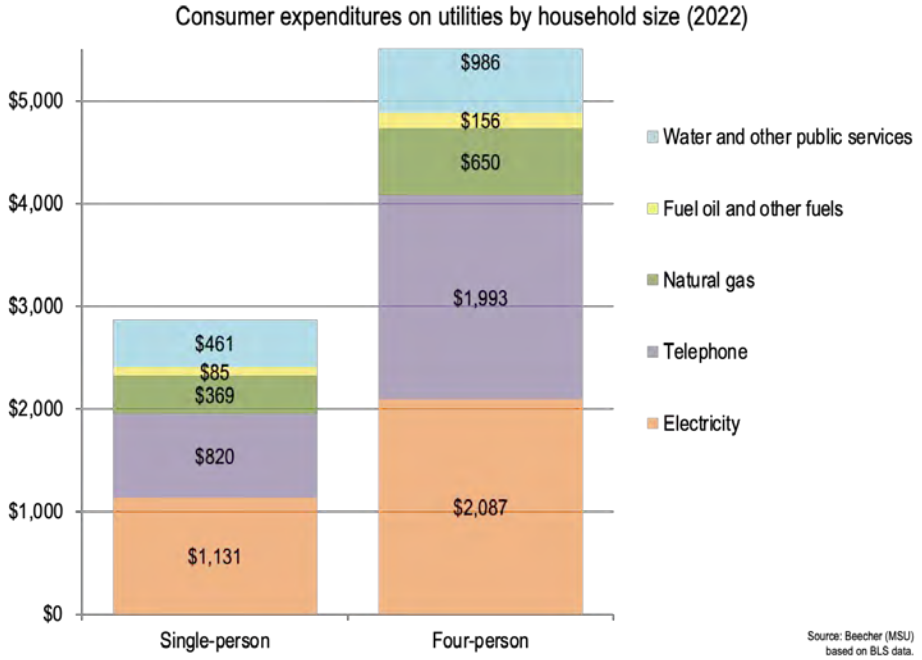
Poll 4: Utilities and income

- What is the average percentage of household expenditures do Americans pay toward utilities (energy, water, and telecommunications)?
  - A. About 2%
  - B. About 6%
  - C. About 10%
  - D. About 16%

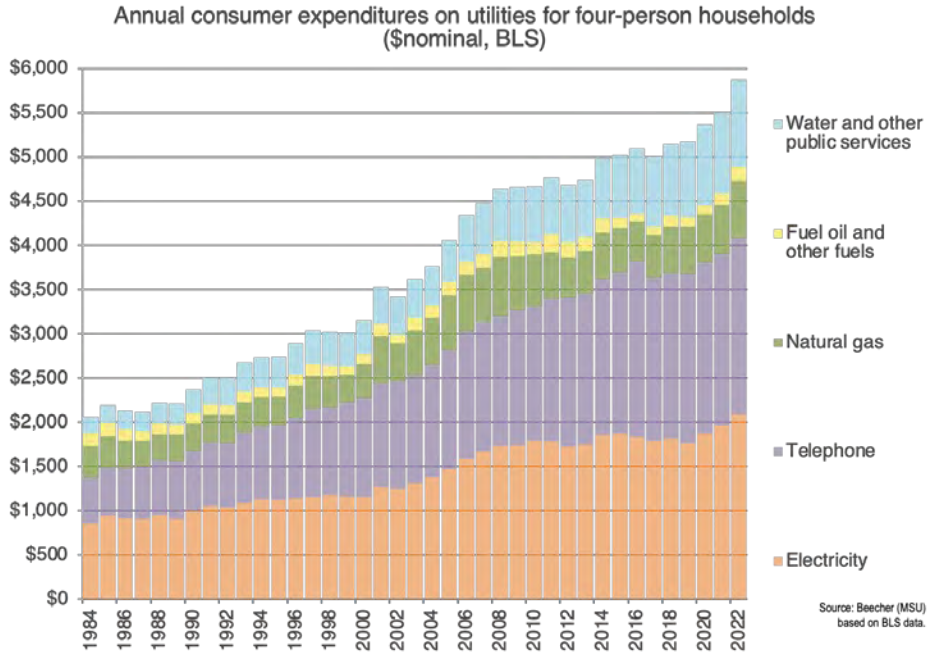
Household expenditures on utilities in the U.S.

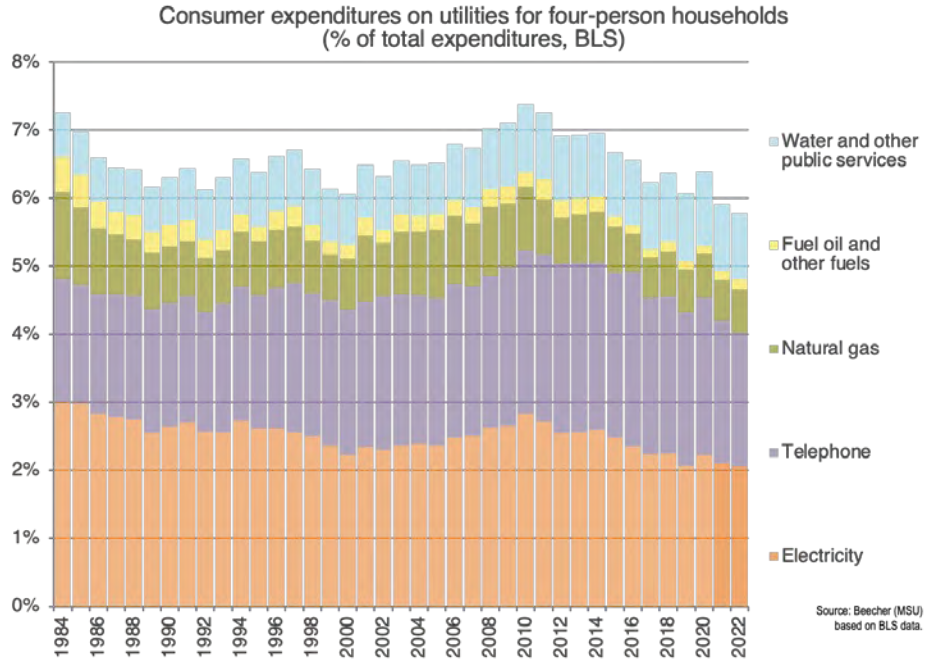


Source: Beecher (MSU) based on BLS data.

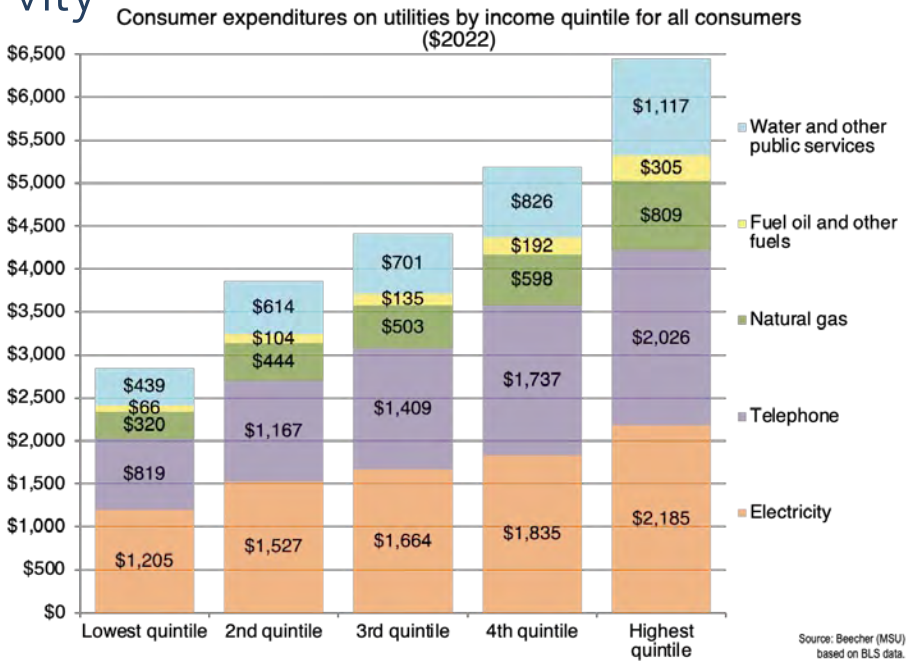


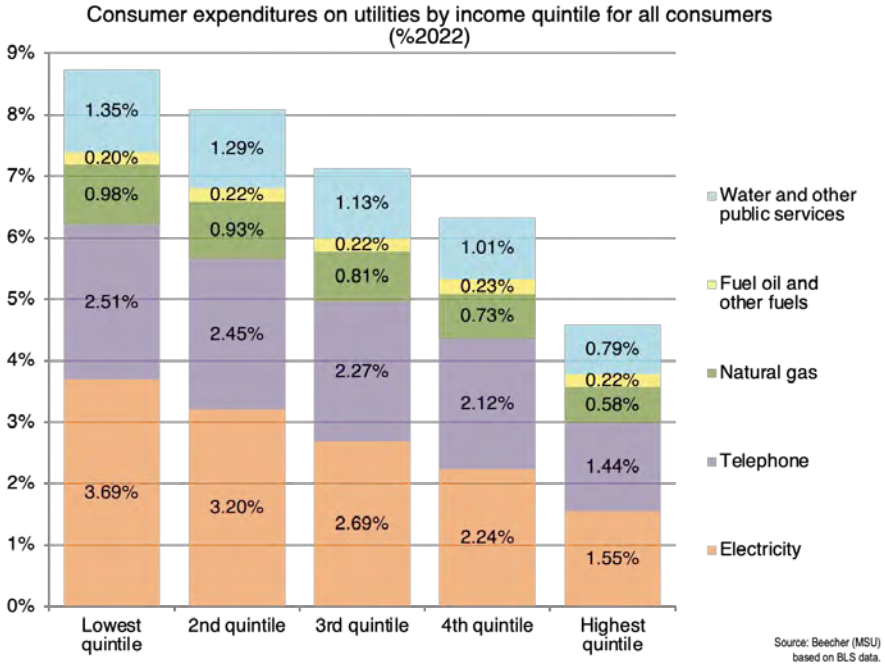
Household expenditures on utilities over time

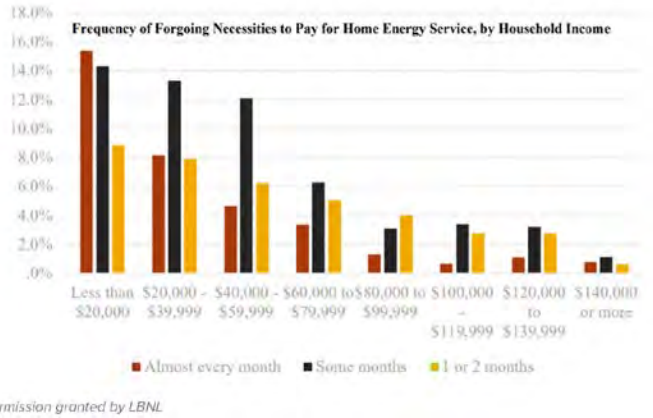




Utilities expenditures by income level and vity

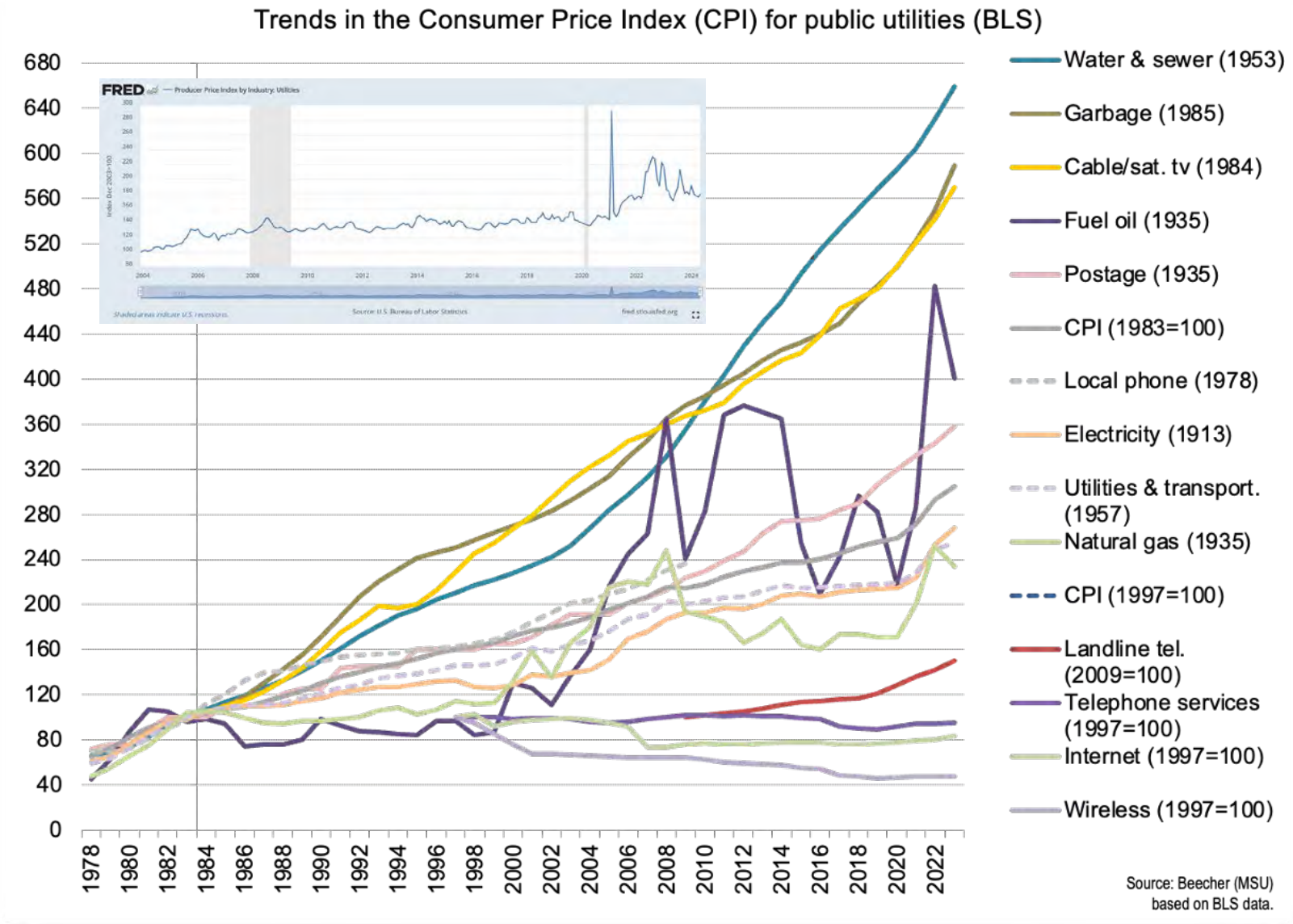




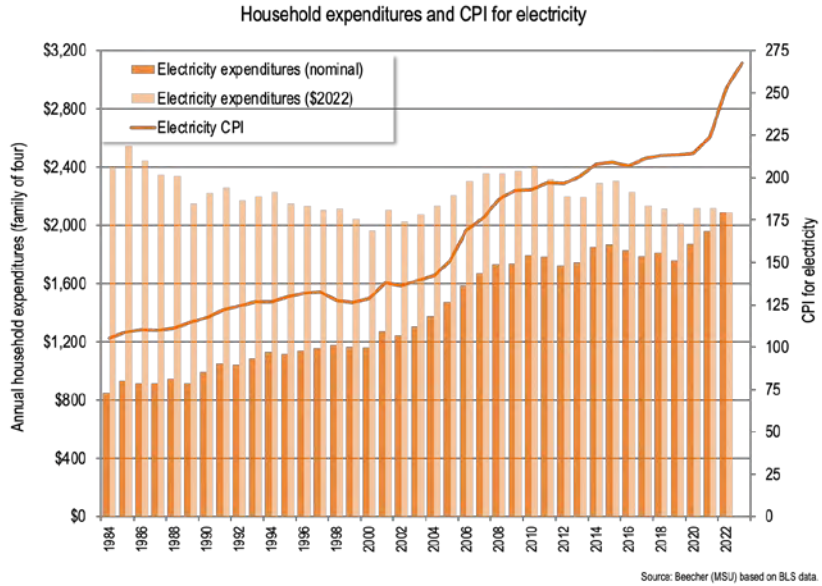


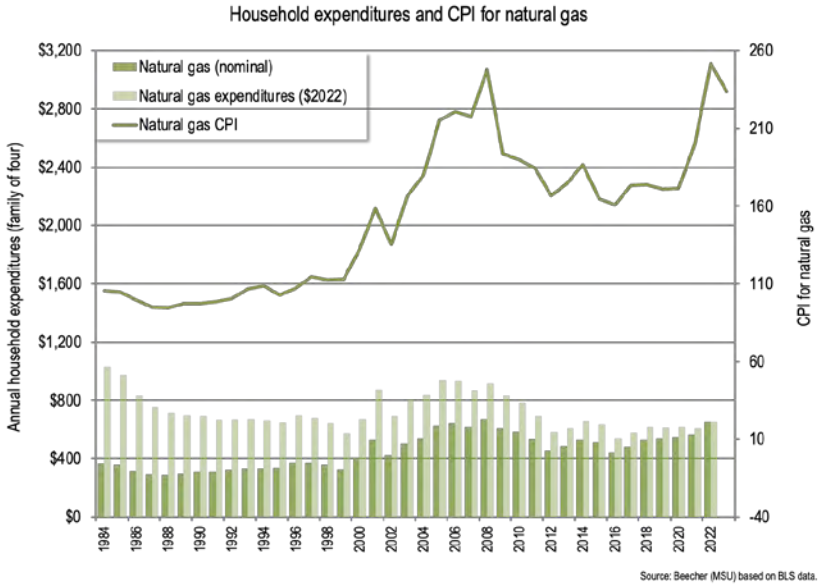
Permission granted by LBNL

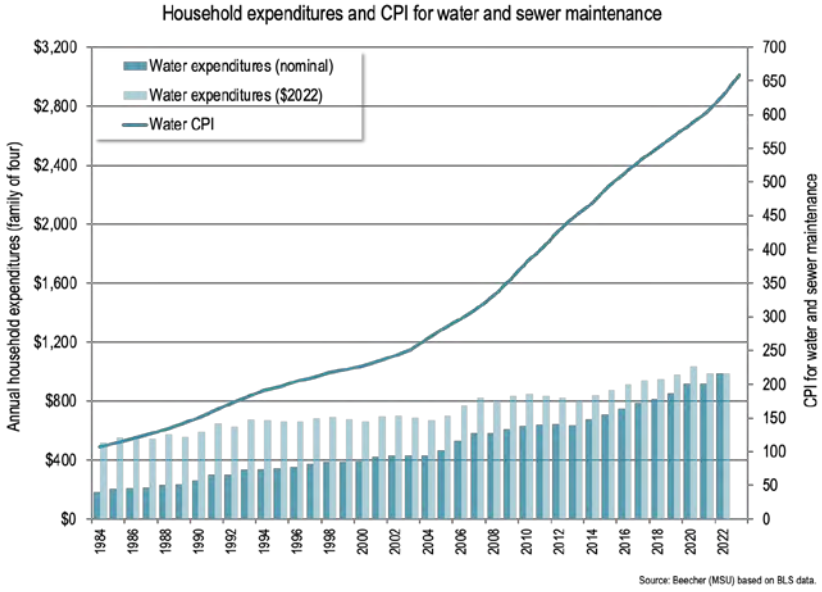
U.S. CPI trends: utilities can drive inflation

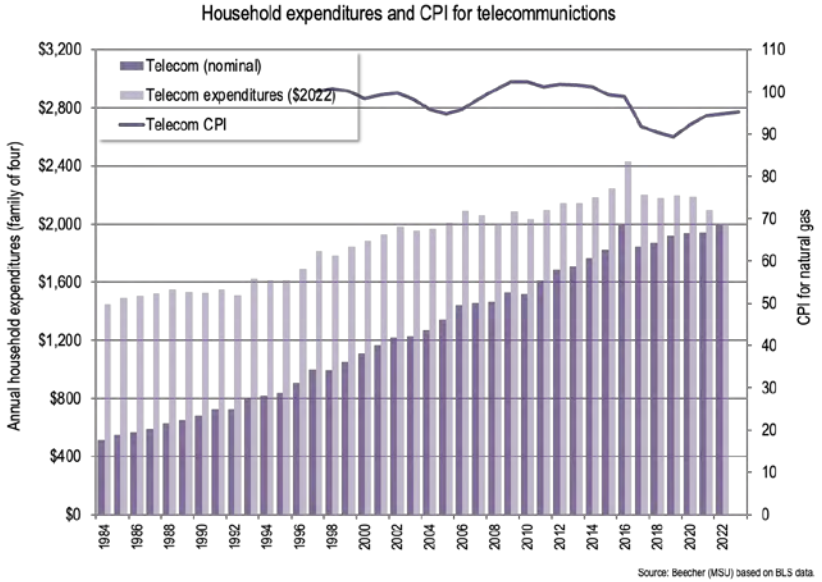


Expenditure and price trends combined and rates by class

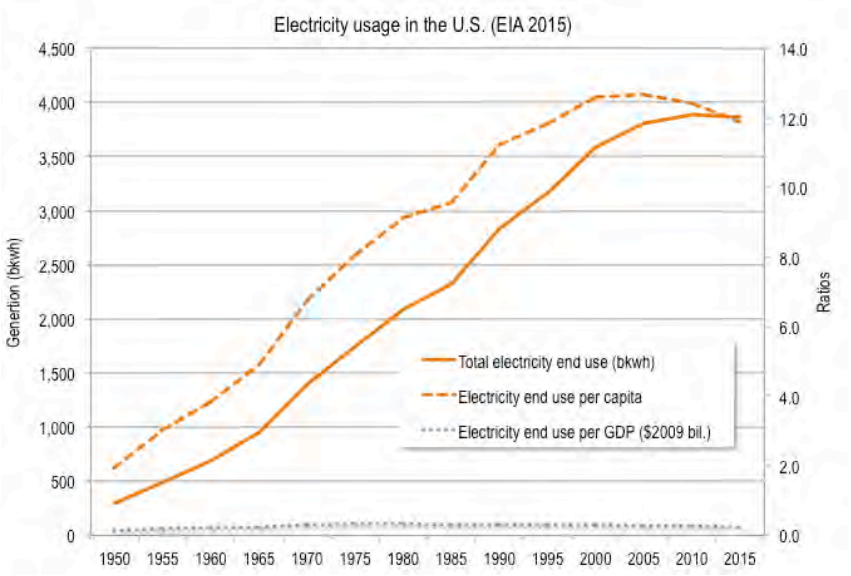


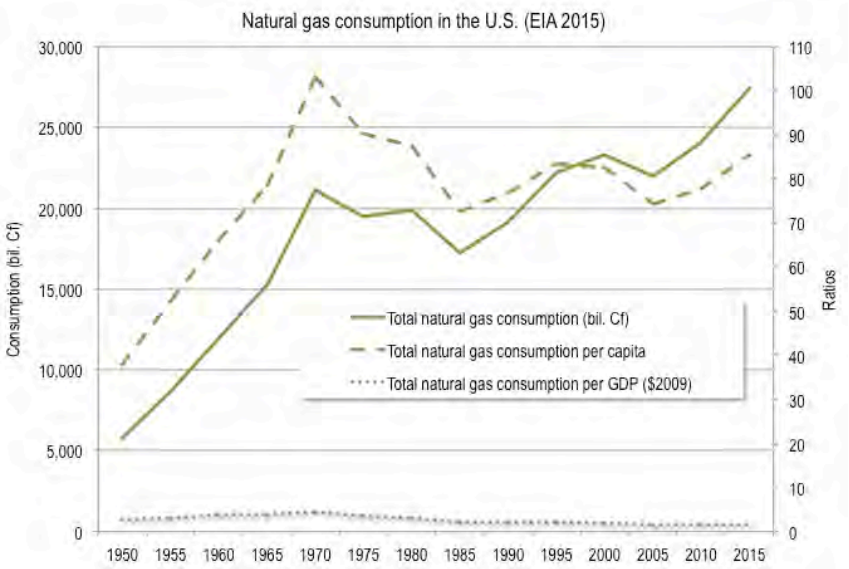


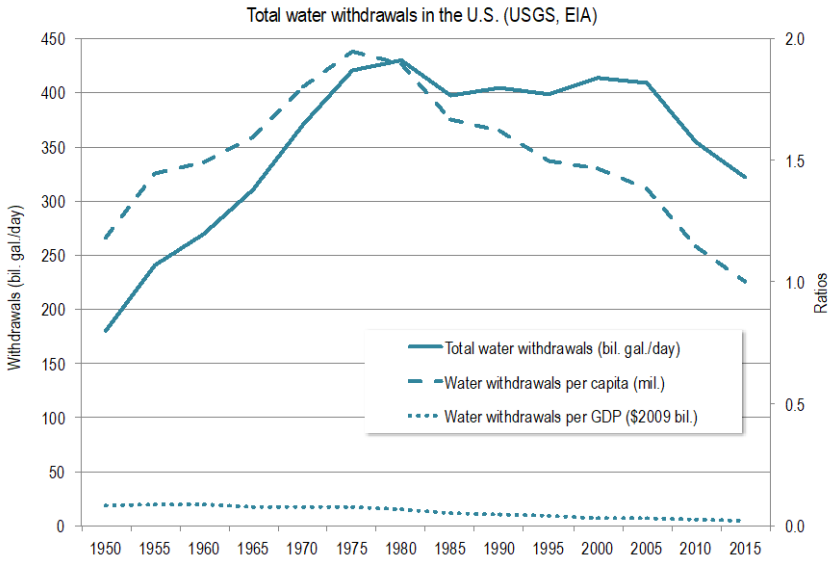




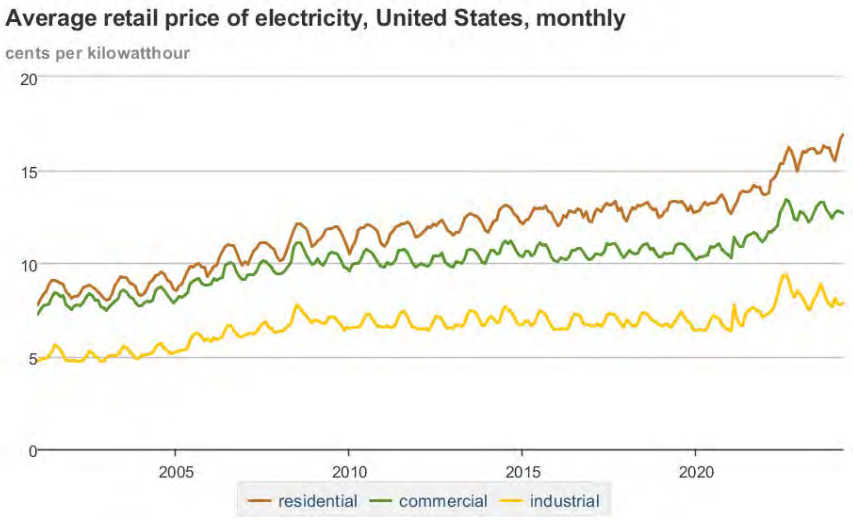
Aggregate trends: electricity, gas, and water

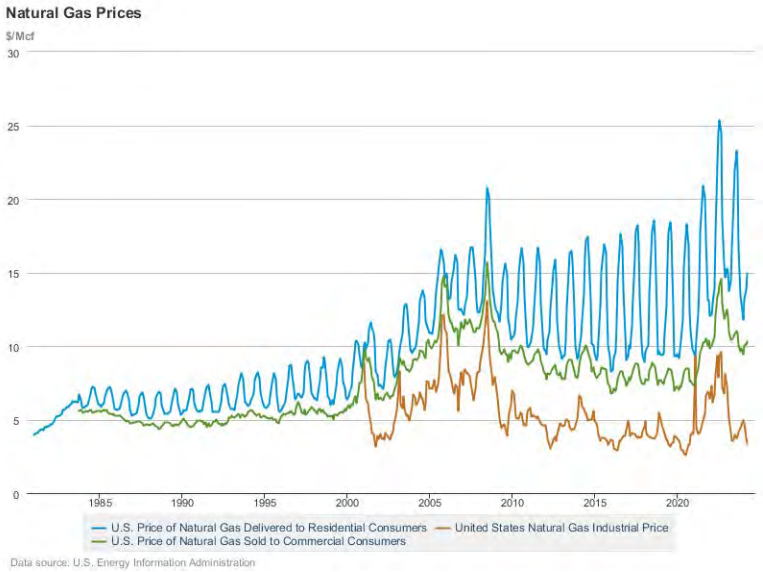


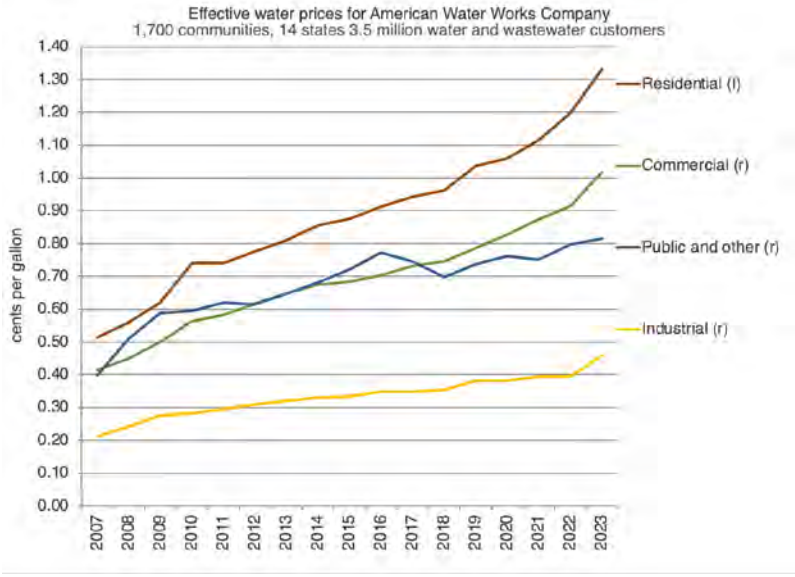




Average prices by class: economics, politics, and policy



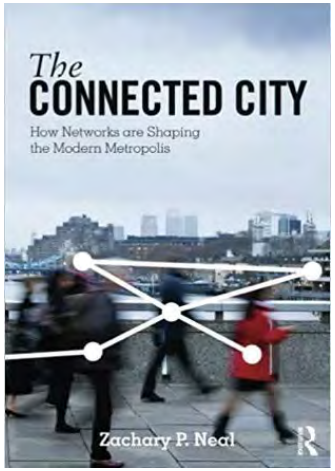




Utilities as infrastructure

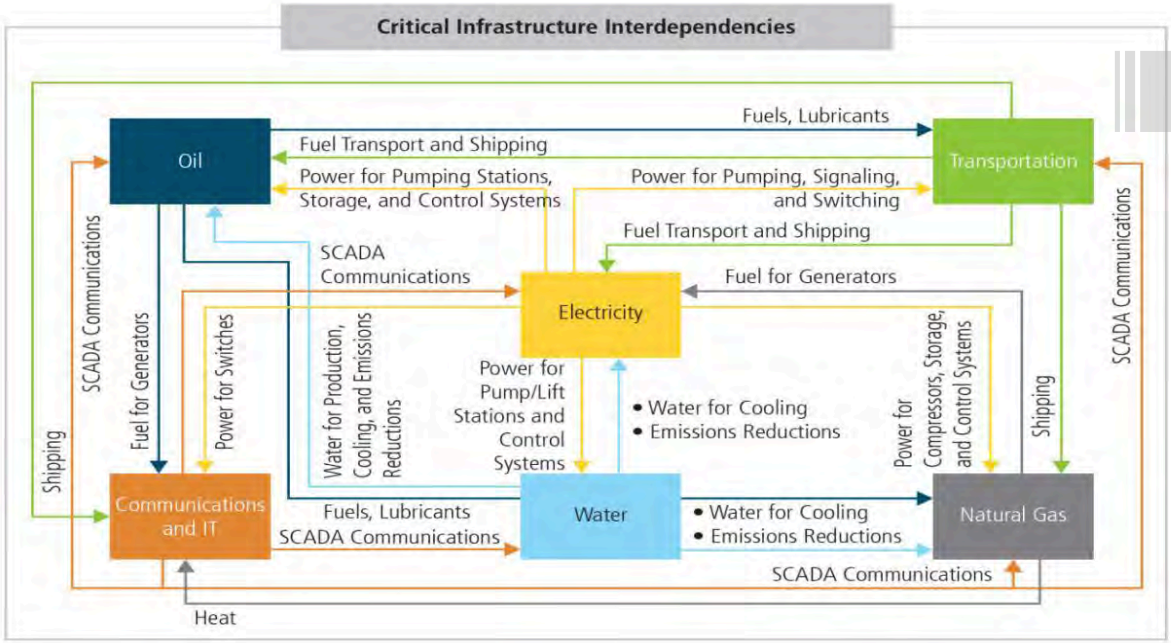
Public utilities as invisible networks

- *"In a very tangible way, public works are the sinews that make modern life possible… Human beings have for millennia developed public works to allow themselves to congregate" (Ann Durkin Keating, 1994)*
- Utility networks connect *not just things but people* – with positive network effects

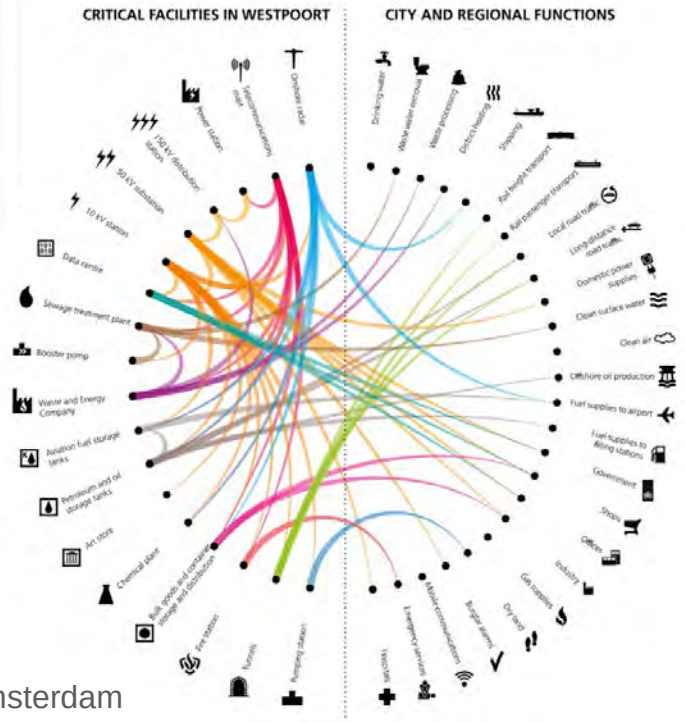


A MUT is a multi-utility tunnel allowing access to several services.

Public utilities as interdependent systems (Argonne, 2016)

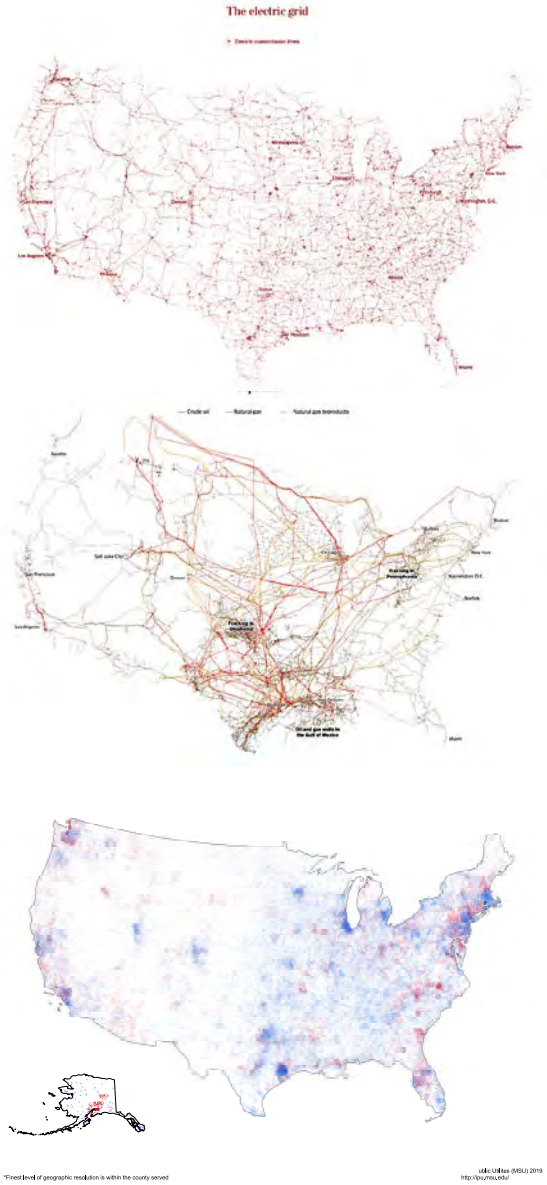


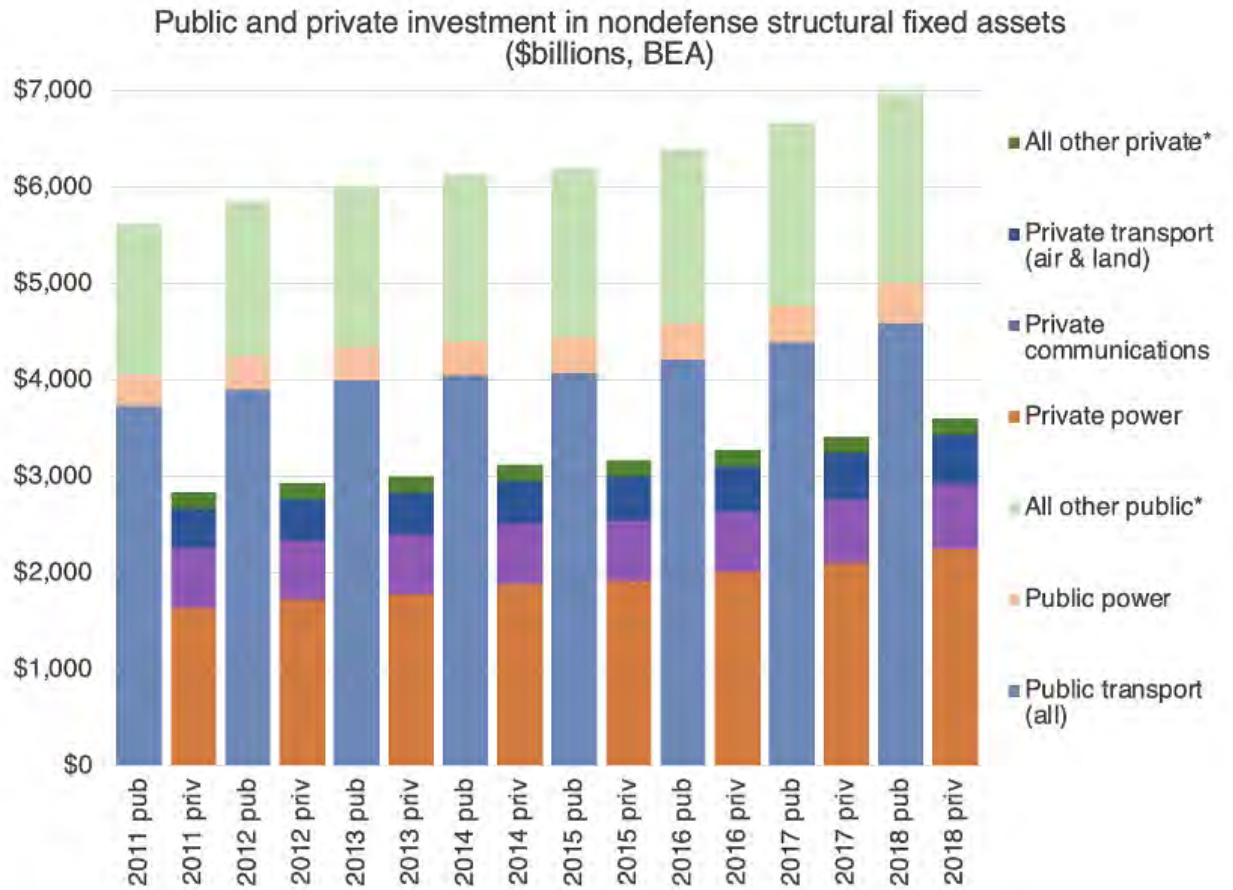
Other social systems



Westpoort Habour, Amsterdam

Public utilities as fixed asset infrastructure: public and private





Public utilities as investments

- *"Utilities are not a good way to get rich, but they are a good way to stay rich" (Warren Buffet, NARUC, 2006)*
  - Utilities historically were called "widow-and-orphan stocks" due to price stability and dividend dependability
  - Dow Jones Utility Index (DJU) is considered by some as a leading economic indicator

https://www.liberatedstocktrader.com/what-is-sector-rotation/

Public utilities and the UN Sustainable Development Goals (SDGs, reordered by Beecher)

Global outcomes

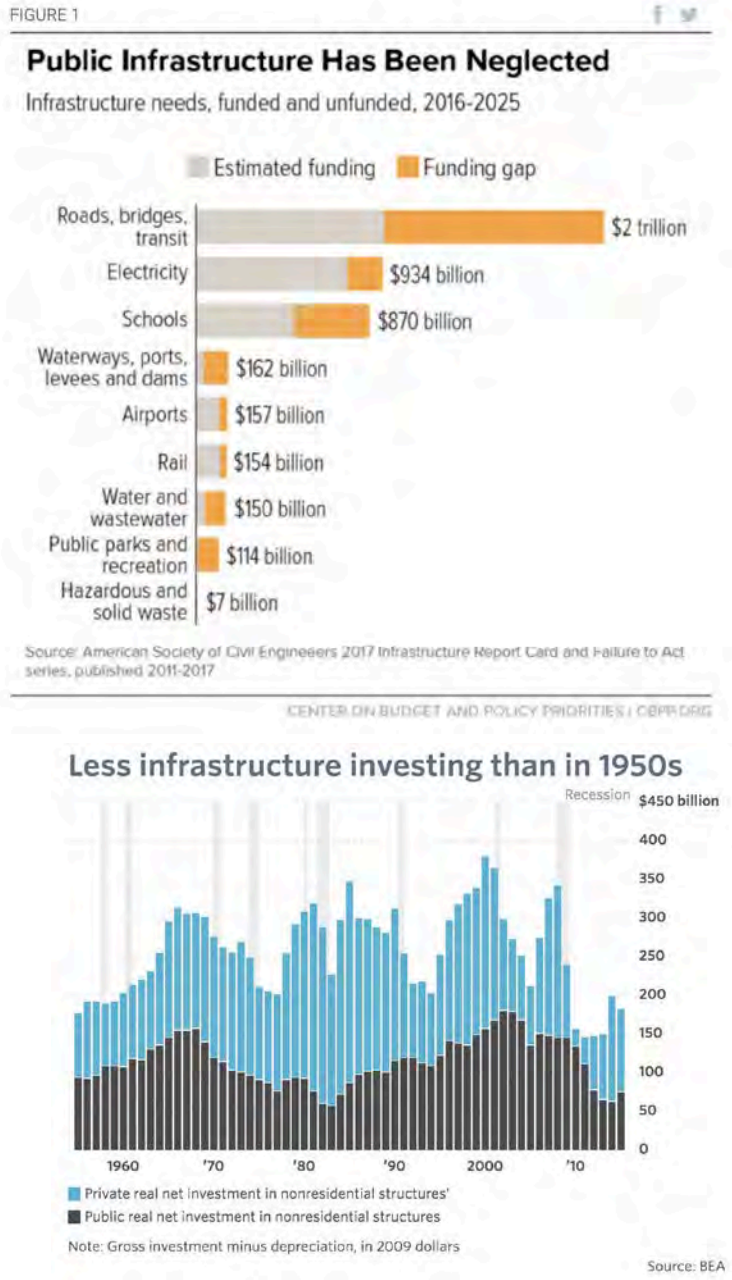
Resource stewardship

Critical infrastructure

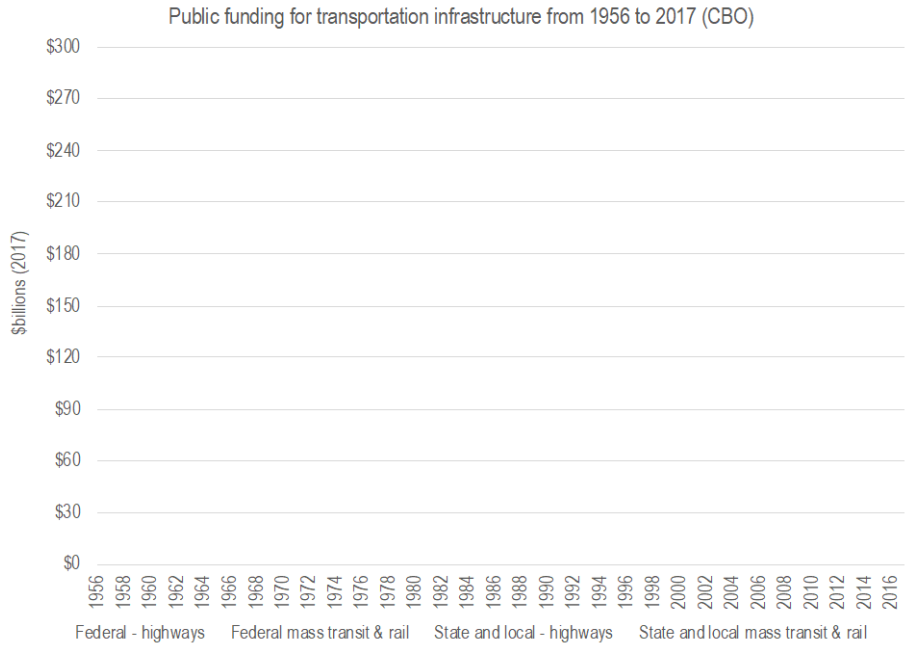
Supportive institutions

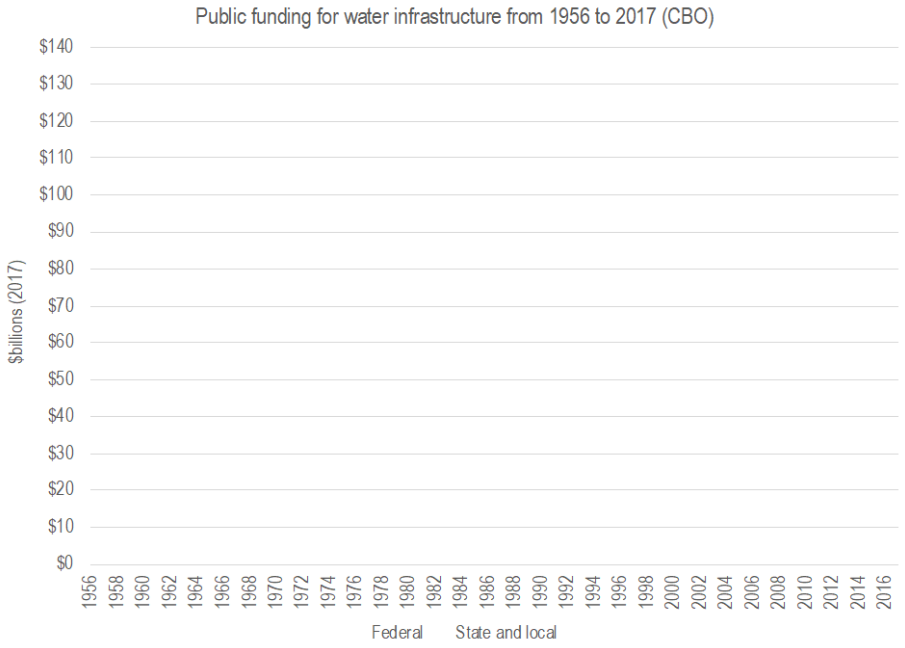
Infrastructure investment needs

- Infrastructure can be supported by taxpayers or ratepayers (reluctantly)
  - Structural and institutional barriers (e.g., California's Prop. 218, Michigan's Headlee & Bolt)
  - More support for public funding for infrastructure in the past – and with current federal investment
  - Role of political power
- Capital spending gaps and D+ grade
  - ASCE Estimates may presume in-kind replacement vs. optimization through modeling
  - Implications for quality of life, public health
- Not all infrastructure is "failing"
  - Alternative infrastructure replacement models – proactive, preventive, just in time, and "run to failure"



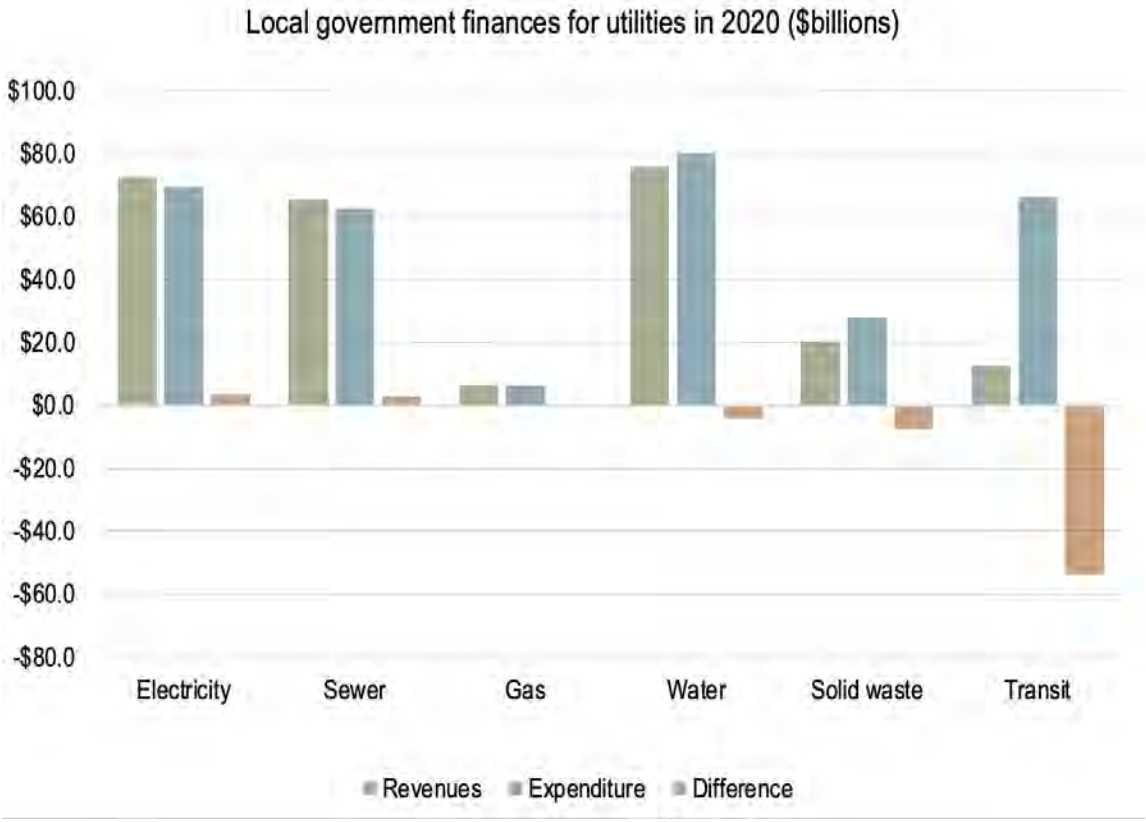
Public funding for infrastructure





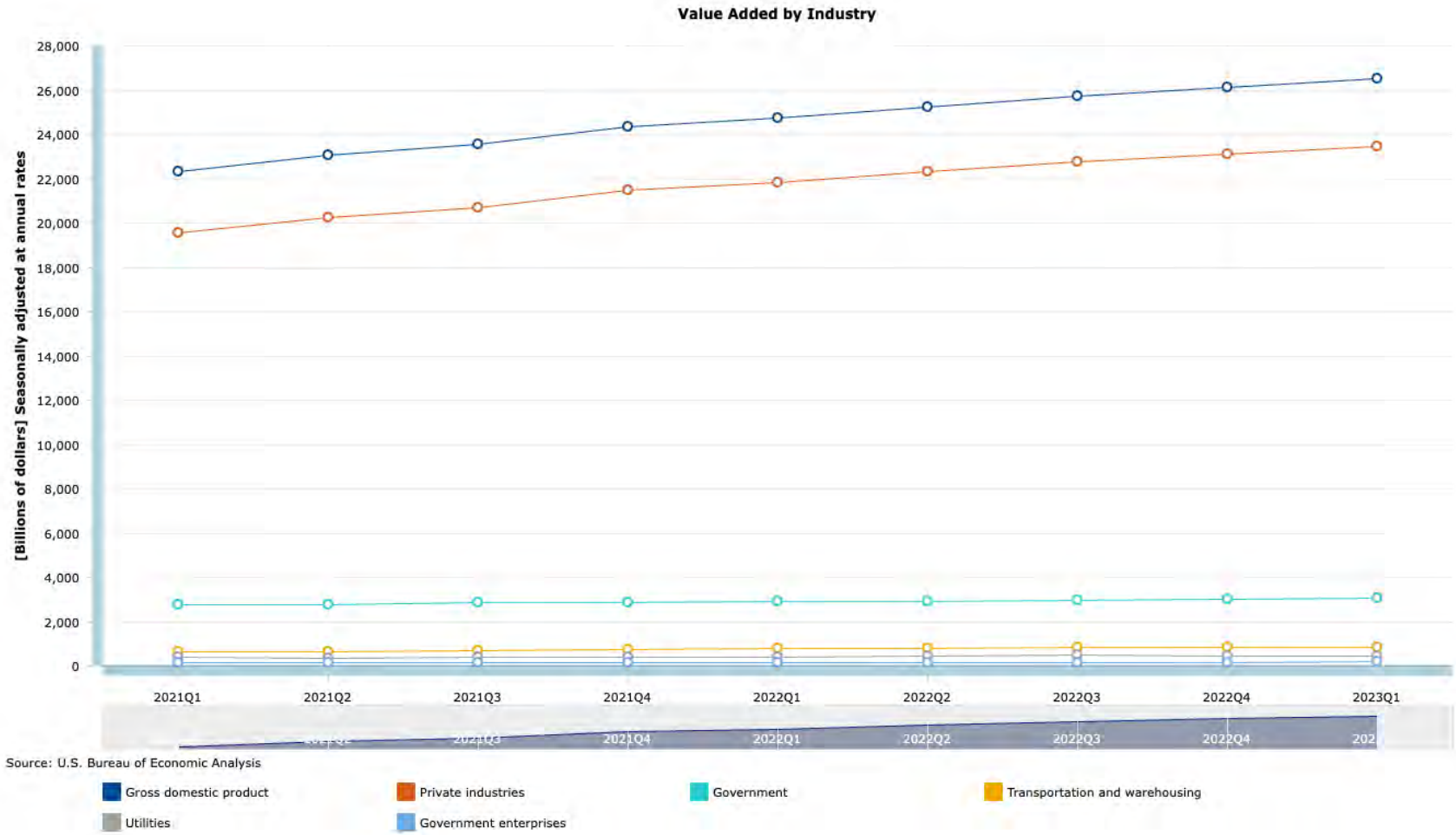
Nonprivate utilities in the U.S.

- Nonprivate utilities
  - About 2,000 public power and about 25,000 public water
  - Numerous nonprofit and cooperative systems
  - Utility enterprises are typically supported by revenues (not transit)
  - Are they spending enough?
- Key differences
  - Taxing authority
  - Debt funding
  - Not profit driven
  - Social values and goals
  - Local regulation
  - Subsidies and transfers
- Hybrid systems
  - Ownership vs. operation

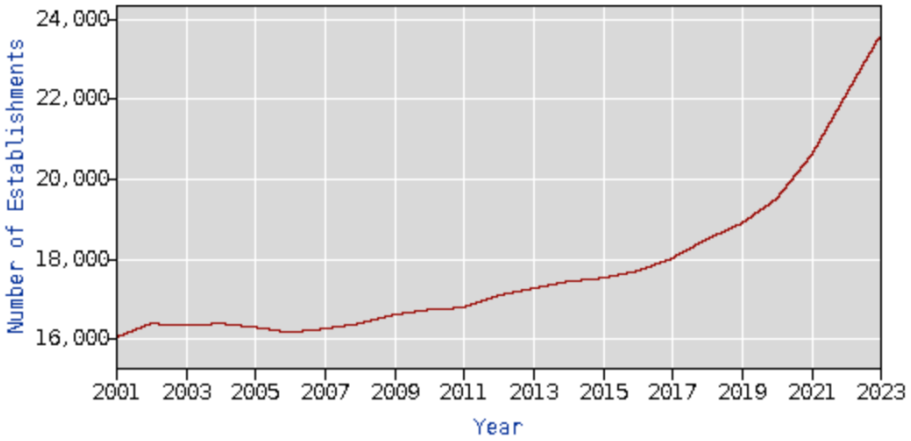


Privately owned utilities in the U.S. economy

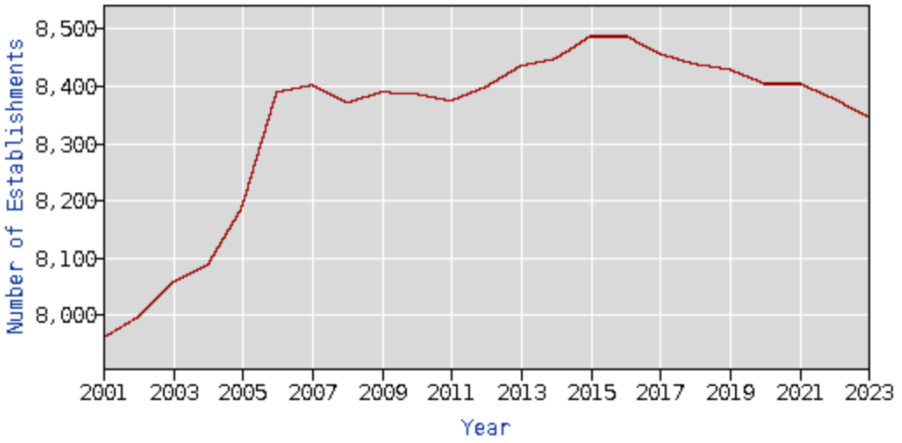
- Privately owned utilities (IOUs) account for about 1.7% of the US gross domestic product (GDP)



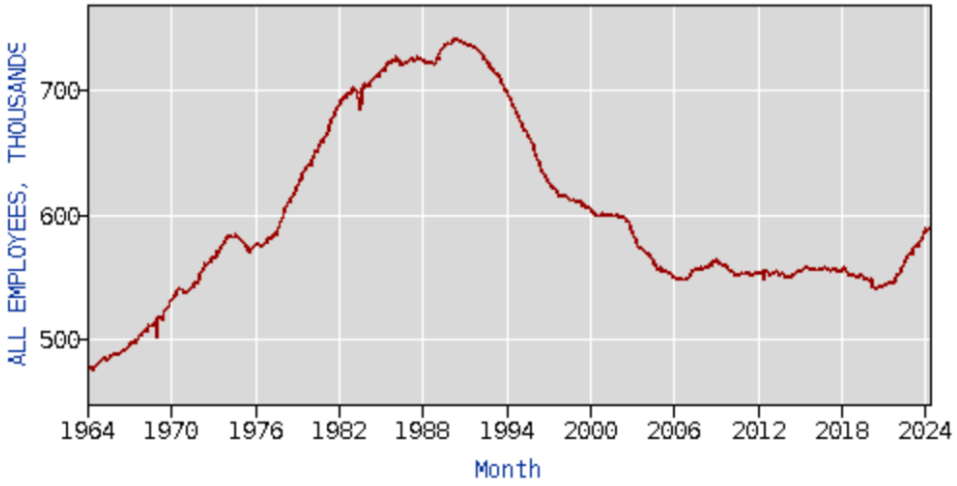
Utility establishments and employees in the U.S. economy



Private establishments



Local government



Employees

Poll 5: Funding infrastructure

- **Which of the following is not a source of funding for infrastructure?**
  - A. Debt and equity
  - B. Government grants
  - C. Revenues from ratepayers
  - D. Revenues from taxpayers
  - E. None of the above

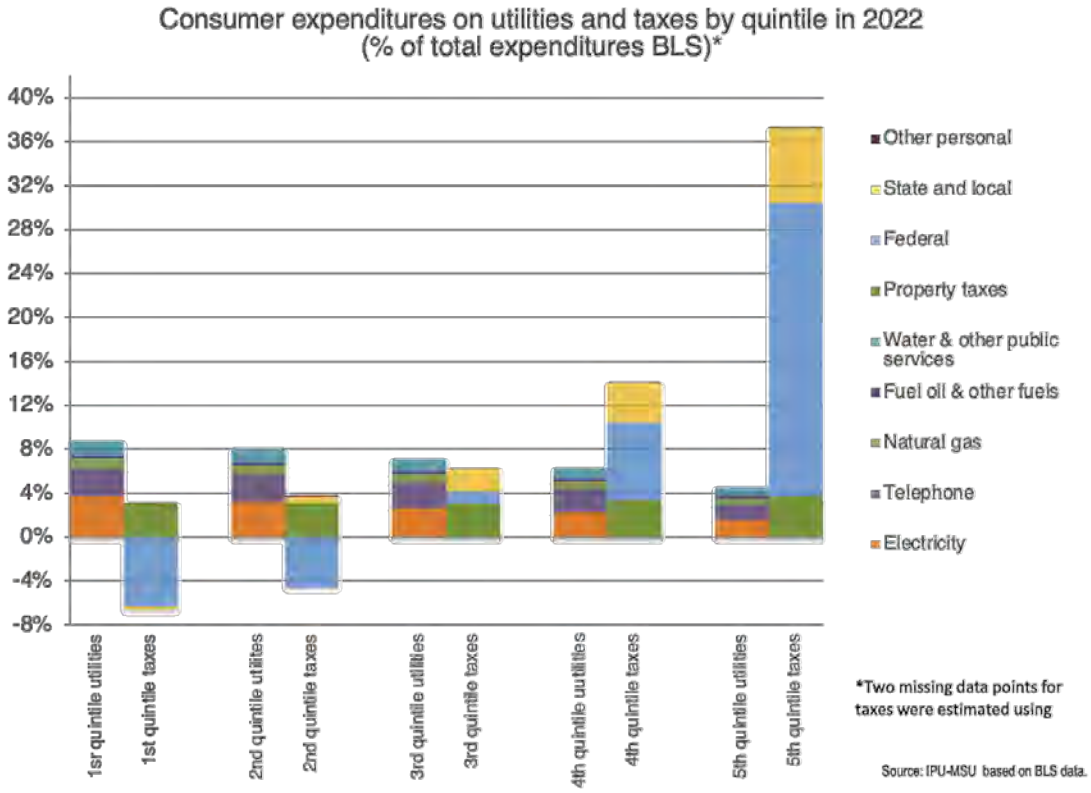
Infrastructure funding vs. financing

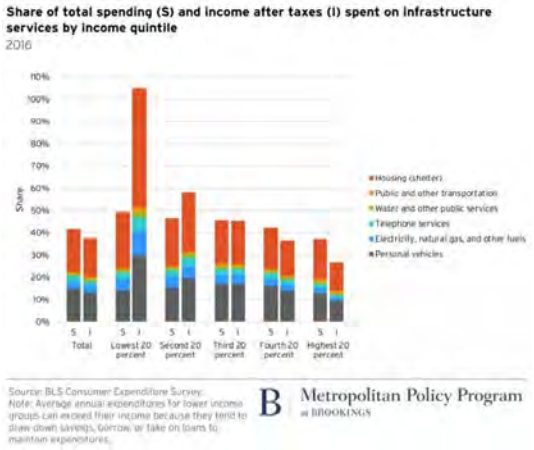
- Funding for infrastructure comes mainly from two sources
  - Taxpayers (federal, state, or local) or ratepayers (user fees and other charges)
  - Taxes require political processes; rates require bureaucratic/technocratic processes
- Utility enterprise model, fiscal autonomy, and financialization dominates
  - Full-cost pricing is favored over taxation
  - Rates are more regressive; taxes can be less regressive (distributional effects)
  - Operating costs are funded from operating revenues or other budgets
  - OECD subdivides three Ts: tariffs, taxes, & transfers (e.g., development funds)
- Financing for infrastructure
  - Financing supplies revenues – but also creates a liability
  - Capital financing comes from debt and/or equity (at a higher cost)
  - Privatization is a means of financing, not a source of "funding," not "competition"
  - Hybrid models combine options (such as partnerships)
- Examples
  - Stormwater management as enterprise or environmental service?
  - Charging station funding in FL (taxes) vs. NY (rates)
  - Cost of community fire protection borne by water utilities

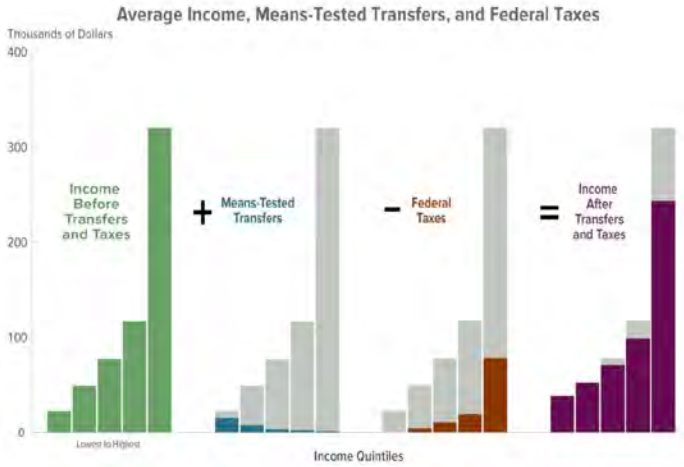
Infrastructure funding vs. financing

			Financing	
			Public sector (not-for-profit)	Private sector (for-profit)
			Lower cost of capital and weaker provider incentives	*Higher cost of capital and stronger provider incentives*
Funding	Taxes	*Less regressive effects and weaker consumer incentives*	Public provider (e.g., municipal department)	Private partner (e.g., contract operator)
	User fees	*More regressive effects and stronger consumer incentives*	Public enterprise (e.g., publicly owned utility)	Private enterprise (e.g., investor-owned utility)

Differential effects of tax and rate instruments







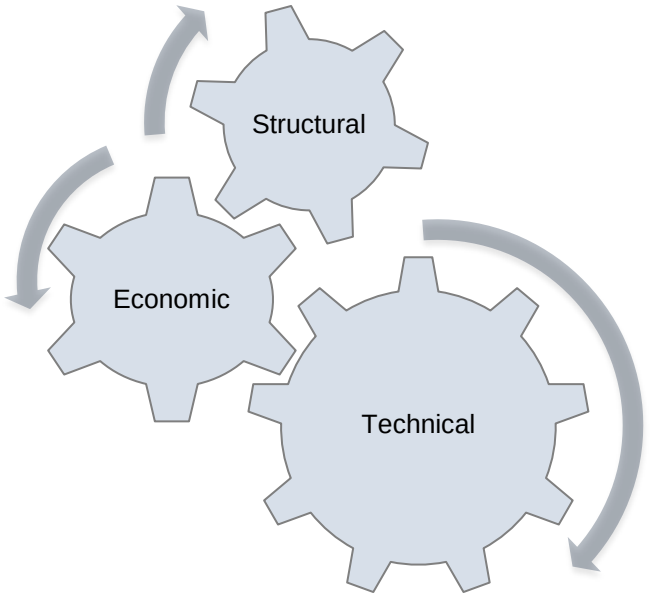
Utilities as monopolies

Poll 6: Monopolies

- **Which of the following is not necessarily a trait of utility monopolies?**
  - A. Capital intensity
  - B. Few substitutes
  - C. Very large size or scale
  - D. Price-inelastic demand
  - E. None of the above

Characteristics of utility monopolies

- Common fundamental technical, economic, and structural traits
  - Reinforcing barriers to market entry (e.g., capital intensity and longevity)
  - Limiting application of market theory and metrics by definition
- Services are imbued or “affected with the public interest”
  - Public health, safety, welfare, development, and prosperity – “social goods”
  - Integral role in local and national economies as well as secondary markets
  - Under-appreciated in the absence of crisis (blackouts, weather-related deaths)
- Traditional utility monopolies had much in common
  - At least some monopolistic features are persistent
  - Distribution functions generally remain monopolistic

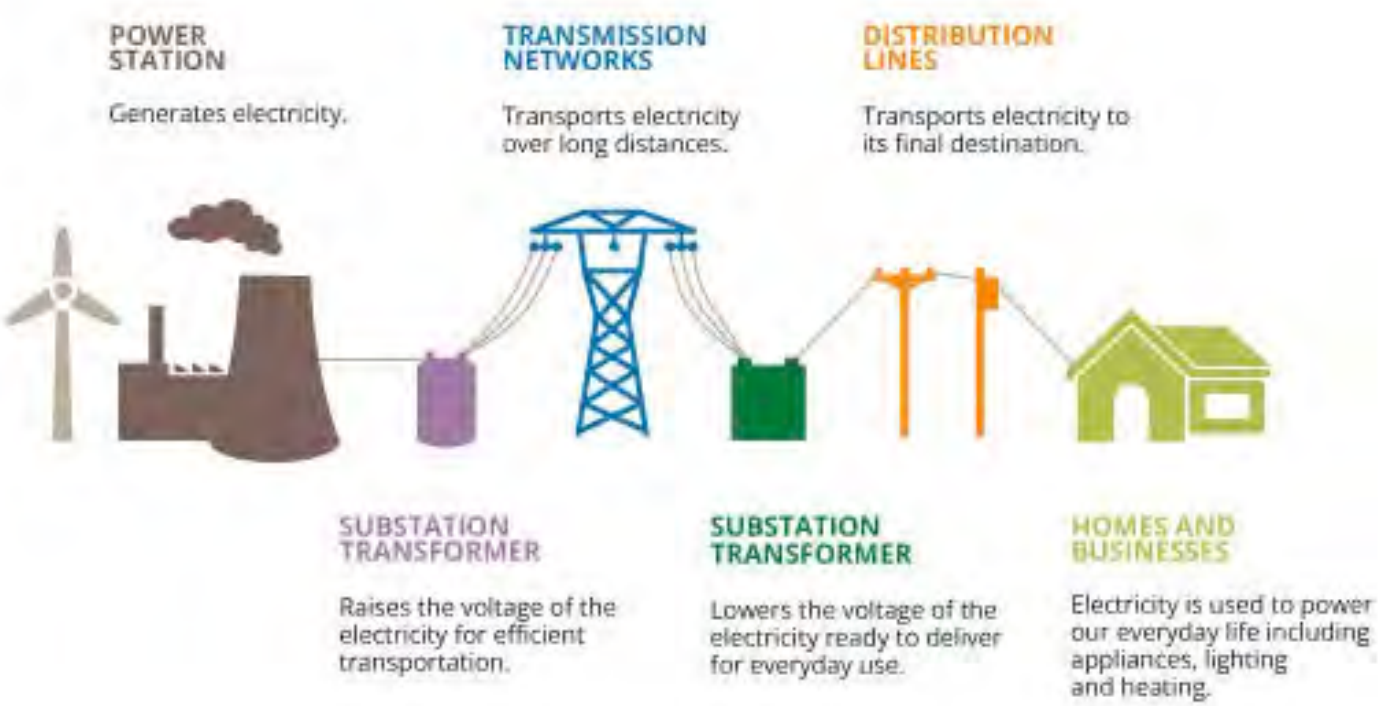


Technical traits of traditional utility monopolies

- Functions are integrated and services are “bundled”
- Investment is capital intensive (steel, concrete) and “lumpy”
- Fixed asset (machinery) specificity, longevity, & encumbrance (“sunk costs”)
- Land-use and siting issues for all resources are challenging (NIMBY)
- Supply and demand are kept in balance (temporally and spatially)
- Supply is firm, dense, directional, and upward dispatchable (vs. variable)
- Demand or load patterns shape system design (cyclicality, peaks)
- Desired service levels (quantity and quality) are available “on demand”
- Demand management can avoid operating and capital costs
- Network access and operations are closely controlled
- Standards and expectations for reliability and security are high
- Public and worker safety are prioritized (trenching, explosions, electrocution)

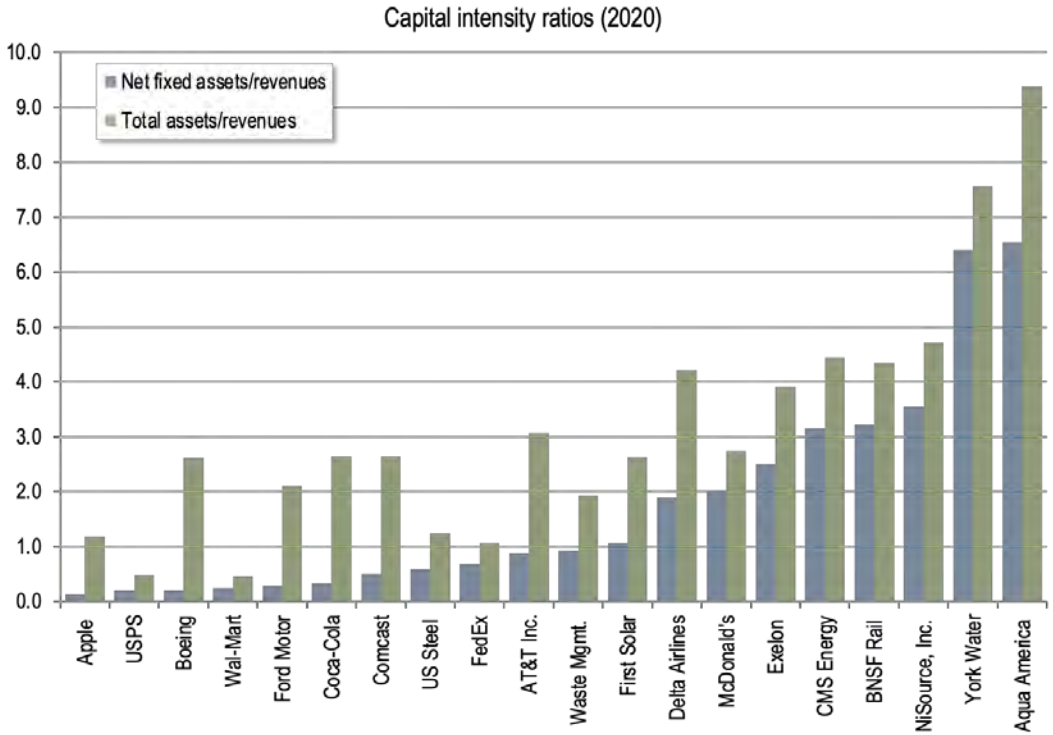
Vertical integration

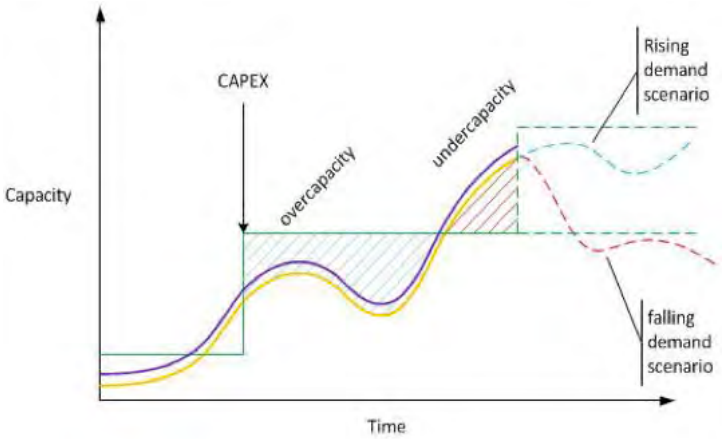
- Generation, transmission, and distribution functions
  - Generation costs are relatively higher for energy utilities
  - Transmission voltage ranges – high, medium, and low
  - Distribution costs are relatively higher for water utilities
  - Commodity costs are nature-based and variable



Capital intensity

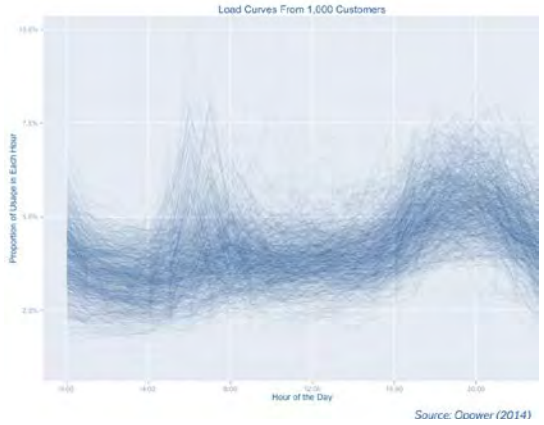
- Utility infrastructure is particularly capital-intensive
  - Measured as a ratio of assets to revenues - can drag competitive firms
  - Capacity investments are long-lasting, with large (lumpy) increments
  - A barrier to entry (monopoly) and a rationale for economic regulation
  - Possible rationale for public ownership of some (sub)sectors (transportation, water)
  - As cost structures change, capital intensity can change

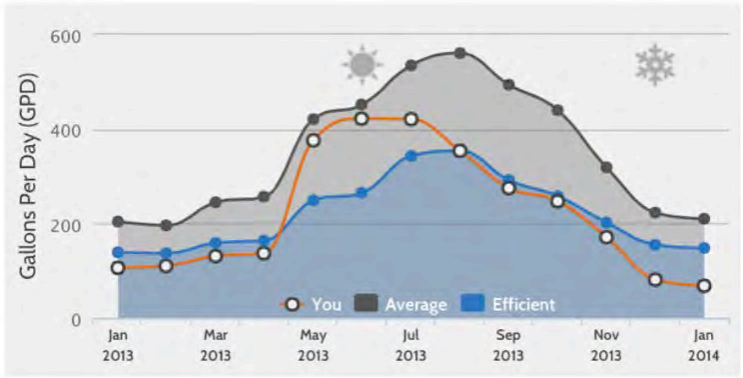


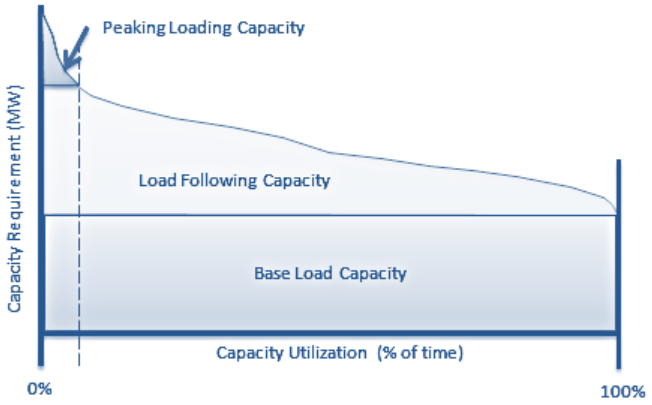


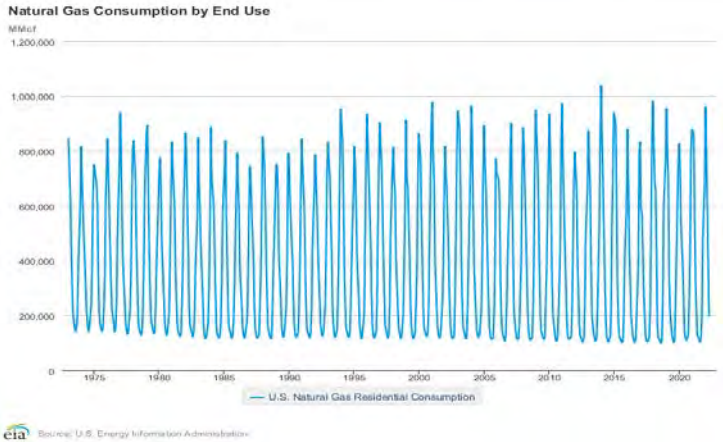
Cyclical load patterns

- By hour of day, day of week, season of year, customer class, over long periods
  - Seasonality depends on the type of end uses
- Utilities match supply with demand in real time – both are diverse and dynamic
  - Storage (water, natural gas, batteries) provides balance and helps meet peaks



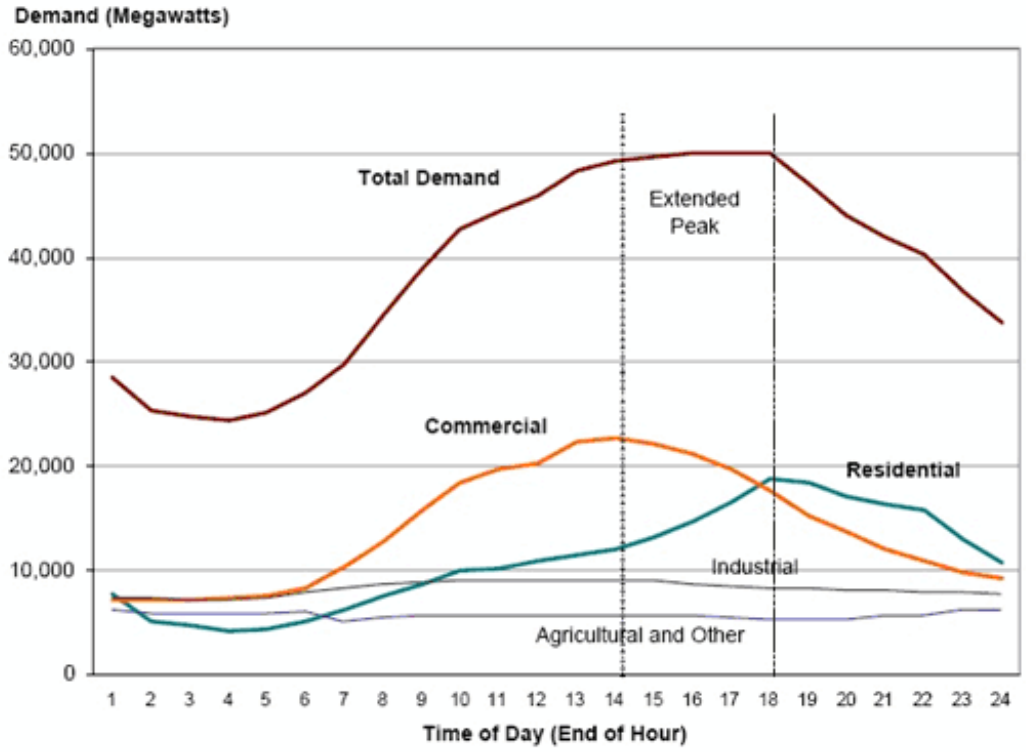


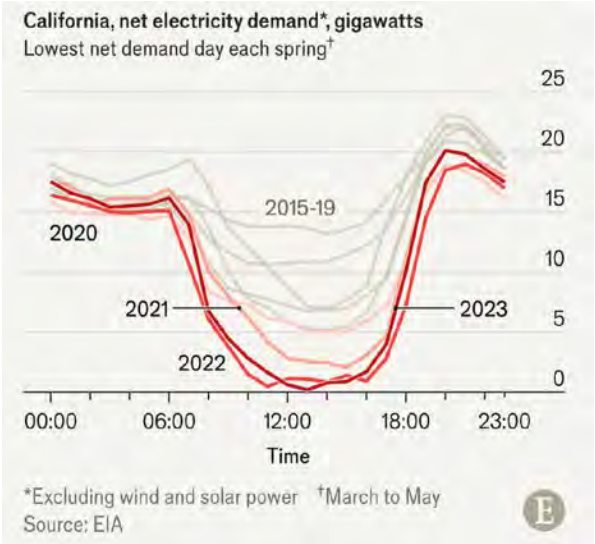


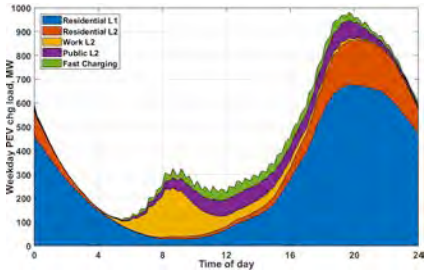


Service on demand

- Utilities meet “base load” plus peak demand with reserve margin or “slack”
  - Reserves accommodate critical peaks, needle peaks, demand shocks
  - Renewable resources may lead to excess supply during peak hours (“duck curve”)
  - Usage can be reduced or shifted with pricing and demand management
  - Could the concept of baseload become obsolete?





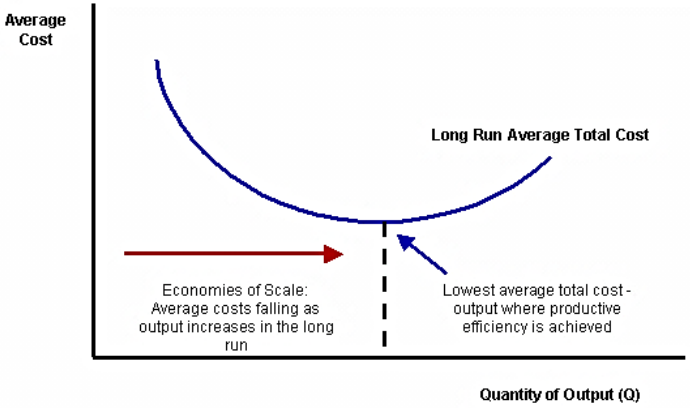


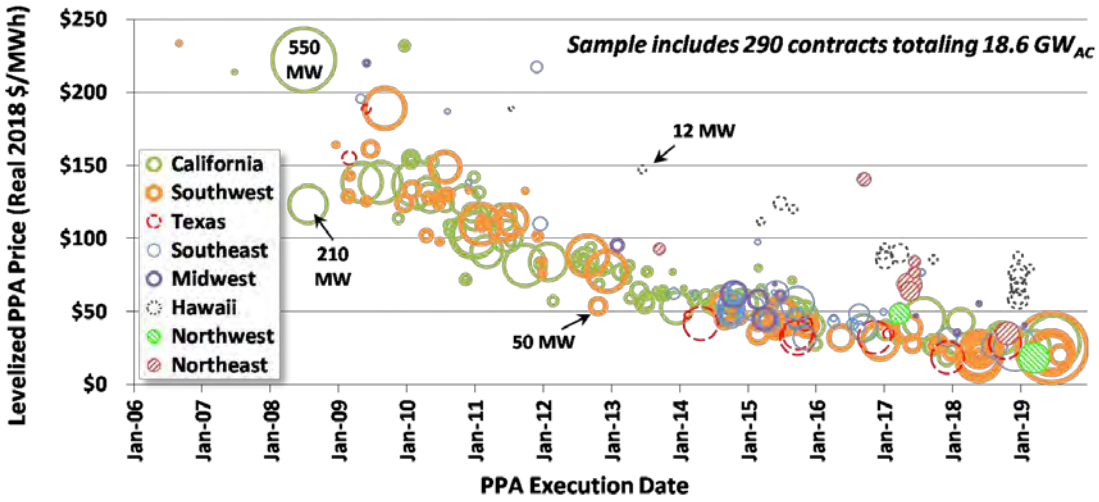
Economic traits of traditional utility monopolies

- Systems realize economies of scale in production (offset by distribution)
- Systems realize economies of scope, density, vertical integration, and “learning”
- Average cost of production is above marginal cost (ATC>MC)
- Production and consumption have negative *and* positive externalities
- Infrastructure and commodities are significant cost drivers (by sector)
- Participants and society benefit from network economics and effects (connectivity)
- Supply and demand are subject to external forces (e.g., weather)
- Technologies, standards, and policies limit product differentiation
- Customers are divided into broad classes – residential, commercial, industrial
- Demand is relatively price and income inelastic in the short term
- Access and expenditures for utilities have distributional consequences
- Core customers are captive (limited choices, substitutes, or switching)

Scale economies

- Declining unit costs of production (returns to scale) favor bigger utilities
  - Consider the cost of backup generators, batteries, home water softening, etc.
  - Apply to conventional and new technologies, including renewable resources
  - Scale economies are not unlimited for utilities or projects – diseconomies, overhead
  - Scale effects can change with time - falling usage could move or alter the curve
- Many contemporary issues concern optimal scale and spatial location
  - Decentralization and locating facilities closer to load (loss reduction)
  - Implications for models of utility structure and governance (including micro-grids)
  - Production scale for proximity service territories vs. corporate consolidation





Price elasticity of demand

- Price elasticity is the responsiveness or sensitivity of demand (usage) to price
  - For individual, system, or market – varies by various factors
  - Demand curve reflects the consumer's marginal willingness to pay
  - Price elasticity incorporates ability to pay (income effects)
- Measured as: (%△ in quantity demanded) / (%△ in price)
  - Represented as an absolute or negative value – and challenging to estimate
  - A value of 1 (or -1) is unitary elasticity (e.g., price up 1%, usage down 1%)
  - Lower for necessities and higher for discretionary goods
- Other elasticities of demand
  - Income
  - Weather

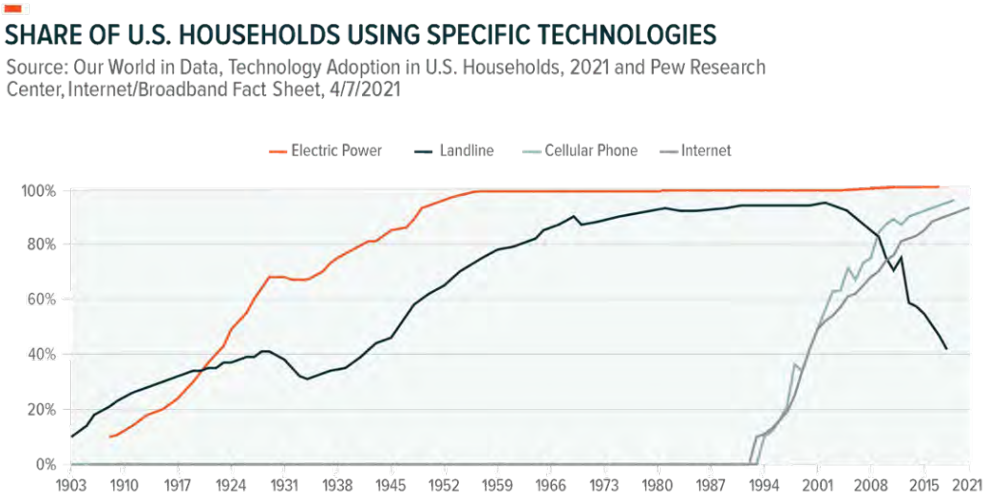
Price elasticity for utility services

- Elasticities are relevant to ratemaking in terms of forecasting sales revenues
- Utility services are relatively price-inelastic – with variations by usage
  - Price increases may not induce substantial usage reductions
  - First blocks tend to be more essential and less elastic – equity
  - Later blocks may be shaped by marginal prices – efficiency

Less price-elastic	More price-elastic
Nondiscretionary goods or necessities	Discretionary goods of luxuries
Less expensive, low-volume, & efficient usage	More expensive, high-volume, & inefficient usage
Short-term or more immediate needs	Long-term or less immediate needs
Goods without substitutes and choices	Goods with substitutes and choices
Goods in noncompetitive markets	Goods in competitive markets
Indoor and dry weather water usage	Outdoor usage and wet weather usage
Discretionary usage at higher incomes	Discretionary usage at lower incomes

Substitution

- Reasonable alternatives bring about workable competition – and less regulation
  - Disruptive, transformative, and game-changing technologies
  - Email, VoIP, on-demand media, ride-sharing, fuel cells, solar panels, reuse water
  - Water commodity has no substitutes – only in treatment and delivery methods
- Alternatives are judged in terms of comparable availability, quality, and price
  - Some alternatives may be complementary
  - Some are reasonable but not identical (calling vs. texting)
  - Customers must be willing and able to shop and switch (bear transaction costs)
  - Markets may be dominated despite alternatives (Apple, Comcast, Google)
  - Corporate image and reputation may be factors



Structural traits of traditional utility monopolies

- Ownership may be public, private, or not-for-profit, public (local vs. SOEs)
- Services may be converged (e.g., electricity and natural gas)
- Systems range from very small to very large, may be isolated or interconnected
- Firms have rights of way and powers of eminent domain
- Conditional franchises are granted for exclusive service territories
- Duplication and rivalry would be expensive, wasteful, or ruinous
- Networks are neutral and service provision is nondiscriminatory
- Competition and contestability are limited (lowering risk)
- Providers are obligated to serve (including the “last mile” as feasible)
- Wholesale and retail “markets” are organized (structured) and monitored
- Performance is subject to regulatory and self-regulatory standards
- Structural form determines federal and state regulatory jurisdiction

Utility ownership structures

	Publicly owned	Cooperatively owned	Privately owned
Classification	Governmental	Nongovernmental not-for-profit	Nongovernmental for-profit
Ownership	Government-owned department, division, or enterprise	Member-owned cooperatives, associations, other NFPs	Investor-owned corporation or private proprietor
Governance structure	Elected officials (councils), local boards, and commissions	Member boards of directors	Corporate boards of directors and governmental regulators
Orientation	Constituent service	Member benefits	Shareholder returns
Responsible owner of assets	Unit of (local) government	Member-owners or shareholders	Investors in publicly traded or private equity
Tax status of operations	Tax-exempt but may make payments in lieu of local taxes	Tax-exempt but may make payments in lieu of local taxes	Pay income, property, and other taxes on private corporations
Distribution of profits	May retain reserves or make transfers to parent governments	Proportionate to member shares and subject to federal tax policy	Regulated returns based on capital invested in utility plant (rate base)
Sources of funding	Citizen ratepayers and taxpayers (including grants and other contributed capital)	Member ratepayers and taxpayers (including grants and other contributed capital)	Customer ratepayers with limited funding from contributed capital (including grants)
Means of financing	Debt, government equity, advances, and reserves	Debt, member equity, and advances, and reserves	Debt, investor equity, advances, and reserves
Financial rules	Governmental Accounting Standards Board (GASB)	Financial Accounting Standards Board (FASB)	Financial Accounting Standards Board (FASB)
Financial regulation	State-level as applicable	State-level as applicable	Federal Securities and Exchange Commission (SEC) if publicly traded
Economic regulation	Sometimes and conditional	Sometimes	Always for monopolies

Structural and regulatory status of the sectors

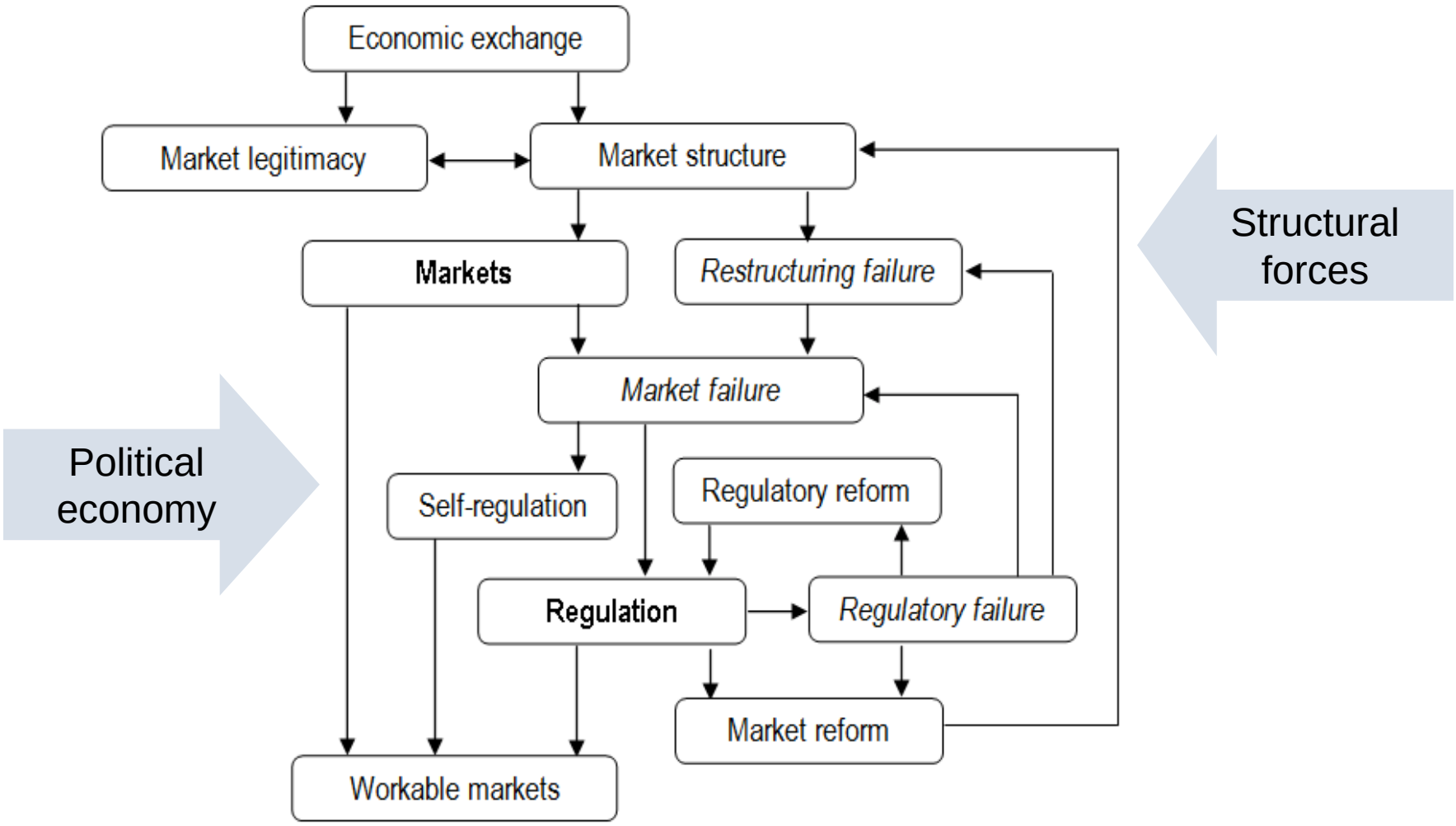
	Structural status	Unregulated	Regulated
Electricity	Restructuring and wholesale markets (transmission access); some retail choice	Independent power generation; most non-private utilities	Interstate and unbundled transmission (federal); retail distribution (state); vertically integrated (shared)
Natural gas	Vertical segregation with competitive wholesale markets; some retail choice	Wellhead (commodity) gas production; most non-private utilities	Interstate transmission (federal); intrastate trans-mission and retail distribution (state); pipeline safety (shared)
Telecom	Oligopolistic with workable competition; regulation is limited in scope	Long-distance and wireless services and other services and equipment	Small independent providers (state); universal service (shared); network access and internet service (federal)
Water	Generally integrated and monopolistic; some wholesale and contract activity	Most non-private utilities; most privatization contracts; most wastewater providers	All privately owned utilities and some non-private utilities (state only; no federal economic regulation)

Need to question our assumptions given sectoral dynamics

- Supply and demand-side changes
- Consumer and voter preferences
- Scale and scope economies
- Vertical and horizontal integration
- Spatial dimensions and (de)centralization
- Base-load and one-way power
- Customer classifications
- Business and service models
- Structural and organizational forms
- Governance and regulatory schemes

Markets and market failure

Markets and regulation: which comes first?



Competitive markets: theory, conditions, and results

Theoretical conditions of markets

- Diversity of preferences among many consumers
- Diversity of resource endowments among many producers
- Technical specialization and production economies
- Product differentiation, consumer choice, and substitution
- Orientation toward shareholder value and growth (vs. sustainability)

Conditions of perfect markets (rare)

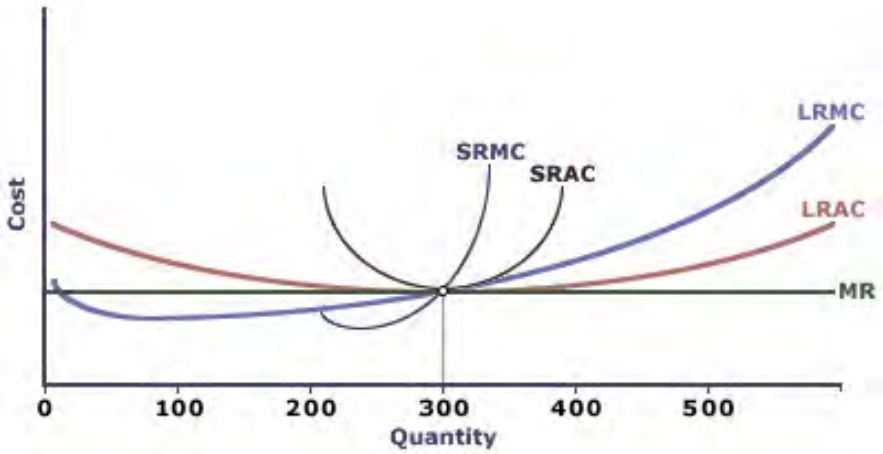
- No public goods: well-defined property rights
- No externalities: no spillovers in production/consumption
- No information asymmetry: no distortions or misrepresentation
- No transaction costs: no constraints on choices
- No welfare effects: consumer choices do not impact others or markets
- No market power: no entry/exit barriers, manipulation, discrimination
- No opportunity for “creative destruction” (innovation) in the short term
- No regulation: no price reviews and controls

Results of perfect competition (rare)

- Dynamic equilibrium of supply and demand for homogenous goods
- Highly decentralized economic activity
- Prices at the marginal cost of production
- Perfectly price-elastic demand
- Equity returns at the cost of capital (no premium) – static efficiency
- Market share gained only thru technological and managerial innovation

Perfect competition

- *"Our goal at FERC is perfect competition, textbook competition. Competition that is so perfect and beautiful it would make an economist weep" (former FERC Chairman J. Kelliher, 2008)*
- Perfect competition results in supply-demand equilibrium and normal profit
  - In reality, "perfect competition is the exception…" (Schumpeter, 1942)
  - Market equilibriums can also be disrupted by technology
- Competition (perfect or otherwise) is not inevitable
  - Even "competitive" businesses are highly self-regulated and state-regulated
  - For utilities, choice is between imperfect markets and imperfect regulation
- Theoretical alternatives to perfection
  - Workable competition (Clark, 1940)
  - Contestable markets (Baumol, et al., 1982)
  - Must be robust to be protective



Alternate theory 1: workable competition ⓘ

- *"Towards a Concept of Workable Competition" (J.M. Clark, 1940)*
  - Competition may not perfect – but it must be "workable"
  - Workable competition can be "structured" (i.e., "organized markets")
  - Market oversight and monitoring are needed to check market power and manipulation
- Criteria
  - Multiple suppliers without market dominance
  - Meaningful choices for customers, including substitutes
  - Checks on market power
  - Access to transmission networks
  - Timely price information
  - Manageable volatility
  - Reasonable rules and certainty
  - No market barriers or impairments
- A modern rendition is "comparative competition" based on performance metrics
  - Monopolies can be compared to other monopolies (none are "pure") – benchmarking
  - Generally requires sufficient structural separation

Alternate theory 2: contestable markets ⓘ

- *"Contestable Markets and the Theory of Industry Structure" (Baumol, Panzar, and Willig, 1982)*
  - Based on the potential for new entrant(s) to seize market share
- Assumptions are "looser" than for perfect competition
  - Very easy market entry with very low technological, economic, or institutional barriers
  - Entry/exit of new firm faster than incumbent's defensive price adjustment
  - New firms can produce at the same or lower cost than incumbents
  - Exiting firms easily dispose of assets, fully recover sunk costs
- Critique
  - "Monopolistic competition" is counterintuitive – and an oxymoron
  - Implies "perfect contestability" – same theoretical problems as perfect competition
  - Meeting the assumptions is still very difficult (entry barriers, sunk costs)
  - Weak competition still argues for structured markets and/or economic regulation
- Example: "structural contestability"
  - Public vs. private ownership – although transfers are rarely simple or easy (see City of Boulder, Pennichuck Water)
  - Policy favors privatization over municipalization

Competition continuum and regulatory divide

Deregulate

Competitive: market power is negligible among multiple firms (deregulation possible)

Workable: trivial or tolerable imperfection (market power is inconsequential)

Contestable: private vs. public (structural competition)

Oligopolistic: a few firms with market power (entry barriers are significant)

Monopolistic: one firm has absolute market power (must be regulated)

Regulate

"Failure" in the political economy

Technological	Service outage caused by natural disaster, human error, sabotage, etc.
Ethical	Criminality, fraud, lacking controls, conflicts of interest, hubris (ENRON, WorldCom, Andersen, FirstEnergy)
Policy	Ineffective policies, rules, or processes, including bureaucratic and regulatory failure
Business	Bankruptcy due to incompetency, obsolescence, weak competitiveness – may indicate competition is working
Market failure	Constraints on competition or poor outcomes, including but not limited to the problem of ***monopoly***

Note: there is distinction between market and business failure in a functioning market of winners and losers.

A typology of market failure or imperfection ⓘ

Effectiveness	Efficiency	Equity
Structural	*Transactional*	*Distributional*
• Public and social goods, network infrastructure, and monopolistic cost structures and pricing issues • Market power and potential for abuse • Social and economic instability and ruinous competition • Missing markets or lack of interest in or commitment to market participation • Extreme risks and irreversible impacts	• Uneven or undefined property rights • Transaction, coordination, opportunity costs (friction) • Asymmetrical and distorted information or preferences and lack of standards • Limited consumer choice and discretion • Bounded rationality and capacity, adverse selection • Conflicts, agency, moral hazards, collusion, fraud, free riders, gaming	• Positive and negative externalities and risk shifting • Short-term focus, exploitation of commons, and intergenerational inequity • Undersupply of knowledge, limits to charity, philanthropy • Unintended outputs, outcomes, or incentives • Uneven privilege, access, opportunity, and vulnerability • Violations of non-monetary values, morals, rights, and environmental justice

Note: the list is inclusive and policy response is not limited to economic regulation.

The problem of market failure

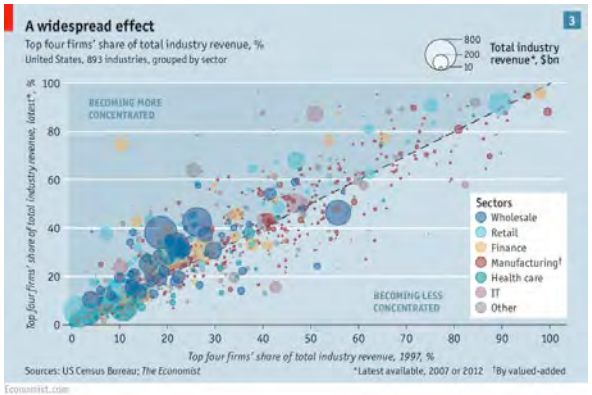
- *Market failure reflects a misalignment of private and social costs, benefits, risks, and incentives* (J. Stiglitz, 2009)
- Paradigm and rhetoric are powerful, but markets are not a panacea
  - Markets sometimes work but sometimes fail to meet efficiency & equity criteria or self-correct
  - Denial of market failure and uncritical acceptance of markets is pervasive ("neoliberalism")
  - More markets cannot necessarily fix market failures
  - Markets can fail when producer power is high, and consumer discretion is low
- Dichotomizing markets and regulation as "belief" systems can polarize and mislead
  - Perceptions and evaluations of failure tend to reflect different values
  - Diagnosing failure should be "clinical" (technical, empirical) and nonpartisan (not bipartisan)
  - Regulators are sensitive and responsive to market failure – *it's their job* (vs. "anti-market")
- Market and regulatory theories come from the same body of knowledge
  - Economic discipline must come from either competition or the state
  - Markets shape the form of regulation and vice versa
  - Regulation must evolve to address persistent and new market failures
- Privatization brings investment and profit motives but not necessarily competition
  - Private monopolies suggest the potential abuse of market power
  - Private ownership reflects the "public use of private interest" (C. Schultze)
  - "Half a market – profit drive without meaningful specifications or discipline – can be worse than none" (J. Donahue)

Market failure beyond monopoly ⓘ

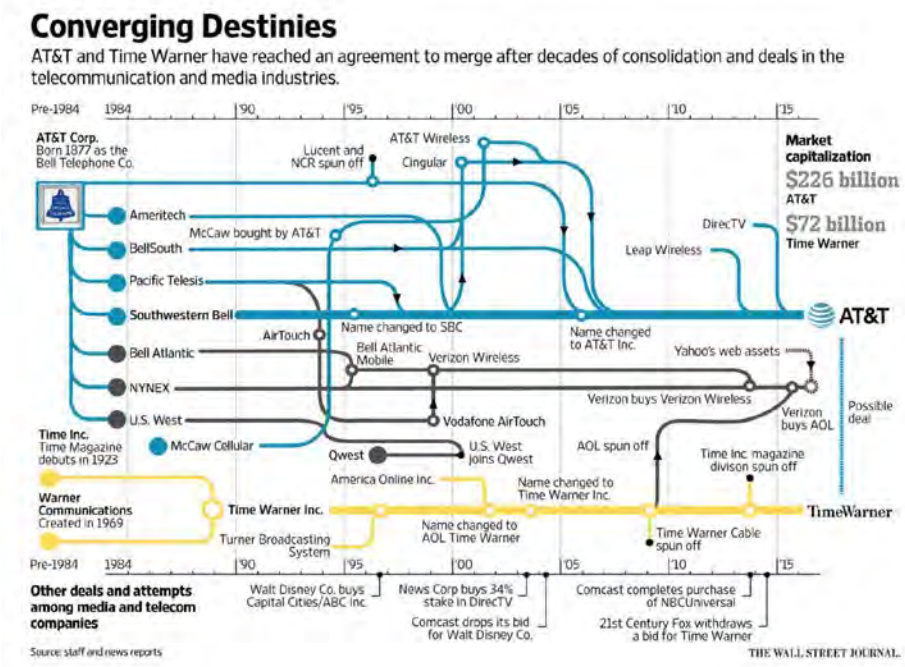
- Persistent market failures call for regulatory solutions – or structural alternatives
  - Markets can suffer from supply chain issues and shortages (e.g., propane)
  - Markets will allow for price discrimination (including Ramsey pricing) and distributive effects that regulation tends to mitigate
  - Structural options include cooperative or public ownership
- Eliminating some market failures (such as monopoly) may invite others
  - Examples include predatory pricing, consumer deception, and fraud
  - Market restructuring typically involves layering of multiple market actors and mechanisms and substantial transaction and coordination costs
- Deregulation may be feasible when competition is sufficiently robust
  - But deregulation complicates the achievement of critical social goals related to public utilities (including universal service and decarbonization)
  - "Overall, deregulation was successful in terms of economic efficiency. Looked at through the wider lens of democratic capitalism, however, the issue is more complicated. The regulatory systems that were dismantled included all sorts of cross-subsidies, reflecting delicate balances among various interests" (R. Reich, 2007)

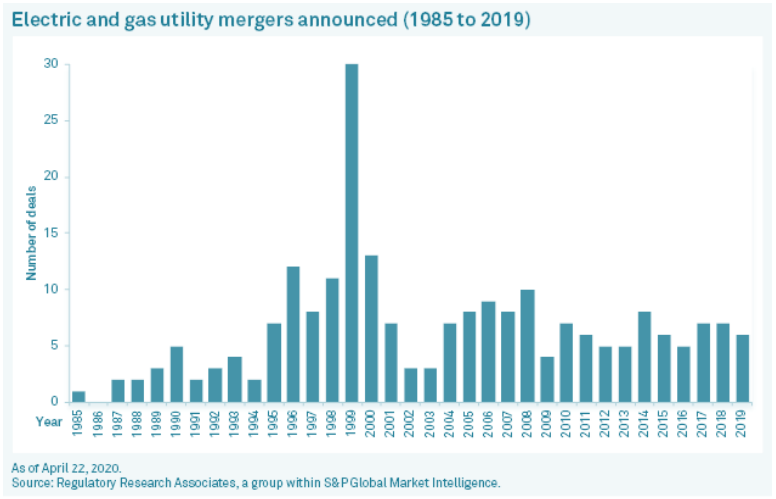
The problem of market concentration and power

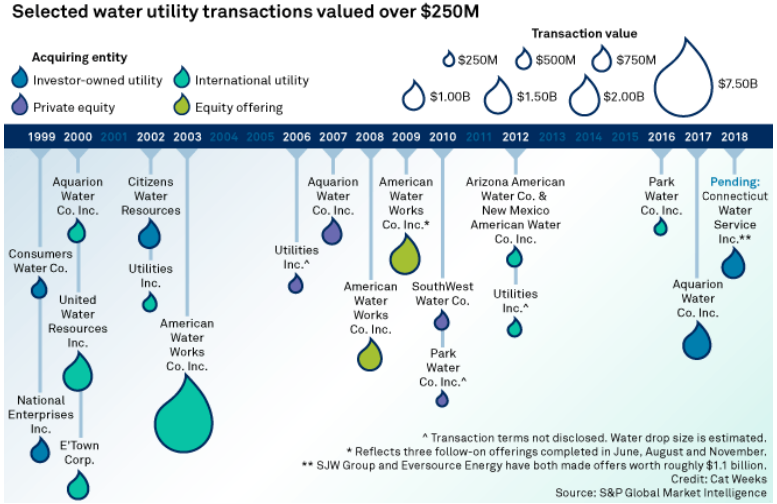
- Policy issue is not just about market share but abusing market power
  - Market share may be gained by lowering prices – even in concentrated markets
  - Market power is not the same as scale or "purchasing" power"
- Market power may be horizontal or vertical
  - Evident when firm, cartel can maintain price above competitive level - "price leadership"
  - Price leverage increases with inelastic demand
- Market power violates key theoretical assumptions about markets
  - Undermines market integrity and has negative welfare effects
  - Barriers to entry and incumbency are market advantages
  - Market power offsets efficiency gains from restructuring
- Monopolies benefit from protective regulatory structures with weak oversight



Market consolidation in telecom and energy utilities







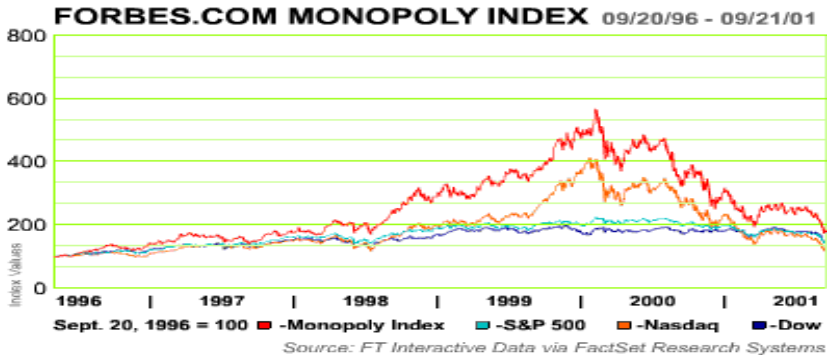
The problem of market power (continued)

- *"We don`t have a monopoly. We have market share. There`s a difference" (S. Ballmer, Microsoft)*
- Potential abuse of market power
  - Many markets have a degree of concentration, dominance, or influence
  - Concentration and consolidation are not uncommon in the US economy
  - Governmental intervention is not always necessary or cost-effective
- What can regulators do about market power?
  - Measure and monitor – screening tools and forensic economics
  - Check for behaviors – collusion, gaming, and manipulation
  - Deploy enforcement powers and tools
  - Allow of market entry (supply) and aggregation (demand)
  - Scrutinize mergers, acquisitions, and terms and hold companies accountable
  - Implement market-like tools – pricing, competitive bidding, comparative competition
- For non-utility services
  - Anti-trust policy applies – U.S. Department of Justice
  - Does the U.S. need a Competition Commission?

Colbert on monopoly and Oliver on utilities

The problem of monopoly

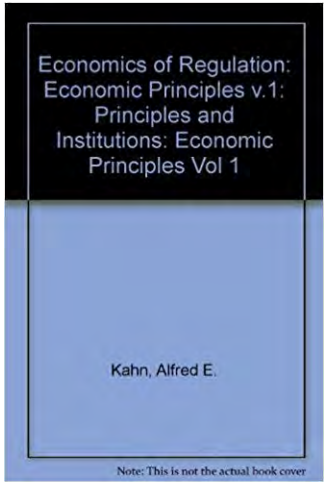
- *"You always want to aim for monopoly and… avoid competition" (Peter Thiel)*
- Monopoly is a form of organized economic activity in a defined market
  - Absolute market dominance (power) by an exclusive provider (no competitive discipline)
  - Can be "economical" based on production-cost characteristics (utilities)
  - Governments maintain a variety of monopolies (e.g., national defense)
- Potential for market abuse by profit-oriented monopolies
  - Supply curtailment and price inflation causing welfare loss to society ("dead-weight")
  - Degradation of service quality to lower costs (e.g., maintenance practices)
  - Undue price or service discrimination among captive, price-inelastic customers
  - Abuse of market power and incumbency to limit potential competition
- Monopoly calls for protective governmental intervention (regulation)
  - Self-regulation and social coercion by cajoling or shaming are insufficient
  - Unregulated monopolies (or tight oligopolies) are economically & politically undesirable



Monopolies, captivity, and accountability

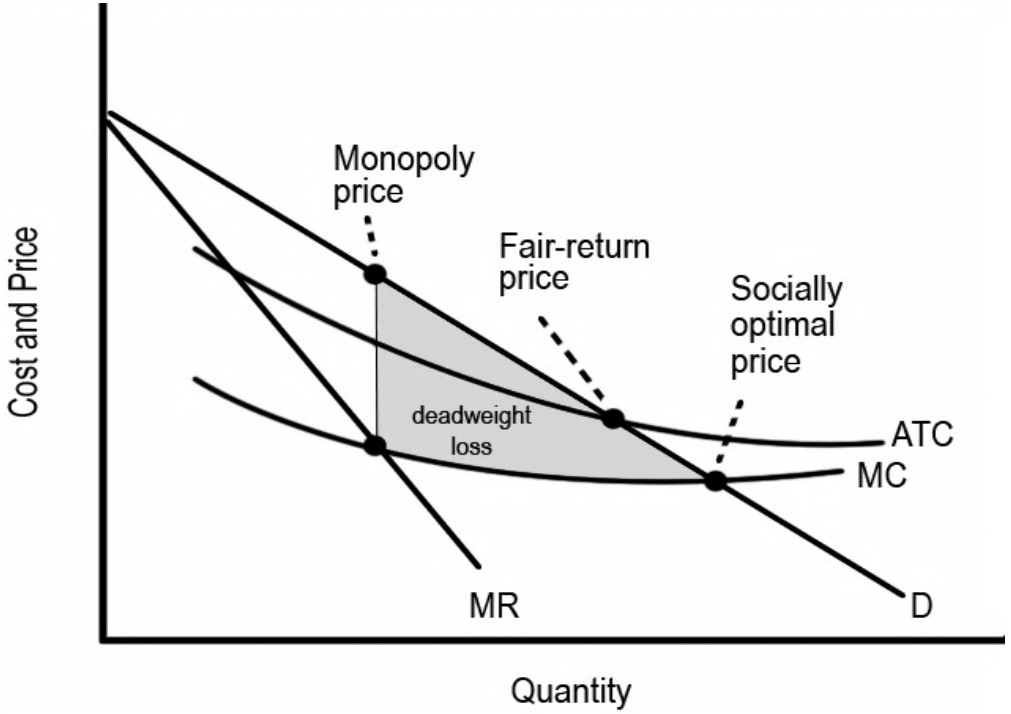
Alfred Kahn's principles

- *Economics of Regulation: Principles and Institutions (1971)*
  - "Whenever competition is feasible, it is, for all its imperfections, superior to regulation as a means of serving the public interest."
  - "Public economic policies [can be] formulated and judged only in terms of some conception of the proper definition and weight to be placed on... various noneconomic goals" (emphasis added)
- Kahn's principles (Weisman, EJ, 2017)
  - Economic regulation should seek to emulate the competitive process
  - Even imperfect competition may be preferred to economic regulation
  - There is no halfway house between regulation and competition ("regulated competition")
  - Protect the integrity of the competitive process not the competitors (antitrust policy)
  - Static efficiency is less less important than dynamic (innovation)
  - Prices should reflect the marginal cost of the service



Economic, financial, & legal dimensions of monopoly pricing

- Average total cost (ATC) above marginal cost (MC) of service
  - Welfare losses, monopoly rents, second-best solutions, missing-money problem
- A profit-seeking monopolist
  - Can adjust prices and quantities up to the point that marginal revenue = marginal cost
- Monopolies will enhance profits by withholding supplies and raising prices
  - Monopolies pose problems of both *efficiency and equity*



Monopolies and efficiency ⓘ

- Efficiency issues are central to both problem (monopoly) & solution (regulation)
  - Regulation is a conditional proxy for competitive discipline (“prime directive”)
  - Regulation promotes efficiency (as markets purport to do) but should also promote equity (as markets often fail to do)
  - Promoting innovation by monopolies is more challenging
- Potential advantages of market power and (possibly) regulated monopoly
  - Scale, efficiency, development, and innovation (J. Schumpeter, M. Porter)
  - Managers devote less time on market share and profits, more on process improvement
  - Whether regulated monopolies can truly innovate is debated
  - Bell Labs innovation: advancing knowledge or securing monopoly?
- Monopolies will tend to underperform in terms of
  - Market efficiency – equilibrium of undistorted supply and demand
  - Allocative efficiency – use of resources
  - Productive efficiency – output relative to input
  - Internal (“X”) efficiency – organizational structure
  - Dynamic efficiency – encouraging innovation
- Different efficiency goals may conflict with each other and with equity goals
- Incumbency, culture, and sunk costs may thwart change and innovation

Monopolies and equity ⓘ

- Market power can lead to discriminatory behavior and inequitable outcomes
  - "Price gouging," "cream skimming," "greenlining," and/or inequitable results
  - Equity can be defined in terms of various social or public values
  - Equity can be understood in horizontal, vertical, and intergenerational terms
- Thinking about equity is much harder than thinking about efficiency
  - Economic regulators define equity in economic and legal terms
  - Equity is applied as an economic standard – do rates reflect "cost causation"?
  - Equity can also be considered in broader legal and even broader social terms
  - Solutions considered equitable may or may not be considered *fair*
- Monopolist's wealth is appropriately limited by fair returns
  - Excess returns by utilities might be considered usurious
- Regulation can distribute or redistribute (transfer) wealth or economic "rents"
  - Regulatory consideration of equity – especially social equity – is always controversial
  - Sometimes attributed to political motives of regulators (intentional)
  - Cost allocation can favor some interests at the expense of others ("social ratemaking")
  - Using rates for taxation and wealth transfer departs from cost-based ratemaking
  - Problematic given monopolistic nature of utilities and nondemocratic nature of regulation
  - By altering transfers, deregulation has disruptive distributional effects (R. Reich, 2007)

What's so "natural" about monopoly?

- Monopoly is persistent for some sectors and functions - especially distribution
- In the long run, pure monopolies are very rare (J. Schumpeter)
  - May be "artificial" or institutional (exclusive franchise, entry/exit/access barriers)
  - Many non-utility, non-monopoly production processes reveal scale economies
  - Scale economies may be limited and changing (decentralization, flexible infrastructure)
- Public utilities today are "network industries" – open access, switching, choice
  - Networking may have scale, integration, and coordination benefits
  - Consolidation and market power can undermine competition (antitrust)
- Technologies, economics, and markets sometimes evolve to challenge the concept and assumptions of "natural" monopoly
  - Hush-a-Phone, Carterfone, MCI and Sprint, VoIP

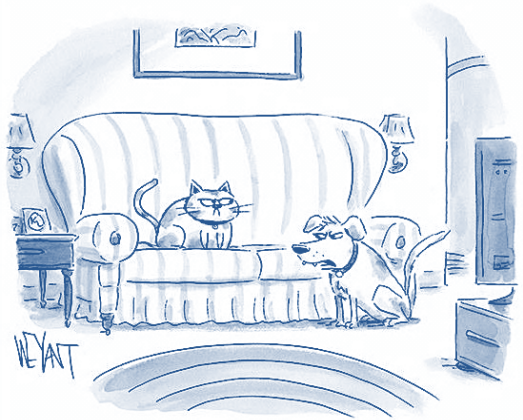
Regulatory policy

Poll 7: Opinion

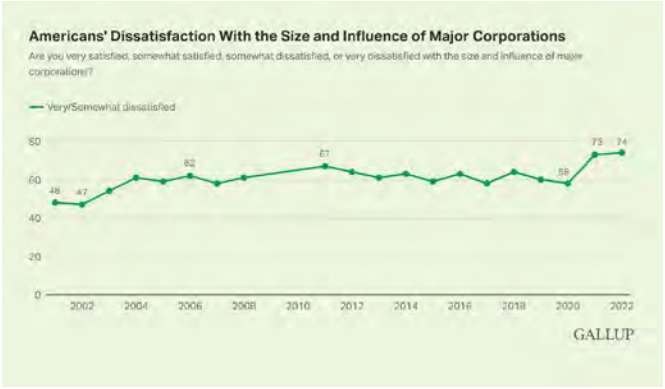
- **Do you think there is**
  A. Too much regulation of businesses and industries?
  B. Too little regulation of businesses and industries?
  C. About the right amount?

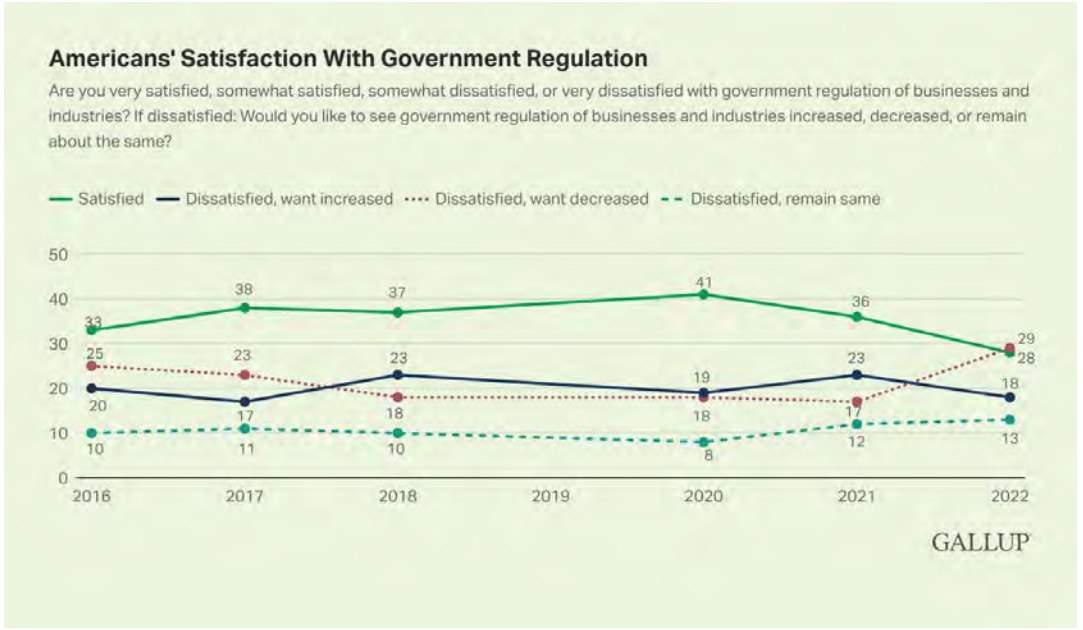
Views about regulation

- Regulation in the U.S is mostly maligned
  - Excessive, expensive, and burdensome (“red tape”)
  - Until something goes wrong, and someone suffers
  - Public inevitably & rightly asks, “where was the regulator?”
  - Should reduce worry (assurances) so we can live our lives
  - Perceptions vary over time and by party ideology
- Institutional (regulatory) failure has consequences
  - 2001 California energy crisis
  - 2008 Subprime mortgage crisis
  - 2014 Flint water crisis
  - 2019 COVID crisis
  - 2021 Texas power crisis
  - 2023 Bank failures



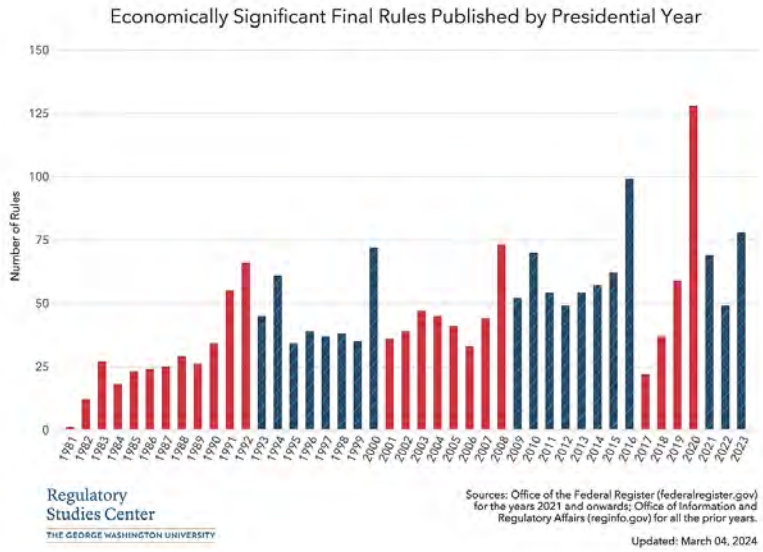
“Who are you kidding? You’re all about small government until you get stuck in a tree.”





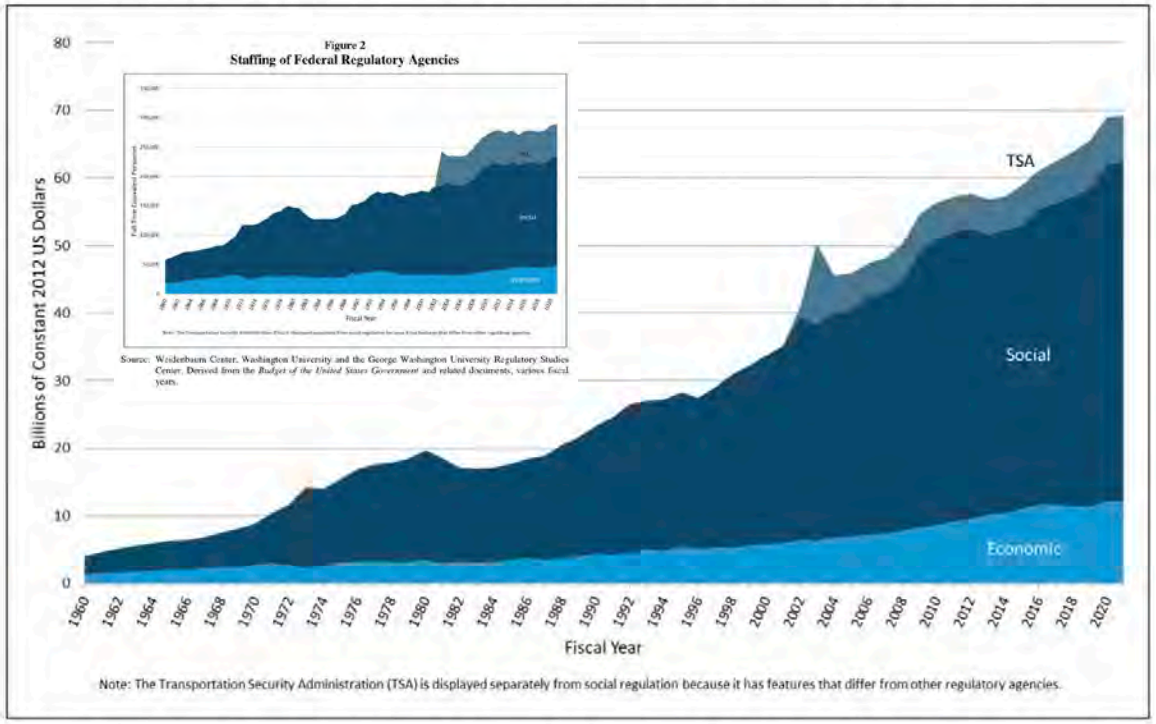
Regulating business in the US

- Registration, certification, licensing, insurance and bonding
- Standards of practice and codes of conduct (professions)
- Health & environmental regs (FDA, EPA, state, local)
- Minimum wages (Congress)
- Worker safety and labor laws (OSHA)
- Product safety (CPSC)
- Zoning regulations and requirements (local)
- Intellectual property rights (Patent Office)
- Broadcast media and content (FCC)
- Financial (securities) regulation (SEC)
- International trade rules (ITC)
- Price controls (USDA, housing agencies)
- Pipeline safety (PHMSA)
- Consumer protection (CPFB)
- Liability and litigation (courts)
- Tax law, including “windfall profits” (Congress, IRS)
- Antitrust and fair market exchange regulation (FTC)
- Economic regulation (FCC, FERC, state commissions)
- Local government franchises, ownership, and operation

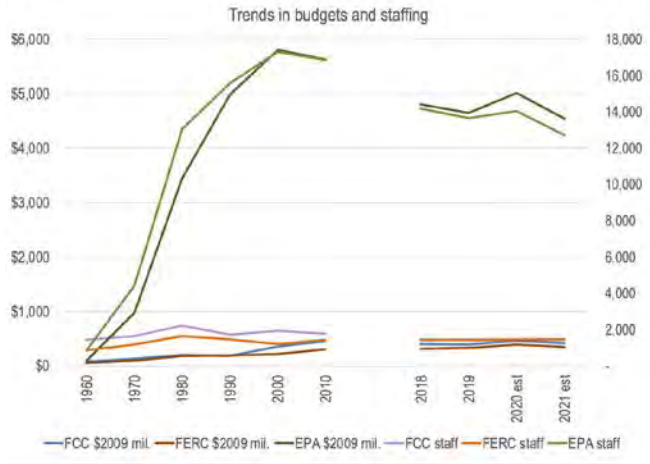


Regulation in the federal budget (WU&GWU)

Figure 1
Budgetary Costs of Federal Regulation, Adjusted for Inflation

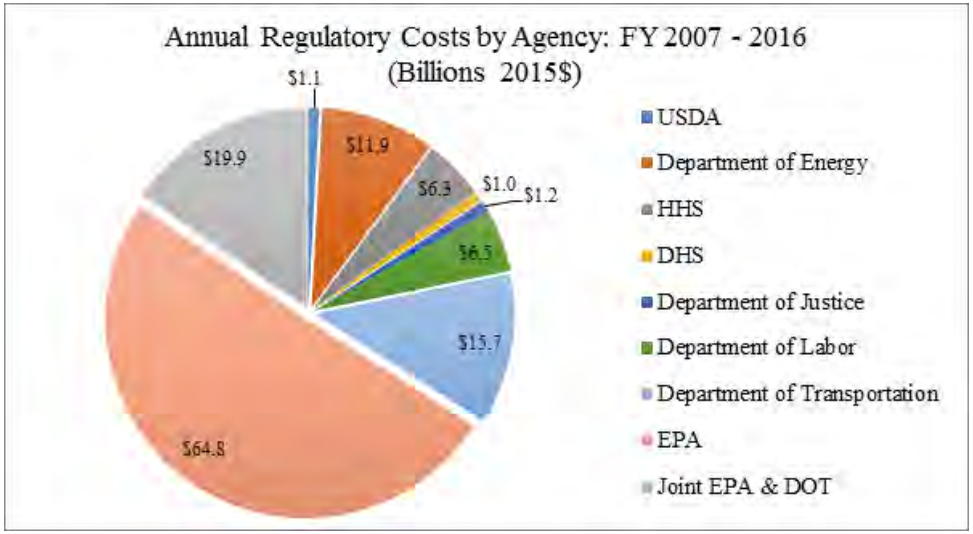


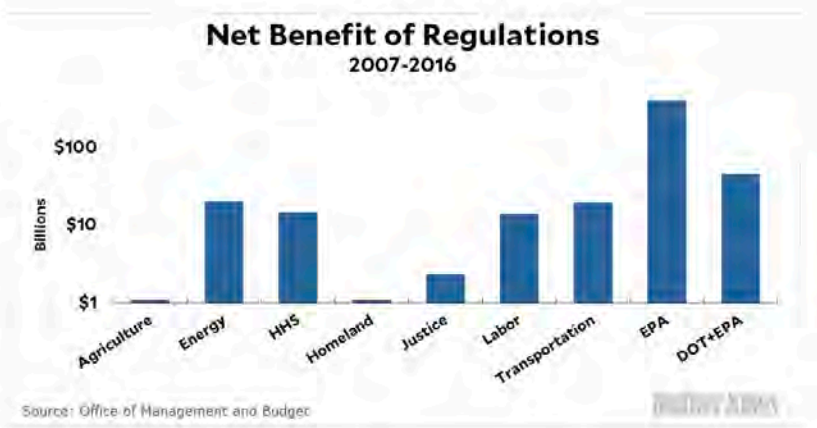
Source: Weidenbaum Center, Washington University and the George Washington University Regulatory Studies Center. Derived from the *Budget of the United States Government* and related documents, various fiscal years.

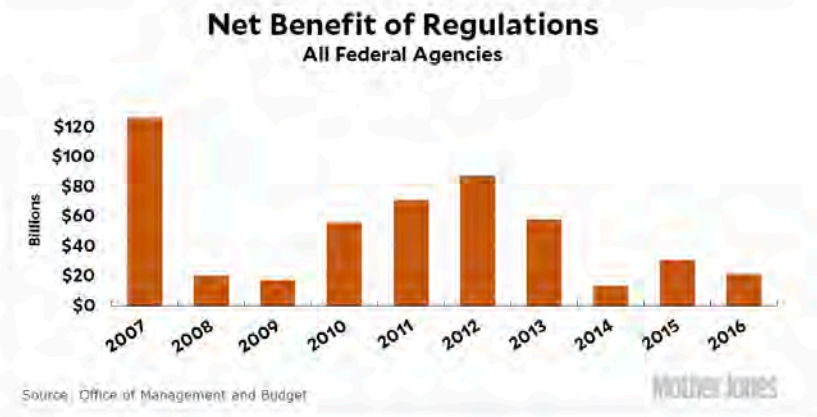


Benefits and costs: challenge of monetization

- A common perception is that regulation is costly relative to benefits
  - Economic regulation is more like the judicial system in terms of metrics
  - Fallacy of trading "two regulation for one" for regulatory efficiency
  - Freezing regulation is harmful because modification is impossible





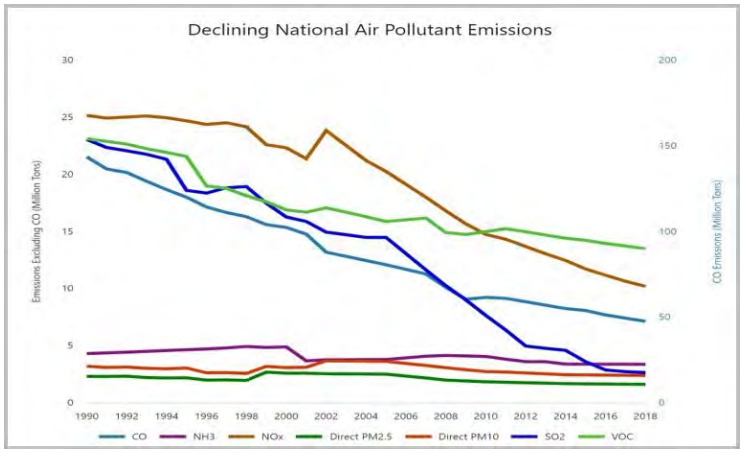


Benefits of clean air rules

Avoided Health Impacts (PM2.5 & Ozone Only)*	Pollutants	Year 2010	Year 2020	Estimated Cumulative Benefits 2010-2020 (NRDC)**
PM 2.5 Adult Mortality	PM	160,000	230,000	2,145,000
PM 2.5 Infant Mortality	PM	230	280	2,805
Ozone Mortality	Ozone	4,300	7,100	62,700
Chronic Bronchitis	PM	54,000	75,000	709,500
Acute Bronchitis	PM	130,000	180,000	1,705,000
Acute Myocardial Infarction	PM	130,000	200,000	1,815,000
Asthma Exacerbation	PM	1,700,000	2,400,000	22,550,000
Hospital Admissions	PM, Ozone	86,000	135,000	1,215,500
Emergency Room Visits	PM, Ozone	86,000	120,000	1,133,000
Restricted Activity Days	PM, Ozone	84,000,000	110,000,000	1,067,000,000
School Loss Days	Ozone	3,200,000	5,400,000	47,300,000
Lost Work Days	PM	13,000,000	17,000,000	165,000,000

*Chart from Environmental Protection Agency, The Benefits and Costs of the Clean Air Act from 1990 to 2020, Summary Report, March 2011, p. 14.

**To estimate the cumulative life savings and health benefits of the 1990 amendments from 2010 to 2020, NRDC assumeda roughly linear growth rate to interpolate benefit estimates between EPA's estimates for years 2010 and 2020 and then aggregated the annual estimates across the period.



Transition to EVs could save $72B in health costs: American Lung Association

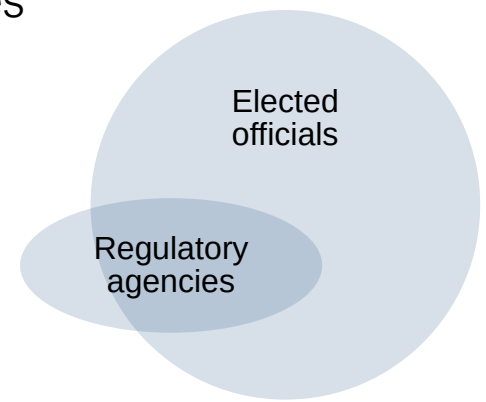
A typology of governance and policy

	Legislative and substantive policies allocate resources	Administrative and regulatory policies govern the political economy
	Democratic institutions	*Delegate institutions*
More direct	**Distributive policies:** nonzero sum allocations (e.g., resource policy)	**Command-and-control policies:** structures, rules, codes, and design standards (e.g., social regulation)
Less direct	**Redistributive policies:** zero-sum allocations requiring tradeoffs (e.g., tax policy)	**Incentive-based policies:** material and nonmaterial rewards and penalties (e.g., economic regulation)

Note: regulatory policies also have distributive and redistributive consequences – both intentional and unintentional.

Regulation and democracy

- Market vs. democratic processes
  - For citizen-consumers, markets reveal personal preferences
  - For citizen-voters, democratic processes define rights and social goals
- Economic regulatory remit is delimited
  - Generally, does not advance “original policy” and cannot solve social problems alone
  - Public-value theory promotes citizen engagement and social cost-benefit analysis
  - Participation is costly, so consumers rely on regulators, representatives, or aggregators
- Regulation is a product of democratic institutions but not directly democratic
  - Agencies are creatures of legislatures with delegated responsibility (not representative)
  - Empowered by laws as an independent trustee of the public interest within bounds
  - Cannot supplant direct democracy for translating social values or (re)distributing wealth
  - Regulators can and should inform democratic policymaking
- Executives & legislatures should own major policy imperatives
  - Tax and spend to (re)distribute resources
  - Provide public goods and manage the commons
  - Promote economic development
  - Mitigate externalities (climate action)
  - Dispense distributive justice (universal service)

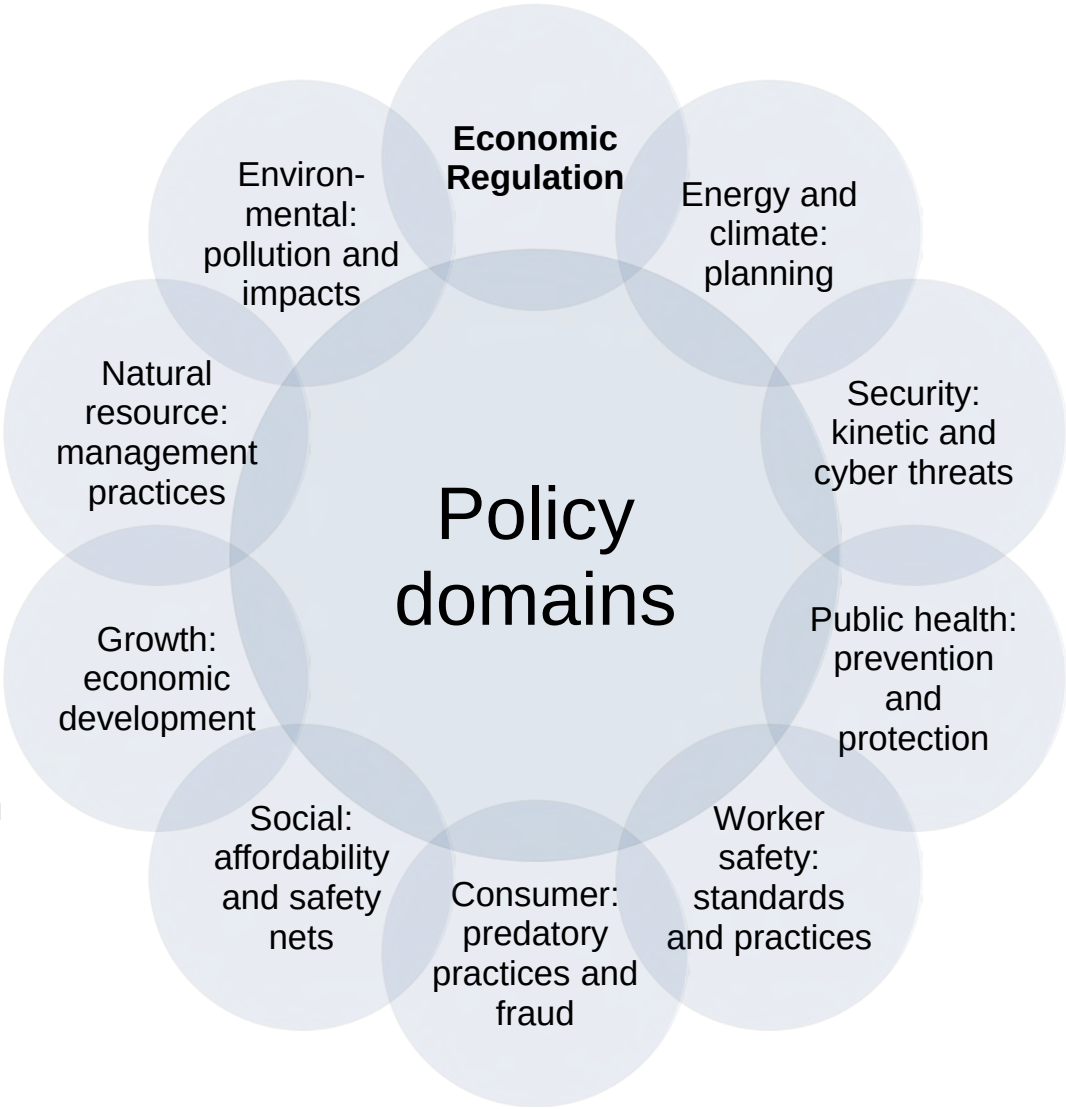


Regulation: tools and types

- *"Regulation is state intervention in the private domain, which is a byproduct of our imperfect reality and human limitations" (Barak Orbach, 2012)*
- Regulation:
  - 1. the act of regulating; the state of being regulated. 2. (a) an authoritative rule dealing with details or procedure; (b) a rule or order having the force of law issued by an executive authority of a government… To control, order, normalize, legalize, standardize, make conform, police.
- Two general types of regulation
  - Social (command): public health, safety, welfare, consumer risk, environment protection
  - Economic (incentives): tariffs, returns, price supports, quotas, trade restrictions
- Five general regulatory tools (Morgan and Yeung, 2007)
  - Command: mandates
  - Competition: market mechanisms
  - Consensus: agreements
  - Communication: information
  - Code: technical standards for design or performance
- Regulatory incentives for behavior
  - Prices (considered most efficient), taxes, standards, limits, specifications

Economic regulation and other policy domains

- Complementary authority with checks and balances
  - Each domain is specific and legislatively authorized
  - Duplication or discontinuity over time adds uncertainty
  - Complicated by federalism and multi-criteria decision processes (e.g., permitting and siting)
- Harmonization, coordination, and continuity
  - Clear boundaries can improve performance signals, reduce conflicts, and lower costs
  - Common identifiers and information sharing are helpful
- PSC remit and responsibility
  - “Safe, adequate, and reliable”
  - Implies water and air quality



Agency mission statements

- Federal Energy Regulatory Commission
  - To ”assist consumers in obtaining reliable, safe, secure, and economically efficient energy services at a reasonable cost through appropriate regulatory and market means, and collaborative efforts.”
- Department of Energy
  - “To ensure America’s security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions.”
- Environmental Protection Agency
  - “To protect human health and the environment.”
- Department of Interior
  - “[To protect and manage] the Nation’s natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated Island Communities."

Regulatory policy domains and agencies

- Economic regulation always takes the form of a deliberative panel rather than a single administrator to provide for diversity of views and a deliberative process

		Single administrator		Board or commission	
Social regulation		BLM CDC CFPB EPA FAA FDA	FEMA FHFA MSHA OSHA SBA	CSB CPSC EEOC FEC FHFB FMC	FMSHRC NLRB NRC NTSB STB
Economic regulation	*Markets*			CFTC FDIC FED	FTC SEC USITC
	Prices			FCC, FERC, PRC State PUCs	

Economic regulation

- *"Regulation is justified because the regulatory regime can do what the market cannot" (A. Ogus, 2004)*
- Regulation presumes that markets will fail to serve social goals and priorities
  - Market failure is used to rationalize governmental intervention (A.C. Pigou)
  - Precautionary, protective, and arguably paternalistic toward ratepayers and utilities
  - Complements other policy institutions and social regulation (health, safety, environment)
  - Net neutrality is an interesting case study in "democratic regulation"
- Regulation is not just an agency but an institution
  - Structural policies, established principles, agency rules, and administrative discretion
  - A shared responsibility of the state in general and the regulatory agency
  - Legitimate with the consent of the people and independent but accountable
  - Enforceable under the coercive power of the state
  - Provides for social and economic stability (Keynesian theory)
- Broader definitions include non-state or private tools
  - Self-regulation may be strong and transparent (standards) or weak (captured)
  - Social persuasion or pressure are usually insufficient
- Competing theories about regulation
  - Based on the influence of public vs. private interests – with some truth to both

Competing theories of regulation

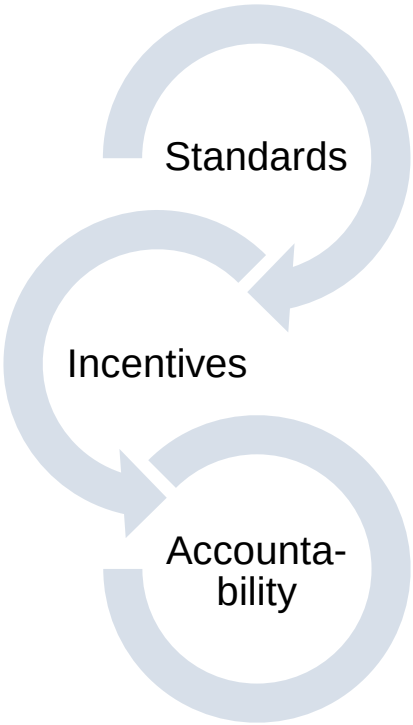
Public-interest theory	Private-interest theory
▪ Draws on institutional & resource economics (Wisconsin tradition)	▪ Draws on welfare & behavioral economics (Chicago school)
▪ Centrality of institutions & expertise	▪ Centrality of individual actors & self-interest
▪ Regulation improves welfare	▪ Markets improve welfare
▪ Regulation ensures just resource allocation	▪ Markets ensure efficient resource allocation
▪ Broadens conception of market failure	▪ Narrows conception of market failure
▪ Equity as objective & efficiency as criterion	▪ Efficiency as objective & equity as a criterion
▪ Regulation is a social good	▪ Regulation is an economic good
▪ Regulation is cost-effective	▪ Regulation is costly and ineffective
▪ Regulation ensures equity and stability	▪ Regulation redistributes wealth
▪ Regulators consider competing interests	▪ Regulators serve special interests, coalitions
▪ Regulation fails due to lack of capacity	▪ Regulation fails due to ineptitude, capture
▪ Failure calls for regulatory reform	▪ Failure calls for market reform

Normative implications of regulatory theories

	Public-interest theory Favors regulation even if imperfect	Private-interest theory Favors markets even if imperfect
Market failure	Regulation by command or incentive	Market reform or restructuring
Nonmarket failure	Regulatory reform and capacity development	Markets or market-like mechanisms

"All (economic) regulation is incentive regulation"

- Inspired by Alfred Kahn, popularized by Peter Bradford et al.
- Regulators do not "govern" or "manage" utilities
  - Returns are not "guaranteed"
- Regulation has always been about*
  - Setting performance standards for utilities and markets
  - Providing incentives – exercising discretion
  - Ensuring accountability – enforcing rules
- A formal definition of economic regulation
  - An authoritative institution for governmental intervention in the context of market failure to police, influence, or correct individual or corporate behavior to protect and improve welfare consistent with the public interest and associated social values
- Standards impose structure – baselines and benchmarks
  - Critical for evaluating prudent performance and PBR
  - Sacrifices some flexibility but can promote innovation
  - Set by various regulatory, self-regulatory bodies
  - Examples: NERC (reliability), API (pipeline safety), ISO (fire protection)



* Parallels Morgan & Yeung (2007)

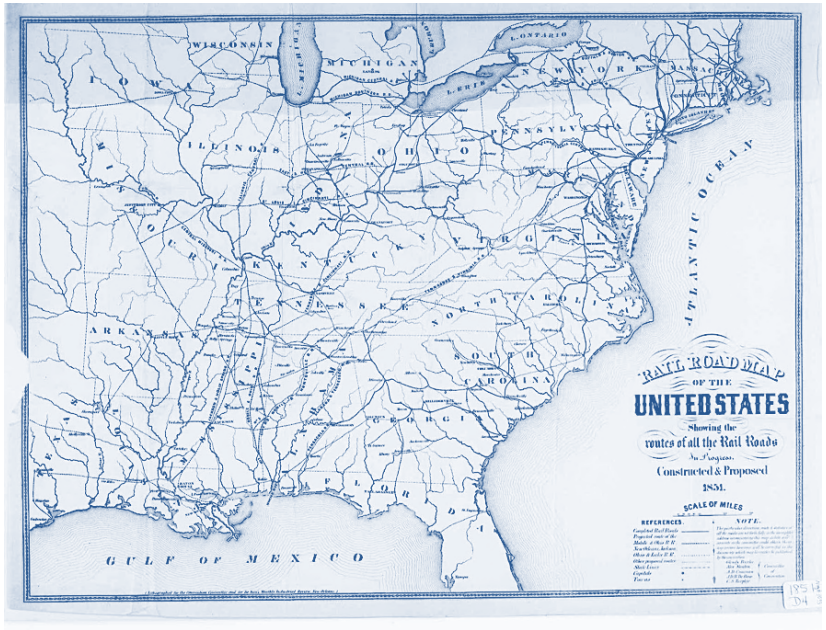
Origins of regulation

Poll 8: Origins

- **Who of the following did not want utility regulation?**
  - A. Political reformers
  - B. Utility companies
  - C. Consumer interests
  - D. Legislatures
  - E. Academics
  - F. None of the above

From saints to sinners: historical origins of regulation

- Where we came from matters to where we are going
- Regulation has a long and rich history
  - Philosophers and saints (Aristotle, St. Thomas Aquinas)
  - Kings and ferry boats (British common law)
  - Railroads and grain elevators
  - Progressive reformers and political capitalists
  - Governors and presidents



Ancient origins of regulation

- Monopoly concerns are traceable to ancient philosophy & theology
- In ancient times, economic transactions were guided only by a “natural price” agreed to by willing buyers and sellers (market test)
- Aristotle (384-322 BC)
  - “The true forms of government… govern with a view to the common interest; but governments which rule with a view to the private interest… are perversions.”
  - The just exchange ratio of goods (just price) should be in proportion to "intrinsic worth.”
  - Aristotle condemned the idea of using monopoly power to gain wealth: “It is an art often practiced by cities when they are want of money; they make a monopoly of provisions.”
- “Just price” in Medieval doctrine condemned “unjust enrichment”
  - St. Thomas Aquinas (1225-1274): “if either the price exceed the quantity of the thing's worth, or, conversely, the thing exceed the price, there is no longer the equality of justice.”
  - John Duns Scotus (1265-1308): the just price of a good is the cost of production; cost will be exaggerated; competition can determine just price; monopoly implies “immorality.”

Common law heritage of regulation

- In the Middle Ages, rules were needed for "common callings"
  - Inns and taverns, and later "common carriers" (public transportation)
  - Common carriage is distinct from *contract* carriage
- Common carriers
  - Granted rights and obligations and must be "fit, willing, and able"
  - Duty to serve reasonable requests for service under reasonable rates and terms and high standards of liability
- Regulation is grounded in common law (judicial precedent)
  - *Humber Ferryman* (1348) established the idea of common carriage duties in the absence of a "covenant" (contract)
  - Foundation for regulatory jurisprudence in the UK and the US
  - In defining utilities and justifying regulation, the public character of enterprise is as important as the problem of monopoly
- Treatises by Lord Chief Justice Sir Matthew Hale (c. 1670)
  - De Portibus Maris: When private property is "affected with a public interest, it ceases to be juris privati only."
  - De Jure Maris: The king has "a right of franchise or privilege… and every ferry ought to be under a public regulation, viz., that it give attendance at due times, keep a boat in due order, and take but reasonable toll; for if he fail in these, he is finable."

Railroads and grain elevators (1800s)

- Post Civil War agrarian economy: railroads, towns, and grain elevators
- Who wanted regulation (to work to their advantage)?
  - The customers (farmers, merchants)
  - The investors (bankers)
  - The regulated (railroads)
- Business interests welcomed protective regulation
  - Concerns about ruinous competition and investment performance
- For public utilities, competition was initially favored
  - Local charters and perpetual but nonexclusive franchises
  - Early advisory boards reported on utilities to state legislatures
  - Granger movement (1870s) challenged the immunity of charters from regulation
- Antitrust regulation also emerged at the end of the 19th century
  - Anti-Monopoly Party existed briefly in 1884

Evolution of administrative regulation (1900s)

- Interstate Commerce Commission (1887-1978) regulated railroads
  - Later trucking, which emerged as an intermodal competitor (1933)
  - Per Hepburn Act (1906), railroads had the burden of proof for just & reasonable rates
  - State railroad commissions emerged (Texas, 1891-present), and regulation spread
  - Railroads were deregulated by the Staggers Act (1980)
- Progressive reform movement converged with the private interests of investors
  - By 1908, new or remodeled commissions operated in 39 states
  - "Co-managed" utilities and "brokered" solutions outside of the more contentious arenas of legislatures, courts (William Childs)
  - To some, early regulation transformed from a movement of the people to a "champion of the rights of the utility" (C. Morgan, 1923)
  - By the mid-1900s, about15% of the U.S. economy was directly regulated (R. Reich)
- National Association of Railroad Commissioners was formed in 1889
  - National Association of Railway and Utilities Commissioners (1917)
  - National Association of Regulatory Utility Commissioners (1949)
  - Common denominator is state jurisdiction and rights
  - NARUC and its affiliates constitute "regulatory networks"

Political convergence (1900-1930)

- Progressive reformers were central to the design of regulation
  - Wisconsin Gov. Robert La Follette (1900) advanced the "Wisconsin Idea" – "scientific," academically informed regulation, working closely with Prof. John Commons and other academics to "depoliticize" regulation (technocratic approach)
  - New York Gov. Charles Evans Hughes (1906) preferred regulation to legislative or judicial controls: "for the protection of the public there should be created a commission with inquisitorial authority, competent to make summary investigations of complaints, to supervise issues of securities and investment in the stocks or bonds of other companies, to regulate rates…"
  - National Civic Federation (1907 coalition) argued that "Public utilities are so constituted that it is impossible for them to be regulated by competition… None of us is in favor of leaving them to their own will, and the question is whether it is better to regulate or to operate."
  - Journalist and "new nationalism" philosopher Herbert Croly (1909) wrote that "Efficient regulation there must be; and it must be regulation which will strike, not at the symptoms of the evil, but at its roots… The existing concentration of wealth and financial power… is inimical to democracy."
- Industry icons Theodore Vail and Samuel Insull favored regulation
- Both Presidents Roosevelt strongly supported effective regulation

Theodore Vail (1845-1920) ⓘ

- Industrialists simultaneously advanced a form of “political capitalism” – where industry shapes government intervention
- Vail was twice head of the Bell Telephone Company
- “It is contended that if there is to be no competition, there should be public control [over the telephone industry]. It is not believed that there is any serious objection to such control, provided it is independent, intelligent, moderate, thorough, and just…” (1907)
- “A public utility giving good service at fair rates should not be subject to competition at unfair rates. It is not that all competition should be suppressed but that all competition should be regulated and controlled” (1910)
- The Bell system was briefly nationalized in wartime (1918)

Samuel Insull (1859-1938) ⓘ

- Edison's personal secretary and President of Com. Edison
- "Whilst we may not care to be hampered by the rules and regulations established by commissions created to watch over our operation, the further those commissions go into our business the more they will be convinced that the best results can be obtained only by regulated monopoly and that competition is alike as ruinous in the long run to our customers as it is to the central station company itself.
- The result will be that our monopoly of the business will be secured, our securities will stand in higher credit, and new capital will come flowing into our coffers for the extension of our business. I do not myself view with any alarm the proper regulation of the business in which we are engaged, but feel its stability may be greatly enhanced thereby" (1910)

Samuel Insull (1898) ⓘ

- “While it is not supposed to be popular to speak of **exclusive franchises,** it should be recognized that the best service at the lowest possible price can only be obtained, certainly in connection with the industry with which we are identified, by **exclusive control of a given territory being placed in the hands of one undertaking.**
- In most European countries public-service operations enjoy exclusive franchises, under proper control, and are able to obtain capital for their undertakings at the lowest commercial rates, thus materially affecting the cost of their product, of which interest, as I have already stated, is necessarily so great a part.
- In order to protect the public, exclusive franchises should be coupled with the condition of public control requiring all charges for services fixed by public bodies to be based on cost, plus a reasonable profit. It will be found that this cost will be reduced in direct proportion to the protection afforded the industry. The more certain this protection is made, the lower the rate of interest and the lower the total cost of operation will be, and consequently, the lower the price of the service to public and private users.
- If the conditions of our particular branch of public service are studied in places where there is a definite control, whether by commission or otherwise, it will be found that the industry is in an extremely healthy condition, and that users and taxpayers are correspondingly well served.”

Samuel Insull and the monopoly man: coincidence?

"The government should keep its hands off me" (Feb. 27, 1933)

Regulation and the Roosevelt "deals" ⓘ

- Theodore Roosevelt
  - Square Deal between capital and labor (1904 campaign)
  - Emphasized control of corporations, consumer protection, and conservation of natural resources
  - Hepburn Act (1906) extended ICC jurisdiction and strengthened railroad regulation (financial records, maximum rates)
  - "[W]e are not attacking the corporations, but endeavoring to do away with any evil in them. We are not hostile to them; we are merely determined that they shall be so handled as to subserve the public good. We draw the line against misconduct, not against wealth" (SOTU, 1902).

- Franklin D. Roosevelt
  - New Deal economic and social reforms (1933 to 1938) expanded the federal regulatory role and public power projects (TVA)
  - The PSC has legislatively "delegated authority and duty to act as the agent of the public" to provide "positive and active protection of the people against private greed!" (Portland Speech, 1932)
  - Condemned the "evil features of holding companies" (SOTU, 1935)
  - Chastised the "economic royalists" of the "age of machinery" – including railroads and utilities (Acceptance speech, 1936)

Regulation as historical political compromise and delegated authority

Executive governance

Public ownership	Regulatory governance	Competitive markets
- “Heavy hand”	- “Light hand”	- “Invisible hand”
- Politicization	- Independence	- Ruinous
- Direct control	- Indirect control	- Limited control
- Lower risk	- Moderate risk	- Higher risk
- Public corruption	- Capture	- Private corruption

Legislative governance

A century of expansion of the federal regulatory role*

- Sherman Antitrust Act (1890, 1910)
- Hepburn Act (1906)
- Federal Trade Commission (1914)
- FTC Utilities inquiry in (1928)
- Federal Power Commission (1930)
- Tennessee Valley Authority (1933)
- Federal Communications Act (1934)
- Rural Electrification Administration (1935)
- Federal Power Act (1935)
- Public Utility Holding Co. Act (1935-2005)
- Civil Aeronautics Board (1938-1978)
- Office of Price Administration (1942-1947)
- Atomic Energy Commission (NRC, 1946)
- Environmental Protection Agency (1970)
- Commodity Futures Trading Commission (1974)
- Pipeline and Hazardous Materials Safety Administration (2004)
- Consumer Financial Protection Bureau (2010)

Federal anti-trust policies

- Antitrust is a reactive (ex post) policy instrument
  - Regulation protects *the public interest* by promoting efficient and equitable conduct
  - Anti-trust protects *competition* – not competitors (Brown Shoe Co., 1962)
  - Antitrust focuses on market structure, market power, and predatory practices
- Regulated monopolies are exempt from antitrust action by the Dept. of Justice
  - Due to their legal and economic character (e.g., franchises)
  - Divestiture of AT&T effective in 1984 followed DOJ action
  - Europe exercises competition regulation (e.g., UK, EU, Microsoft case)
- Key legislative policy is not industry specific
  - Collusion (Sherman Act, 1890)
  - Monopoly (Sherman Act, 1910)
  - Exclusionary practices (Clayton Act , 1914)
  - Holding companies (PUHCA, 1935, repealed in 2005)
  - Price competition (Robinson-Patman Act, 1936, amended Clayton)
  - Fairness in competition (FTC Act, 1914)
  - Anticompetitive mergers (Celler-Kefauver Act, 1950, am. Clayton)
- Restructuring, consolidation, and “too big to fail”
  - Raise market power and anti-trust issues

Continuing history of utility regulation

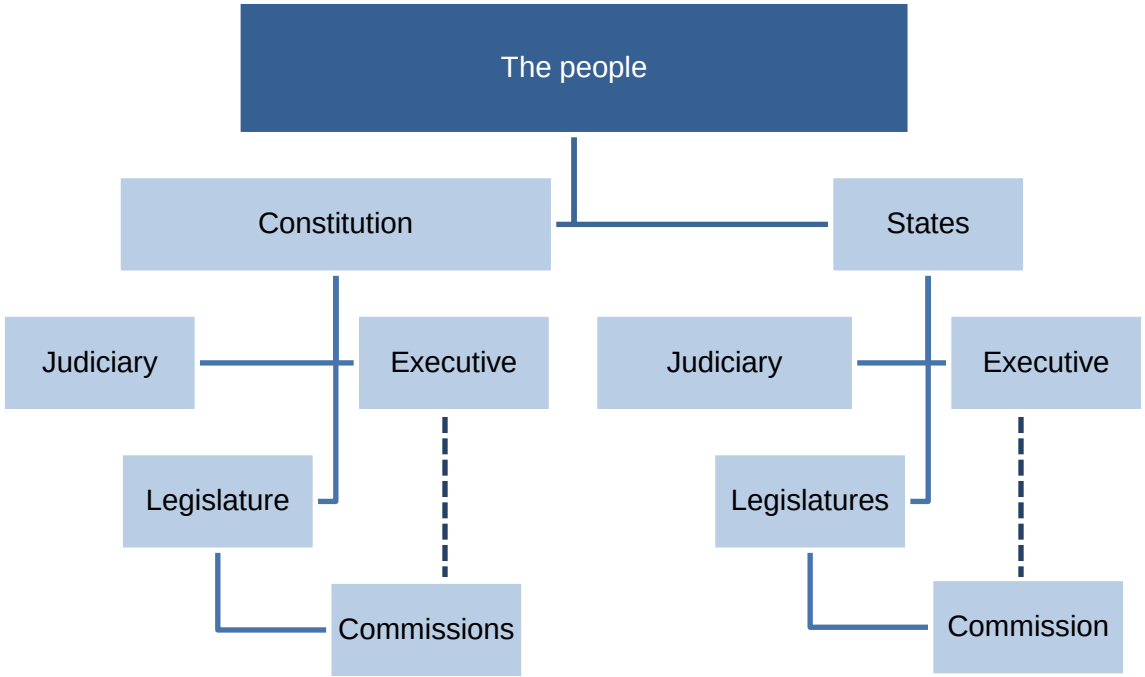
- Postwar stability (c. 1950s and 1960s)
  - Infrastructure expansion, industry consolidation, new technologies, scale economies
- Social regulation (c. 1970s)
  - Excess capacity, consumer protection, environmental regulation (EPA), inflation, energy crisis, conservation
- Market restructuring (c. 1980s and 1990s)
  - Technological breakthroughs, emerging markets, vertical separation (de-integration), access, service unbundling, jurisdictional issues, globalization, partial deregulation
- Regulatory adaptation (c. 2000s)
  - Reconciling markets and regulation, consolidation and convergence, performance, infrastructure modernization and intelligence, environment and climate, security and resiliency, regulatory activism
- Disruption and transformation (c. 2010s and 2020s)
  - Clean energy transformation, distributed resources, aggregation, grid neutrality, disruptive technologies, declining demand, existential threats, alternative business models, regionalism, equity and affordability, new regulatory and deregulatory paradigms, possible re-regulation ("regulation redux"), post-Chevron, partisan divides

Private ownership with regulation

- Perceived benefits of private ownership of monopolies with economic regulation
  - Private ("privatized") capital financing for infrastructure investment and cost-based rates
  - Performance incentives based on profit motive and risk allocation (liability, fines)
  - Regulatory accountability to the state – assuming effectiveness (regulatory risk)
  - Downsides: profit motives, investment propensity, private equity, holding companies
- Public sector and regulatory oversight
  - Publics have more flexibility and ability to use tax instruments
  - Economic tools and incentives are more limited (e.g., loss of job or license, jail time)
  - Public ownership allows for direct consideration of community and social values (ESG)
- In theory, independent regulation should be
  - Institutionally superior to franchises, competitive contracts, or legislative ratemaking in terms of oversight and dispute resolution
  - Socially superior to competition in terms of equity and other non-economic criteria
- Regulation involves "the public use of private interest" (C. Schultz)
  - It can also involve "the private use of [the] public interest"
  - No structural or governance model is immune from corruption or capture
  - Ethical controversies undermine the integrity of the model and public trust

Regulation “in the public interest”

- Regulation has a legislative purpose, an executive function, and a judicial form
  - Originated in British common law
  - Legitimized by the Constitution and Supreme Court starting with *Munn v. Illinois* (1877)
  - Codified statutorily “public convenience, interest or necessity” (Fed. Radio Act of 1927)
- Public-interest standard implies judgment – regulators must “divine” it
  - Tradeoff between established rules (continuity) and discretion in application



The public-interest rationale ⓘ

- Regulation serves the public interest
  - Common good, greater good, or public welfare (over time and space)
  - Regulated utility services are considered “basics” (not luxuries)
  - Public utilities can be regarded as “servants” (agents) of the state (principal)
  - Can raise issues of public trust and conflation of utility rates and taxes
- Some see the public-interest rationale as too expansive to be meaningful
  - “To say that a public utility is a business affected with a public interest is to include piggeries and mortuary parlors. To say that a public utility supplies a service necessary to our present stage of economic life… is to include the United States Steel Corporation...” (Arthur Stone Dewing, 1953)
- Easier to define what the public interest is *not*
  - Not defined by public-opinion polls or measured in consumer complaints
  - Not short-term focused or politically expedient
  - Not the sum or net of special interests; not fixed and static
  - Not the opposite of “private interest”
- National Energy Board of Canada
  - “The public interest is inclusive of all Canadians and refers to a balance of economic, environmental, and social interests that changes as society's values and preferences evolve over time…”

Constitutional basis for regulation

- Regulation is guided by constitutional, statutory, and administrative law
- Commerce Clause (Art. I, Sec. 8):
  - Empowers Congress, for the general welfare, 'To regulate Commerce with foreign nations, and among the several States, and with the Indian tribes" (and establish Post Offices & post roads)
  - Establishes a federal role in interstate, wholesale markets – can be controversial
  - "Dormant Commerce Clause," implies states cannot erect undue barriers, including laws that favor intrastate over interstate businesses or allow for hoarding local resources
- Contracts Clause (Art. 1, Sec. 10):
  - "No State shall…pass any…ex post facto Law, or Law impairing the Obligation of Contracts…"
- Constitutional amendments
  - 5th: "…nor shall private property be taken for public use, without just compensation" ("takings" clause viewed in context of 14th amendment protection of due process) – focuses on property of utilities vs. ratepayers
  - 10th: "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people."
  - 14th: "…nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws" (extends takings protection to the states)
- State, territorial, and tribal governments regulate pursuant to their constitutional and statutory "police" powers

Legislative basis for regulation

- Various standards applied in regulation are codified in legislation
  - For example, the "just and reasonable" standard for ratemaking
- Interstate Commerce Act (1887)
  - "All charges made for any service rendered or to be rendered in the transportation of passengers or property as aforesaid, or in connection therewith, or for the receiving, delivering, storage, or handling of such property, shall be reasonable and just; and every unjust and unreasonable charge for such service is prohibited and declared to be unlawful."
- Federal Power Act
  - "All rates and charges made, demanded, or received by any public utility for or in connection with the transmission or sale of electric energy subject to the jurisdiction of the Commission, and all rules and regulations affecting or pertaining to such rates or charges shall be just and reasonable, and any such rate or charge that is not just and reasonable is hereby declared to be unlawful."
- Communications Act (Title II)
  - Requires carriers to "furnish . . . communication service upon reasonable request" and engage in no "unjust or unreasonable discrimination in charges, practices, classifications, regulations, facilities, or services."

Judicial basis for regulation

- Chief Justice Waite, Railroad Commission Cases (1866)
  - "[The] power to regulate is not a power to destroy, and limitation is not the equivalent of confiscation... neither can [the State] do that which in law amounts to a taking of private property for public use without just compensation, or without due process of law."
- A rich history of judicial review legitimizes regulation
  - Regulation follows a quasi-judicial process with a healthy tension in pursuit of "truth"
  - Various tests or standards of review are applied by both commissions and courts
  - The Supreme Court has been a reactive and corrective force
- Illinois established a commission to set maximum rates for grain storage
  - *Munn v. Illinois* (1877) relied heavily on the common law concept of the public interest
  - Justice Waite: "When, therefore, one devotes his property to a use in which the public has an interest, he, in effect, grants to the public an interest in that use, and must submit to be controlled by the public for the common good…"
  - Justice Field dissented: "No reason can be assigned to justify legislation interfering with the legitimate profits of that business…"
  - Munn also expressed the doctrine of judicial self-restraint in regulation cases
- The public interest became central to regulatory theory and practice and subsequent cases expanded the concept

Regulatory federalism

- Does a “bright line” define regulatory jurisdiction?
  - Federal jurisdiction for interstate and wholesale activities pursuant to the interstate commerce clause and the Narragansett doctrine (1976)
  - State jurisdiction for intrastate and retail commerce
- State regulation has been transformed
  - Federal initiatives substantially affect state workloads
  - Focus on new areas (e.g., siting, consumer protection, resource planning)
  - Implementation role – more defined in environmental regulation, where federal requirements set the minimum
  - Regional coordination: interstate compacts and initiatives (e.g., RGGI)
  - Possibilities for regional regulation (energy, water)
- Preemption and shift of regulatory responsibility to the federal government (see case law)
  - Apparent in the telecom sector
  - Encroachment in the energy sector
  - Limited in the water sector

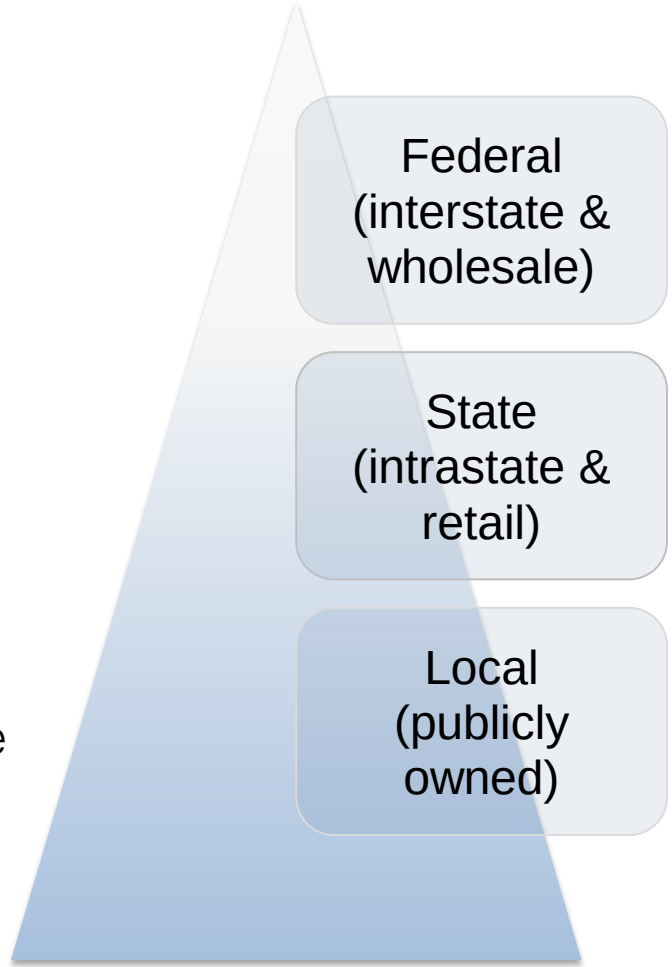
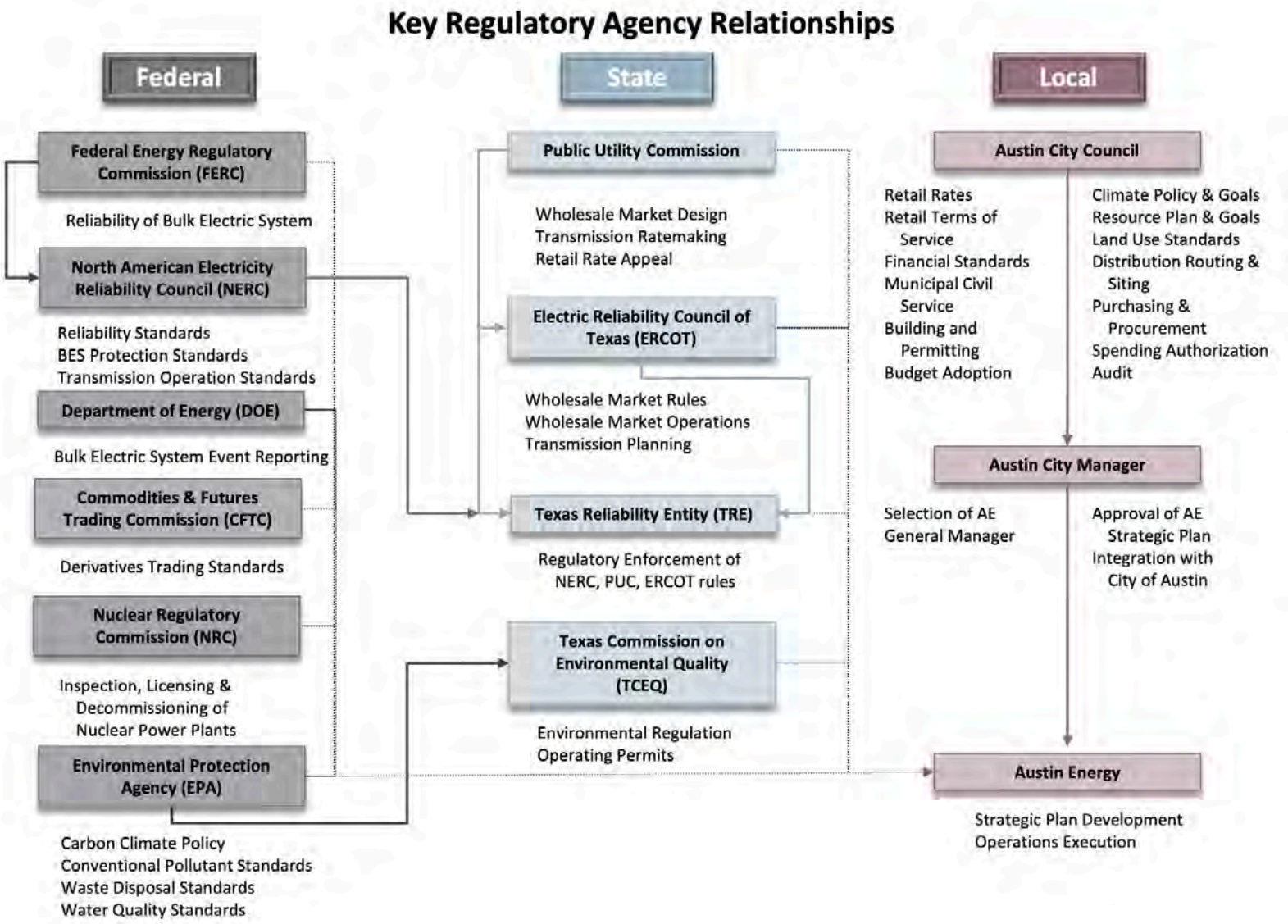
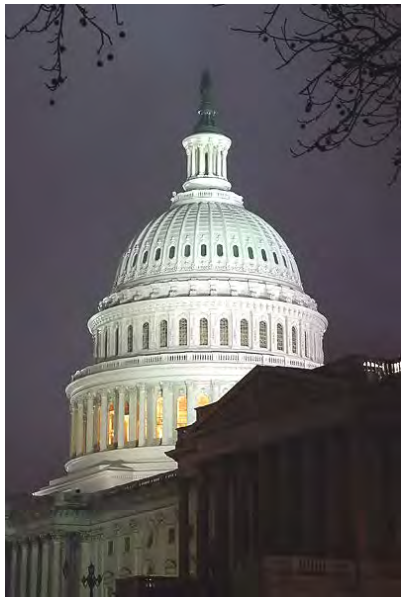


Illustration of regulatory federalism (Austin Energy, 2017)



Federal jurisdiction (as amended)

- Telecom: network access, interconnection, compensation, universal service
  - Federal Communications Commission (FCC)
  - Communications Act of 1934
  - Telecommunications Act of 1996
- Energy: interstate/wholesale transmission
  - Federal Energy Regulatory Commission (FERC)
  - Federal Power Act of 1935
  - Natural Gas Policy Act of 1978
  - Public Utility Regulatory Policy Act (1978, 2005)
  - Energy Policy Act of 1992 and 2005
  - Energy Independence and Security Act
  - Environmental and safety regulation
- Water: no federal economic regulatory jurisdiction
  - Environmental Protection Agency (EPA)
  - Clean Water Act of 1972
  - Safe Drinking Water Act of 1974



Regulatory paradigm

Poll 9: Consumer protection

- **Who should protect utility consumers?**
  - A. Consumers themselves
  - B. Consumer advocates
  - C. Attorneys general
  - D. Utility commissions
  - E. All of the above

Regulation as a balancing act

- Regulation "in the public interest" is a balancing act under the law
  - Regulation also been described in terms of interest "alignment" (S. Hempling)
  - A utility "may not fix its rates with a view solely to its own interests, and ignore the rights of the public…" (Smyth v. Ames, 1898)
  - "Price must draw a balance between wealth and welfare" (FPC v. Hope Nat. Gas, 1944)
  - "An advocate of neither the public nor the utilities, the IURC is required by state statute to make decisions that balance the interests of all parties to ensure the utilities provide adequate and reliable service at reasonable prices" (Indiana)
- Regulation weighs interests with unequal power – advocacy matters
  - Regulation protects captive ratepayers from monopoly abuse
  - Regulation provides stability for infrastructure investors
  - Does not mean equal treatment, undue compromise, or fairness bias
- Regulators are "in the middle" of a multi-dimensional space
  - Typically, no party is completely satisfied
  - Power, resource, and information asymmetry favors utilities
  - Regulators must ensure that "ratepayer value" is considered
- Regulatory paradigm centers on a living social or regulatory "compact"
  - A necessary if "imperfect" proxy for competition (fear to balance greed)
  - Ensures that utilities serve the interests of the state (principal agency)
  - Regulation must do what markets cannot or will not do (dispense justice)
  - Emphasizes economics over other disciplines or social values

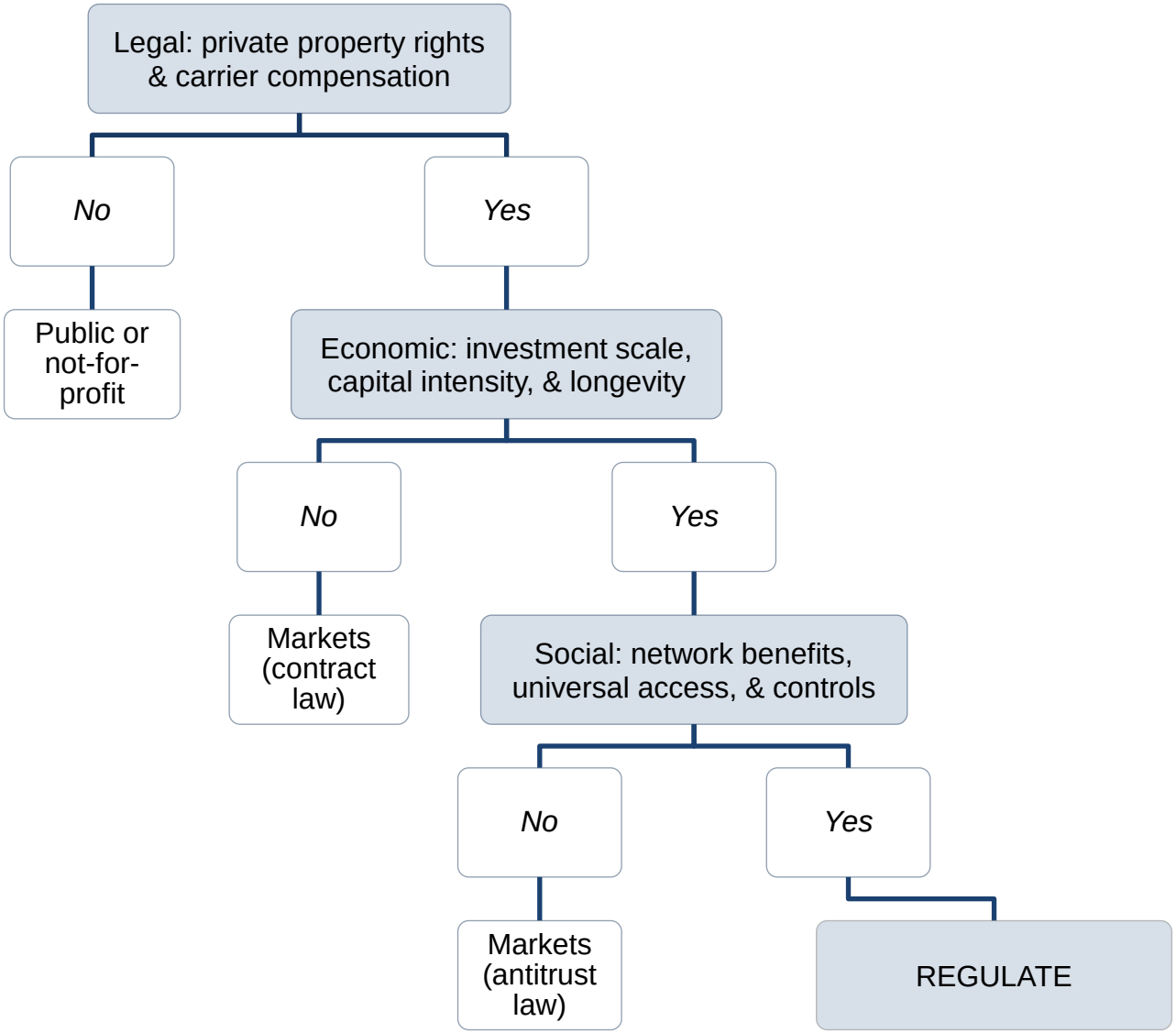
Regulatory paradigm: requisite conditions and institutions

Regulation responds to market failure manifested by monopoly of essential utility services		
Legal: private property rights & carrier compensation	Economic: investment scale, capital intensity, & longevity	Social: network benefits, universal access, & controls

Regulation serves the public interest by promoting economic efficiency and equity		
Public-interest doctrine	Principled social compact	Independent governance

Regulation functions as a conditional proxy for *both* market competition & direct state control		
Standards for performance	Risk and reward incentives	Mechanisms of accountability

Is economic regulation needed?



The regulatory compact

- Guiding paradigm for regulation centers on the construct of a social compact
  - Independence of the regulator as an arm of the institutional state is presumed
  - Regulation legitimately proxies for market competition *and* direct state control – these perspectives may lead to different answers
  - Regulation must be a "tough substitute" (Trebing) because competition is tough, including uncertainty and risk
- Compact is a stable but living, evolving charter between the state and the utility
  - Freely entered into by the utility with acceptance of conditions
  - Private utility is an agent or "servant of the state" (not an arm – see jurisprudence)
  - Meeting the terms warrants just compensation and failure implies voluntary forfeiture
- The regulator implements and enforces on behalf of the state
  - Regulation provides a conditional proxy for competition – imitative but benevolent
  - Imposes discipline to promote economic efficiency and "economic equity"
  - Also considers "legal equity" (just and reasonable standard)
  - Other institutions advance "social equity" – e.g., environmental and distributive justice
- Compact does not ensure investment opportunities or returns
  - Or shield utilities from loss, or ensure their survival in perpetuity

Utility rights and obligations under the regulatory compact

Rights: The utility enjoys

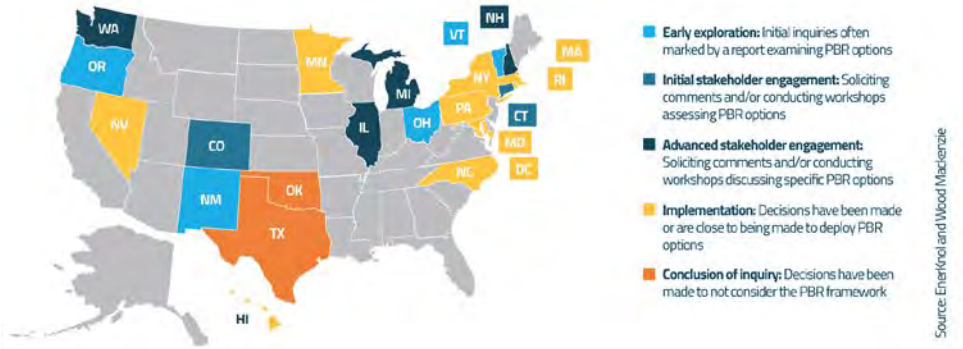
- A conditional exclusive franchise for a certificated service territory, rights of eminent domain, protection from direct competition and antitrust, recovery of allowed costs through rates and charges, and *a **reasonable opportunity** to earn a **fair return** on **prudent and useful** investment assuming **efficient management.***

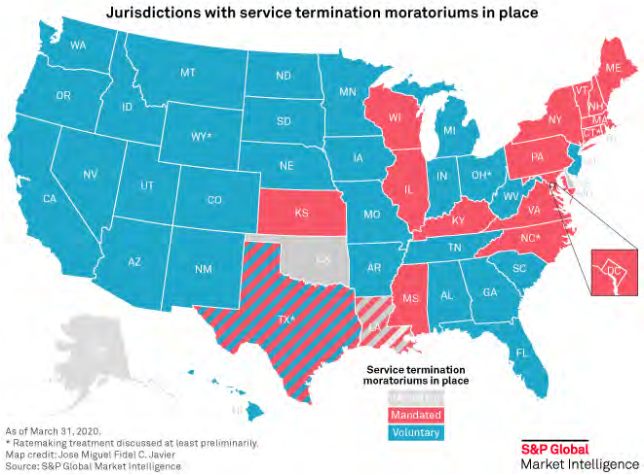
Obligations: The utility accepts

- An obligation to provide all paying customers with access to safe, adequate, reliable, convenient, and nondiscriminatory service on just and reasonable terms, *while assuming certain business and market risks and consenting to comprehensive regulatory oversight.*

Terms specified under the compact

- Potential terms and conditions imposed by the state for social purposes
  - Universal affordable access to service
  - Energy and water resource portfolios
  - Energy efficiency and demand response
  - Operational and reliability standards
  - Merger and acquisition terms
  - Public and worker safety
  - Service quality and enforcement
  - Economic development
  - Consumer education and information
  - Security, reliability, and resilience
- Dissolving the compact requires
  - Divestment of property, disruption of technology, or “disintegration” of network
  - Deregulation relinquishes authority over the terms to markets or other policy institutions
- Do we need a new paradigm or a “new prudence”?





A new paradigm or a new prudence? ⓘ

- New business and pricing models do not constitute a new regulatory paradigm
  - Corporate culture may be more relevant than technological, business, and regulatory models
- Regulators may need a new prudence
  - Based on enforceable standards and generally accepted utility and regulatory practices
  - Both can be strengthened in light of technological advances and opportunities
  - Dynamic supply and demand conditions call for questioning assumptions (e.g., scale)
  - Many contemporary issues in ratemaking lack standards, guidance, and precedents
- Legal standard for prudence based on “known and knowable” remains core
  - Various regulatory tools can be used to enforce prudence within the paradigm
  - Certificates of need do not ensure prudence or cost recovery
- Flexible design under uncertain and dynamic conditions
  - Infrastructure that is intelligent, flexible, modular, adaptable and resilient
  - Utilities as distribution system optimizers for a diversified portfolio – supply and demand
  - Each discrete project must be proven - no preapproval or rolling prudence that shifts risk
  - Supported by flexible engineering design (R. de Neufville, MIT)
  - F.R.A.M.E.: flexible, reliable, available, maintainable, economic (NextGen Infra., TU Delft)
- New tools for a new prudence – “digital” utilities and regulators
  - Utility tools for enhancing performance and regulatory tools for evaluating performance
  - The power of tough questions – if not, why not?
  - Utilities must make their case and provide proof – not other stakeholders or vendors

A new paradigm or a new prudence?

A new prudence: tools for enhancing utility performance ⓘ

- Real-time digital intelligence & communication platforms, big-data storage, analytics
- Decision support (e.g., construction, supply-chain, project, and risk management)
- Comprehensive and integrated resource planning and portfolio diversification
- Capital asset and ecological planning, management, and control systems
- Contingency planning and security protocols for physical and cyber threats
- Optimization modeling for capital and operating options
- Dynamic load and congestion management technologies and controls
- Spatial imaging, mapping, forecasting, and analysis (e.g., RS, GIS, and SCADA)
- Market mechanisms (e.g., competitive bidding and time-variant pricing)
- Consumer information, services, outreach, and engagement
- Research and development and pilot studies (firm and industry)
- Flexible, adaptive, modular, and resilient infrastructure design

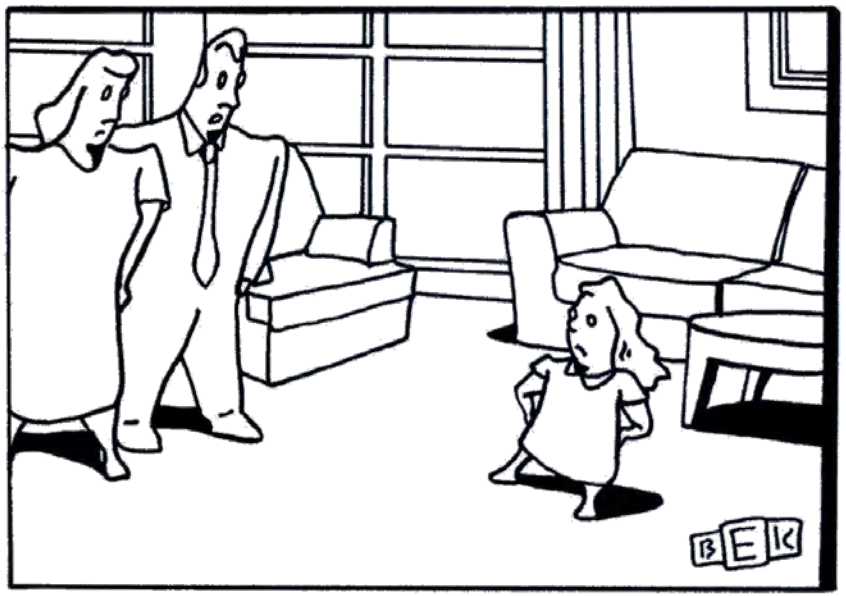
A new prudence: tools for enhancing regulatory enforcement ⓘ

- Uniform technical standards, codes, and rules (e.g., franchising, siting, sizing, interconnection, interoperability, and so on)
- Statistical benchmarking and comparative competition with metrics and targets
- Certification of alternative service providers and model contracts
- Informed and consistent rules for cost and risk allocation and rate design
- Technological, structural, and market neutrality in planning and approval
- Empirical analysis of cost-effectiveness, productivity and other performance metrics
- Outcome-based compensation mechanisms (e.g., management or investor bonuses)
- Comprehensive empirical evaluation of programs, services, and customer satisfaction
- Management and performance audits and improvement plans
- Transparent and data-driven compliance monitoring and reporting systems
- Consumer protection rules, procedures, and penalties (e.g., fraud prevention)
- Process improvement, organizational development, research, professional education

Regulatory commissions

Poll 10: Commissioners

- What is the “right” number of commissioners for a commission?
  - A. 1
  - B. 3
  - C. 5
  - D. 7
  - E. 9



“Yes, we do have the authority to regulate you.”

The U.S. regulatory commissions

- Commission evolution
  - All U.S. state commissions evolved from railroad commissions
  - Statutory or constitutional (AZ, CA, LA, NE, NM, ND, OK, VA)
- Considered “arms” or “creatures” of the legislature
  - Some are organized as independent agencies
  - Some are housed within executive agencies (e.g., commerce)
- Structures vary according to functional responsibilities
  - All have a professional staff, with many organizational variations
  - Most oversee multiple industry sectors (telecom, electricity, gas, water)
  - Potential tensions – electrification, coal ash pollution
  - May regulated other industries (e.g., Virginia Corporation Commission)
- Most are funded by assessments on jurisdictional entities
  - Special assessments may be used for special purposes (such as a study)
  - Autonomy in budgeting and staffing are important to independence
  - Commissions must comply with state personnel and fiscal policies

Early evolution of the Illinois Commerce Commission

1871	Creation of the Railroad and Warehouse Commission
1907	Authority expanded to issue warehouse licenses
1911	Commission's jurisdiction extended to include the supervision of express companies, carriers by water, and sleeping car companies
1913	The Railroad and Warehouse Commission succeeded by the Public Utilities Commission
1917	The Civil Administrative Code of 1917 made the Public Utilities Commission an independent unit of the Dept. of Trade and Commerce
1921	The Illinois Commerce Commission succeeded to the powers and responsibilities of the Public Utilities Commission
1933	The Dept. of Trade and Commerce was abolished, and the commission continued to operate independently
1951	Responsibility for grain inspection transferred to the Dept. of Agriculture

Commission mission statements

- California Public Utilities Commission
  - “We are dedicated to ensuring that you have safe, reliable utility service at reasonable rates, protecting against fraud, and promoting the health of California’s economy.”
- Michigan Public Service Commission
  - “The mission of the Michigan Public Service Commission is to serve the public by ensuring safe, reliable, and accessible energy and telecommunications services at reasonable rates.”
- Pennsylvania Public Utility Commission
  - “The PUC works to ensure safe and reliable electric, natural gas, pipeline, motor carrier, rail, telecommunications, water and wastewater service at reasonable rates.”
- Vermont Public Utility Commission
  - “The Commission's mission is to ensure the provision of high-quality public utility services in Vermont at minimum reasonable costs, consistent with the long-term public good of the state.”

Three bounded policymaking roles of independent commissions

Quasi-administrative: *regulator as expert*

- Commissions apply expertise like a bureaucratic agency; implementation and enforcement; controversial as to effectiveness and efficiency

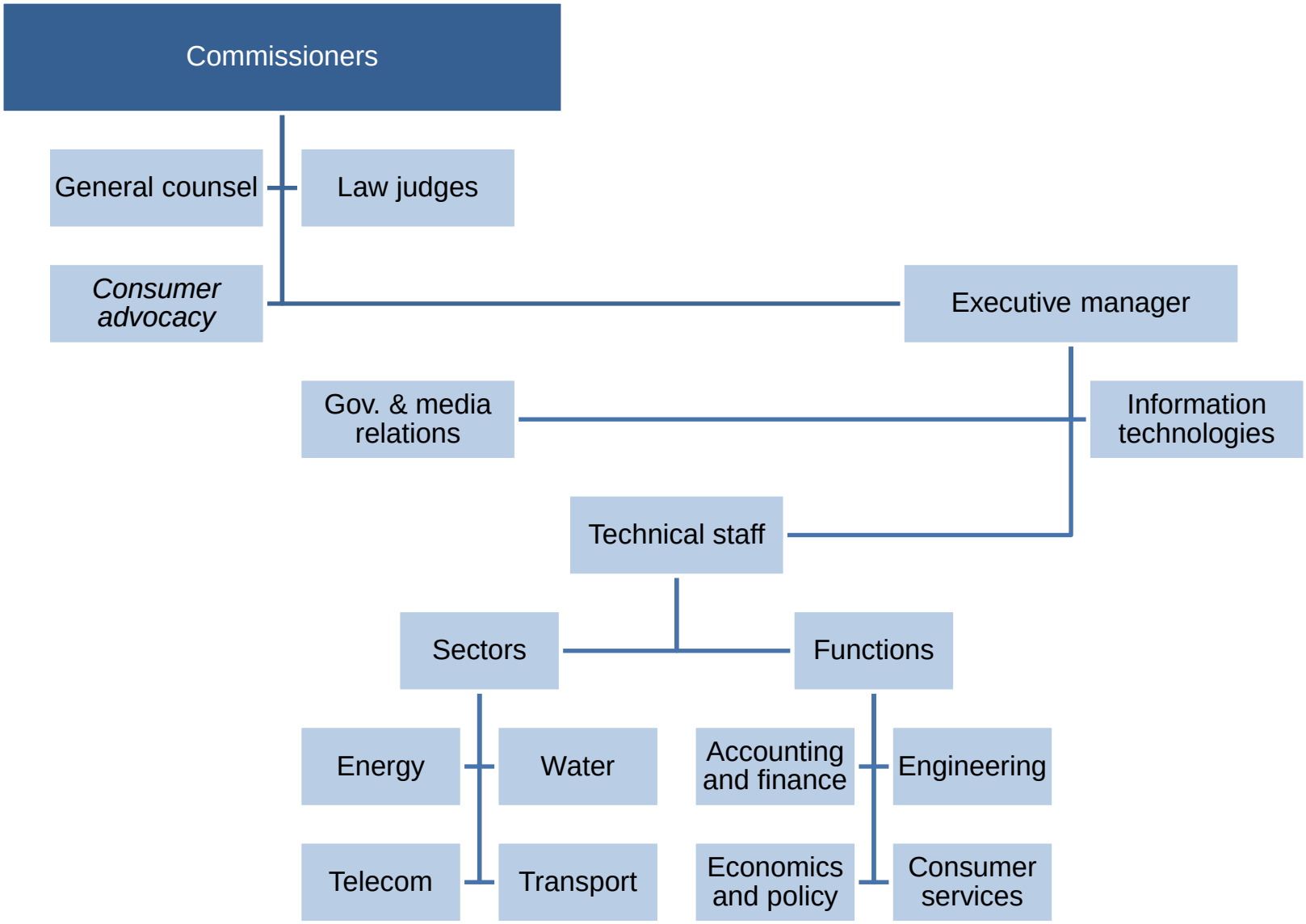
Quasi-legislative: *regulator as trustee*

- Commissions make policy like a legislature; rulemaking and standards development; controversial as to authority, discretion, and policy activism

Quasi-judicial: *regulator as judge**

- Commissions deliberate and make decisions like a specialized economic court; procedural due process, impartiality, judicial demeanor; controversial as to conflicts of interest

Commission organizational structure



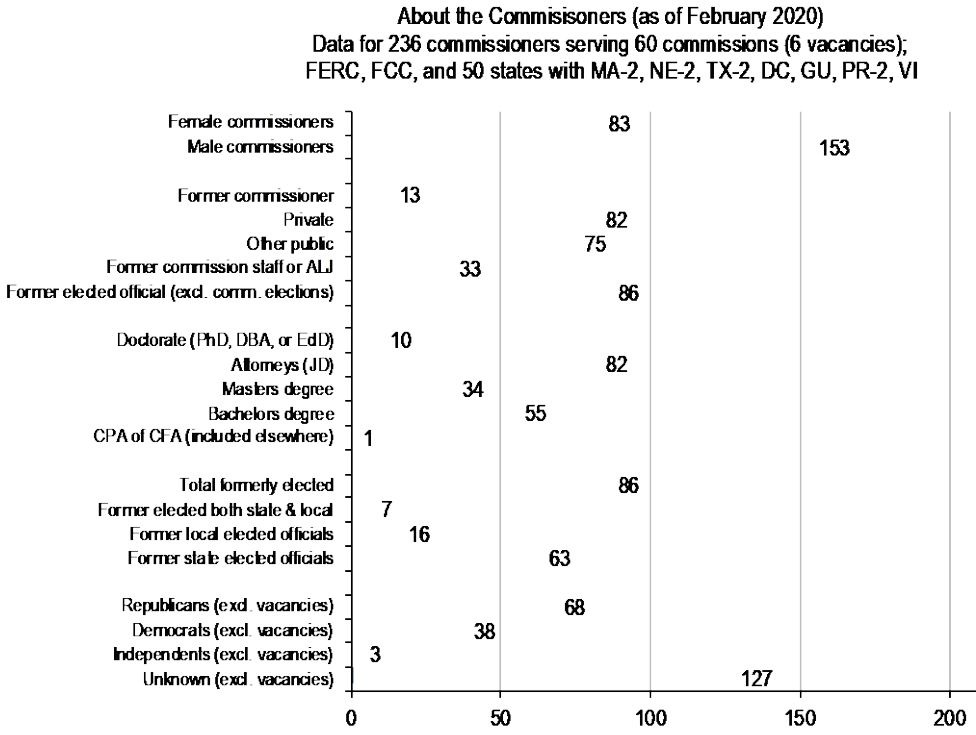
Commission staff roles

- Staff roles and rules of conduct vary by subject, proceeding, and time
  - Administrators that help implement policy
  - Advisors in policy formulation and decision assistance
  - Advocates appearing before the commission as experts
- Staff advocates
  - A relatively high degree of independence and a professional work ethic
  - Require organizational separation and controls (i.e., ex parte rules)
  - Should be viewed as “first among equals” in proceedings
  - Represent the public interest (long-term, societal perspective)
  - Build the decision record “in the middle”
  - Redress the resource imbalance favoring utilities
  - May support a position or provide a range of supportable options
  - Staff should avoid directing the commission (“the commission should…”)
- Commission organizations often face staffing, funding, and political issues
  - Can limit regulatory capacities
  - Preservation of institutional and technical knowledge is critical

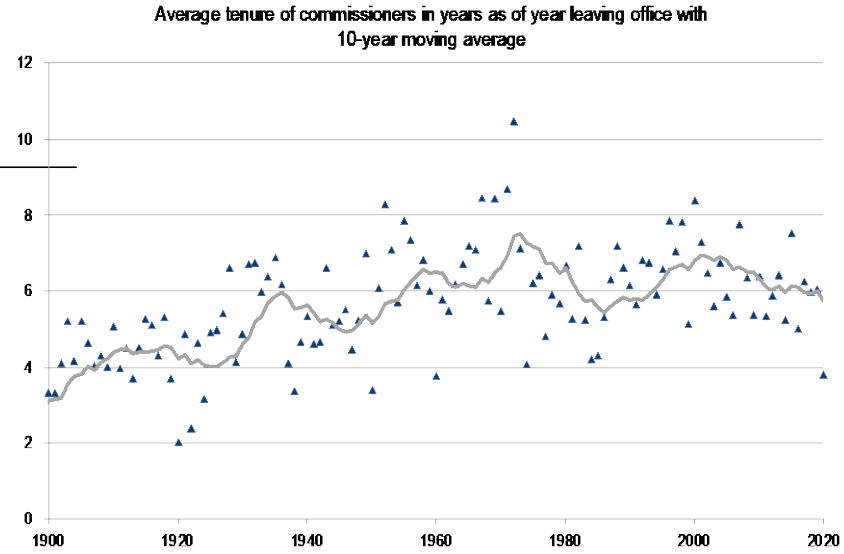
The U.S. commissioners

- Three to five members; turnover can be significant
- Virginia Corporate Commission Judges
- Fixed terms of office vary (4-6 years) and are staggered for continuity
- Most are appointed but some are elected (13 jurisdictions)
- Governors have vetting and selection processes (e.g., committees)
- For appointed, partisan representation may be specified and limited
- May be statutory, customary qualifications (business, labor, consumers, gender)
- Some commissioners specialize in an industry subsector
- Method for selecting the chairman varies (”first among equals”)
- Commissioners in some states hear cases and write orders
- Prior employment and experience varies
- Salaries are in a broad range, and other employment is restricted

U.S. commissioner demographics

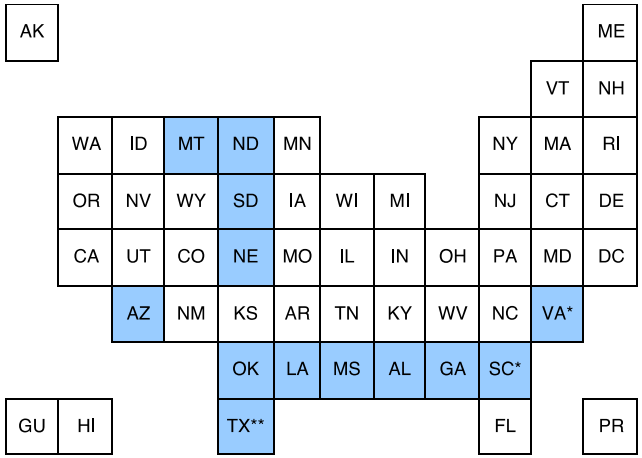


Average tenure of commissioners in 2020 was 5.3 years (median was 3.5)



Elected and appointed commissioners

- Theory favors appointment, evidence is limited and mixed,
  - Both processes are political – most “campaign” for the job
  - Arguments for election: democratization, broadens candidate pool, transparency, direct accountability to electorate, post-election political independence
  - Arguments against election: political orientation, qualifications and demographic diversity, electorate understanding, voter favoritism, campaign financing (growing issue)
  - Orientation, agency resources, and other factors also matter
- Possible safeguards for elected
  - Endorsement (e.g., ABA), term limits, professional staff, and effective oversight
- In 2020, New Mexico voters voted to change from elected to appointed



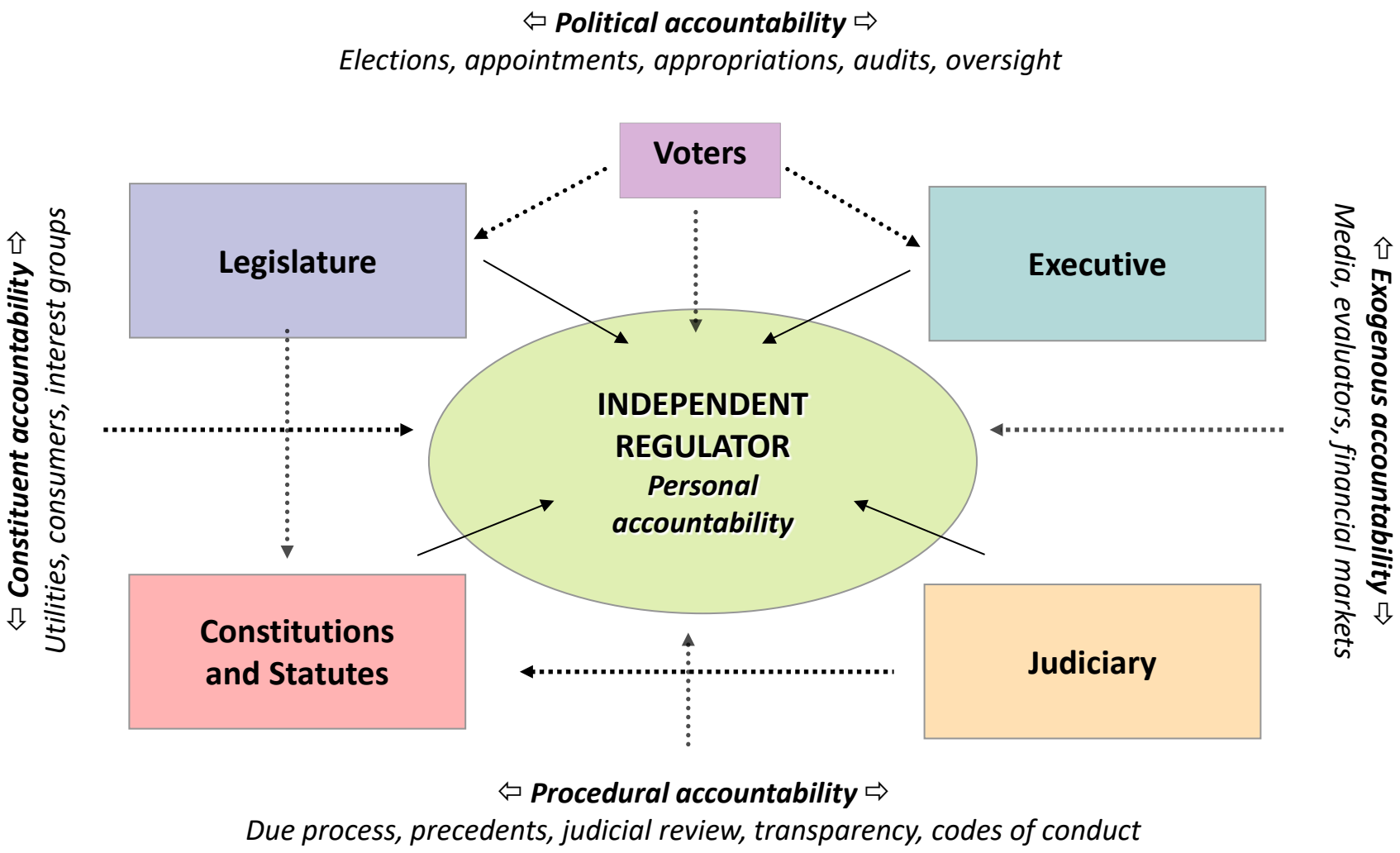
Poll 11: Preside or lead

- Should regulators preside or lead in terms of policy? (S. Hempling)
  A. Yes
  B. No
  C. Not sure

Regulatory independence

- Central principles in the design and purpose of regulation in the public interest:
  - Independence, accountability, and transparency with checks and balances
  - Commissions should operate within executive or legislative authority but without interference – similar to courts
- Commissioners and staff are expected to be independent from
  - Each other – among commissioners from staff advocates
  - Executives – influence of presidents, governors
  - Legislatures – avoidance of legislative regulation or pressure
  - Political parties – balanced, and party should not be predictive
  - Regulated utilities – corporations and their agents (law firms, consultants)
  - Interest groups – interest-based organizations, think tanks, and lobbyists
  - Others – intermediaries, financial sector, vendors
- People disagree about whether regulators should be more or less independent
  - Regulators can preside and still vigorously pursue the public interest
  - Political environment can jeopardize independence and balance
  - Taking public preferences into account is challenging (public accountability)
  - Other democratic institutions are better for broad social issues and distributive policy
  - Economic and environmental regulatory roles ideally should not be blurred
  - Economic regulation gets us there prudently, consistent with the public interest

Bounded independence of the regulator



Regulatory capture

- Regulatory independence is bounded
  - Regulators should model themselves as judges
- What is meant by regulatory capture?
  - Regulators may succumb to corporate or political (partisan) capture
  - They may begin to identify with and think like industry and promote industry views ("Stockholm syndrome")
  - Other participants in regulation can be captured as well, including consumer and environmental advocates
- Capture is often insidious
  - Relationships, sponsorships, recognitions
  - "Research and education"
- Capture can be operationalized
  - "Return without risk" and asymmetric mechanization of ratemaking

Regulating the regulator: ethics and accountability*

- Politics are necessary for translating values into policy
- Politics, independence, and ethics are intrinsically related
  - Various mechanisms help ensure accountability and independence
  - Rules may be situational (jurisdictions and processes), but ethics are absolute
  - Adherence to the rules of conduct benefit all parties in the process
- Codes of ethics govern and restrict certain activities
  - Conflicts, communications, and corrupting influence
  - Specific restrictions on investments, gifts, post-service employment, etc.
- Personal responsibility is critical
  - Independence does not require isolation but awareness and vigilance
  - Regulators are well served by looking to judges as role models
- Regulatory networks and networking provide opportunities and challenges
  - Professional socialization, capacity development, institutionalization

* See “The Prudent Regulator” (Beecher, 2008)

Good regulators lead to good regulation: characteristics ⓘ

- Dedicated to public service as expert, trustee, and judge
- Understanding and appreciation of the public interest
- Intellectual curiosity and a genuine interest in the subject
- Humility in the face of the public interest charge and difficulty of the task
- Independent from political interests, unbiased, impartial, non-ideological
- Judicial demeanor & disposition, circumspect, mature, sensible, patient, collegial
- Committed to the highest ethical standards

Regulatory impact: commission performance metrics

Capacity: budget, staffing, credentials, longevity, information technologies

Process: transparency, procedural due process, timeliness, dispute resolution processes

Outputs: cases, complaints, audits, investigations, studies and reports

Outcomes: universal access, affordability, public safety and health, financial sustainability, infrastructure investment, market performance, environmental impact

Integrity: continuity and consistency, ethics compliance, agency independence

Process and principles

The regulatory process

- Regulation abides by the "rule of law" and administrative procedures
  - Quasi-judicial role with judgelike independence and demeanor and fact-finding role
  - Rights of due process and prohibitions on ex parte communications
  - Openness (transparency) of records, proceedings, and deliberations
- Commissions can initiate actions on their own or in response to legislation
  - Show cause, generic proceedings, and rulemakings
  - Compliance and enforcement – notice of alleged violation (NAV)
  - Retroactive ratemaking is not permitted – but reconciliation is needed for adjustments
- Procedural steps are generally comparable across commissions
  - Generally reactive – a response to filings by utilities who bear the burden of proof
  - Precedents apply, but decisions are made "case by case"
  - Cases can be "contested" by staff and other parties (but not always contentious)
- Alternative dispute resolution (ADR)
  - Regulation is litigious but not necessarily contentious or adversarial
  - Stipulation and settlements can be used to reduce regulatory time and expense
  - Settlements are still subject to commission review and approval
- Regulated utilities and other stakeholders shop for favorable venues and terms
  - Regulatory, legislative, or judicial – sometimes to bend the rules in their favor
  - Legislative ratemaking may be on the rise limits discretion (broader authority preferred)
  - Regulatory arbitrage refers to manipulation of rules to private advantage (SASE, 2019)

Participants in the regulatory process

- Appointed or elected commissioners
- Administrative law judges/hearing examiners
- Advisory and advocacy staff
- Utility companies and their consultants
- Legal representatives of all parties, including State Attorneys General and commission general counsels
- Intervenors generally must have a relevant interest ("standing")
  - Consumer advocates, customer groups, businesses, governments and agencies, vendors, and other interested parties
  - Resources vary, and some may receive assistance paid by the state or the utility
  - Multiple participants complicate but also enrich the record

Information asymmetry

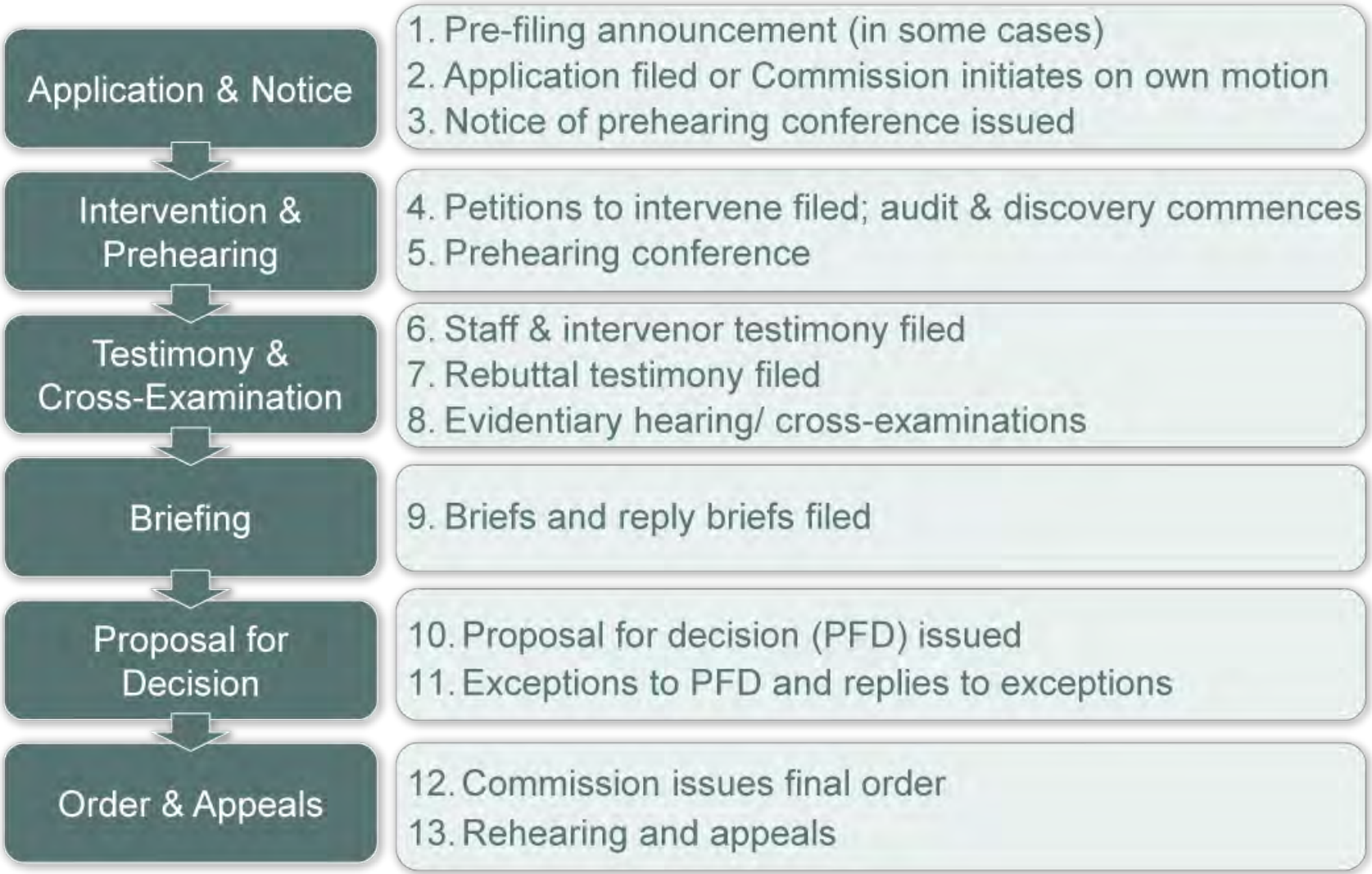
- *"I know enough to be dangerous, but not enough to be competent" (regulator)*
- The "knowledge problem" in policymaking (Friedrich Hayek)
  - Importance of acknowledging what we do not know
  - Regulators will never know as much as the regulated
  - If they did, they should directly provide utility services
  - Regulators do not need perfect information to be effective

- Regulators are challenged by information dependence and asymmetry
  - So are other participants ("some animals are more equal than others")
  - Producers are advantaged over regulators, consumers, and public-interest groups
  - Distortion or abuse of the information advantage is a form of "moral hazard"
  - Information asymmetry exacerbates the "principal-agent" (state-utility) issue
  - Increasingly problematic with inadequate regulatory capacity and complex issues
- Regulators can be empowered by valid and diverse information
  - Compelling utilities to produce and report information (judiciously) is a powerful tool
  - Information creation, procurement, maintenance, and protection is costly
  - Regulators have a responsibility to regulate "intelligently" (McDermott)
  - Information freedom has become complex and controversial
  - Objective research and education can help

Openness in commission governance

- Openness and transparency of government are valued in our political culture
  - "The public's business should be conducted in public"
  - Rationale for openness in proceedings vs. commissioner deliberations
- Open proceedings: "sunshine"
  - "The General Assembly finds that the right of the public to be present at all meetings of agencies and to witness the deliberation, policy formulation and decision-making of agencies is vital to the enhancement and proper functioning of the democratic process and that secrecy in public affairs undermines the faith of the public in government and the public's effectiveness in fulfilling its role in a democratic society." (PA Statute § 702)
- Open records: "right to know" and "freedom of information"
  - Provide equal access to public, parties, the media
  - Annual and other financial reports of utilities
  - Rate-case and other filings
  - Maps and other information
  - Commission studies and reports
- Balancing openness, propriety, security, and regulatory scrutiny
  - Potential chilling effect on documentation – staff audit papers, draft reports

Procedural steps in regulation (MPSC)



Procedural steps in regulation ⓘ

- Pre-filing meeting – utility and regulator before filing, consider timing and workload (controversial due to appearances)
- Initial filings re tariffs and other issues, usually by the utility – time limit from filing to decision may apply (“shot clock” and “self-implementing” tariffs)
- Coordinated proceedings may occur when jurisdiction is shared (rare)
- Notice of proceeding, opening of record – by the commission
- Suspension of filings – holds the case for contested hearing
- Petitions for intervention – by interested and affected parties for “contested” cases (intervenors include various stakeholder and interest groups)
- Discovery, interrogatories, audit and data requests – documentation
- Filed testimony/exhibits/schedules – expert witnesses for utility, technical staff, other parties; generally open
- Evidentiary hearings – parties cross examine, build record; generally open

Procedural steps (continued) ⓘ

- Public hearings – open, various locations; both symbolic and meaningful because they can sensitize commissioners and parties to issues
- Rebuttal and surrebuttal testimony – issues must be within scope of the original testimony (no new issues)
- Stipulations and settlements throughout process, as appropriate (when to settle or not; when to reject)
- Briefing by counsel – initial and reply; summarizes issues, positions
- Commission orders – proposed, draft, final; comment periods; findings of fact and law; resolution of issues based on the "four corners of the record"
- Petitions for rehearing – request or appeal to the commission
- Appeals to courts – constitutional, statutory, procedural grounds; (violations of rights or law vs. findings of fact)
  - Commissions enjoy a degree of discretion from legislatures and deference from courts
  - Appeals are relatively infrequent – aversion to litigiousness and need to move on
  - Courts may direct commissions to reopen a case
  - Chevron standard allowed a reasonable interpretation when statutory authority is unstated or ambiguous – *overturned in 2024*

Core standards of regulatory and judicial review ⓘ

- The “power to regulate is not a power to destroy” by taking property without just compensation or due process *(Stone v. Farmers' Loan & Trust Co., 1886)*
- Property owners are entitled to due process, but rates cannot place “unjust burdens” on the public to ensure dividends to stockholders *(Covington & Lexington Turnpike, 1896)*
- Companies are “entitled to ask” for fair returns on the fair value of property employed for public convenience (“just compensation”) *(Smyth v. Ames, 1898; overturned)*
- “Neither justice nor the Constitution requires” full compensation or rate base inclusion for excess investment that is not “used and useful” *(San Diego Land & Town Co. 1903; Denver Union Stock Yard, 1938)*
- Regulation involves the “fair interpretation of a bargain” that finds a “midway” between too little and too much profit *(Cedar Rapids, 1912)*
- Returns should reflect “corresponding risk” to maintain credit and attract capital while assuming “efficient and economical management” and value depends on earnings not rates *(Bluefield Water Works v. WV PSC, 1923; FPC v. Hope Natural Gas, 1944)*
- Commission judgment should not substitute for board discretion, and prudence is presumed, but “dishonest, wasteful, or imprudent expenditures” should be disallowed *(Southwestern Bell v. Mo. PSC, 1923)*
- Regulation does not ensure that businesses will produce “net revenues” or recover losses *(FPC v. Nat. Gas Pipeline, 1942)*

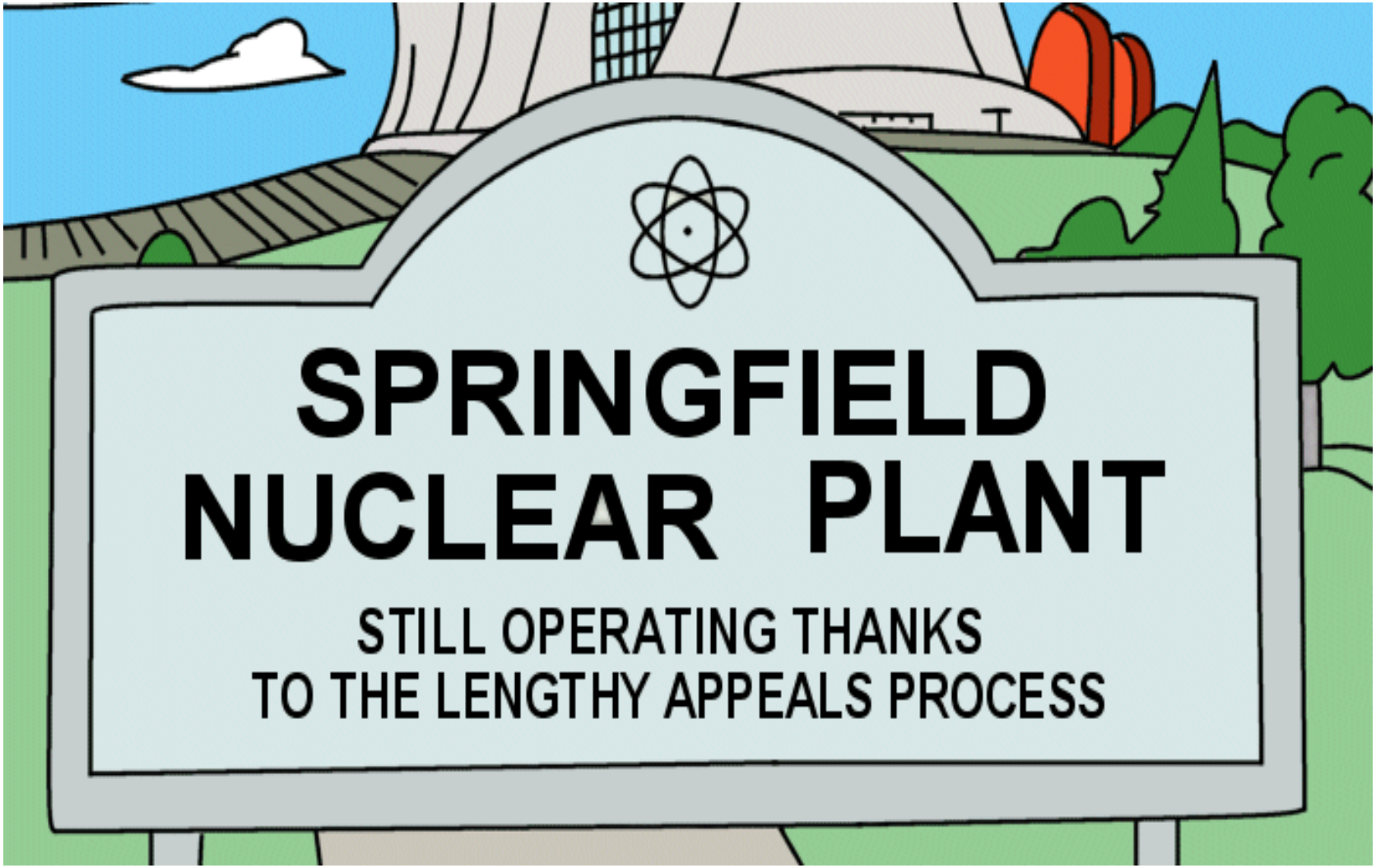
Core standards (continued)

- 'Fair value' is not an input but the result, as firm value depends on earnings *(FPC v. Hope Natural Gas, 1944)*
- Regulators are not bound by formulas and are free within their statutory authority to make "pragmatic" adjustments to achieve end results *(FPC v. Natural Gas, 1942; FPC v. Hope, 1944)*
- Due process does not insure or protect utilities from losses due to business risk associated with "economic forces" *(Market St. Railway, 1945)*
- A contract rate may be evaluated relative to the public interest but is not "'unjust' or 'unreasonable' simply because it is unprofitable" *(FPC v. Sierra Pacific, 1956)*
- Utilities must "operate with all reasonable economies" *(El Paso NG, 1960)*
- Regulators should not usurp management or judge prudence with the "20-20 vision of hindsight" *(TWA v. CAB, 1967)*
- Courts allow regulators to decide within a "zone of reasonableness" *(Permian Basin Area Rate Cases, 1968)*
- Utility monopolies are "relatively immune to the usual market risks" with risk largely defined by rate methodologies that should not arbitrarily shift risks to and from investors; "it is not theory but the impact of the rate order which counts" *(Duquesne Light v. Barasch, 1989)*
- FERC's exclusive jurisdiction over interstate wholesale electricity preempts restructured states from developing generation resources *(Hughes v. Talen, 2016)*
- FERC should consider climate change and environmental justice *(DC Circuit, 2021)*
- Limits to regulatory scope for "major questions" *(West Virginia v. EPA, 2022)*

Judicial review of regulatory agency decisions

- Focus of review is on process vs. re-litigating the facts
  - Constitutionality: protection of fundamental liberties and rights
  - Procedural due process: compliance with administrative procedures, rules of evidence
  - Agency responsibility: unambiguous authority for the case and issues
  - Legal interpretation: reasonability based on legislative intent
  - Factual findings: substantial support by the record
  - Exercise of discretion: neither "arbitrary" nor "capricious"
  - Ethical conduct: violations of communications and influence
- Example: FERC v. EPSA, 2016
  - "This Court's important but limited role is to ensure that FERC engaged in reasoned decision making—that it weighed competing views, selected a compensation formula with adequate support in the record, and intelligibly explained the reasons for making that decision. Here, FERC provided a detailed explanation of its choice of LMP and responded at length to contrary views. FERC's serious and careful discussion of the issue satisfies the arbitrary and capricious standard."
- Justice Breyer wrote about an apparent anomaly in regulatory jurisprudence
  - Judicial deference on matters of law (interpretation) and judicial scrutiny on matters of policy (reasonableness)
  - Breyer suggests consideration of the French model of Conseil d'Etat – a specialized expert counsel review of regulatory issues
  - See *Skidmore* (1944). *Chevron (1984), Auer (1997), Kisor* (2019), and *Loper Bright* (2024)

"Still operating thanks to the lengthy appeals process."



Utility ratemaking

Variations in commission regulation: J.A.M.

Jurisdiction

- *Who is regulated (providers and thresholds)*

Authority

- *What is regulated (structures and functions)*

Methods

- *How they are regulated (tools and processes)*

Core functions of traditional regulation

- *Review and approve rates and terms for utility services as specified in "tariffs"*
- Control market entry, exit, and territorial expansion
- Issue certificates of need or "public convenience and necessity" (CPCN)
- Develop & enforce rules for service access, safety, adequacy, and reliability
- Specify performance standards for operations and service quality
- Provide resources to process, hear, and resolve customer complaints
- Impose systems of accounting, auditing, and reporting
- Review capital structure (debt and equity) and financial issuances
- Condition mergers, acquisitions, affiliate transactions, and diversification
- Conduct investigations, prudence reviews, and management audits
- Review resource portfolios and infrastructure plans
- Prepare forecasts for resource supply and consumer demand

Functional map of commission roles (Wisconsin PSC)

Public Service Commission

Division of Water, Telecommunications, and Consumer Affairs

The Water Team works with water and sewer utilities to ensure fair and reasonable water and sewer rates and service standards.

- **Set Water Utility Rates**
  - Process Conventional Rate Cases (CRC)
  - Process Simplified Rate Cases (SRC)
  - Establish Terms of Service (Tariffs)
  - Process Tariff Amendments
  - Process Purchased Water Adjustment Clauses
  - Maintain Rate Case Tool and Application
  - Process Amortization Requests
- **Review Utility Construction Projects**
  - Review Applications
  - Ensure Compliance
  - Coordinate with DNR, DOA, etc. to Identify Projects Proactively
- **Review Utility Organizational Transactions**
  - Review Mergers and Acquisitions
  - Review Abandonments
  - Review Extra-Territorial Service Extensions
  - Process River Tolls
- **Investigate Sewer and Water Complaints**
  - Conduct Formal Complaint Process
  - Provide Technical Support to Resolve Customer Complaints
- **Promote Utility Effectiveness and Viability**
  - Identify Financial Concerns
  - Promote Compliance Through Annual Report Reviews and "Audits"
  - Assist Utilities with Planning
  - Promote Conservation and Efficiency
  - Approve Rebate and Incentive Programs
  - Provide Support to "Troubled" Utilities
  - Provide Training and Outreach
  - Monitor Non-Revenue Water
- **Manage Data and Information**
  - Collect Annual Reports
  - Ensure Data Quality
  - Identify Best Practices
  - Manage Rates Dashboard
  - Publish Newsletter Articles

Provide Utility and Ratepayer Support – Answer Inquiries, Provide Guidance, etc.

Manage Databases and Records

Stakeholder expectations about ratemaking

Public utilities

- Revenue stability, reasonable certainty, and a fair return to ensure financial viability and satisfy investors

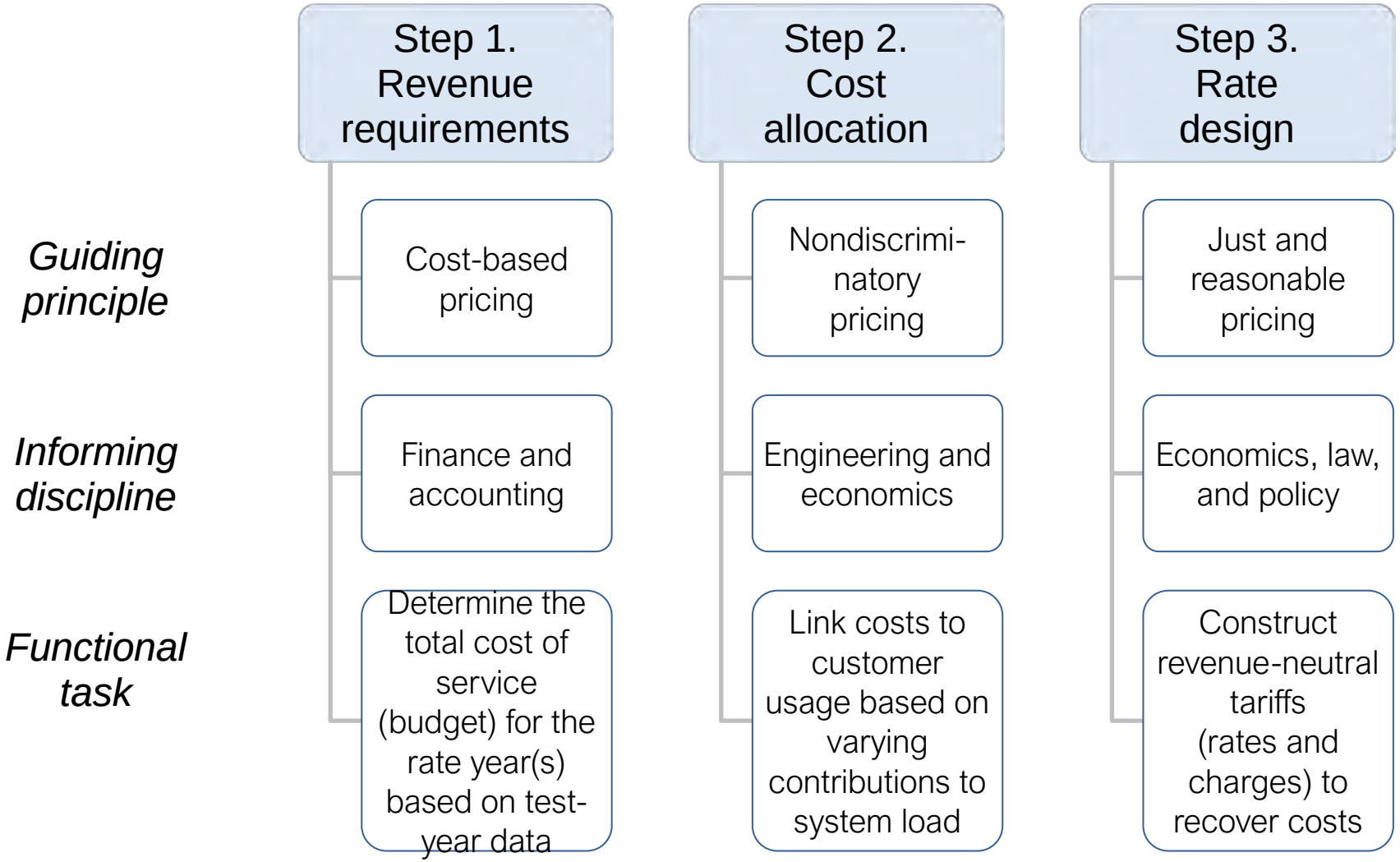
Utility ratepayers

- Safe, adequate, reliable, and convenient service, fair, reasonable, and stable rates, and a controllable and affordable bill

Utility regulators

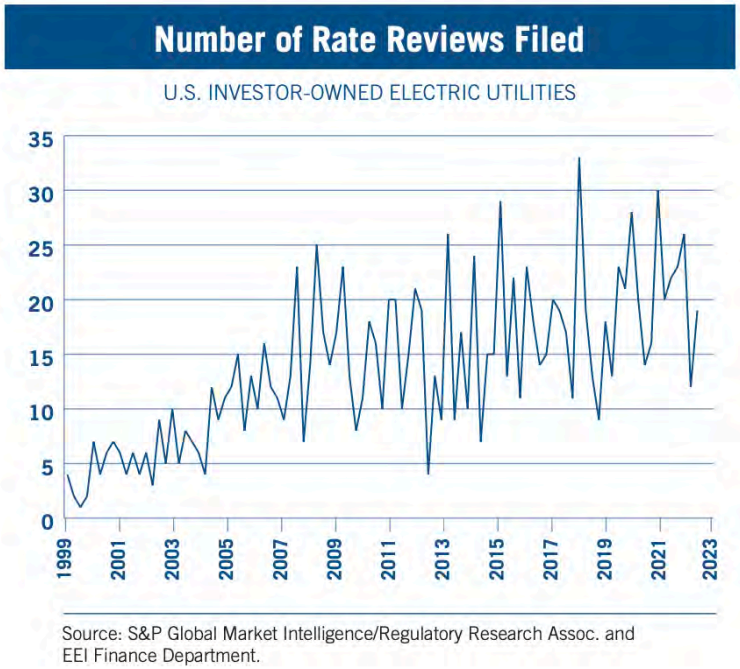
- Utility services that serve society and promote the public interest in terms of prudent infrastructure spending, operational efficiency, and other performance goals

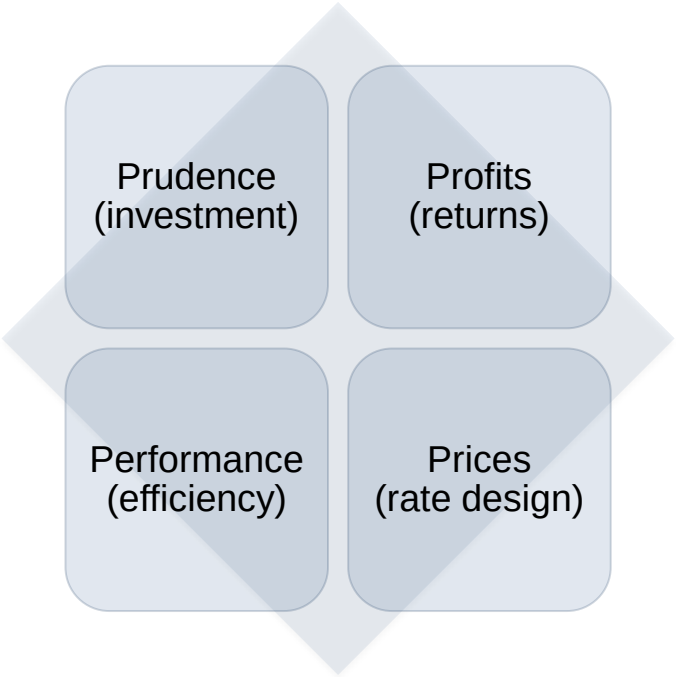
Ratemaking steps & guiding principles: all three matter to rate levels



Rate regulation

- Rate regulation responds to a filing for “rate relief”
  - Comprehensive litigated rate case is the default method – but many are settled
  - Preferred to single-issue ratemaking (tax rate change may be the exception)
  - Other types of cases have growing importance: reconciliation, certification, IRP
- Rate regulation focuses on four areas – policy and discretion apply to each
  - Rate-case workload fluctuates but is on the rise
  - Cases are usually filed sequentially vs. “pancaking” (overlapping)





Uniform systems of accounts (USoA)

- Books are kept in accordance with different bases of accounting
  - Financial regulators (SEC), Internal Revenue Service (IRS), economic regulators (PUCs)
  - Regulatory accountants need fluency across systems
- Utility regulators need accounting standards for policy purposes
  - Cannot rely on private entities (FASB, GASB)
  - They borrowed from the U.K. to develop and implement their own detail Uniform Systems of Accounts (USoA)
- Uniform federal requirements were established for shippers
  - Pursuant to the Hepburn Act (1906)
  - Implemented by the Interstate Commerce Commission
- Regulatory systems
  - New York, Wisconsin, Maryland created USoAs in the early 1900s
  - First interstate system was published by the “National Association of Railway and Utilities Commissioners” (“NARUC”) in 1922
  - In the 1930s, the Federal Communications Commission (FCC) and the Federal Power Commission (predecessor of FERC) issued systems

Regulatory accounting and GAAP

- Regulatory accounting is more than modified GAAP accounting
  - Accounting and reporting evolve and vary for regulators, shareholders, and the IRS
  - Key distinctions are associated with regulatory policy and timing issues
  - Regulatory decisions impact financial reporting and how items are booked
  - Regulatory auditors should compare various reports and read footnotes
- Regulatory policies prevail over GAAP
  - FASB and GASB (via GAAP) have no authority over federal or state regulators
  - "If GAAP conflicts with the accounting and financial reporting needed by the Commission to fulfill its statutory responsibilities, then *GAAP must yield…" (ital. added)*
  - "GAAP cannot control when it would prevent the Commission from carrying out its duty to provide jurisdictional companies with the opportunity to earn fair return on their investment and to protect ratepayers from excessive charges and discriminatory treatment" (FERC Order No. 552, 62 FERC 61,299, March 31,1993)
- Financial Accounting Standards Board (FASB) is a private entity
  - SEC delegated standards-setting to FASB in 1938
  - Statement 71 (ASC 980) provides guidance for privately owned utilities
  - Government Accounting Standards Board (GASB) rules apply to publicly owned
- XBRL: eXtensible Business Reporting Language

Regulatory auditing ⓘ

- Regulatory auditor is a watchdog, not a “pitbull” (D. Parrish)
  - U.K. headline: “when watchdogs didn’t bite” – occasional bite lends credibility
- Regulatory auditing is more than fraud detection
  - Regulatory audit presumes compliance vs. violation
  - Audits and shadow audits are used to assess prudence (proportionate reasonableness)
  - Trends, benchmarks, and comparable systems are used to screen for anomalies
  - Staff capacity and expertise are needed as well as enforcement and penalty tools
  - New issues: large projects, bidding processes, multistate companies
- Core concepts in accounting and auditing (D. Parrish):
  - Matching, business entities, going concern, periodicity, conservatism, consistency, cost, materiality, objectivity, disclosure
  - For more information, see NARUC *Ratecase and Audit Manual*

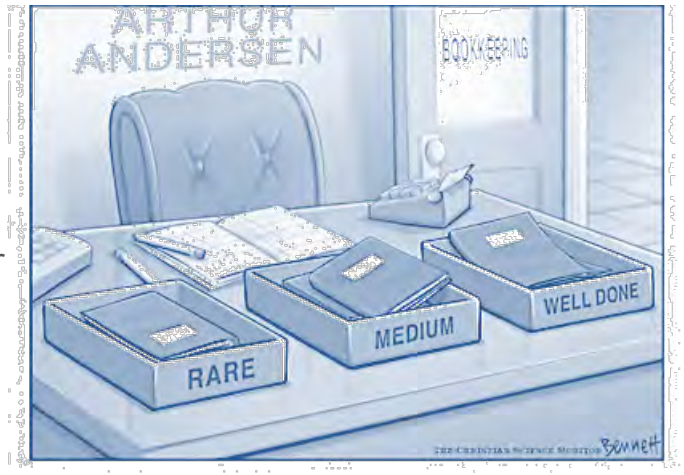
Corporate accountability issues

- Synergies between regulators and corporate boards
  - Shareholders and directors also provide incentives – e.g., executive compensation committees
  - Shareholders have primacy despite “conscious capitalism”
- Accountability under Sarbanes-Oxley
  - Protects investors but may affect cost of capital
  - Separation of advisory and audit functions
  - Improves transparency and accountability
  - CEOs and CFOs certify reporting
  - Cost of compliance varies – who should pay?
- Risk management and asset protection
  - Segregation, firewalls, and ring-fencing
  - Review and conditions on mergers and acquisitions
- Environmental, social, and governance (ESG)
  - ESG disclosure and reporting align with regulatory standards of the public interest, prudence, accountability
  - SEC statement and guidance on cyber-security disclosures for public companies issued in 2018
  - SEC issued the Enhancement and Standardization of Climate-Related Disclosures for Investors rule in 2024

FEATURE

Add shareholder discontent to the list of problems facing Southern Co.

Investor pushback on Kemper and executive pay failed in May, but some shareholders are not giving up



Cost-of-service (cost-based) ratemaking

- *"The fixing of future rates always involves an element of prediction" (Market St. Railway, 1945)*
- Promoting efficient production, consumption, and resource allocation
  - Principle of "burdens follow benefits" and vice versa (matching)
  - Cost causers and beneficiaries should pay (rules for allocating costs based on usage)
  - Costs should not be knowingly or unknowingly shifted to others (cross-subsidies)
  - Practicality and social goals may justify socialization (postage) or subsidization (transportation)
  - Subsidies for broad social goals are needed, ideally supported by taxpayers vs. ratepayers
- Under RB/ROR, regulators *approximate* an "efficient" (market-based) price
  - "Cost-plus" (costs plus returns) ratemaking is misleading
  - Revenues from prices include a "fair" rate of return to investors
  - Determining and allocating service costs is the essence of ratemaking
  - A test year (base year or rate year) is used to establish "base rates"
  - A projected test year requires both usage and cost forecasting or budgeting
  - Test year practice may differ from theory in terms of approximating costs
  - Matching principle for revenues and costs is used to evaluate earnings
- Utility incentives
  - Strong incentives to recognize "known & measurable" (supportable) costs
  - Weak incentives to recognize potential cost savings (including following capex)
  - Strong incentives to understate sales – sales forecasts must be supported

Competitive firms vs. utilities

- Competitive firms
  - Revenues - Expenses = **Net income** (accounting "profit")

- Regulated utilities
  - **Revenue requirements** = Net income + Expenses

- Non-private utilities (government and cooperatively owned)
  - **Revenue requirements (budget)** = Debt service + Expenses + Amount to maintain reserves

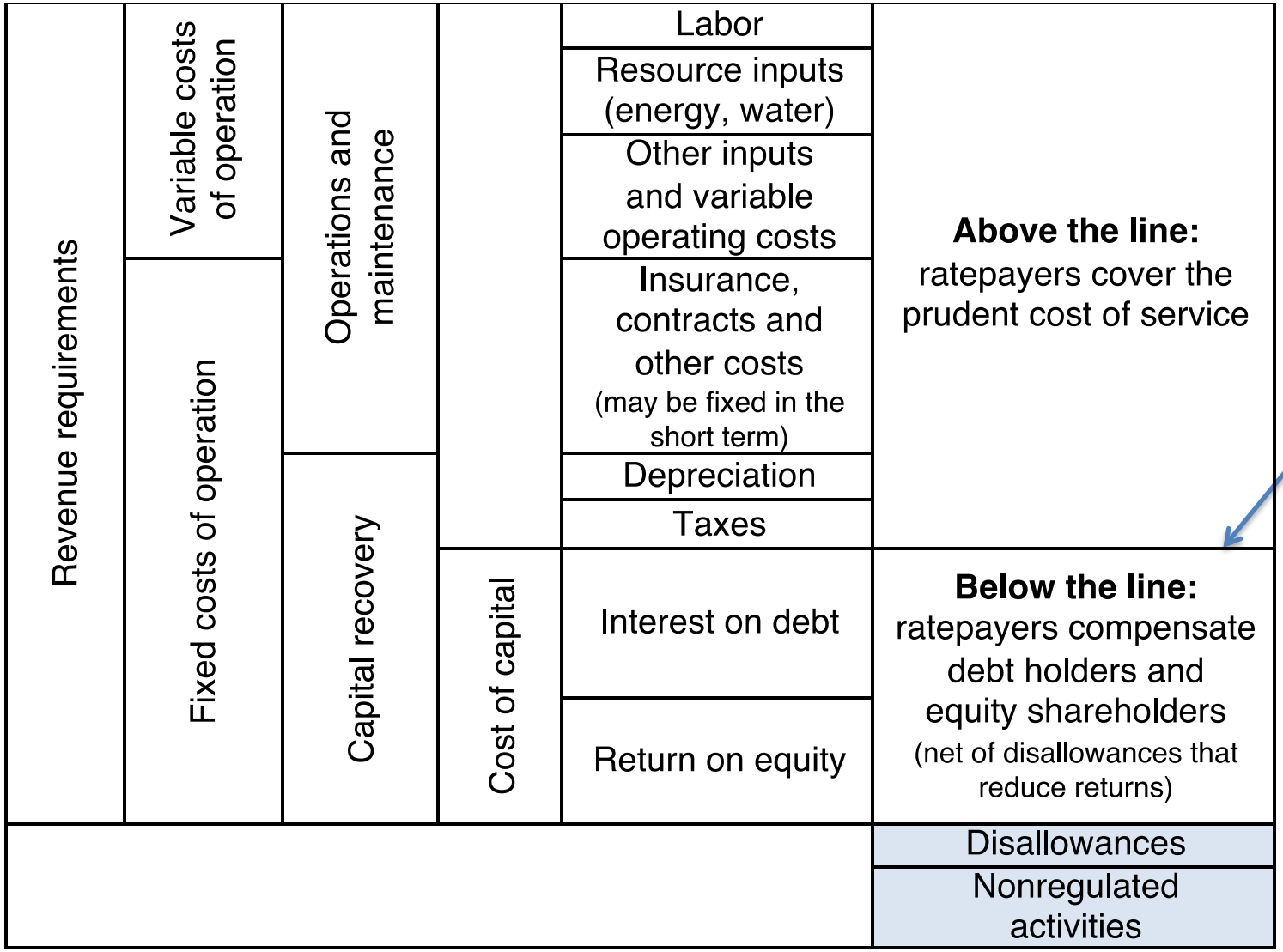
DTE asked for roughly twice what it needed in rate increase, attorney general says in new filing

Updated: Aug. 18, 2023, 10:50 a.m. | Published: Aug. 18, 2023, 8:15 a.m.

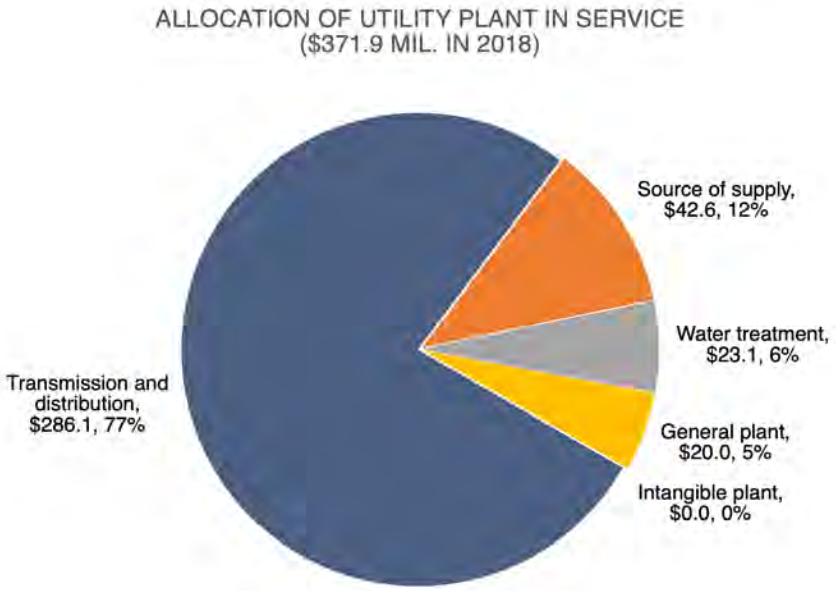
Revenue requirements

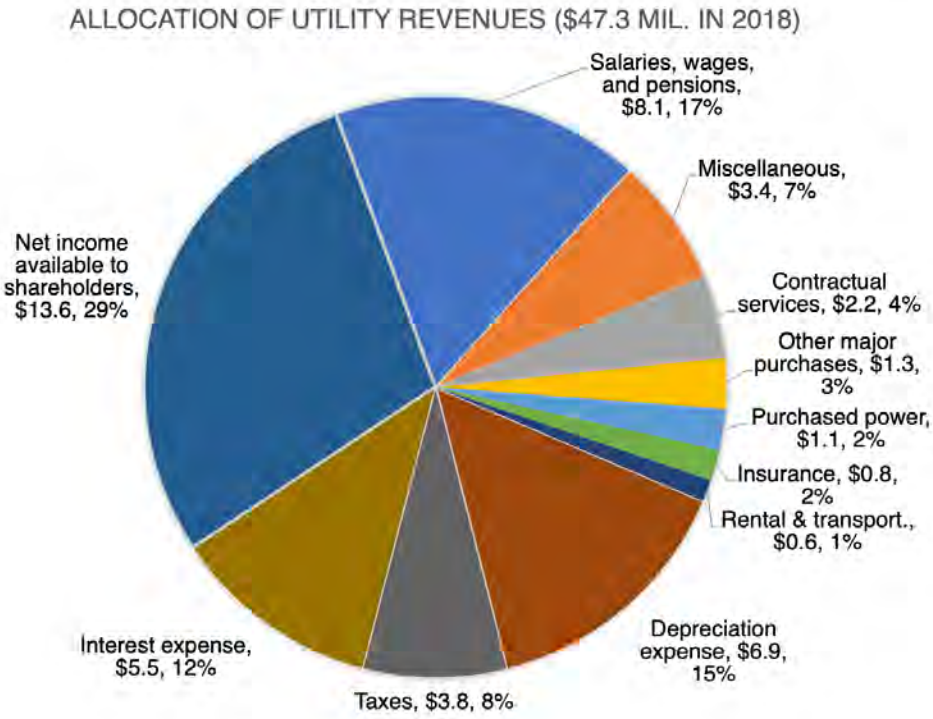
- Utility revenue requirements
  - Level of gross income from sales needed to recover prudent, necessary, and economical operating and capital expenditures
  - Including interest to debt holders and a fair return to equity investors
  - Reflects what is known and measurable in terms of the cost of service
  - No guarantee, but a reasonable opportunity for cost recovery and returns
  - Regulatory approval sets revenues, profits, and prices (tariffs)
- Revenue requirements reflect adjustments to current levels at current rates
  - Based on the cost of service and set for a test or rate "year" going forward
  - Difference between expected and actual reflects an income shortfall or excess
  - Must be adjusted to account for the effects of taxes and other factors on income
- Key differences between non-private and private utilities
  - Calculation of revenue requirements
  - Debt, equity, and cost of capital
  - Depreciation expense
  - Taxes and tax equivalents (e.g., PILoT or PILT)
  - Cash flow, working capital, and reserves

Components of revenue requirements



Distribution of plant investment and revenues (water)





Cash-needs vs. utility basis for ratemaking

Cash-needs basis	Utility basis
• Used by publicly owned utilities • Accepted by government auditors • Accepted by credit-rating agencies • May not incorporate depreciation expense • May not promote intergenerational equity in cost allocation • Easier to understand and more adaptable	• Used by privately owned and regulated utilities (some public) • Accepted by state regulators • Consistent with GAAP • Incorporates depreciation expense • May promote intergenerational equity in cost allocation • Challenging to understand and less adaptable

Cash-needs, debt-service, or budget basis: non-private

$$RR = Capex + Opex + DS + Teq + Res$$

where:

RR	=	total test year (annualized) revenue requirements from rates (Totex)
Capex	=	current capital expenditures not contributed or debt-financed (recorded as assets)
Opex	=	operation & maintenance expenses, including administrative & general
DS	=	debt service (loan and revenue bond payments) for utility plant
Teq	=	tax equivalents (gross receipts or PILT) and other payments state or local governments based on obligations, costs, or risks
Res	=	reserve payment based on debt service coverage or other criteria

Cost-based rates and revenue sufficiency are a function of both the numerator and denominator:

$$\frac{\text{Revenue requirements (RR)}}{\text{Estimated sales (billing determinants)}}$$

Utility, enterprise, or investment basis: private and some public

$$RR = r_a (RB) + O\&M + D + T$$

where:

RR	=	total test year (annualized) revenue requirements from rates
r_a	=	authorized (not guaranteed) rate of return to compensate debt holders and equity shareholders
RB	=	rate base (original cost of invested utility plant in service net of accumulated depreciation and adjustments)
O&M	=	operation & maintenance expenses, including administrative & general
D	=	depreciation and amortization expense
T	=	income tax expense and other taxes not expensed or billed

Cost-based rates and revenue sufficiency are a function of both the numerator and denominator:

$$\frac{\text{Revenue requirements (RR)}}{\text{Estimated sales (billing determinants)}}$$

Rate base

- Rate base is a *regulatory construct* representing invested capital
  - Assets are valued at original cost less depreciation vs. market value

Generally allowed and included (additions)	Generally disallowed and excluded (deductions)
• Assets not yet depreciated or amortized • Construction work in progress (CWIP) • Plant held for future use • Plant in service but not yet classified • Miscellaneous deferred assets (debits) • Acquisition adjustments ("goodwill") • Prepayments (may be averaged) • Fuel stock inventory • Materials and supplies inventory (may be averaged) • Unamortized rate case expense • Pending collections from cost trackers • Investor-funded (cash) working capital	• Plant deemed unnecessary or imprudent (including excess capacity) • Assets already depreciated or amortized (accumulated amounts) • Accumulated deferred income taxes • Plant unrelated to regulated services • Governmental grants for capital projects • Customer contributions (non-investor-supplied capital) • Unamortized income tax credits • Pending refunds from cost trackers • Customer deposits and advances • Ratepayer-funded (cash) working capital • Regulatory liabilities (e.g., refund of unapproved rates or charges)

Net operating income ⓘ

- Net operating income = operating revenues – operating expenses
- Operating expenses as specified by USOA
  - Functional
    - Production expenses
    - Transmission expenses
    - Distribution expenses
    - Customer account expenses
    - Customer service expenses
    - Sales expenses
    - Administrative and general expenses
  - Depreciation expense
  - Amortization expense
  - Taxes other than income
  - Federal and other income taxes
  - Investment tax credit adjustment
  - Regulatory expenses

- Revenue requirements are grossed due to taxes on income and earnings
  - Revenue conversion or net-to-gross factors (multipliers)

Rate base investment at scale as a motivator (water)

Reconciliation of Estimated Rate Base

AMERICAN WATER

($ in billions)

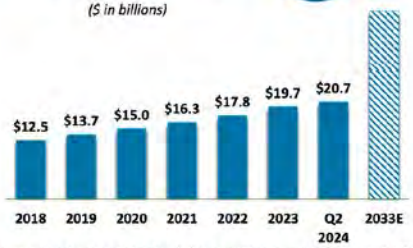
Estimated Rate Base*

	As of 6/30/2024
Net Utility Plant	$26.4
Less	
Advances for Construction	$0.4
CIAC – Contributions in Aid of Construction	$1.6
Net Deferred Income Taxes	$3.7
	$5.7
Total Estimated Rate Base	**$20.7**

Estimated Rate Base*
(Includes Acquisitions)

($ in billions)

~8-9% CAGR for Rate Base



Note: annual rate base totals include New York American Water through 2021. New York's 2021 rate base was $0.5 billion.

** An approximation of rate base, which includes Net Utility Plant not yet included in rate base, pending rate case filings/outcomes.*

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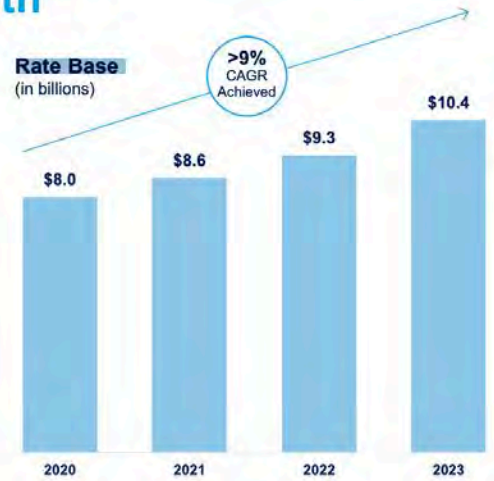
Infrastructure Investments Drive Significant Rate Base Growth

Annual Infrastructure Investment
(in billions)

3x from 2015 level[2]

Rate Base
(in billions)

>9% CAGR Achieved



(1) Includes $53.5M of capital invested by Peoples prior to closing.
(2) 2015 capital investment of ~$0.4B.

Essential. 21

Recoverable and unrecoverable costs

- Regulators and their auditors look for abuses of "monopoly money"
  - Examples: storm damage, service line replacement, charging stations, covid-19 impact
  - Prudence and usefulness standards help avoid stranded investment
- Recoverable costs – potential allowances
  - Utility plant that is used and useful to ratepayers
  - Prudent capital and operating expenditures
  - Spending needed to meet standards and mandates
  - Spending to remain a going concern
  - Compensation of holders of debt and equity
- Unrecoverable costs – potential disallowances
  - Utility plant that is not used and useful to ratepayers
  - Imprudent capital and operating expenditures
  - Fines, penalties, and certain legal liabilities and defense
  - Spending and excesses disallowed by regulatory policy
  - Unacceptable compensation paid to company officers
- Allowances and disallowances are anticipated
  - Disallowances may result from utility's action or inaction (e.g., emergency planning)
  - Some disallowances may be symbolic – to show that regulators are watching
  - Allowances and disallowances may be negotiated in settlement processes

PSC staff: Proposed WV American Water rate hike includes unnecessary project

Max Garland Jul 18, 2017 Updated Nov 22, 2017

Kansas utilities are generous to charities — often with your money

AG Nessel Denounces DTE's Attempt to Pass Private Jet Travel Costs on to Customers, Seeks to Reduce DTE's Requested 10% Gas Rate Hike by More than Half

Poll 12: Allowed or disallowed

- **Which of the following expenditures typically are recoverable from ratepayers?**
  - A. Community charitable donations
  - B. Advertising and marketing
  - C. Political contributions
  - D. Fines and penalties
  - E. Reasonable rate case expenses

Capital structure: debt and equity

- Utilities finance investments with a combination of debt and equity
  - Capital is freely available – despite the ”capital attraction” and “competition” narratives
  - Equity (”privatized capital”) is useful for risk-bearing and performance assurance
  - Debt (“leverage”) has tax advantages as interest payments are deductible
- Overall return reflects weighted returns on debt and equity (capital structure)
  - Debt rate reflects less risk (lower cost of money) – market-determined
  - Equity rate reflects more risk (higher cost of money) – regulator-determined (judgment)
- Financial risk is a function of a firm’s authorized capital structure
  - When a firm is heavily leveraged (high debt), financial markets will require higher returns on both the debt and the equity securities issued by the firm
  - Higher credit ratings can be achieved by lowering debt, but this may not translate into a lower cost of capital when considering the effect of corporate income taxes
- Capital structure generally is optimized in the range of 45-55 or 55-45
  - To maintain investment quality credit ratings
  - To maintain sufficient capital investment
  - To maintain low overall financial costs relative to risk
- Regulators auditors can impute the capital structure
  - Based on divergence from industry data

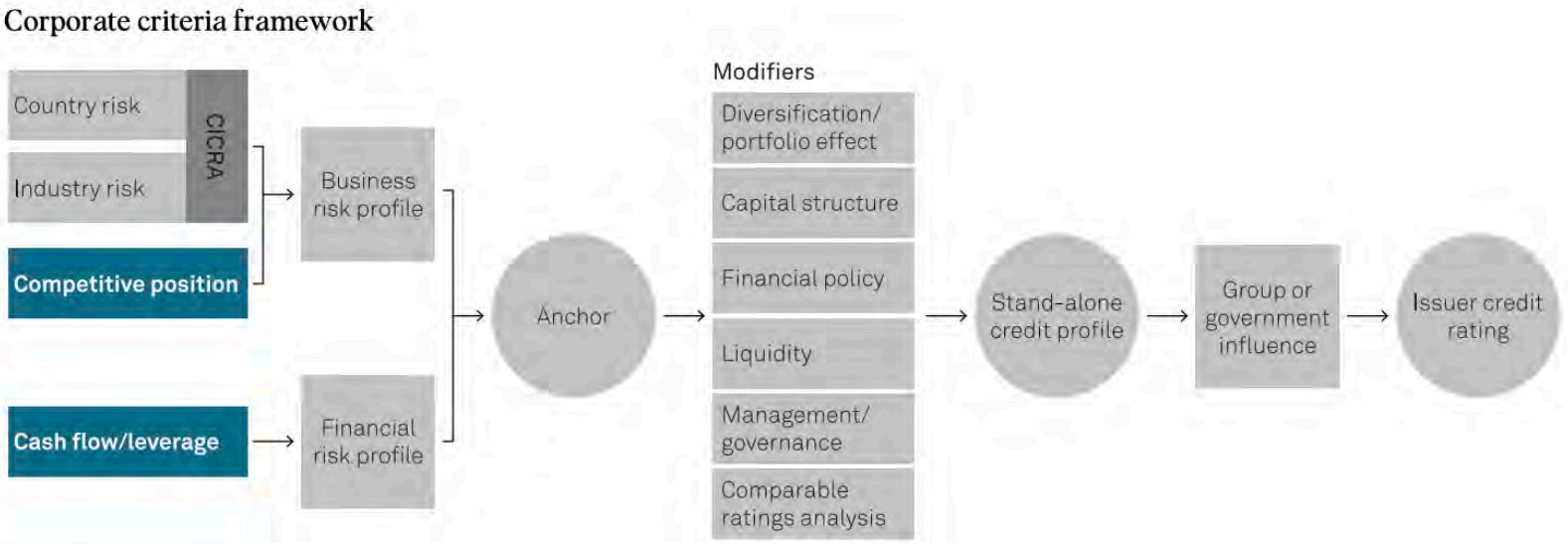
Capital structure and weighted cost of capital ⓘ

Initial capital structure with credit rating = BB		Cost of capital (rate)	Weighted cost of capital
Debt	50%	5%	2.5%
Equity	50%	10%	5.0%
			7.5%
Initial capital structure Credit rating = A		Pre-tax cost of capital	Pre-tax weighted CoC
Debt	45%	4.7%	2.1%
Equity	55%	9.7%	5.3%
			7.5%

Returns on capital investment (r)

- *"Some returns are more adequate than others" (water utility executive)*
- Regulators authorize and allow returns – not the cost of capital
  - Incentives (+/-) for investment and efficiency based on equity returns to shareholders is central to the regulated private utility model – economic profit motive
  - Returns can seem subjective and even arbitrary
- James Bonbright's criteria for evaluating rates of return (*Principles,* 1961)
  - Capital attraction ✓
  - Management efficiency (reward/punish)
  - Rate-level stability
  - Consumer rationing (price signals)
  - Fairness to investors
- Cost of capital is a finance concept (see S. Kihm)
  - Sets the "floor" for returns (A. Kahn, C. Phillips)
  - "Efficient" returns would equal the cost of capital (allocative)
  - Allowed returns typically exceed the cost of capital (dynamic)
  - Fairness of returns is a matter of policy and cannot be determined by risk models
- No rate base (RB), no return (r)
  - Consider structural options, such as competitive contracting
  - Operating ratio as a stop-gap solution (return on O&M)

Credit rating frameworks affecting the cost of debt ⓘ

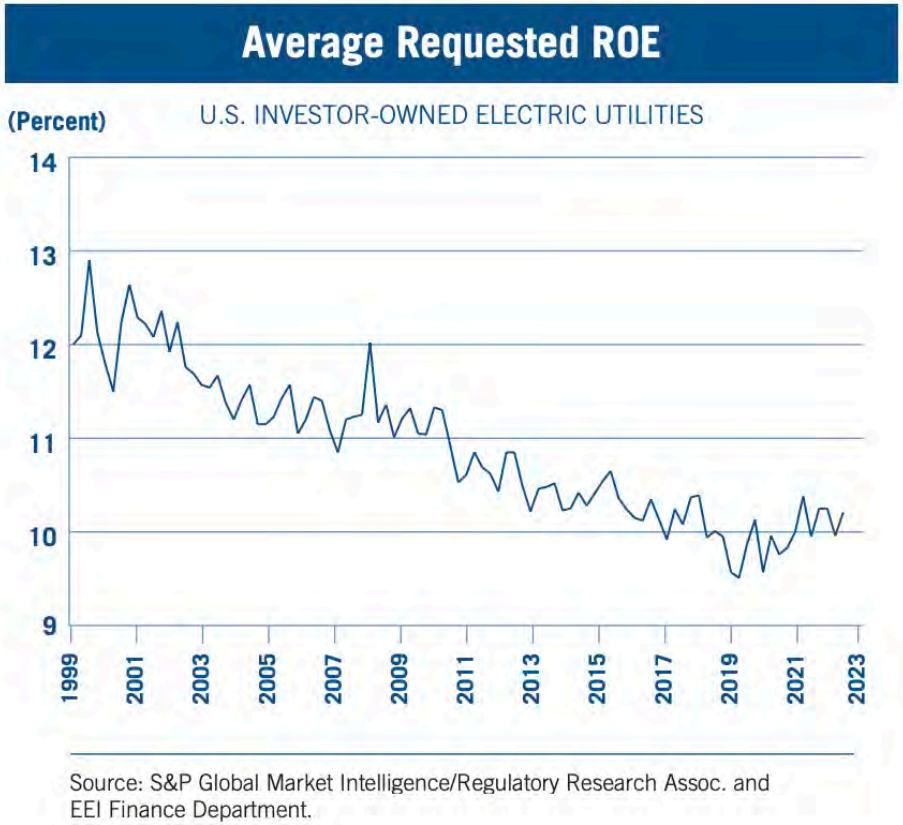


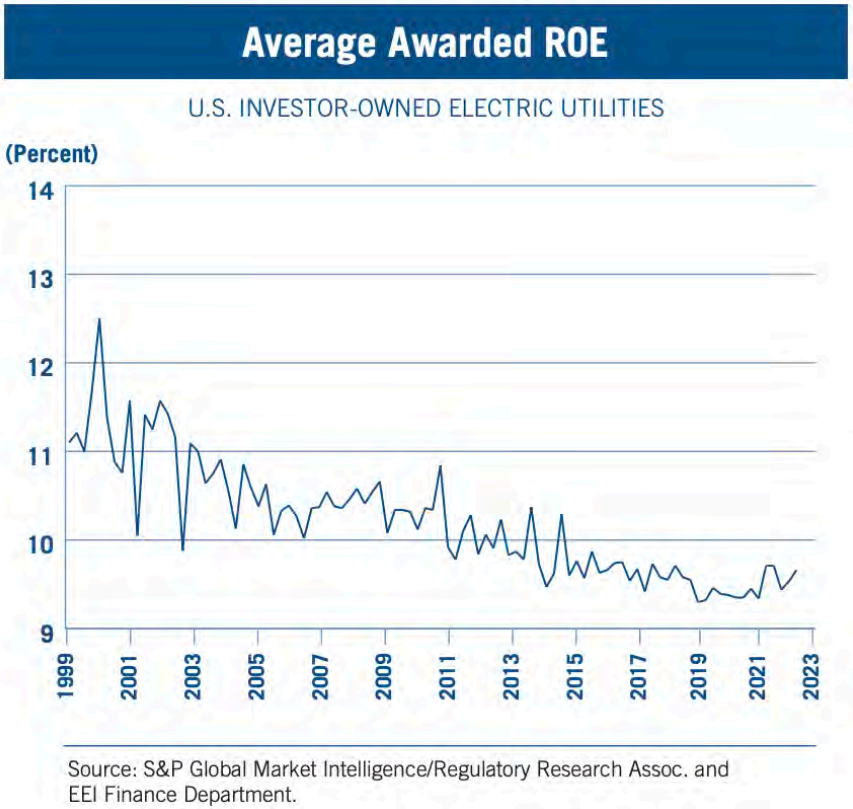
Source: S&P Global Ratings.

	Fitch	Moody's	S&P	Status
Investment Grade (Lowest risk/cost)	AAA	Aaa	AAA	Prime
	AA+	Aa1	AA+	
	AA	Aa2	AA	High Grade
	AA-	Aa3	AA-	
	A+	A1	A+	
	A	A2	A	Upper Medium Grade
	A-	A3	A-	
	BBB+	Baa1	BBB+	
	BBB	Baa2	BBB	Lower Medium Grade
	BBB-	Baa3	BBB-	
Non-Investment Grade	BB+	Ba1	BB+	Non-Investment Grade Speculative
	BB	Ba2	BB	
	BB-	Ba3	BB-	
	B+	B1	B+	
	B	B2	B	Highly Speculative
	B-	B3	B-	
In Default (Highest risk/cost)	D	C	D	In Default

Credit ratings below B-/B3/B- and above D/C/D not included in above chart

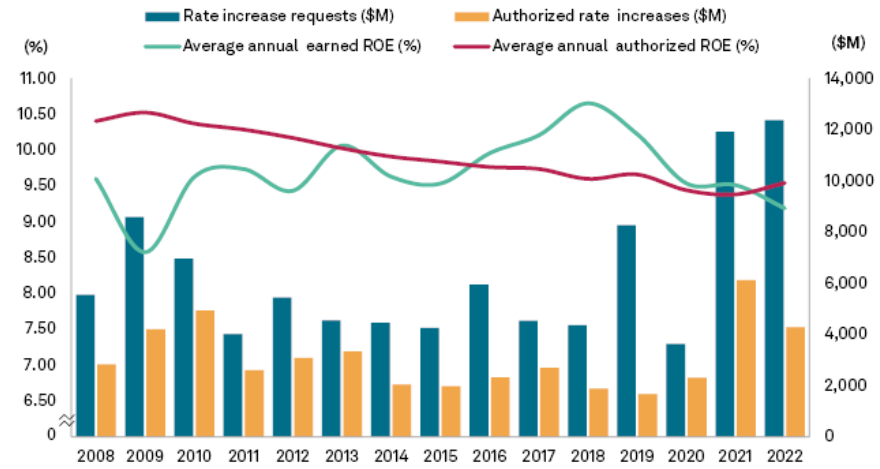
Requested and authorized returns on equity (EEI)





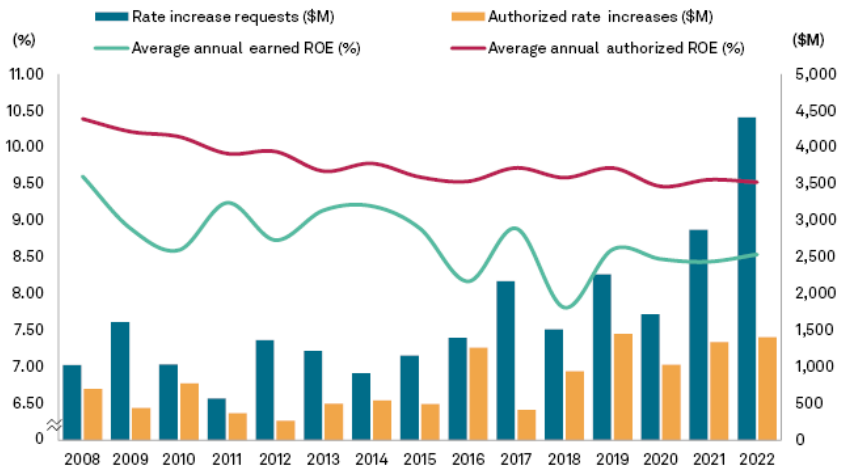
Earned vs. authorized returns (electricity and gas)

Earned versus authorized ROE by electric utility operating subsidiary



Data as of May 10, 2023.
Includes a sample of US investor-owned utility operating subsidiaries tracked by Regulatory Research Associates.
Source: Regulatory Research Associates, a group within S&P Global Commodity Insights.

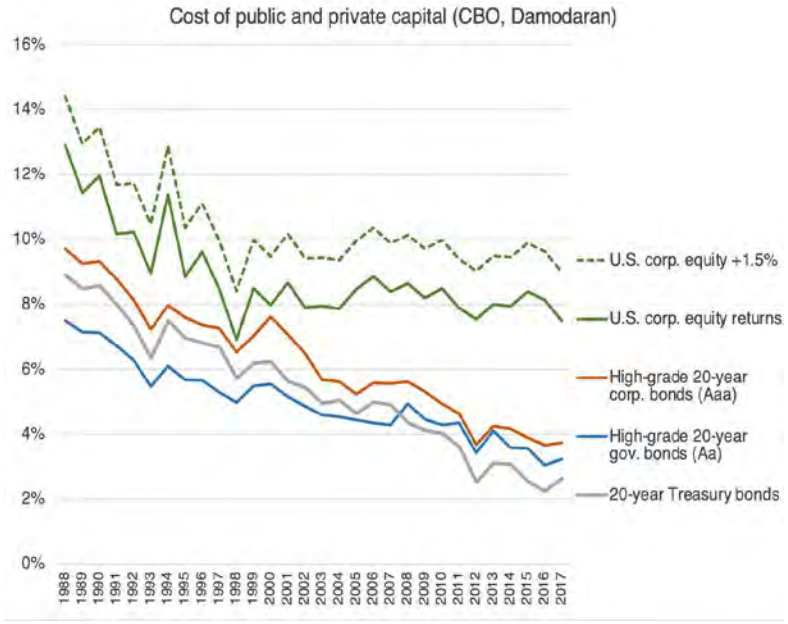
Earned versus authorized ROE by gas utility operating subsidiary



Data as of May 10, 2023.
Includes a sample of US investor-owned utility operating subsidiaries tracked by Regulatory Research Associates.
Source: Regulatory Research Associates, a group within S&P Global Commodity Insights.

Risk profile of utilities ⓘ

- Utilities are less risky than stocks in all other sectors of the economy
  - As measured by betas (the sensitivity of an investment to systematic risk)
  - Utility stocks have sometimes been considered “bond-like” in terms of risk
- Regulators should be “risk aware” as much to maintain as to moderate risk
  - Regulatory compact provides a “path to profit” (or” safe harbor”) but not risk-free
  - Utility culture appears to be very risk sensitive if not risk averse
  - Shielding utilities from risk and assuring returns violates the regulatory compact
  - Actions to “reduce risk” typically shift it from investors to ratepayers



Risk and return hierarchy

Regulatory consideration of policy	^	Excessive or extortive return	An economically inefficient return
	^	Incentive or bonus return	A return with a premium to motivate desired performance
	^	**Fair return**	**A return with a premium to motivate beneficial investment**
Regulatory consideration of risk	^	Compensatory return	A return based on the cost of equity including an equity-risk premium
	^	Risk-free return	A return based on the yield on risk-free securities*
	^	Confiscatory return	A return below the cost of capital (unconstitutional taking)**

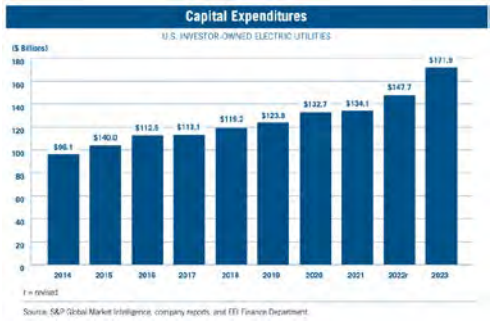
* Government-owned and not-for-profit utilities are generally insulated from equity risk.
** For an investor-owned utility that still faces equity risk, any return below the cost of equity would be considered confiscatory (taking or appropriating private property by the state).

Rate-of-return considerations ⓘ

- *"[S]etting a rate of return cannot – even in principle - be reduced to an exact science" (S. Breyer)*
- Returns are expressed as a percentage of capital investment (rate base)
  - Methods for estimating cost of equity capital are based on "comparable risk"
  - DCF: cost of equity = dividend yield (observed) + long-term growth rate (estimated)
  - CAP-M: cost of equity = risk-free rate + market-based risk premium
- Investor expectations and policy goals are relevant to returns
  - Equity shareholders bear more risk than bondholders but get upside potential
  - Firm-specific (idiosyncratic) risk is diversifiable by equity investors
  - Bond-holders and credit agencies favor steady cash flows over high returns
- Regulatory compact does not promise profitability – "no RB, no *r*"
  - With return comes risk associated with utility decisions and performance
  - Regulation does not ensure utility investment or survival over the long term
  - Reasonable opportunity is afforded by test year, grossing up, adjustment mechanisms
  - A rate of return at the cost of capital is the compensatory minimum (C. Phillips)
  - Rates should not result in "widely divergent profits" across activities (A. Kahn)
  - Deregulation shifts asset valuation to markets (possible stranding), financial risks to investors, and service risks to customers

Three determinants of shareholder value (S. Kihm) ⓘ

- Financial capital can always be raised in the financial markets – no scarcity
  - Stock pricing ensures that capital flows easily to all utilities regardless of earned returns
  - Regulators can be sensitive to the effect of their decisions on share prices
  - But neither finance nor regulatory theory support this sensitivity
- Shareholder value is a function of $(r_e - k) \times I$
  - Returns earned (r_e) less cost of capital (k) times investment scale (I)
  - Firm value does not depend on sales growth but on realized returns on investment
- When r_e exceeds k for a project
  - More capital is invested (I) and more value is created
  - If $r_e = k$, the utility's stock price equals its book value
  - When $r_e = k$, utilities are indifferent to investing (static efficiency)
  - When $r_e < k$, utilities have no incentive to invest in plant
  - When $r_e > k$, utilities have an incentive to invest in plant



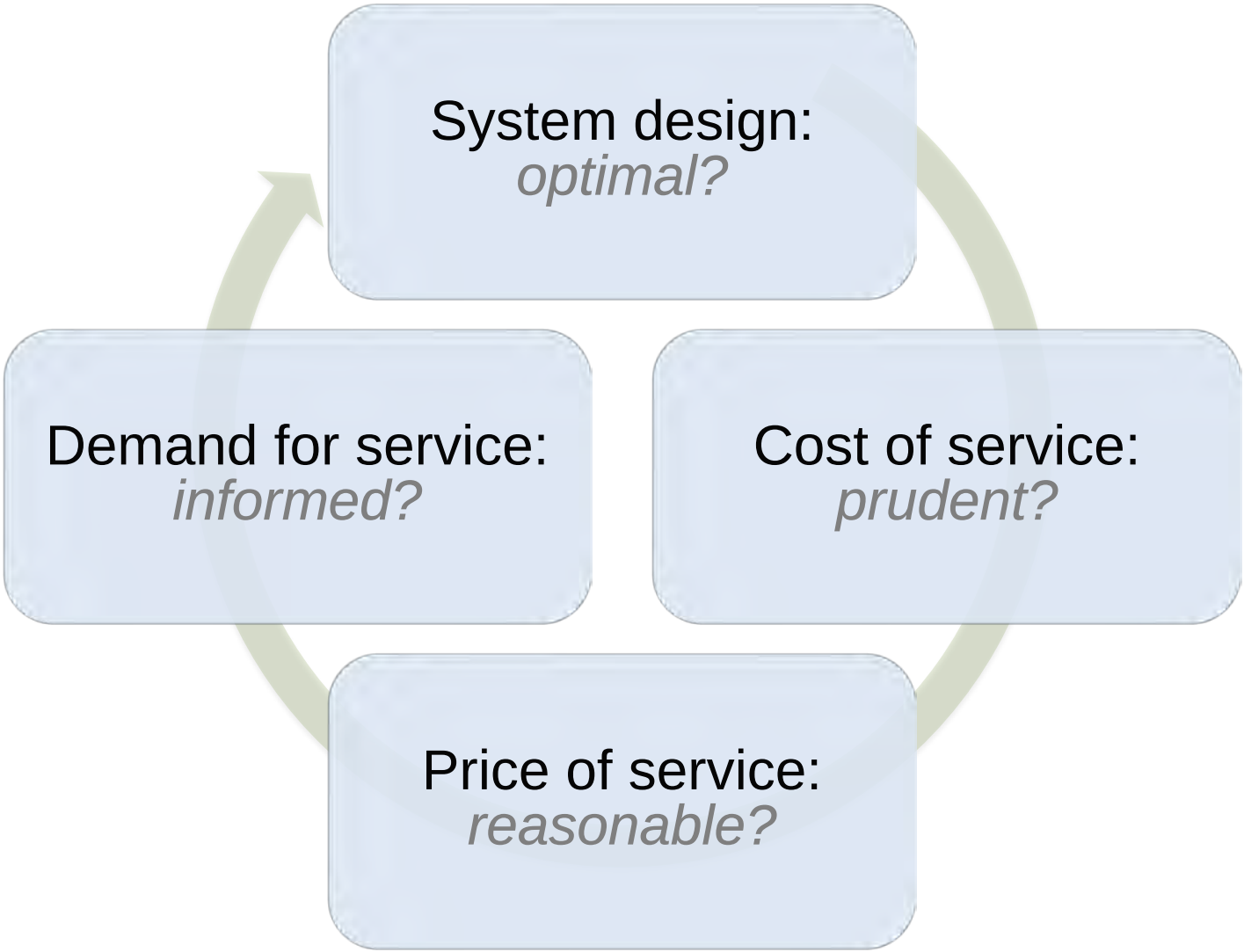
- Regulatory policies and decisions can affect any of the elements and behavior
  - Examples: decoupling, formula rates, price caps, treatment of capital or operating expenses, differentiated rates of return
  - Why are other incentives for investment needed if capital intensity is growing?

How does this work in practical terms?

- Utilities invest in and manage infrastructure assets for a public purpose
  - Utility is expected to be a going concern and meet its service obligation (even with low returns)
  - Certificates (CPCN) recognize need – but expenditures are still subject to prudence review
  - Generally, at their risk, without guarantee of cost recovery or returns to investors
  - Investment is financed by debt from lenders and equity from investors
  - Utilities seek “regulatory relief” and face some “regulatory risk”
- Privately owned utilities are strongly motivated to invest in the rate base
  - Cost recovery for prudent and useful investments and expenditures is allowed
  - Rates cover OPEX and CAPEX, including returns covering the cost of capital
  - Investors are entitled to a fair profit (return on) and depreciation (return of)
- Depreciation expense compensates for “using up” the assets over time
  - A means of allocating capital costs over time (intergenerational equity)
  - Accounting life vs. service life vs. economic life vs. technical obsolescence
  - Composite rates have been replaced by asset-specific rates based on analysis
  - Provides cash flow but reinvestment of cash is not actually required
- Regulators adjust, restate, or impute costs – vs. compel, intervene, or micromanage
  - Inappropriate and imprudent costs are disallowed with some expenditures are limited
  - Disallowances reduce effective returns (earnings potential) and invite board scrutiny
- Resulting returns and rates must be deemed “just and reasonable”
  - A regulatory, statutory, and judicial standard beyond the market standard of efficiency

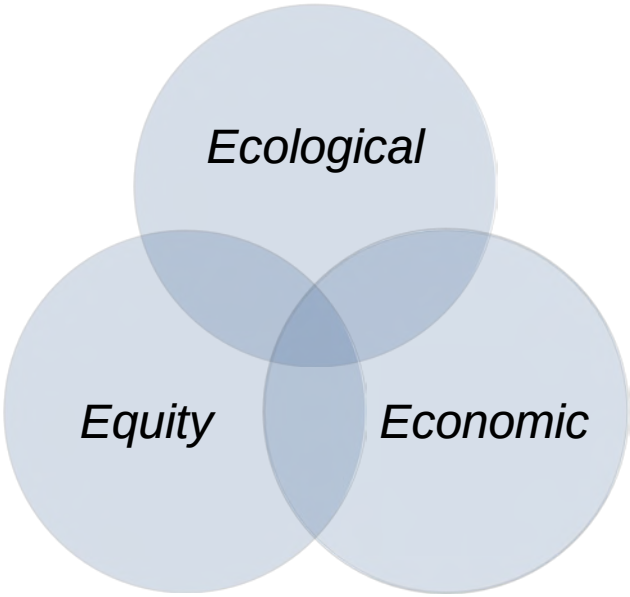
Rate design

Dynamic role of utility prices in utility sustainability



Sustainable infrastructure systems

- Sustainability
  - Living within ecological, economic, and equity tolerances
  - Defined by natural, financial, and political boundaries
  - Not static or unresponsive to dynamic conditions
  - Relates to the idea of a “circular economy”
  - Infrastructure may be at an inflection – can be reoptimized
- Utility model
  - Emphasizes economic or *enterprise* sustainability
  - Revenue requirements based on full-cost accounting (capex and opex)
  - Subsidies (subvention) or transfers are purposive, transparent, and generally limited
- Pricing is a tool – *not an objective*
  - How revenues are collected and how costs are allocated are value choices
  - A. Kahn argued that regulated prices should “mimic” competitive prices (economic efficiency)
  - Systems can be autonomous and sustainable with or without user fees or cost-based rates
  - Public systems may not price to cost for policy reasons



Financially sustainable utilities

System revenues relative to expenditures*	System capital and operating expenditures relative to an optimized compliant service level		
	< 1: expenditures are below optimum ("cost avoidance")	= 1: expenditures are optimal	> 1: expenditures are above optimum ("gold plating")
< 1: revenues are below expenditures ("revenue avoidance")	Deficient system	Deficit system	Wasteful system
= 1: revenues are equal to expenditures	Underinvesting system	**SUSTAINABLE SYSTEM**	Overinvesting system
> 1: revenues are above expenditures ("profit-seeking")	Revenue-diverting system	Surplus system	Excessive system

*Revenues may flow from taxpayer or ratepayer funding.
Revenue requirements from rates are net of any tax-based funding.
Economic regulation plays a role.

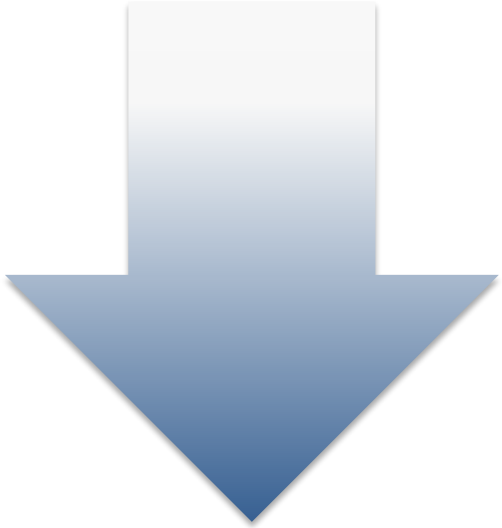
Cost of service and its recovery

	Societal level		System level		Ratepayer level
	Full social cost and value	Full economic cost	Full-cost accounting	Full-cost recovery	Full-cost allocation & pricing
Cost of service					
Environmental, economic, and social externalities (spillovers)	√				
Economic opportunity costs and avoided costs	√	√			
Capital and operating expenditures, depreciation, taxes, and reserves	√	√	√		
Source of revenues					
Property and other taxes, fund transfers, government grants, and other income and contributions				√	
User fees (rates and charges), including connection fees and system development charges				√	√

Pricing economics and potential welfare effects

Prices too high

Exaggerates price signals for discretionary usage
Extracts rents from essential usage (Ramsey pricing)
Regressive deprivation and endangerment
Drag on the local economy from income effect
Excess capacity and stranded investment
High reserves and transfers from system
Foregone revenues from lost sales, theft, bypass, defection

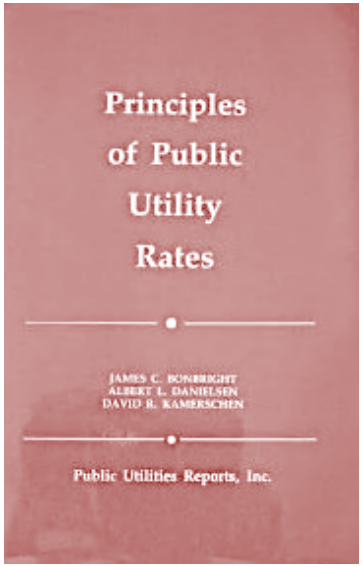


Prices too low

Weakens price signals for discretionary usage
Requires another means of cost recovery
Excessive and wasteful use of resources
Inadequate infrastructure investment
Poor capacity utilization and congestion
Low reserves and subsidies to system
Financial effects of revenue inadequacy

Bonbright's economic criteria for evaluating rates (1961)

- Four functions of rates – implying to many "the 'right way' to price"
  - Production motivation or capital attraction
  - Efficiency incentive
  - Demand control or consumer rationing
  - Income distribution (not generally advocated)
- Accepted principles for "sound" rate structures
  - Effectiveness in yielding total revenue requirements, including returns ✓
  - Efficient resource use (static efficiency) ✓
  - Fairness in cost allocation (consumer equity) ✓
  - Practicality (understanding, acceptance)
  - Interpretability (non-controversial)
  - Revenue stability for the utility
  - Rate stability for the ratepayer
  - *Avoidance of undue discrimination among customers**
  - *Promotion of innovation (dynamic efficiency)**
  - *Reflection of future private and social costs (externalities)**



Bonbright's economic criteria (continued)

- Criteria are subjective and subject to interpretation (e.g., what's "fair"?)
  - Significant tensions are found among the criteria – e.g., equity vs. efficiency)
  - Parsimonious but relevant criteria are excluded – e .g., affordability, sustainability, intergenerational equity)
- Value of service is an "ancillary standard"
  - "Business principles" prevail over "so-called 'social' principles" – namely "ability-to-pay" and "diffusion-of-benefits"
- There is no "right way" to allocate costs and price
  - Only *alignment* with principles and objectives
  - Just because we can price a certain way is not a justification
  - In many respects, all ratemaking is "social" ratemaking

Modern pricing criteria for utility services*

- Financial viability
  - To enable stable recovery of the utility's capital and operating costs
- Economic efficiency
  - To achieve an equilibrium that maximizes social welfare
- Equitable allocation
  - To allocate costs to usage based on cost causation (economic equity)
- Operational performance
  - To manage load for efficient capacity utilization
- Network optimization
  - To enhance system design and resource integration
- Environmental stewardship *(social equity)*
  - To preserve resources and mitigate adverse outcomes (- externalities)
- Distributive justice *(social equity)*
  - To advance fairness, universal service, and beneficial outcomes (+ externalities)

*Inspired by James Bonbright (1961)

Practical constraints and considerations

- Design choices are also bound by practical considerations as rates should be
  - Understandable, unambiguous, and transparent
  - Technically feasible and cost effective
  - Politically acceptable and legally defensible
- Ratemaking is a constrained optimization problem
  - Staying within value-defined tolerances over long term
  - Constraints are a function of mandates, rights, and obligations
  - Not limited to economic criteria (efficiency)
- Regulated rates must also serve the public interest
  - Courts have allowed for a choice of rate mechanisms within a “zone of reasonableness” as well as “pragmatic” adjustments
  - Resulting rates and rate structures are subject to the statutory, regulatory, and judicial standard of “just and reasonable” (legal equity) – discretion and judgment
  - Rates can be equitable and still regarded as very unfair based on need or ability to pay (social equity)

Cost allocation and rate design

- Revenue requirements specify the size of the pie and rate design slices it up
  - Cost-of-service studies functionalize, classify, and allocate costs
  - Cost allocation decisions involve “discrimination” (differentiation) by users and usage
  - Alternative rate structures (designs) can recover revenue requirements
  - Fully allocating costs to ratepayers is considered efficient and equitable
- Rate design should be revenue neutral so that revenues equal requirements
  - Cannot compensate for misestimated revenue requirements
  - Should not be used to “generate” revenues (regressive “taxation”)
  - Engineering (cost) and economic (elasticity) analyses inform blocks and tiers (prices)
- Departures from accepted principles and practices can be controversial
  - “Socialized costs” (spreading costs widely as a form of taxation)
  - “Social ratemaking” (economic development, affordability)
  - “Social programs” supported by rates instead of taxes
  - “Socially defined” service or investment (clean energy, efficiency)
  - “Social tariffs” designed to ensure affordable access
- Cost allocation is informed but subjective and inexact
  - All ratemaking involves some cost averaging
  - When does cost averaging or sharing constitute subsidizing?


Bloomberg Businessweek

Amazon Isn’t Paying Its Electric Bills. You Might Be

The company’s rate discounts have pushed up utility costs for everyone else.

By Mya Frazier

Cost classification ⓘ

- Direct costs
  - Assigned to and recovered from individual customers receiving the service
- Customer (service) costs
  - Vary with customers but not with usage (e.g., meters, billing, other customer services)
  - Can be allocated by weighted average of costs for metering and billing
- Capacity (network infrastructure or demand) costs
  - Fixed in the short term and includes capital and O&M costs of network systems
  - Vary with aggregate demand over the long term (treatment, storage, distribution)
  - Can be recovered by availability, readiness-to-serve, facilities, and demand charges
  - Allocated by peaking factors and other determinants of usage (weighted)
- Commodity (resource) costs
  - Variable in the short term and continuously with volumetric usage over time
  - Can be recovered by time-variant usage charges (including dynamic)
  - Allocated by actual consumption of resources (water, energy)
- Common and joint costs are challenging to allocate
  - Common costs are incurred across organizations – such as general plant
  - Joint cost of production (two services) can be challenging to allocate
  - Allocation rules are tied to accounting treatment of related plant, customers, usage, etc.

Cost functionalization and classification (simplified for water) ⓘ

Cost functionalization		Cost classification*	Cost allocation**
Contractual services ($)	Opex	Direct	Actual billed directly
Purchased water and fuel	Opex	Commodity	Metered usage
Customer accounts, metering, billing, revenue-related	Capex / Opex	Customer	By class in proportion to customers or bills
Source-of-supply facilities, raw water storage	Capex / Opex	Capacity	Average-day and maximum-day demand
Transmission lines, water treatment plants	Capex / Opex	Capacity	Maximum-day demand
Distribution mains, pumping stations, treated water storage	Capex / Opex	Capacity	Maximum-day and peak-hour demand
General and intangible plant, overhead, programs, taxes	Capex / Opex	Capacity	By class in proportion to customers, usage, other

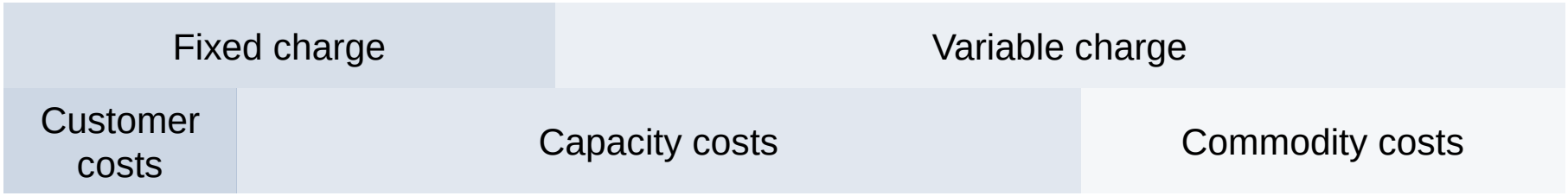
* Capacity costs are fixed in the short term and variable in the long term.
** Methods and practices vary.

Poll 13: Fixed charges

- **Which of the following is false?**
  - A. Fixed charges cover all fixed costs
  - B. Fixed charges have regressive effects on consumers
  - C. Utilities favor cost recovery through fixed charges
  - D. Environmental advocates favor variable charges

Fixed vs. variable costs and charges

- *"The mere existence of systemwide fixed costs doesn't justify fixed charges" (S. Borenstein, 2014)*
- Fixed and variable tariff charges may not match fixed and variable costs
  - A Coasian pricing solution is a two-part tariff with a fixed fee plus marginal-cost
  - Utilities often recover a substantial portion of fixed costs from variable charges ("absorption") *– as do competitive firms*
  - Cost classification guides design of fixed and variable charges but is not determinative
- Utilities favor fixed charges for recovery of network capacity costs
  - Environmental and consumer advocates tend to prefer variable to fixed charges
  - Improve price signals about costs and capacity requirements
  - Net metering for distributed energy poses new challenges for covering network costs
- Fixed charges are uncontrollable and unavoidable
  - A high proportion of the bill for low-volume customers
  - Consumer advocates also worry about high bills and disconnection



Fixed vs. variable charges: tradeoffs ⓘ

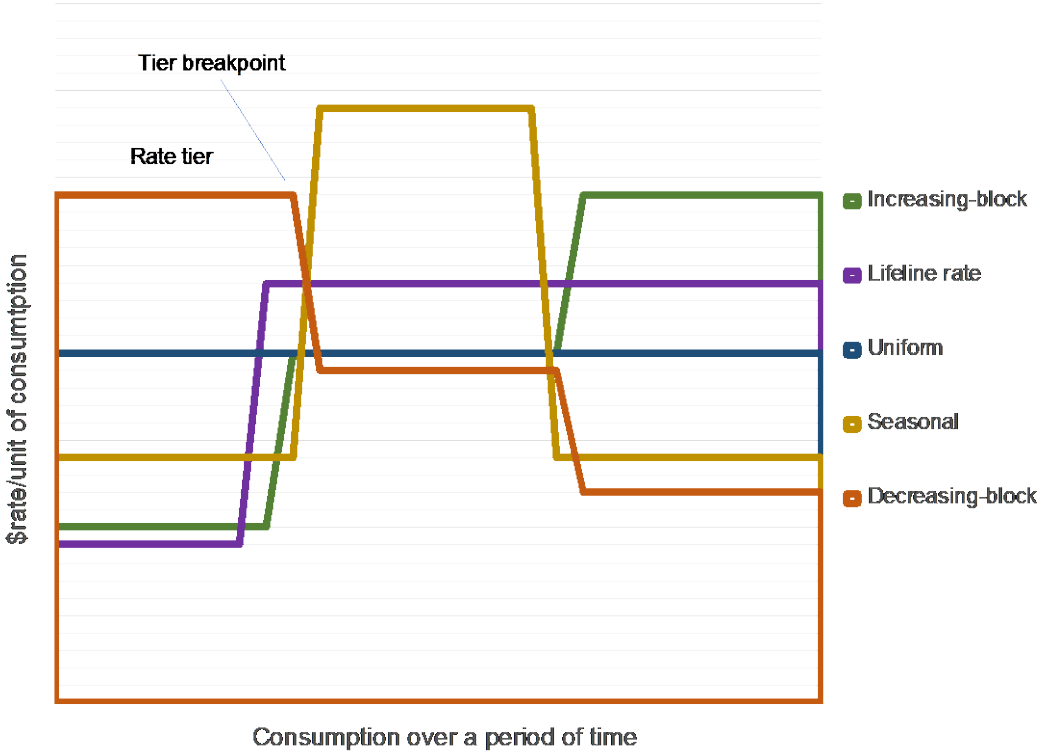
Recovering more costs from fixed charges	Recovering more costs from variable charges
Static view of infrastructure (more sunk costs)	Dynamic view of infrastructure (less sunk costs)
Enhances revenue stability (less sales revenue risk to utility)	Reduces revenue stability (more sales revenue risk to utility)
Weakens price signals (less resource efficiency)	Strengthens price signals (more resource efficiency)
Familiar & understandable but less acceptable (more predictable and less controllable)	Familiar & understandable but more acceptable (less predictable and more controllable)
Less affordable for low-income households (more regressive)	More affordable for low-income households (less regressive)
Encourages self supply and grid defection (may raise some costs)	Preserves grid supply and participation (may lower some costs)
Possible advantage for combined households (one fixed customer charge)	Possible stability from first blocks (relatively inelastic usage)

Ratemaking modifications that shift risk

- Purchased natural gas adjustments
- Electricity fuel-cost adjustments
- Purchased power adjustments
- Normalization and stabilization
- Single-issue ratemaking
- Interim rates
- Cost deferrals
- Allowance for funds used during construction (AFUDC)
- Construction work in progress (CWIP) in rate base
- Attrition allowances
- Inflation adjustments
- Forward-looking test year
- Operating-cost trackers
- Accelerated depreciation
- Cost-of-service indexing
- Minimum bills
- Demand-repression adjustments
- Lost-revenue adjustments
- Revenue decoupling
- System-improvement surcharges
- Capital-expenditure surcharges
- Securitization of stranded costs
- Project preapproval
- Rate-case time limits
- Self-implementing rates
- Cost-of-capital adjustments
- Earnings adjustments
- Higher fixed charges
- Demand charges
- Customer prepayment
- Multi-year rate plans
- Formula-rate plans

Volumetric rates reflect policy goals

- Evolution in rate design
  - Postage stamp rates (full-cost socialization)
  - Unmetered charges
  - Metered rates
  - Monthly “plans”
- Drivers of time-variant rates
  - PURPA (1978)
  - Integrated resource planning
  - Advanced metering technology
  - Demand response



Note: rate blocks can be understood like income taxes, that is, rates usually are incremental or marginal and the customer’s bill reflects cumulative calculations.

Rate design variations and policy orientation ⓘ

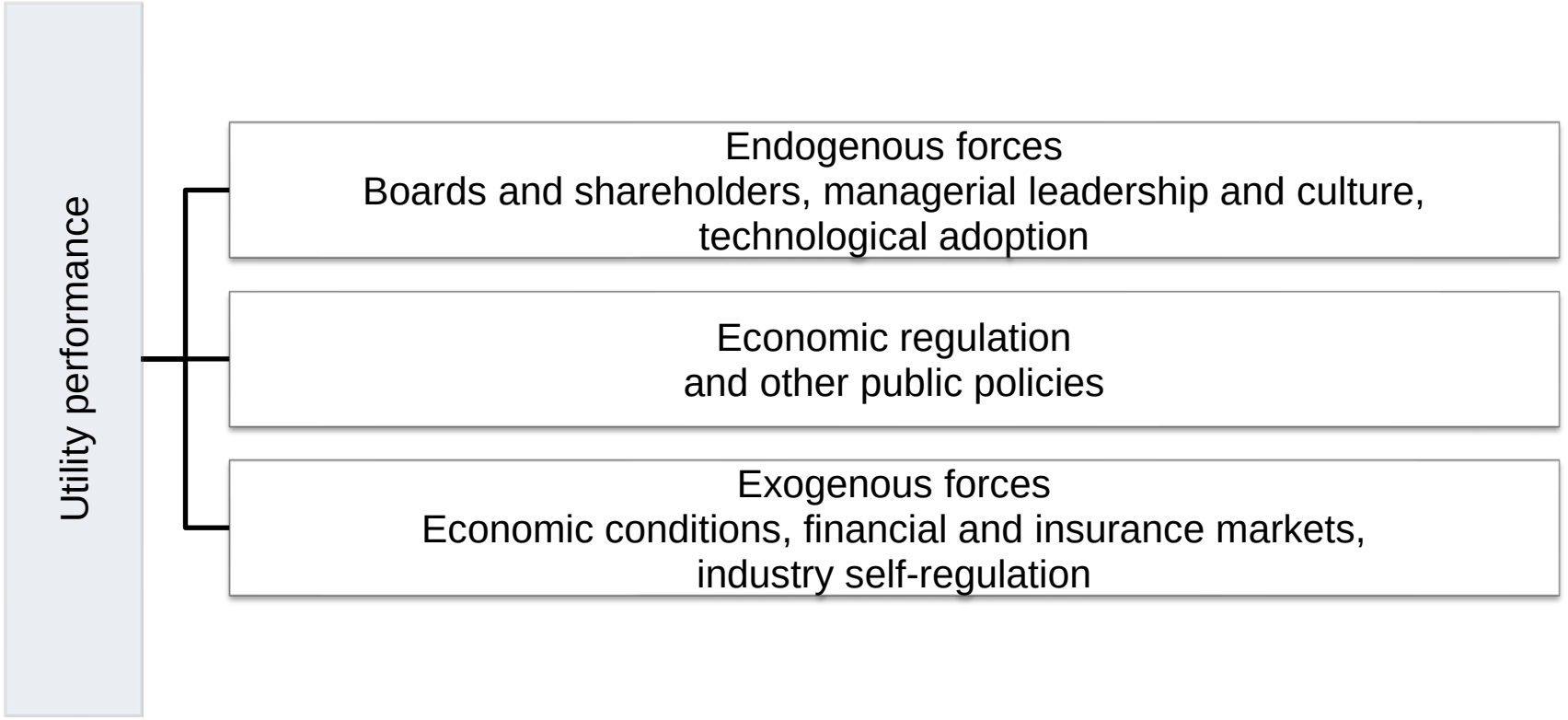
- Uniform (simplicity)
- Seasonal (load management)
- Marginal cost (efficiency)
- Lifeline (affordability)
- Prepaid (payment certainty)
- Spatially differentiated or zonal (efficiency)
- Spatially equalized or STP (regionalization)
- Locational (network congestion)
- Emergency or drought (resource scarcity)
- Negotiated (attraction and retention)
- Economic development (growth and jobs)
- System development charges (growth)
- Interruptible (load management)
- Curtailment (supply management)
- Standby or ready-to-serve (assurance)
- Peaking-factor (efficiency)
- Time-variant (load management)
- Real-time and dynamic (demand response)
- Critical-peak or event-day (load management)
- Quality differentiated (optimization)
- Value-of-service pricing (optimization)
- Excess-use or budget based (use control)
- Property-value based (affordability)
- Restricted or limited service (access)
- Net metering, feed-in tariffs, and value-of-solar (distributed solar generation)
- Virtual net metering (shared renewables)
- System development or impact fees
- Exit and abandonment fees (defection and stranded cost)
- Vehicle charging (electrification)

What ratepayers perceive

Regulation and incentives

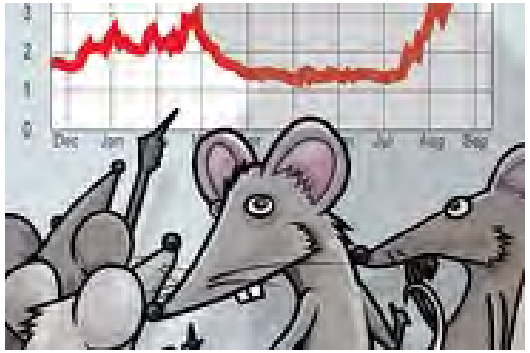
Regulatory and utility performance

- *"There is only one bottom line" (utility executive on "people, planet, profit")*
- Regulatory performance is tied to the performance of regulated firms
  - Especially the price and quality of service
  - Utility performance is also a function of other endogenous and exogenous factors
  - U.S. regulators need more robust efficiency and productivity analytics



Regulation and performance incentives

- *"The rat must smell the cheese"(utility executive John Rowe, 1989)*
- Regulation is meant to promote efficiency (S. Breyer) and progress (A. Kahn)
  - Utilities will respond to the incentives and disincentives provided
  - Regulatory risk is clearly important but not the only performance factor
  - Shareholder expectations also motivate performance
- Well-implemented regulation can provide powerful performance incentives
  - Incentives are stronger when costs are rising, weaker when costs are falling (status quo)
  - Regulators want to ensure against complacency about cost control and efficiency
- Regulated utilities have strong profit incentives that differ from competitive firms
  - Build rate base by invest, acquiring, modernizing, and gold plating
  - Choose capital over labor (Averch-Johnson effect) – e.g., meters and servers
  - Secure cost-recovery and revenue-assurance mechanisms that shift risks to ratepayers
- Rate base has become an "all-purpose" solution
  - Natural gas reserves,
  - Energy efficiency programs
  - Cloud computing expenses
- Regulators should resist the call to "level the field"
  - Distorts accounting and departs from technological neutrality



Regulatory performance incentives ⓘ

- Incentives based on ownership
  - Privately owned companies are strongly motivated by investment-based profits
  - Publicly owned systems may try to avoid spending and related rate politics
  - Cooperative systems are responsive to members and less constrained
  - Most managers (all types) want to control costs and perform well for reputational reasons
- For investor-owned utilities, regulation substitutes for competition
  - Authorized returns should reflect risk and motivate efficiency
  - Returns earned by utilities are not risk-free or guaranteed – performance matters
  - Performance regulation alters incentives for investment and operational efficiency
- For non-private utilities
  - Utilities not subject to external regulation may be more experimental and innovative
  - Non-private "returns" (such as payments to municipal shareholders, taxing authorities, or surplus reserves) may be subject to regulatory review in some jurisdictions
- Regulators may be more prone to capture by private utilities
  - But less inclined to take enforcement action against public entities (similar outcomes)

Regulatory risk as incentive

- Where there is return, there must be risk
  - Regulatory risk (e.g., finding of imprudence) is not the same as governmental risk (e.g., political instability or expropriation) – although legislatures influence regulatory risk
- Regulatory risk may be the predominant form of risk for utilities
  - Provides discipline and shapes utility behavior – along with other forces
  - Allowed returns (a cap, ceiling, band) typically exceed the cost of capital
  - Returns are authorized but not guaranteed – regulatory practice is determinative
  - Capture can be operationalized by return without risk and asymmetric mechanization
  - Utilities must have a reasonable opportunity to earn their authorized returns
  - Returns are not necessarily expected and often unrealized – firms must reach for profits
  - Prudence earns a fair but not an extraordinary or excessive return (unjust enrichment)
  - Regulators may also consider performance incentives and penalties
- Risk and return relate to
  - Opportunity cost of and competition for financial capital
  - Preferences and propensities for capital investment (scale, A-J effect)
  - Perceptions about regulatory climate and uncertainty (commission ratings)
  - Regulatory adaptation, including cost and revenue adjustments and incentive returns
  - Assured returns for nonutility providers from policies and agreements

Regulatory risk

Dominion's doesn't want cost-benefit analysis

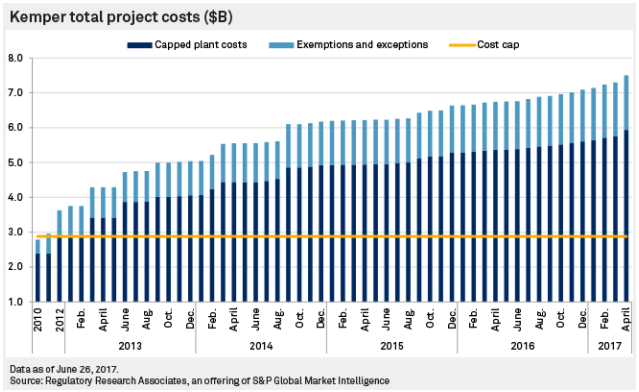
Share Like Comment now

Source: The Daily Progress

RICHMOND - Dominion Energy Virginia does not want state regulators to require a formal cost benefit analysis for a newly proposed plan to modernize the electric utility grid at a cost of $3 billion over the next decade, including $816.3 million in the next three years.

"Investors ... will be left holding the bag if ratepayers can't or don't absorb ballooning project costs."

Edward Kamonjoh
Executive Director, 50/50 Climate Project



Failed SC nuclear project to cost typical Santee Cooper ratepayer $6,200

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How a Florida Power Project Flew Under the Regulatory Radar

The state's biggest utility is building a 176-mile line that may be unsuitable or even unneeded. Its design minimized scrutiny. Critics see a pattern.

CT Insider

Aquarion rate hike denied by CT regulators, instead bills lowered

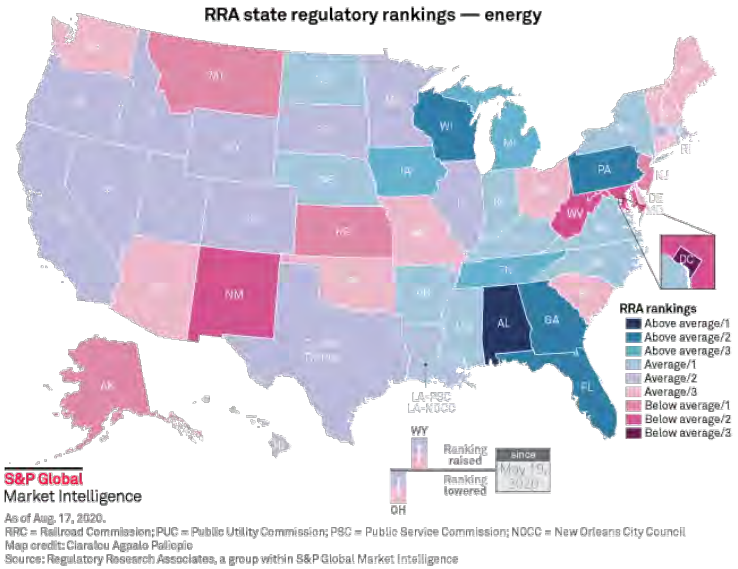
Connecticut utility regulators on Tuesday upheld a draft ruling in a rate case where Aquarion Water had sought a 27 percent rate increase.

WTNH.com

PURA rejects UI's increase rate of $130 million over 3 years

Regulatory climate: credit rating agency perspective

- Commissions are externally rated for a "constructive regulatory environment"
  - Ratings are biased toward shareholder and bondholder perspectives
  - Revenue assurance and "financial resiliency" are favored (risk reduction)
  - In a friendly environment, "allowed" may exceed "authorized" returns



RRA State Regulatory Evaluations — Energy*
(By category, states to watch highlighted)

Above Average/1	Above Average/2	Above Average/3	Average/1	Average/2	Average/3	Below Average/1	Below Average/2	Below Average/3
Alabama	Florida	Iowa	Arkansas	California	Delaware	Alaska	Dist. of Columbia	Arizona
	Georgia	Michigan	Colorado	Hawaii	Louisiana — NOCC	Connecticut	New Mexico	
	Pennsylvania	Mississippi	Indiana	Idaho	Maine	Kansas	West Virginia	
	Wisconsin	North Carolina	Nebraska	Illinois	Maryland	Montana		
		Tennessee	North Dakota	Kentucky	Missouri	New Jersey		
			Texas — RRC	Louisiana — PSC	Ohio			
			Virginia	Massachusetts	South Carolina			
				Minnesota	Texas — PUC			
				Nevada	Vermont			
				New York	Washington			
				New Hampshire				
				Oklahoma				
				Oregon				
				Rhode Island				
				South Dakota				
				Utah				
				Wyoming				

Data compiled May 27, 2022.
NOCC = New Orleans City Council; PUC = Public Utility Commission; RRC = Railroad Commission
* Within a given subcategory, states are listed in alphabetical order, not by relative ranking.
Source: Regulatory Research Associates, a group within S&P Global Commodity Insights

Supportive regulation: utility perspective

Supportive Regulatory Construct

Stable Rate Case Results

- Rate case results are stable
  - Current ROE of 9.60% with an equity layer of 54%
  - Full recovery of plant investments to date
  - Rate cases are settled (almost never litigated)
- Resolution of cases have been timely
- Last case filed in March 2021 and rates effective on December 1, 2021

Decoupled Rates for majority of customers

- Volume risk due to weather or energy conservation mitigated through the *Conservation Incentive Program (CIP)*. This decoupling mechanism allows NJNG to earn a fix margin per customer[1].
- NJNG's natural gas commodity price is a pass-through cost the *Basic Gas Supply Service (BGSS)* program

Minimization of Regulatory Lag

- Investments in customer growth and Infrastructure Investment Program (IIP) earn real-time recovery or accelerated recovery through annual mechanisms
- Through the SAVEGREEN program, energy efficiency investments also have an annual cost recovery mechanism that accelerate recovery of investments and returns

Margin Sharing Incentives

- Like other utilities, NJNG contracts for supply and transportation to meet customer needs
- NJNG's BPU-approved "BGSS Incentive Programs" allow temporary release of capacity or supply when not needed
- NJNG shares margin generated with customers (85% for customers/15% for NJNG)
- BGSS Incentive margin is not counted in NJNG's ROE calculation for overearning

Strong and Stable Utility Gross Margin Profile

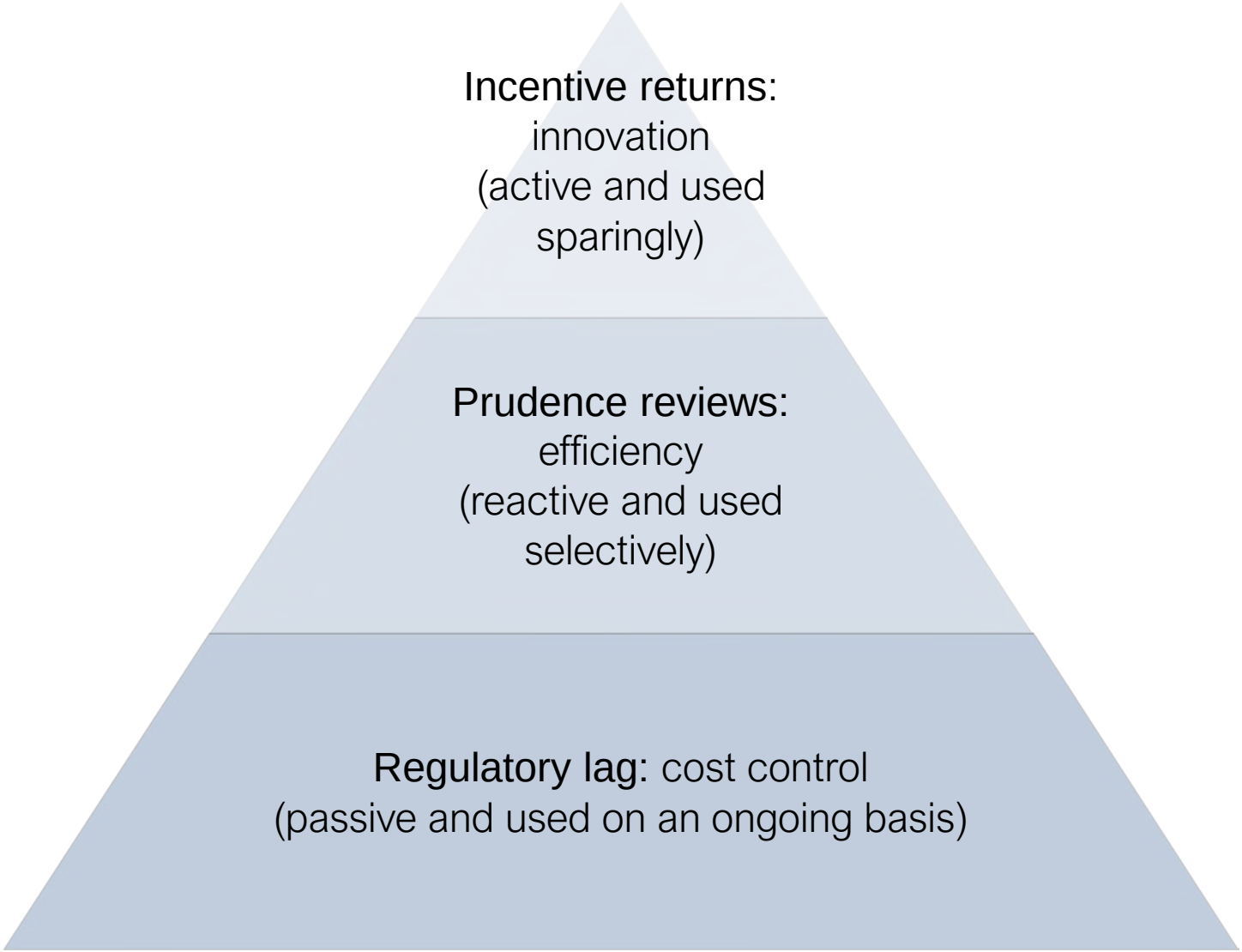
- Insulated from volume and commodity volatility
- Mitigates regulatory lag
- Aligned with environmental goals

New Jersey Resources

11

1. *For residential and small commercial customers, which make the vast majority of NJNG's customers.*

Three risk-based incentive tools used by regulators



Three tools (continued) ⓘ

- Regulatory lag in cost recovery is part of the regulatory paradigm by design
  - ”Constructive environments” using “best practices” tend to shift risks to ratepayers
  - Implementing mechanisms to reduce lag call for adjusting authorized returns
  - Public ownership and deregulation “resolve” the problems of regulatory lag and expense
- Prudential performance is *expected* and earns a fair return only – no bonuses
  - “[T]he practical purpose of income is to serve as a guide for prudent conduct” (“Hicksian income,” J. Hicks)
  - “In principle at least, the short run prudence test is no different from the short run efficiency test imposed by competitive markets" (P. Joskow and R. Schmalensee)
  - Prudence reviews counteract the strong rate base investment incentives under RB/ROR
- Incentive returns can be used strategically but sparingly to motivate innovation
  - Maintain risk and focus on performance vs. specifying means of achievement
  - Returns may be narrowed and tied to performance for a specific project
  - Profit sharing allocates the benefits of innovation between shareholders and ratepayers
  - Utilities do not enjoy the fruits of efficiency or innovation for very long because regulators “expropriate” or “claw back” the rewards (“ratchet effect” or “recapturing created value”)
  - *Competition has the same effect* (see E. Bailey, 1974)

Incentives under traditional regulation

			Performance		
		Investment	Cost control	Efficiency	Innovation
Return on investment	Premium embedded in the fair return to promote infrastructure investment	✓			
Financial accounting and reporting	Transparency in capital and operating expenditures and performance		✓		
Cost recovery	Disallowance of imprudent capital or operating expenditures		✓		
Regulatory lag	Time period between cost incurrence and an authorized rate adjustment		✓		
Prudence reviews	Sound managerial decisions based on knowable information			✓	
Financial audits	Detailed review of general or project-specific financial indicators			✓	
Management audits	Detailed review of general or project-specific management practices			✓	✓
Price freezes or caps	Extension of regulatory lag to a multiyear rate period			✓	✓
Certificate of public convenience	Review of planned capital expenditure to ensure its necessity			✓	✓
Integrated resource planning	Balanced consideration of supply-side and demand-side management options			✓	✓
Performance standards	Specified terms of service to ensure acceptable performance			✓	✓
Incentive returns	Bonus above fair return tied to performance to promote innovation				✓

Poll 14: Regulatory lag

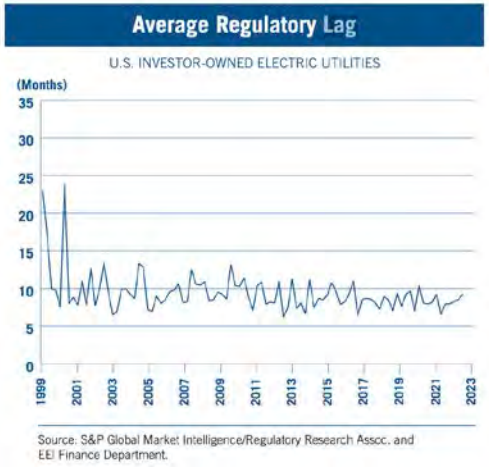
- Does regulatory lag reflect bad policy?
  A. Yes
  B. No
  C. Not sure

Role of regulatory lag

- Allred Kahn (1971) on regulatory lag
  - Lag should be "regarded as not a deplorable imperfection of regulation but as a positive advantage. Freezing rates for the period of the lag imposes penalties for inefficiency, excessive conservatism, and wrong guesses, and offers rewards for their opposites"
  - See also, E. Warren, E. Bailey, P. Joskow, M. Porter, F. Welch, D. Dismukes
- Much maligned as a "blunt" policy instrument
  - But purposive in maintaining short-term risk
  - Price-cap regulation formalizes regulatory lag (e.g., five-year periods)
- Reducing lag reduces revenue and earnings risk
  - Utilities, rating agencies, and other interests promote practices to reduce lag
  - Key rationale is that automation/mechanization will reduce rate case frequency/expense
  - Potential costs from shifting risk, weakening incentives, reducing oversight
  - Firms facing (global) competition also face information asymmetry and pricing lag
- Utilities rationally try to alleviate lag and maintain earnings
  - May spend more effort on reducing lag than reducing costs (lean practices)
  - Methods include cost-recovery and revenue-assurance mechanisms
  - Certain and expedient cost recovery and rate case time limits ("shot clocks") shift burdens of proof and risks from investors to ratepayers

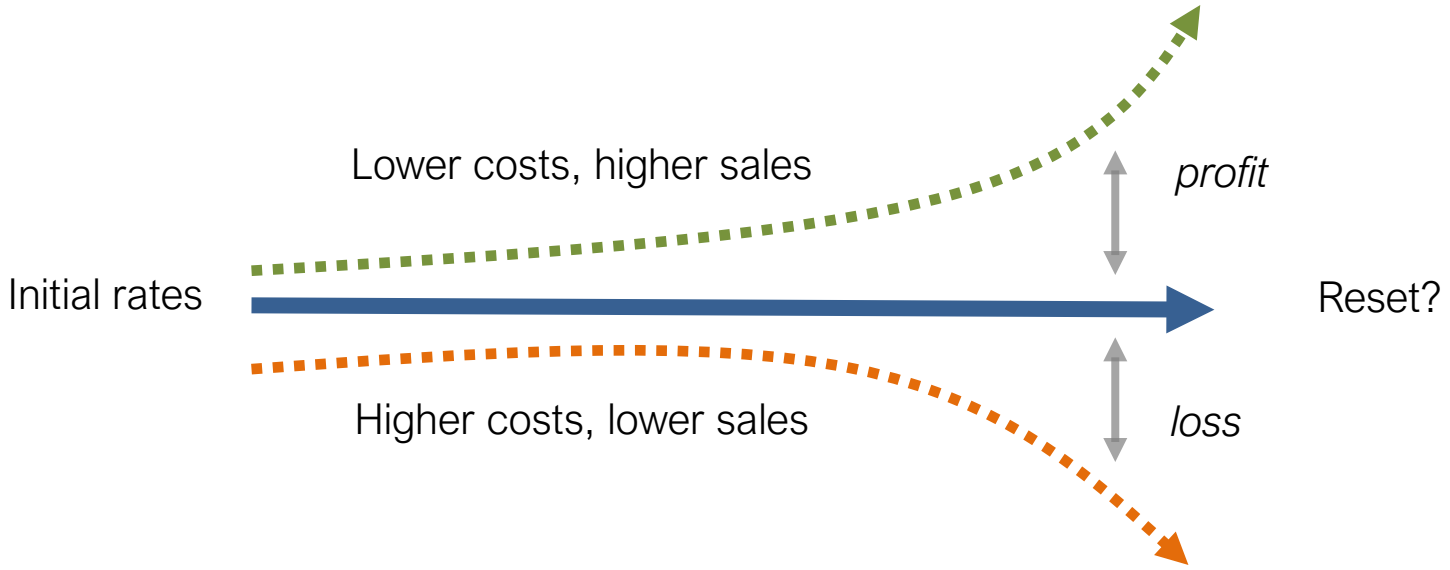
Definitions of regulatory lag

- Formal definition of regulatory lag
  - Period between a change in costs or revenues (+/-) and a change in authorized prices charged to ratepayers of a regulated utility (regulatory
- Alternative conceptions of regulatory lag
  - Period between when an unregulated firm and a regulated firm could put in place a defensive price adjustment (economic)
  - Period between rate filing and rate authorization (procedural)
  - Period associated with decision-making process delays (bureaucratic)
  - Period associated with test years or adjustment mechanisms (rate policy)
  - Period associated with financial conditions affecting realized returns (financial)
  - Period between rate-case decisions when prices are capped (practical)



Regulatory vs. utility lag

- Lag presents upside and downside potential – lag "cuts both ways"
  - During lag, some forces work to the advantage of utilities - utilities should "resort" to rate cases only when necessary (F. Welch, 1954)
  - Lag may have advantages some municipal utilities, given declining usage
- Not all lag is regulatory – "utility lag" may signal managerial deficiencies
  - Responsibility for proactively managing through changing conditions and risks
  - Regulated firms have unique opportunities and tools to address lag
  - For non-private utilities, making timely adjustments may be easier



Regulatory lag and returns

- Regulators should address lag
  - When it materially jeopardizes the reasonable opportunity to earn a fair return
  - Under-earning may be more likely to be addressed than over-earning (asymmetry)
- How regulated utilities can address lag
  - Better forecasting, strategic management, subsequent cost control
  - Accounting for elasticities and other relevant factors
  - Making timely, complete, and convincing regulatory filings
  - Adoption of emerging technologies and practices

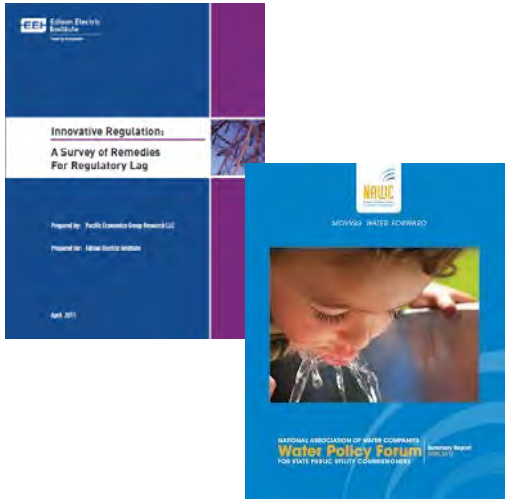
		Efficiency trend between rate adjustments	
		Increasing operational efficiency	Decreasing operational efficiency
Cost and sales trends between rate adjustments	Falling costs and/or rising sales	Achieving returns is likely	Achieving returns is possible
	Rising costs and/or falling sales	Achieving returns is possible	Achieving returns is unlikely

Lag, risk, and performance ⓘ

- *"It is a fundamental rule that utility rates are exclusively prospective in nature…[A]bsent extraordinary circumstances, the utility company must bear the risk of loss inherent in the well-known lag accompanying the making of rate changes" (RI Supreme Court in Narragansett Elec. Co. v. Burke, 1977)*
- Lag is a manifestation of regulatory risk and a proxy for competition
  - As when prices cannot be raised without losing market share
  - Regulation and lag generally have a "smoothing" effect on prices
  - Economic conditions such as growth or retraction mask or magnify effects
- Regulatory lag is affected by
  - Test year, timing of cases, pancaking (overlapping filings), suspension period, agency resources, statutory deadlines, and quality of the filing and evidence (e.g., forecasting)
  - Projected test years rely on cost forecasting or budgeting to lock in costs
  - Protections will undermine the incentives provided by lag when efficiency opportunities arise and may also underplay dynamic and interactive effects
- Uncertainty about assumptions and outcomes expands with time

A cautionary note about “best practices”

- Concept is inconsistent with sound policy analysis
  - Often appropriated by regulated and special interests that define and promote them
  - Who decides and from which perspective (utilities, ratepayers) – “best” to whom?
  - Even good practices can become obsolete
  - Practices evolve in dynamic environments
  - Innovation emerges through experimental method
  - Continuous improvement should be the goal
- A “best practice” would have to be
  - Theoretically sound with proven efficacy
  - Scrutinized, field-tested, and widely adopted
  - Recognized widely by unbiased experts and practitioners



- Regulators should consider the totality of their practices
  - Regulation cannot be “automated” – there is no substitute for reasoned judgment
  - Asymmetric treatment of sales, costs, and revenues alters risk
  - Cumulative or excessive adaptation may erode the regulatory compact
- A better term is “generally accepted regulatory practices” (GARP)
  - “Sound,” “standard,” or “established” for proven
  - “Promising” for experimental

Totality of a rate case

- Regulatory policies and rate-case decisions
  - Impose, mitigate, and allocate risks and rewards – each relates to incentives
  - No issue should be considered in isolation (single-issue ratemaking)
  - Be aware of interest-based "best practices"
- Regulators should consider the totality of regulatory treatment
  - Test year (historical or future)
  - Treatment of construction costs (pre-approval, CWIP)
  - Cost-adjustment mechanisms (opex and capex)
  - Revenue-assurance mechanisms (decoupling)
  - Recovery of operating expenses
  - Depreciation practices and methods
  - Demand (load) projections
  - Demand-suppression adjustments
  - Cost allocation and rate design methods
  - Authorized rates of return
  - Timing of cases and decisions

Evaluation and alternatives

Strengths (benefits) of the traditional regulatory model

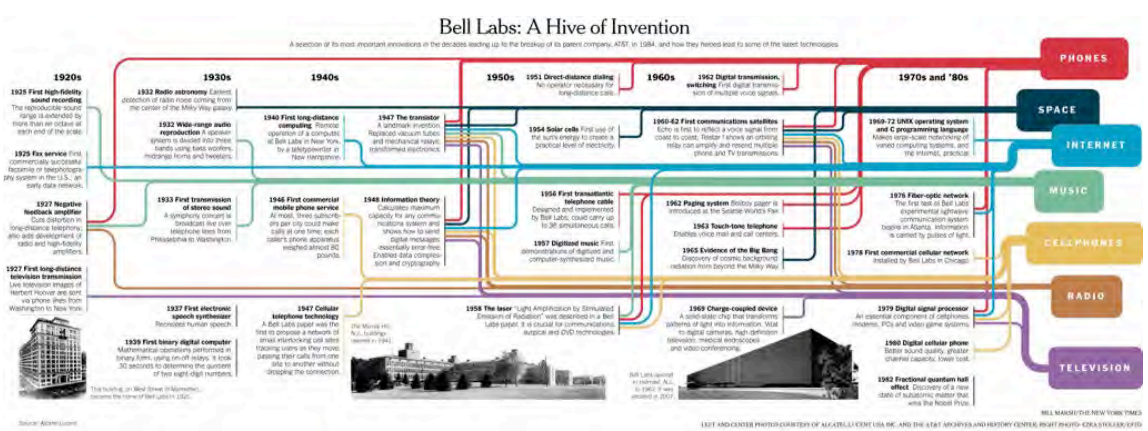
- Mature and generally well proven (100-plus years of experience)
- Transdisciplinary and theoretically reasonable (markets and market failure)
- Institutionally legitimate and grounded in legal principles
- Considers differing interests of shareholders, ratepayers, and society
- Ensures due process and consideration of justice in ratemaking
- Provides transparency and accountability in regulation and markets
- Applies consistent methods producing relatively consistent results
- Provides for overall market structure and rules
- Provides stability in revenues, rate structures, and rate levels
- Encourages long-term infrastructure investment of scale
- Protects consumers and helps ensure access to essential services
- Provides reasonable, if imperfect, performance incentives

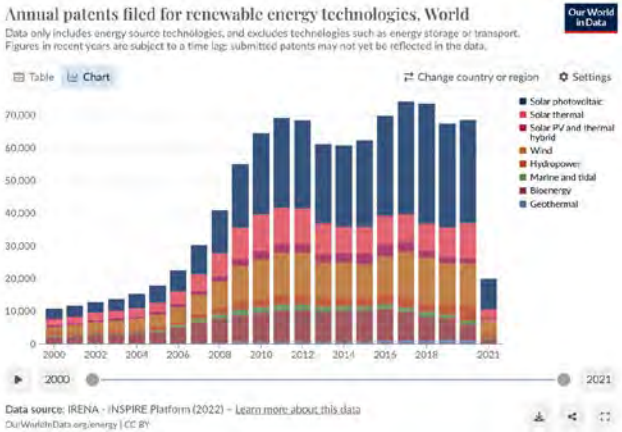
Weaknesses (costs) of the traditional regulatory model

- Too much incentive for cost-maximization & over-investment (“gold-plating”)
- Too little incentive for performance efficiency, innovation (claw back, ratchet)
- Driven by costly, inefficient, arcane, adversarial processes more than by results
- Historical focus and reactive (e.g., historic test years, no pre-approval)
- Prone to excessive delays of cost recovery relative to market forces
- Overly punitive (e.g., disallowances, lower returns, prudence reviews)
- Focuses too little on social or environmental issues (externalities)
- Insufficient attention to changing customer needs and preferences
- Inflexible with regard to dynamic structures, services, and pricing (status quo)
- Tendency toward micromanagement, command-and-control (“central planning”)
- Use of rate structures for cost socialization and wealth transfer
- Nondemocratic and vulnerable to special-interest politics and capture

Regulation and innovation ⓘ

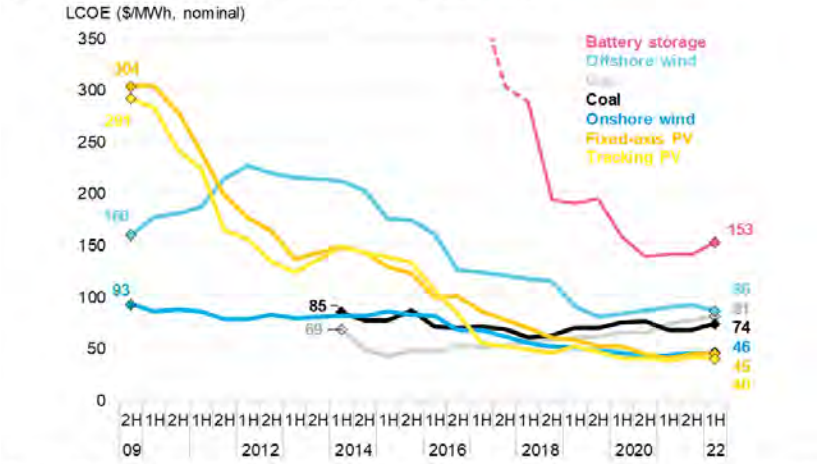
- Regulation is not necessarily incompatible with innovation (Porter hypothesis)
  - Environmental regulations can induce efficiency and innovation that can improve commercial competitiveness (Porter and van der Linde, 1995)
  - Profit-sharing can promote efficient investment in innovative technology (T. Lyon , 1995)
  - Performance standards must be well designed – too specific or rigid can be stifling
  - Deregulation will promote innovation if markets are well-functioning
- U.S. regulated economy leads in innovation (e.g., patents per capita)
  - Innovation by Bell Labs (1925) resulted in seven Nobel prizes by Bell scientists
  - Top ten innovations: data networking, the transistor, cellular telephone technology, solar cells, lasers, digital transmission and switching, communications satellites, touch-tone telephone, unix operating system and C language, digital signal processor (DSP)
  - But did they use this to their corporate advantage – to reinforce the monopoly?





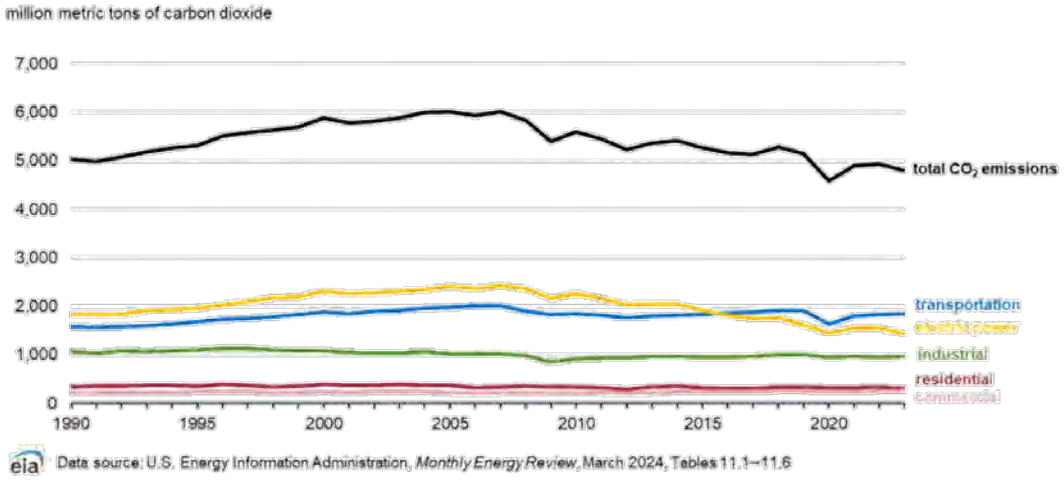
Clean energy technology cost trends and emissions reduction ⓘ

Figure 1: Global levelized cost of electricity benchmarks, 2009-2022



Source: BloombergNEF. Note: The global benchmark for PV, wind and storage is a country-weighted average using the latest annual capacity additions. The storage LCOE is reflective of a utility-scale Li-ion battery storage system with four-hour duration running at a daily cycle and includes charging costs.

Figure 1. U.S. energy-related CO_2 emissions by sector, 1990–2023



Regulation adapts to evolving conditions and policy goals

- Adaptation is “good”
  - When consistent with core principles under the prevailing paradigm, as delegated by democratic institutions and with appropriate oversight
  - But not so good when those principles are compromised

Market condition	Regulatory role
Market failure in the form of “natural” monopoly	As an imperfect but necessary proxy for competition and the state
Workable and reasonably robust competition	As a facilitator and overseer of emerging markets
Persistent market imperfections relative to social goals	As a responsive and corrective instrument of public policy

Emerging goals and associated functions ⓘ

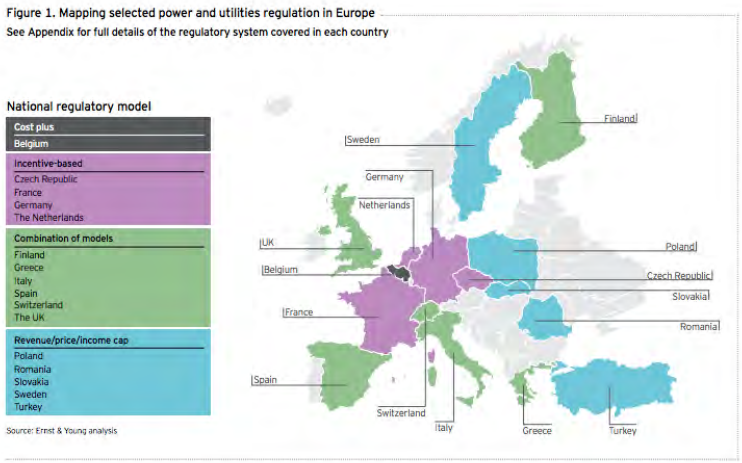
Market goals	Performance goals	Social goals
To structure, facilitate, and monitor workable competition	*To ensure desirable market and utility performance*	*To be a corrective policy instrument of public policy*
• Market design (rules, tools, and platforms) • Market-based rates • Monitor market power • Functional separation and network access • Service unbundling • Rate rebalancing • Promote choice, aggregation • Market dispute resolution • Designate default providers • Allocate transition costs	• Capacity, reliability standards • Resource portfolio standards • Integrated resource management • Performance standards • Performance incentives and earnings adjustment • Asset protection (ring fence) • Corporate accountability • Information systems • Assess supply capacity • Coordination/harmonization	• Consumer information • Consumer rights • Universal service & lifelines • Social ratemaking • Facility siting • Infrastructure security • Public-benefits programs • Efficiency pricing and programs • Climate, emissions, and resource protection policies • Agency modernization

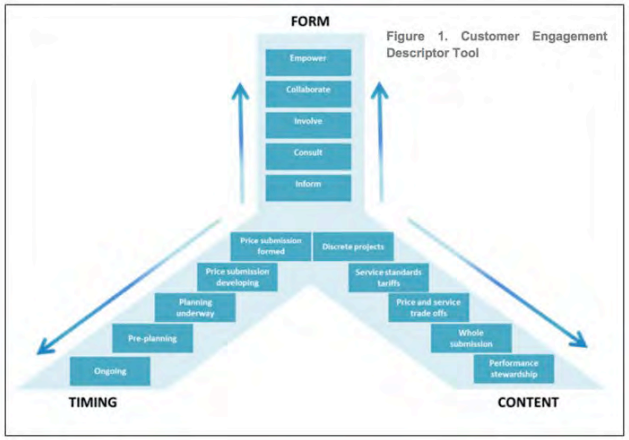
Evaluating (de)regulatory alternatives

- Alternatives include
  - Focus to varying degrees on costs, revenues, returns, prices, efficiency, innovation
  - Cost-recovery and revenue-assurance mechanisms (e.g., clauses, decoupling)
  - Refinement and targeting of regulatory incentives for prudent performance (e.g., PBR)
  - Formulaic and algorithmic regulation that reduce decision-making discretion
  - Market restructuring and deregulation
- Evaluation criteria
  - Standards
    - Infrastructure investment and operations
    - Performance efficiency and innovation
    - Social and environmental costs and impacts
  - Incentives
    - Intended and unintended behavior
    - Risk and risk allocation
    - Achievement of policy goals
  - Accountability
    - Jurisdiction and authority relative to the compact
    - Reporting and monitoring capacities
    - Burden of proof and due process

Economic regulation is a global experiment

- Alternative regulatory models
  - Focus more or less on costs, revenues, returns, and prices
- Alternative models
  - Price caps, revenue caps, and performance incentive schemes
  - Hybrid models include RB/ROR for CAPEX and price caps for OPEX
  - Performance metrics and comparative competition ("yardstick")
- Emerging
  - Responsive and consumer-centric regulation
  - Alternative structural models (ownership)
  - Public-value theory





Source: https://www.accc.gov.au/system/files/Network%20September%202016.pdf12

Source: http://www.ey.com/Publication/vwLUAssets/Mapping_Power_and_Utilities_Report_2013/$FILE/EY%20European%20Power%20regulatory%20report%20FINAL%200513.pdf

Comparing regulatory frameworks

Comparison Between Regulatory Frameworks

Framework	RIIO (2013-present UK)	Price-cap (RPI-X) (1990-2013 UK)	Cost-based (or cost+)	REV (2014-present NY)
Specific consumer outcomes	✓✓✓	✗	✓	✓✓
Performance rewards / ability to earn higher returns	✓✓✓	✓	✗	✓
Incentive to make CAPEX investment in infrastructure	✓	✓	✓✓✓	✓
Incentive to optimise TOTEX	✓✓	✓	✗	✓
Promotion of operational efficiency	✓✓	✓✓✓	✓	✓✓
Fit for decentralised, digital & customer-centric system	✓✓✓	✓	✗	✓✓
Incentive for network innovation	✓✓	✗	✗	✓✓
Simplicity (Easy to implement)	✗	✓✓✓	✓✓	✗

✗ Weak incentive against dimension
✓ Some incentives may exist to support the dimension
✓✓ Strong incentive supporting the dimension
✓✓✓ Very strong incentive supporting the dimension

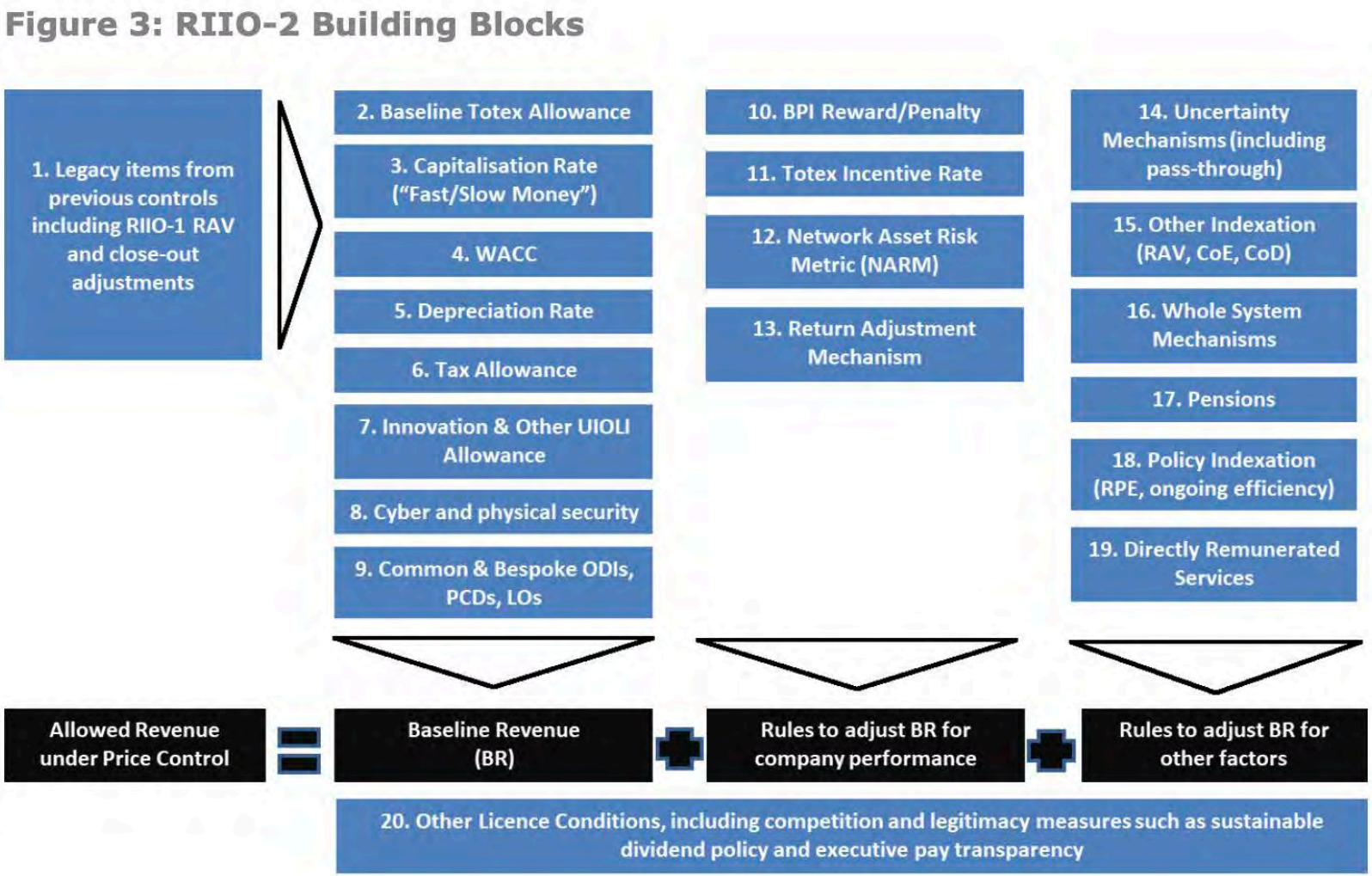
(Source: Navigant)

Source: https://guidehouseinsights.com/news-and-views/how-performancebased-regulation-affects-electricity-distribution-companies-in-the-uk-global-lessons

Critique of price-cap regulation ⓘ

- Particularly “econocentric” approach – price dictates behavior
- High implementation and monitoring costs
- Determining the initial base for rates
- Appropriateness of selected index
- Inflation measurement and self-fulfilling effects
- Potential for accounting manipulations and need for auditing
- Distinguishing efficiency improvements from broader influences
- Potential for cost avoidance and compromised service quality
- Appears to shift risk to investors (higher betas found cross-nationally)
- Weak incentives for infrastructure investment
- Empirical evidence on efficiency and innovation is inconclusive
- Favored in a declining cost environment (telecommunications)

U.K.'s RIIO model: Revenue = Incentives + Innovation + Outputs



Source: https://www.ofgem.gov.uk/sites/default/files/docs/2020/07/ed2_ssmc_overview.pdf

Poll 15: Performance-based regulation

- Should performance-based regulation replace traditional cost-of-service regulation?
  - A. Yes
  - B. No
  - C. Not sure

Clean Energy

States Test an Unusual Idea: Tying Electric Utilities' Profit to Performance

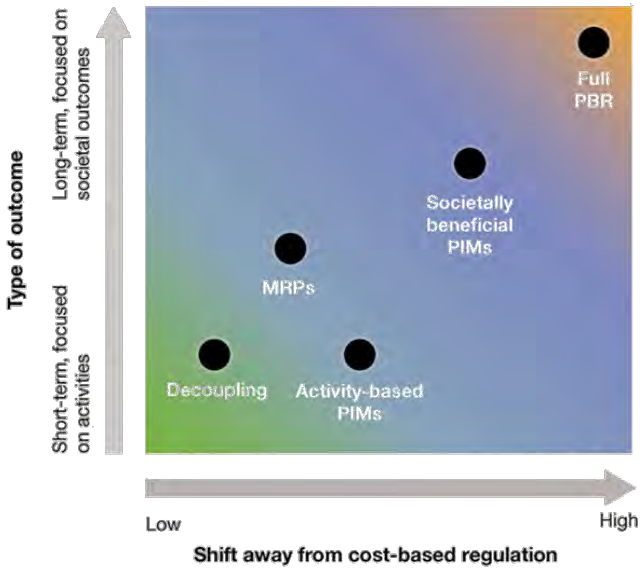
Traditional regulatory frameworks generally allow utilities to make guaranteed returns. Connecticut and Hawaii are experimenting with a new model.

Performance-based regulation: revolutionary or evolutionary?

- PBR is often cast as an alternative to cost-of-service regulation ("altreg")
  - "Broadly speaking, PBR provides an alternative to the traditional "cost of service" regulation by compensating utilities for how they perform rather than for selling more electricity or making new infrastructure investments… Recent PBR legislation has shown that states are increasingly placing their trust in PBR to quickly address challenges that prove difficult to address cost-effectively under the traditional cost of service regulation" (RMI, 2022)
- Perceptions depend on whether it is seen as favorable to interests
  - Similar to perceptions of the regulatory compact
- Regulation can incorporate evolving performance standards and expectations
  - Aligning economic and other objectives and assessing social and consumer benefits
  - Considering customer perspectives and preferences beyond symbolic public hearings
  - Expanding and enhancing the regulatory decision-making record on prudence
- PBR could be revolutionary by opening the door to structural models
  - Combining alternative forms of asset ownership with performance contracts

Conflating PBR with ratemaking mechanisms

- PBR often is but should not be conflated with ratemaking modifications often used simultaneously
  - Forward-looking test years (vs. historical)
  - Cost-adjustment mechanisms
  - Revenue-assurance mechanisms (decoupling)
  - Earnings bands
  - Revenue or profit sharing
  - Bonus or incentive returns
  - Multi-year ratemaking
  - Formulaic ratemaking
- These mechanisms are rationalized to address
  - Regulatory lag (industry perspective)
  - Opportunities to avoid costs through efficiency
  - Incentives for capex, overinvestment, and sales
  - Risk aversion and lack of innovation (nudging)
- Issues
  - Asymmetry and risk shifting from investors to consumers (e.g., decoupling)
  - Conflict with sound practice (e.g., return on opex)
  - Institutional memory and robust application of regulatory principles would render these modifications unnecessary
  - Monopoly costs and profits for essential services

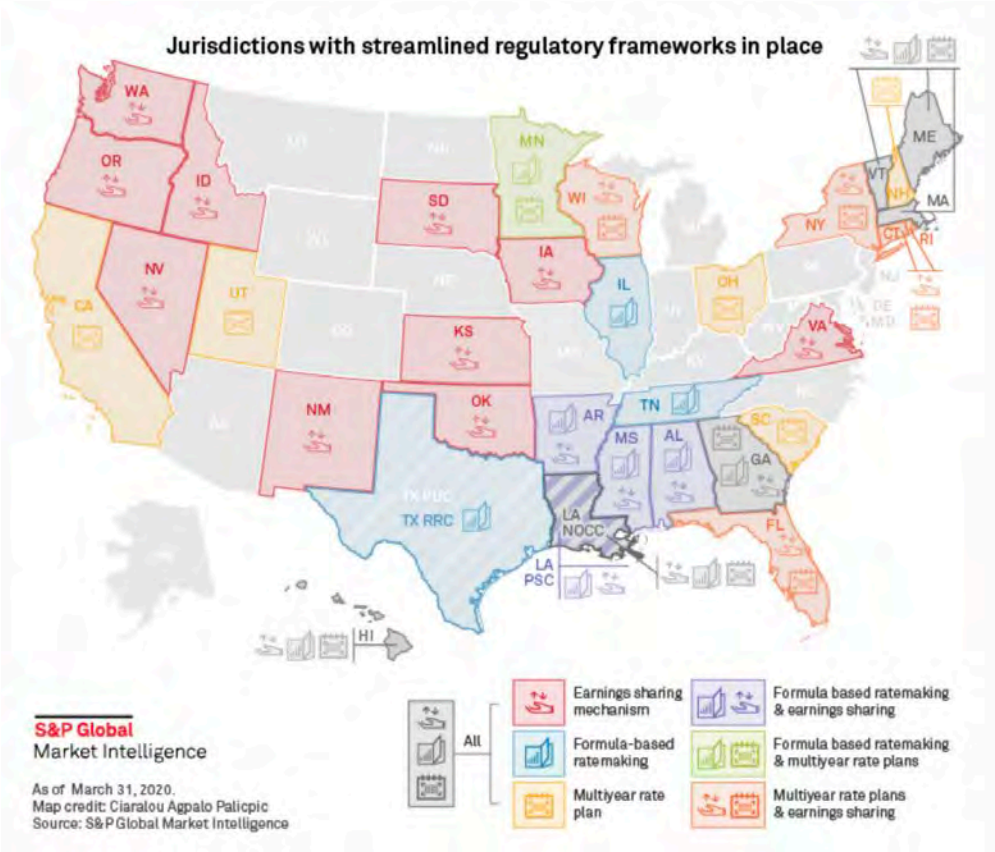


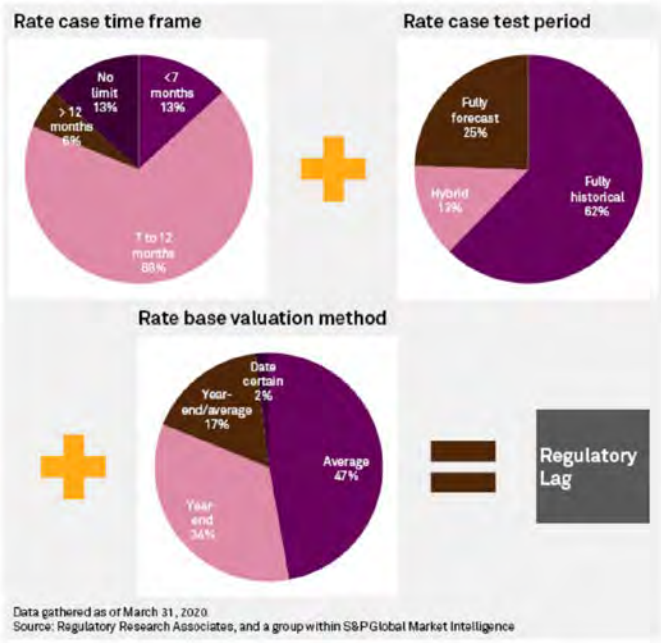
© E Source. **Note:** MRPs = multiyear rate plans; PBR = performance-based regulation; PIMs = performance incentive mechanisms.

Source: https://www.esource.com/report/430211hlay/performance-based-regulatory-strategies-accelerate-beneficial-electrification

Regulatory alternatives are interest-driven

Alternative Regulatory Paradigms Offer Utility Investors A Degree Of Certainty





Potential benefits of incorporating PBR

- Aligns performance objectives, incentives, and outcomes
- Clarifies expectations and points utilities toward a path to profit
- Guides cost disallowances (-) and return on equity (+)
- Can be tied to the recovery of executive compensation
- Focuses regulators on performance objectives and prudence
- Advances innovation in the context of the energy transition
- Can make regulation more consistent and less arbitrary

Potential challenges of incorporating PBR

- Alters regulatory remit, mission, and compact priorities
- Defects attention from economic efficiency
- Formulization and fragmentation
- Prescriptive legislative ratemaking
- Regulatory usurpation or micromanagement
- Blurred boundaries and responsibilities
- Administrative complexity and workload
- Staff competencies and capacities
- Information asymmetry favoring utilities
- Data quality (validity, reliability)
- Data quantity (too little, too much)
- Errors of commission or omission
- Specification and quantification metrics
- Measuring consumer satisfaction
- Detailing and weighting criteria
- Determining performance causation
- Competing performance objectives and
- Conflict with pricing conventions
- Distorted or gaming behavior by utilities
- Shifting risks to consumers
- Regulatory or legislative capture
- Technological favoritism
- Political and public engagement
- Monitoring and evaluation
- Costly shareholder return incentives
- Risk of over-earning by utilities
- Persistent market power
- Consistency with economic theory
- Marginal benefit relative to marginal cost
- Loss of regulatory discretion (paradoxically)

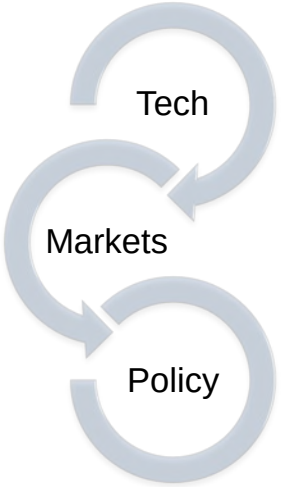
Restructuring and deregulation

Modern regulatory theory

- Questions the “naturalness” of monopoly and monopolization of services
- Breaks the reinforcing circularity of utility, monopoly, and regulation
- Considers industry restructuring to expand markets and market mechanisms
- Avoids monopolization of potentially competitive services (e.g., efficiency)
- Addresses nontraditional areas of market failure (e.g., externalities)
- Promotes performance measurement and cost avoidance
- Recognizes need for new regulatory tools (e.g., monitoring, enforcement)
- Recognizes that regulation may or may not be a precursor to competition
- Adapts and adopts regulatory methods based on evolving conditions and goals
- Allows deregulation of genuinely competitive functions and services

Restructuring drivers

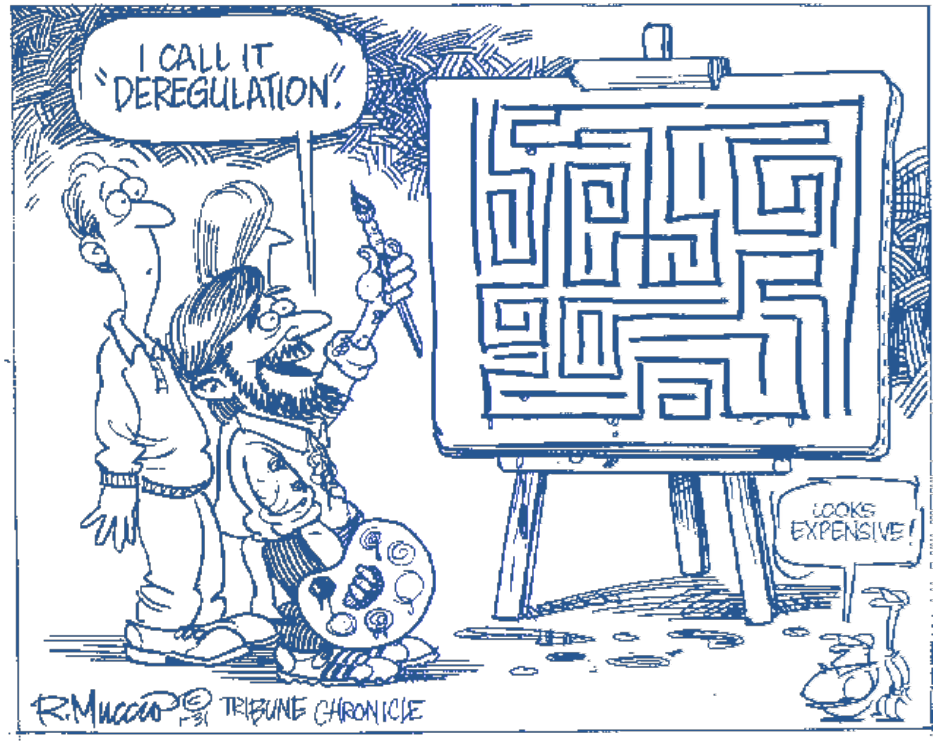
- Proponents of market theory (academics, think tanks, policy entrepreneurs)
- Political ideology of smaller government (Reagan, Thatcher)
- Perception of regulatory ("nonmarket") failure
- Pressure from international institutions (World Bank)
- Competitive pressure from new entrants (MCI)
- Antitrust investigations (US Department of Justice)
- Concerns about interclass subsidies and lack of neutrality



- Technological innovation, disruption, or "creative destruction" (Schumpeter)
- Advances in computational power and information management
- Alternative policy tools (pricing models, alternative regulation)
- Large-volume customers wanted purchasing power (ELCON, water districts)
- Anti-incumbency, sympathy for underdogs, and change for the sake of change

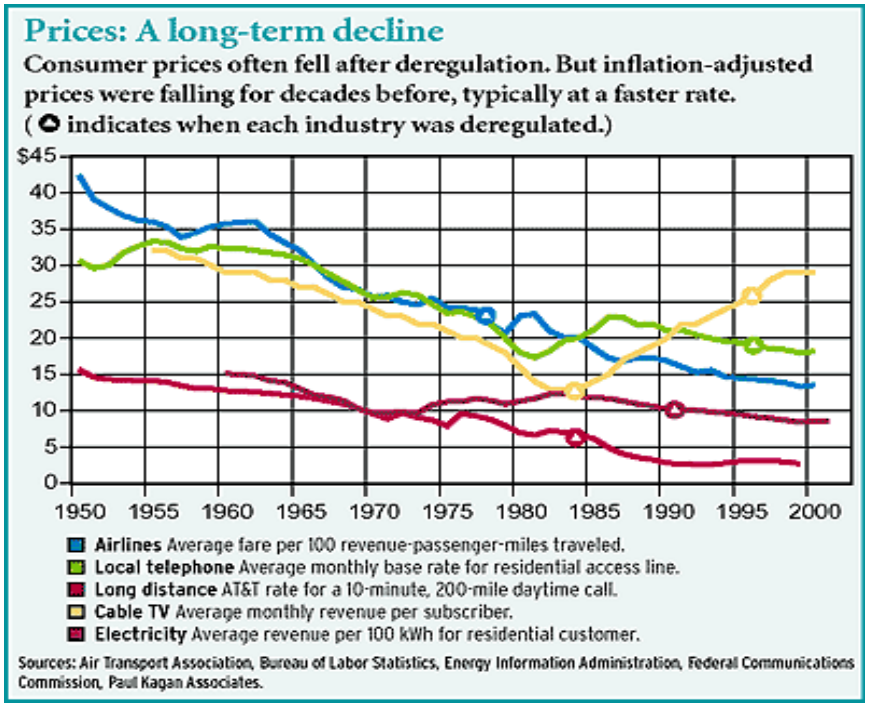
Poll 16: Restructuring and deregulation

- **Has electricity sector restructuring achieved desired policy objectives?**
  - A. Yes
  - B. No
  - C. Not sure



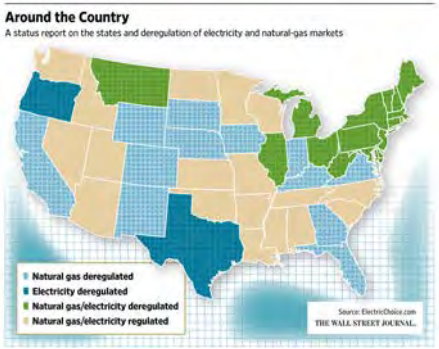
The promises of restructuring

- Lower costs and prices for customers
- Freedom from captivity
- Not just “choice” but good choices
- Influx of new providers
- New products and services
- Competitive discipline for providers
- Sufficient checks against market power
- Innovation and entrepreneurship
- Shift of some risks to investors
- Improved price signals
- Less subsidization or skewing
- More effective than price regulation

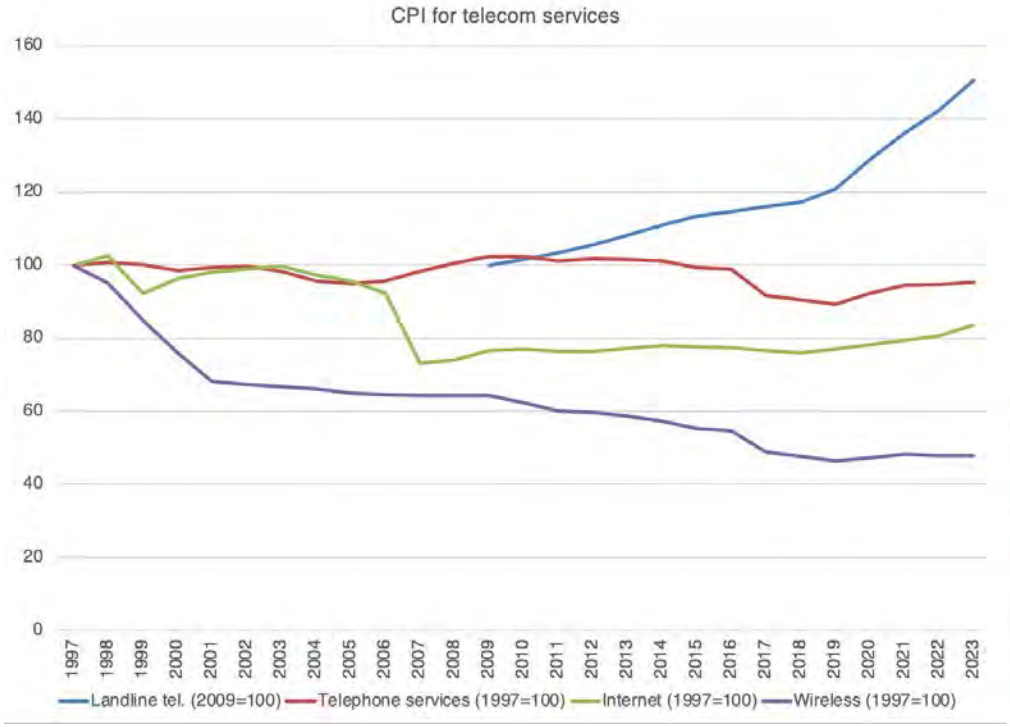


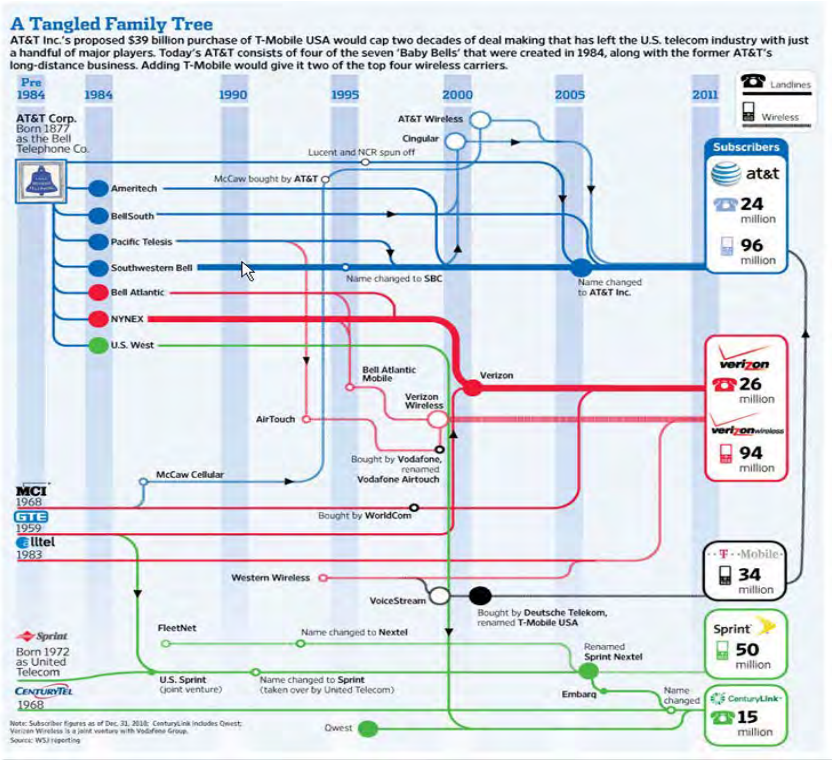
Elements of restructuring ⓘ

- Vertical separation of function (energy: gencos, transcos, discos)
- Horizontal competition among companies (telecom: Bell breakup)
- Delineation of wholesale and retail markets
- Open entry to markets (less exclusivity)
- Regional/independent transmission operators (FERC)
- Access and compensation to transmission networks
- Service unbundling (competitive/noncompetitive elements)
- Aggregation for price shopping and risk mitigation (former regulatory roles)
- Brokering, marketing and aggregation (large-volume customers, communities)
- Facilitation of choice (e.g., number portability)
- Market-based tools (e.g., auctions, trading, hedging)
- Divestiture of some regulated assets (generally irreversible)
- Recovery of transition costs (e.g., stranded cost or “missing money”)
- Regulatory reform and selective deregulation



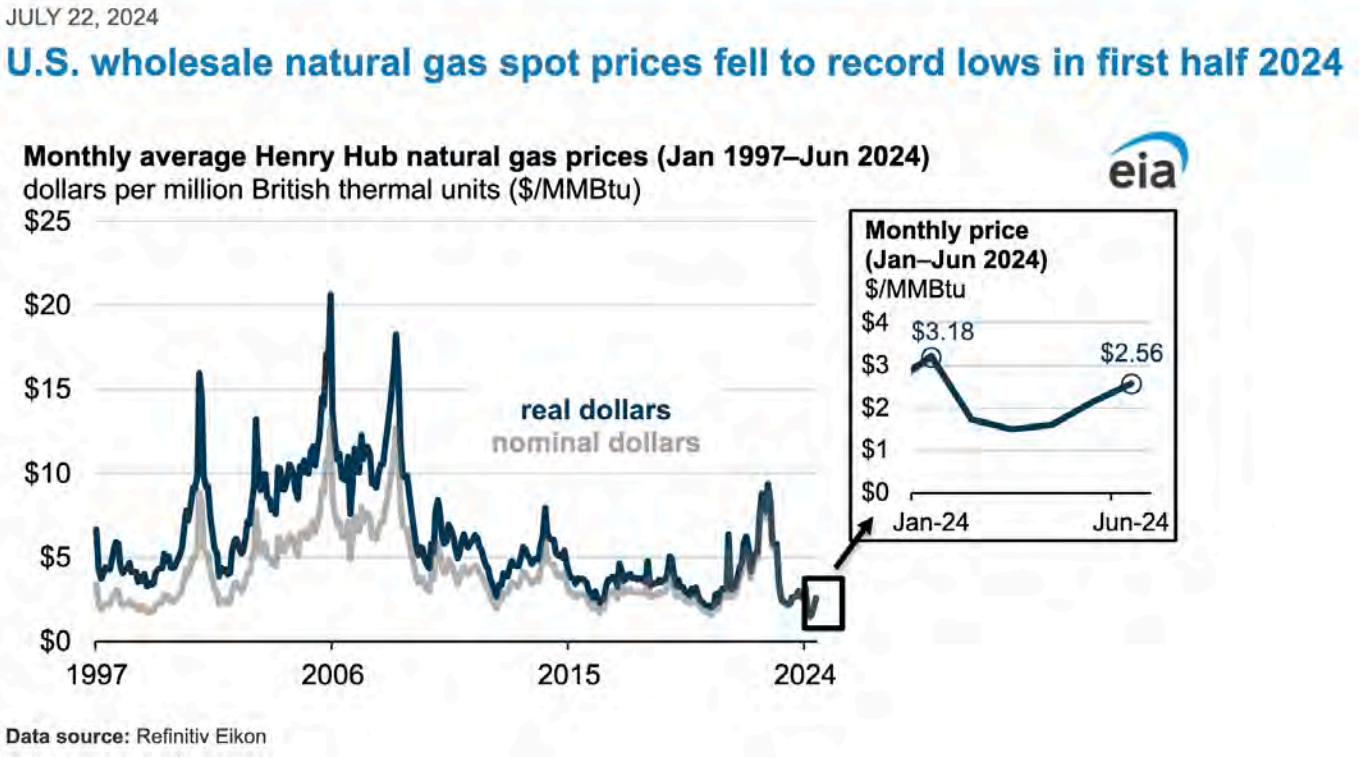
Restructuring, prices, and consolidation for telecom





Restructuring and price trends for natural gas

- Gas is often price to beat for conventional and unconventional fuel sources
- Lower commodity prices can mask rising infrastructure costs
- Wellhead price volatility is still “smoothed” by regulated retail pricing
- Environmental impact of network development remains controversial



Restructuring and price trends for electricity (Rose et al., 2021)

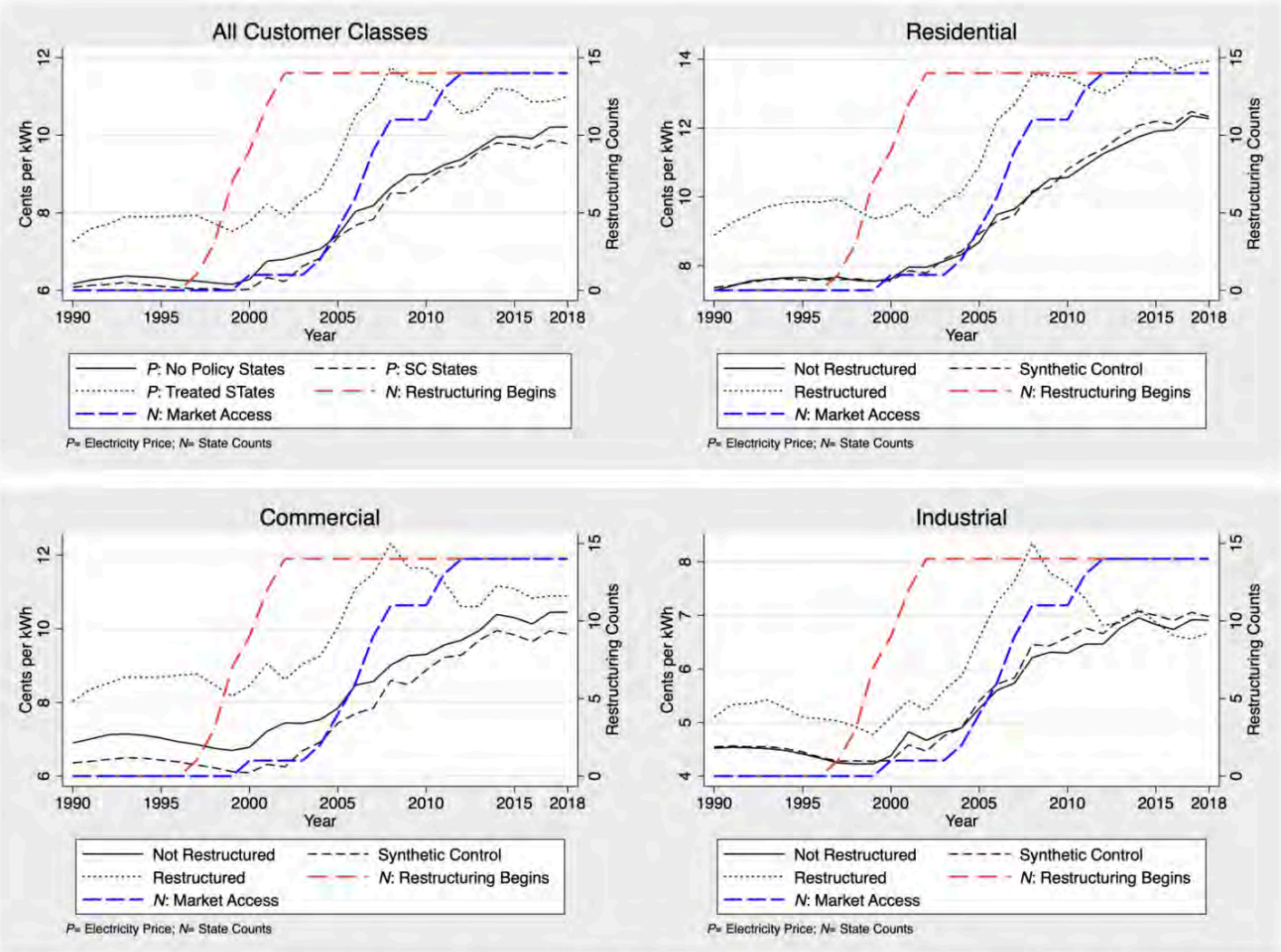


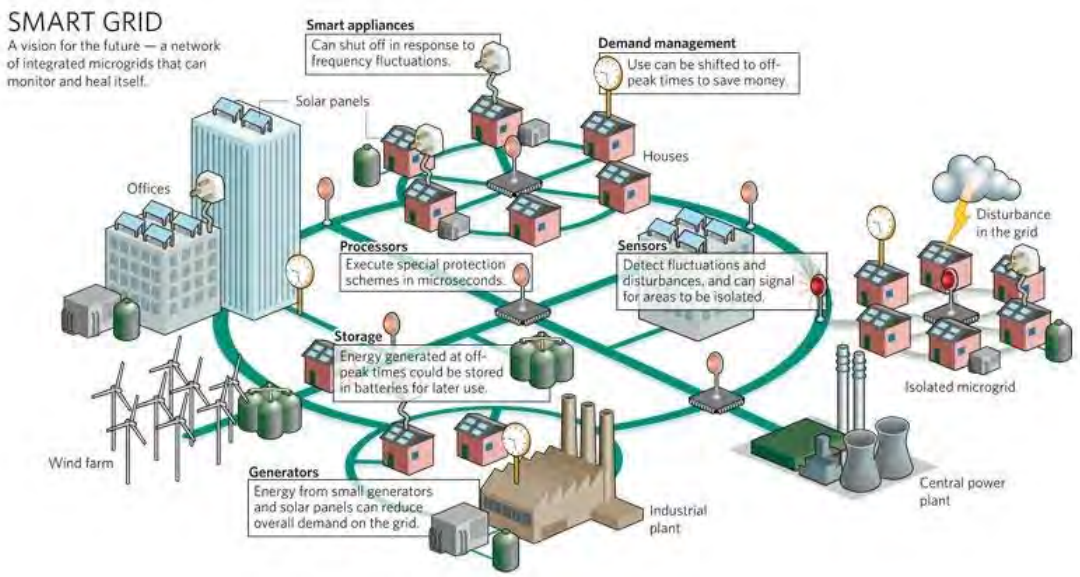
Figure A1: Comparison of Restructured, Non-Restructured and Synthetic Control States and Policy Implementation Dates

Restructuring and price trends for electricity ⓘ

- Appeal of markets or regulation depends on profit potential relative to risk
- Markets are highly structured and layered with market mechanisms
  - Optimization among goals (trifecta of clean, reliable, and affordable) is more difficult
  - Dynamic and interactive technical, economic, and structural forces are at work
  - Flexibility and adaptability in response to changing conditions are needed
- Efficiency gains in generation were not necessarily “market induced” (K. Rose)
  - Primarily realization of scale economies through regional dispatch (wholesale)
  - Exhaustion of excess capacity – from 60% to 90% capacity utilization
  - Learning curve for nuclear plants, such as reduced downtime for refueling
- Price trends are indeterminate, but distributional effects are apparent
  - Efficiency gains in generation from scale (capacity utilization)
  - Offset by lost economies as well as coordination and transaction costs
- Retail access and choice
  - Incremental benefits to structural separation and wholesale markets are unclear
  - Large-volume commercial and industrial customers appear to fare better
  - Residential customers fared better with aggregated default rates (S. Popowsky)

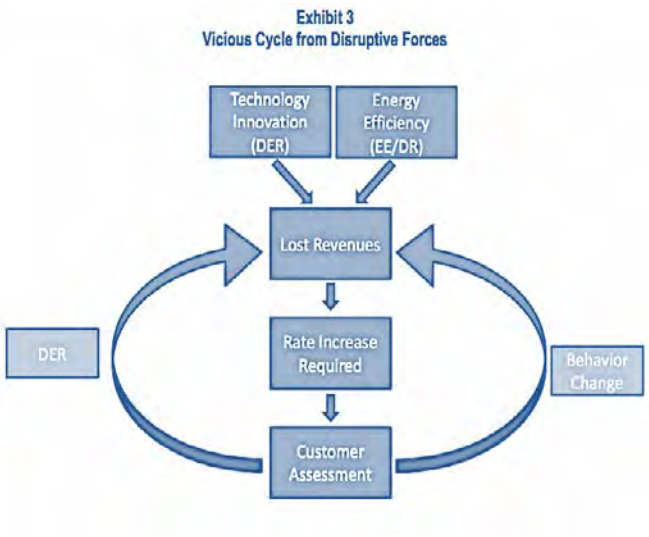
Post-restructuring issues

- Climate and clean energy imperatives
- Resource integration and dispatch
- System and network reliability
- Grid modernization
- Market design
- Demand response
- Behavioral economics
- Distributed resources
- Disruptive technologies
- Loss of customer load
- Cost allocation and rates
- Universal access and service
- Optimal scale and operations
- Structural and business models
- Reconciling choice with obligation to serve
- Consumer protection (cramming, slamming, privacy)
- Regulatory incentives and disincentives for performance



Existential threats to regulated utilities

- "Death spiral" based on loss of load and revenues or complete defection
  - End-use efficiency requires cost recovery over fewer units (rising prices)
  - Rising central supply costs make bypass and self-supply attractive (solar, water reuse)
  - Adverse selection or exclusion effect as healthiest leave and drive-up cost for remaining
- Actual displacement will depend on trends in
  - Marginal costs of production
  - Availability and price of reasonable alternatives
  - Technological advancement and productivity
  - Opportunity costs to customers
  - Price and income elasticities of demand
  - Rate design, including standby rates
  - Public policies and subsidies (tax and regulatory)
  - Public preferences for self-supply, individual ownership

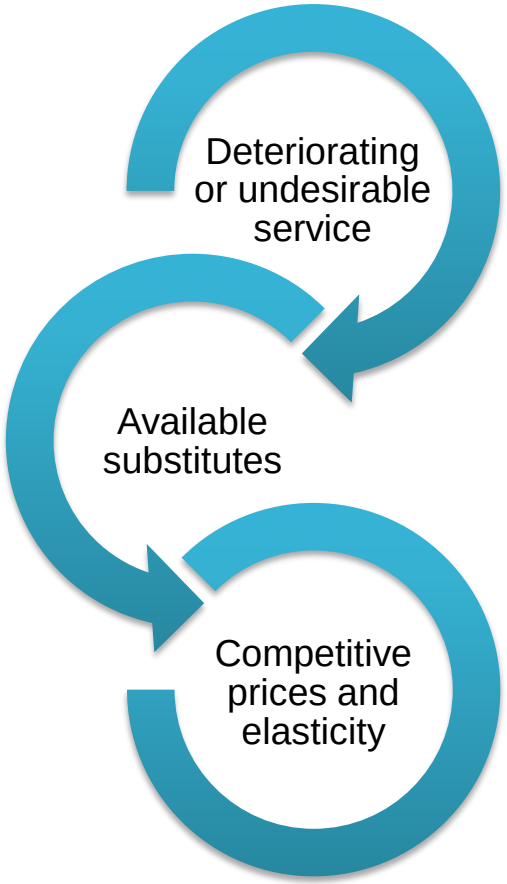


Edison Electric Institute

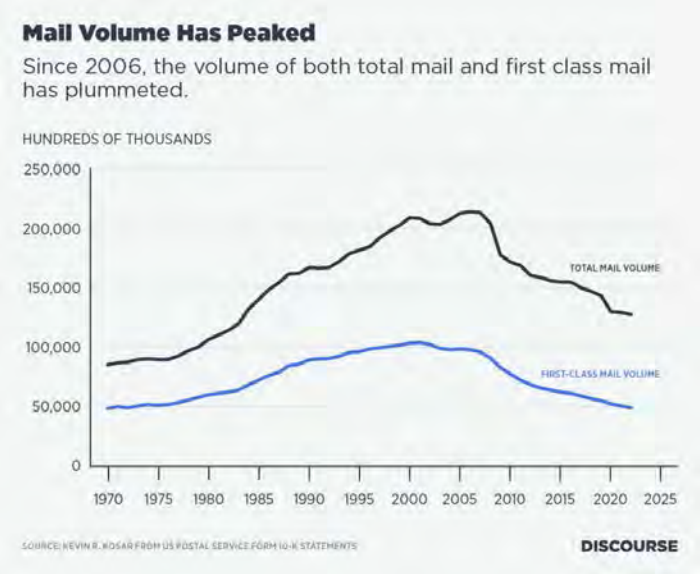
- Utilities must face a dynamic equilibrium
  - Network must continue to provide value at reasonable prices
  - With diversity and decentralization in demand and supply, grids may have more value
  - In the long run, neither the Constitution nor regulation protects utilities from broad market forces, loss of value, and consumer sovereignty (see *Market St. Railway,* 1945)

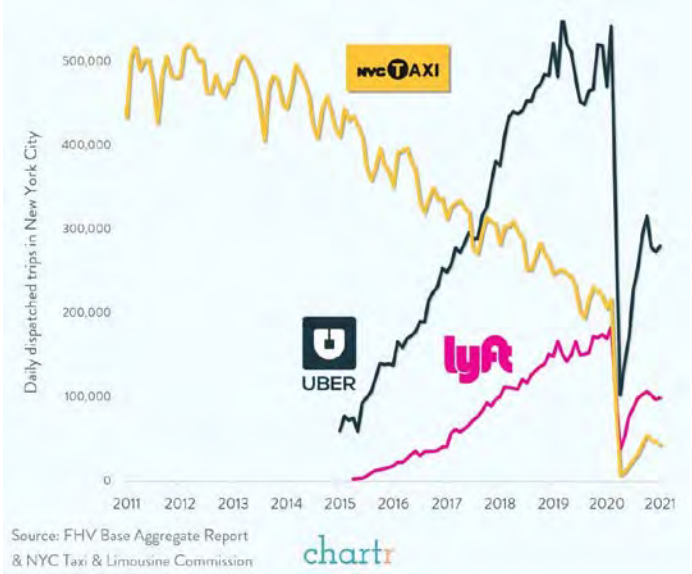
Anatomy of a death spiral: Market St. Railway (1945)

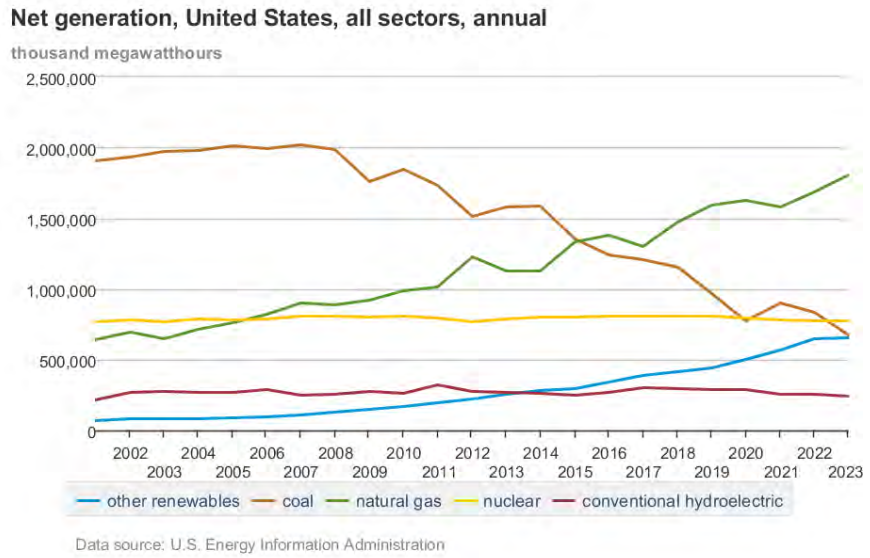
- Competition is normally expected to drive costs and prices downward
  - As prices rise and usage falls (elasticity effects), utilities want revenue protection – higher fixed charges and revenue decoupling
  - Higher prices in turn affect competitiveness
- *Market St. Railway* (1945)
  - The court held that no regulated price that consumers would pay could cover costs and sustain operations
  - "Even monopolies must sell their services in a market where there is competition for the consumer's dollar and the price of a commodity affects its demand and use."
  - Rate regulators had not acted inappropriately and cannot be expected to act as a taxing agency to redistribute wealth
  - Factors contributing to the demise: deteriorating service, available substitutes, competitive prices and price elasticity
- Implications for utilities and energy resources (e.g., coal, gas) – *a case worth reading*



Structural substitution: can postal services, taxis, and coal survive?

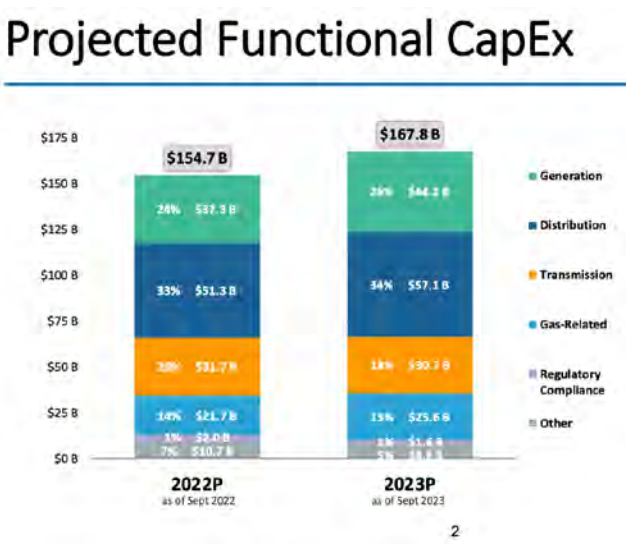




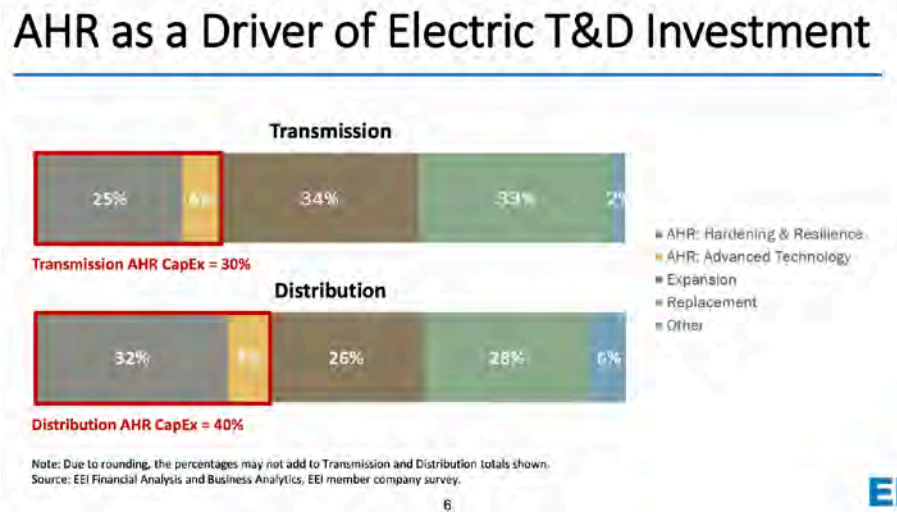


Actual and projected capital expenditures (EEI)

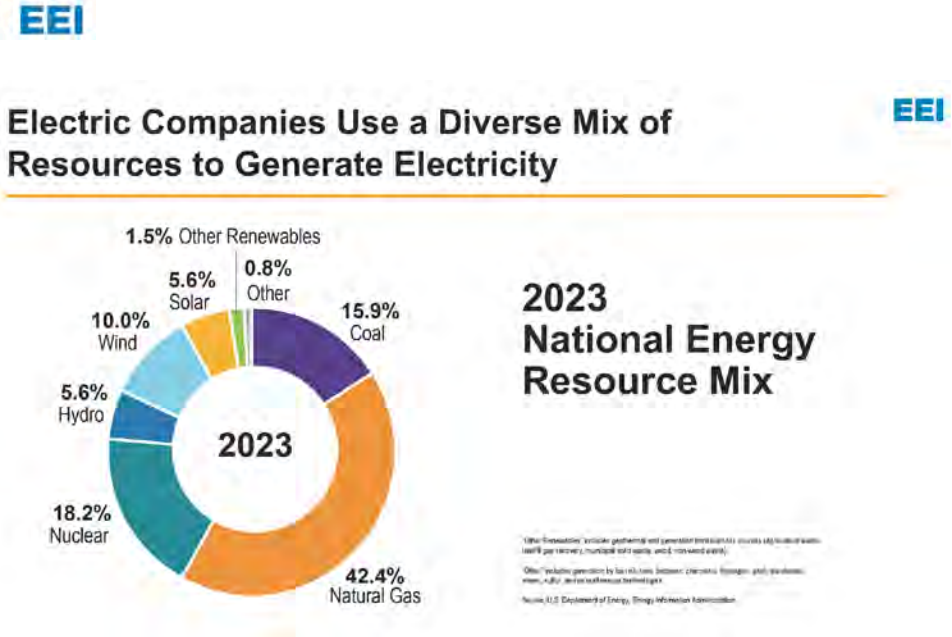
- Time frame matters to the “death spiral,” which is not yet apparent
  - Short-term loss of load and associated sales revenues
  - Mid-term excess capacity and stranded investment
  - Long-term loss of capital investment opportunity
- Stranded investment is a function of technological, economic, and policy forces
  - May stem from public policies and restructuring
  - Loss of investment opportunity is associated with a major disruption and obsolescence
  - Possible offset from “beneficial” electrification of transportation and heating
  - With distributed resources and storage, grids may have more value



Clean energy and resilience will drive investment

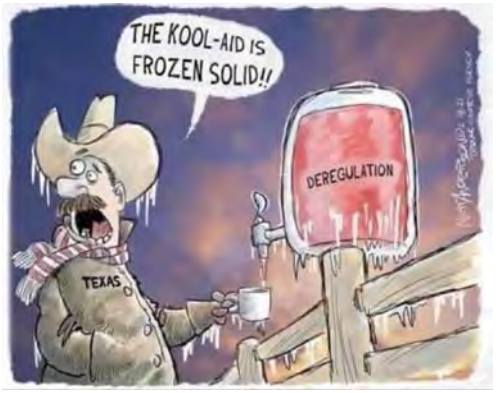


Adaptation, hardening, and resilience

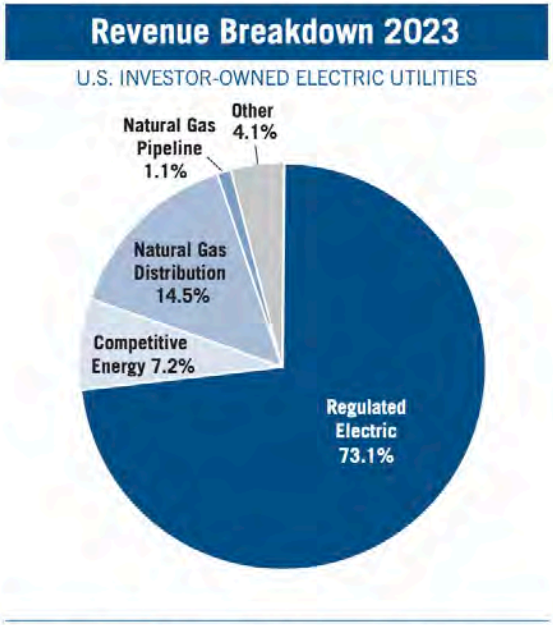


Deregulation

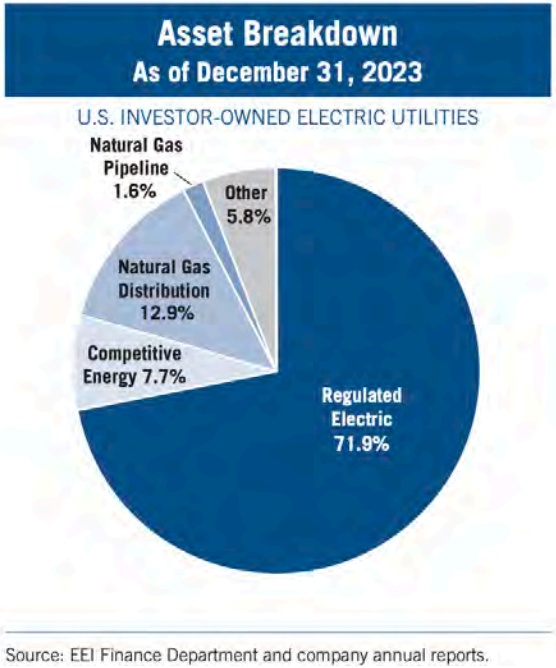
- *"If a government is incompetent to regulate effectively, it probably cannot deregulate effectively either" (M. Rothkopf, 2007)*
- Restructuring & deregulation as radical, non-incremental, irreversible policy change
  - Globally, "liberalization" refers to privatization with increased reliance on markets
  - US has deregulated (e.g., trucks, banks, airlines, cable, wellhead gas prices)
  - Agency termination is rare (e.g., ICC and CAB)
  - Utility restructuring (partial deregulation, detariffing) has seen mixed results
- Deregulation ("letting go" per Alfred Kahn) may be appropriate when
  - Regulation was mistaken in the first place (Peltzman)
  - Technological and other forces facilitate the emergence of markets
  - Competition is workable and sufficiently robust to relax safeguards
  - Residual market imperfections are trivial or tolerable
  - Net social benefit (considering all values) is achievable
  - The state is ready to surrender sovereignty (all or nothing)
- Deregulation requires regulatory capacity
  - Limits to "commodification" of utility services
  - Reliance on reactive policy tools (fair trade, antitrust)
  - Need for effective standards, analysis, and market oversight
  - Need for social regulation remains (e.g., safety, privacy, cybersecurity)



Regulation redux



Source: EEI Finance Department and company annual reports.



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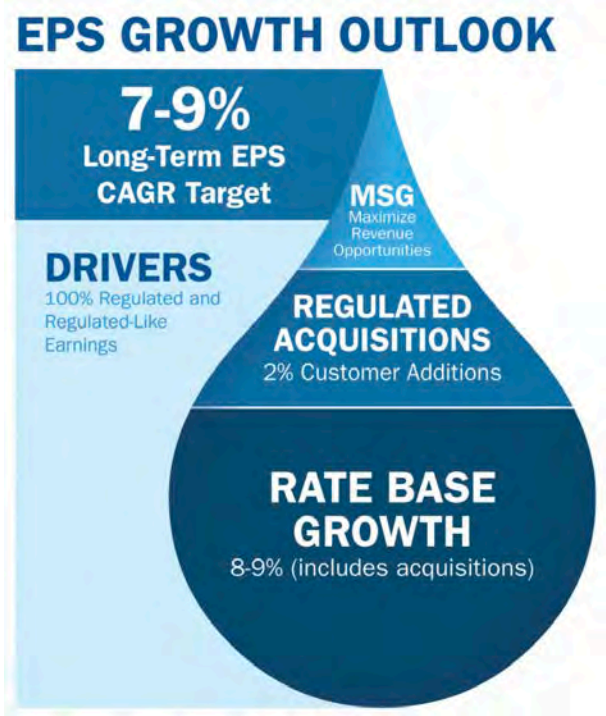

AMERICAN WATER

Reconciling markets and regulation

- Markets and regulation both serve social purposes
  - Neither markets nor regulation are ends unto themselves
  - Solution to market failure is not necessarily more markets
  - Institutional options may offer more than what markets are able or willing to provide
- Regulation and markets as institutions are not dichotomous but symbiotic
  - Ideology and values shape perceptions and can create cognitive dissonance
  - Markets do not always "naturally" evolve to workable competition
  - Regulation is needed to address demonstrable, intractable, intolerable market failures
- Regulation ("rules") can be good for markets ("just right")
  - Over-regulation: utilities lose faith and stop investing
  - Under-regulation: public loses faith and seeks alternatives
- Regulation can also be good for business
  - Good companies can take good regulation and perform well
  - Problem-solving companies can fare well
  - Government should step aside when markets are workable
  - Regulation must still do for society what markets will not do

Existential threats to regulation ⓘ

- Market failure is paralleled by “nonmarket” failure (Charles Wolf)
  - Regulation itself poses cost and efficiency issues
- Independent technocratic regulation has weakened along with other institutions
  - Overall decline in the public’s trust in government (profound implications)
  - Interest-driven technologies, methodologies, and “best practices” (best to whom?)
  - Politically motivated appointment and removal of regulators
  - Loss of independence, authority, discretion, comprehension, and institutional memory
  - Loss of analytical capacity and professionalized workforce
  - Lack of commitment to “regulatory science) – applied research, continuing education
  - Adaptation, activism, technology favoritism, micro-management, and over-reach
  - Capture, corruption, and politicization of regulators, legislators, courts
- Does regulation fail *or do we fail regulation?*
  - “Golden era” of regulation may be over (S. Thomas) as memory fades
  - Policy design, implementation, and enforcement (with exceptions)
  - Regulatory (nonmarket) failure is used to rationalize deregulation
  - Answer may not be to broaden, but to rebuild capacity and refocus
  - Markets still call for structure, rules, oversight, protections, and enforcement
  - New structural and institutional models may be necessary and inevitable

The theory of regulatory (nonmarket) failure ⓘ

- Market failure is paralleled by nonmarket failure (Wolf)
  - Even well-intended and well-designed regulation (like other policies) can result in unintended consequences and offsetting effects – cost, efficiency, effectiveness
- Is regulation a "bad" theory that is poorly formulated policy in the first place?
  - Incapable (Hayek), inefficient (Friedman), ineffective (Stigler), interest-driven (Posner), inimical (Peltzman), innovation-stifling (Kahn), inflationary (Wolf), inessential (Winston)
  - Regulation serves private interests over the public interest – where regulators seek or succumb to rent-seeking and capture (Chicago and Virginia schools)
  - Economic progress masks regulatory failure (Peltzman)
  - Fortunately, pluralism limits regulatory inefficiency or deadweight loss (Becker)
- Is regulation a "good" theory that fails in practice?
  - Regulation can be manifested in culture, capacity, continuity, and coercion
  - Signs of weakness in terms of professionalization, implementation, enforcement
  - Consequences include venue shopping, structural contestability, deregulation
- Regulatory failure is not a sound rationale for deregulation
  - Markets should demonstrate workable competition
  - Weak regulation is also de facto deregulation

Does regulation fail or do we fail regulation?

- Is regulation a “bad” theory that was poorly formulated policy in the first place?
  - Incapable (F. Hayek), inefficient (M. Friedman), ineffective (G. Stigler), interest-driven (R. Posner), inimical (S. Peltzman), innovation-stifling (A. Kahn), inflationary (C. Wolf)
  - Regulation serves private interests over the public interest – where regulators seek or succumb to rent-seeking and capture (Chicago school)
  - Economic progress masks regulatory failure and deregulation is needed when regulation was simply a “mistake” (S. Peltzman)
  - However, pluralism limits regulatory inefficiency or deadweight loss (G. Becker)
- Is regulation a “good” theory that fails in practice?
  - Types of regulatory failure: culture, capacity, continuity, and coercion
  - Manifestations: weak implementation and enforcement
  - Consequences: venue shopping, structural contestability, and rationalizing deregulation
- Effective regulation
  - Performance assessment according to suitable metrics
  - Benefits of regulation should outweigh costs
  - Regulatory processes should be efficient

Observations on the evolution of regulation

- Regulation remains a necessary policy tool in the context of market failures
- History reveals there are no market or regulatory panaceas
- Policy change is path-dependent, incremental, and experimental
- Regulation should be independent and fair but also tough and vigilant
- Improving regulatory practice requires capacity and commitment
- Regulators should adhere to core principles, ethics, and due process
- Regulation can and should be responsive and cautiously adaptive
- The regulatory paradigm has evolved and will continue to do so
- Policymakers should remain open to structural and regulatory alternatives

Finally, if you feel like an imposter, you're not alone…