Regulatory policy and accounting practice
Poll 1: Accounting regulators

- Which of the following is *not* an accounting regulator:
  - A. Securities and Exchange Commission (SEC)
  - B. Internal Revenue Service (IRS)
  - C. Federal Energy Regulatory Commission (FERC)
  - D. Financial/Governmental Accounting Standards Board (FASB/GASB)
Established in 1973, the Financial Accounting Standards Board (FASB) is the independent, private-sector, not-for-profit organization based in Norwalk, Connecticut, that establishes financial accounting and reporting standards for public and private companies and not-for-profit organizations that follow Generally Accepted Accounting Principles (GAAP).

The FASB is recognized by the U.S. Securities and Exchange Commission as the designated accounting standard setter for public companies. FASB standards are recognized as authoritative by many other organizations, including state Boards of Accountancy and the American Institute of CPAs (AICPA). The FASB develops and issues financial accounting standards through a transparent and inclusive process intended to promote financial reporting that provides useful information to investors and others who use financial reports.

The Financial Accounting Foundation (FAF) supports and oversees the FASB. Established in 1972, the FAF is the independent, private-sector, not-for-profit organization based in Norwalk, Connecticut, responsible for the oversight, administration, financing, and appointment of the FASB and the Governmental Accounting Standards Board (GASB).
ESG reporting and standards

- **Purpose of reporting and standards**
  - Communicate the impacts of Environmental, Social, and Governance (ESG) factors facing the reporting company
  - Establish a framework and disclosure standards facilitating communication about financially material, decision-useful ESG information

- **Standard-Setting authority for reporting and standards**
  - More than a dozen organizations are currently providing guidance, scoring, or standards, for ESG reporting
  - June 2022, SEC issued proposed rules to establish new disclosure and reporting requirements related to ESG
  - At the end of June 2022, the Sustainability Accounting Standards Board (2011) transitioned into the International Sustainability Standards Board (ISSB), becoming part of International Financial Reporting Standards Foundation

- **Ongoing issues**
  - Competing incentives and possible conflict with fiduciary obligations
  - Authority of and consideration by financial and economic regulators
  - Separation of E,S, and G
Environmental, social, and governance reporting

Environment
Climate change, greenhouse gas/carbon emissions, environmental policies, energy/renewable usage, water usage, land protection, biodiversity, waste management, etc.

Social
Diversity, equity & inclusion policies, wage gaps, health & safety, human rights and child labor protections, data privacy, community relations, employee engagement, etc.

Governance
Board composition, executive compensation, ethics, bribery and corruption, lobbying, political contributions, etc.

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ESG and regulation

- Utilities exemplify ESG issues and raise interesting regulatory issues
  - Do ESG objectives align with those of shareholders, ratepayers, and regulators?

- Implementation costs
  - Monitoring and reporting only
  - Investment and spending decisions

- Reconciliation with prevailing regulatory standards
  - Prudence
  - Used and useful
  - Just and reasonable
  - Ratepayer benefits
  - Public interest

- Should ESG standards also yield to regulators?
Poll 2: Accounting standards

- When regulatory accounting conflicts with Generally Accepted Accounting Principles (GAAP)
  A. GAAP prevails
  B. Regulatory accounting prevails
  C. Parties negotiate a settlement
  D. FASB issues an order
  E. Call Danny Kermode
“GAAP must yield”

- "If GAAP conflicts with the accounting and financial reporting needed by the Commission to fulfill its statutory responsibilities, then GAAP must yield. ..."

- 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).

- Regulatory policy drives accounting, not vice versa
  - Accounting principles, standards, and practice inform policymaking
  - Changing accounting rules does not change regulatory policy
  - GAAP does not constrain or grant permission

- Examples
  - Depreciation expense for contributed capital
  - Valuation of physical and natural assets
  - Ratebase treatment of expenses
  - Revenue decoupling
Poll 3: Accounting and policy

- Which of the following is false?
  
  A. Regulatory policy is expressed in accounting treatment
  
  B. Regulatory accountants implement regulatory policy
  
  C. Accounting rules constrain regulatory policy
  
  D. Accounting treatment plays a role in incentive regulation
“All regulation is incentive regulation”

- A formal definition of economic regulation
  - An authoritative institution for governmental intervention in the context of market failure in order to police, influence, or correct individual or corporate behavior in order to provide protection and increase general welfare consistent with the public interest and associated social values

- Regulation has always been about*
  - Setting performance standards for utilities and markets – imposing structure
  - Providing incentives – exercising discretion
  - Ensuring accountability – enforcing rules

- Role of standards in economic regulation
  - Set by various regulatory, self-regulatory bodies
  - For example, FASB for accounting, NERC for reliability (both private entities)
  - Critical tools for evaluating utility performance (baselines and benchmarks)

* Parallels Morgan & Yeung (2007)
Modifications to regulation

- Create tension with
  - Accounting theory
  - Finance theory
  - Economic theory
  - Legal theory

- Alter or magnify behavioral incentives to achieve policy objectives
  - Aimed at producers or consumers
  - Promoted by utilities and other special interests
  - May reflect regulatory activism

- Involve changes to conventional ratemaking practices
  - Cost accounting
  - Cost allocation and rate design
  - Authorized return on investment
Modifications to regulation

- Tend to shift costs and risks
  - Among ratepayers
  - From shareholders to ratepayers
  - From taxpayers to ratepayers

- Incentive mechanisms also transfer wealth ("subsidization")
  - Long-standing critique of economic regulation
  - Subsidies supported by utility rates are a regressive form of taxation
  - Direction matters - incentives intended to change the behavior of utilities, their investors, or their ratepayers are distinct from those to advance the goals of universal service
Three risk-based incentive tools used by regulators

- **Incentive returns:** innovation (active and used sparingly)
- **Prudence reviews:** efficiency (reactive and used selectively)
- **Regulatory lag:** cost control (passive and used on an ongoing basis)
Three tools (continued)

- **Regulatory lag in cost recovery is part of the regulatory paradigm by design**
  - Much maligned and a “blunt” instrument but purposive in maintaining short-term risk
  - “Best practices” and “constructive environments” tend to shift risks to ratepayers
  - Use of mechanisms to reduce lag call for adjusting authorized returns
  - Public ownership and deregulation also “resolve” the problems of lag, 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 ratebase 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”) – as will competition (see E. Bailey, 1974)
## Incentives under traditional regulation

<table>
<thead>
<tr>
<th></th>
<th>Investment</th>
<th>Cost control</th>
<th>Efficiency</th>
<th>Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Return on investment</strong></td>
<td>Premium embedded in the fair return to promote infrastructure investment</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Financial accounting and reporting</strong></td>
<td>Transparency in capital and operating expenditures and performance</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td><strong>Cost recovery</strong></td>
<td>Disallowance of imprudent capital or operating expenditures</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td><strong>Regulatory lag</strong></td>
<td>Time period between cost incurrence and an authorized rate adjustment</td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td><strong>Prudence reviews</strong></td>
<td>Sound managerial decisions based on knowable information</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td><strong>Financial audits</strong></td>
<td>Detailed review of general or project-specific financial indicators</td>
<td></td>
<td>✔</td>
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</tr>
<tr>
<td><strong>Management audits</strong></td>
<td>Detailed review of general or project-specific management practices</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td><strong>Price freezes or caps</strong></td>
<td>Extension of regulatory lag to a multiyear rate period</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td><strong>Certificate of public convenience</strong></td>
<td>Review of planned capital expenditure to ensure its necessity</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td><strong>Integrated resource planning</strong></td>
<td>Balanced consideration of supply-side and demand-side management options</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td><strong>Performance standards</strong></td>
<td>Specified terms of service to ensure acceptable performance</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td><strong>Incentive returns</strong></td>
<td>Bonus above fair return tied to performance to promote innovation</td>
<td></td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>
Poll 4: Regulatory lag

- Can regulatory lag be a good thing?
  
  A. Always
  B. Never
  C. Sometimes
  D. 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

- Considered by some as a “blunt” policy instrument
  - Price-cap regulation formalizes regulatory lag

- Utilities, rating agencies, other interests promote “constructive” practices to reduce regulatory lag – and thus revenue and earnings risk
  - Key rationale is that more automation and mechanization will reduce rate case frequency and expense
  - Policymakers have to consider the potential cost of 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 spent more effort on reducing lag than reducing costs (lean practices)
  - Methods include cost and revenue adjustment mechanisms
  - Certain and expedient cost recovery and time limits (“shot clocks”) shift burdens of proof and risks from utility investors to ratepayers
Definitions of regulatory lag

- **Formal definition of regulatory lag**
  - The delay between a change in costs or revenues (+/-) and a change in authorized prices charged to ratepayers – normally triggers a rate filing

- **Alternative conceptions of regulatory lag**
  - Lag is the time period between when an unregulated firm and a regulated firm could put in place a defensive price adjustment (economic)
  - Time associated with relevant changing conditions on realized returns (financial)
  - Time associated with test years or adjustment mechanisms (policy)
  - Time associated with decision-making process delays (bureaucratic)
  - Time period between rate filing and rate authorization (procedural)
  - Time period between rate-case decisions when prices are capped (practical)
Regulatory vs. utility lag

- Lag presents upside and downside potential – “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)

- Not all lag is regulatory – “utility lag” may fall to management
  - 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

<table>
<thead>
<tr>
<th>Cost and sales trends between rate adjustments</th>
<th>Increasing operational efficiency</th>
<th>Decreasing operational efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falling costs and/or rising sales</td>
<td>Achieving returns is likely</td>
<td>Achieving returns is possible</td>
</tr>
<tr>
<td>Rising costs and/or falling sales</td>
<td>Achieving returns is possible</td>
<td>Achieving returns is unlikely</td>
</tr>
</tbody>
</table>
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 if prices could not 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 case, 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 costs in and 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
Reducing lag with adjustment mechanisms

- **Adjustment mechanisms to reduce lag have proliferated (“mechanization”)**
  - Pushed by industry interests and rationalized by lowering rate case expense

- **Cost adjustments: riders, trackers, and surcharges**
  - Originally applied only to variable operating costs meeting four criteria:
    - Substantial, recurring, volatile, and largely outside of utility’s control – e.g., fuel
    - Expanded to include capital-related costs that do not meet these criteria – e.g., DSIC
    - Similarities to construction-work-in-progress (CWIP) in rate base
    - Not “automatic” - must be reviewed and reconciled

- **Revenue adjustments: decoupling**
  - Detaches sales from revenues and profit potential
  - Ultimate adjustment mechanism – creates a revenue cap (vs. price cap)
  - Similar to weather normalization or other revenue-related mechanisms

- **Implications for risk and returns**
  - Risk shifting from shareholders to ratepayers
  - Reduction in cost and and revenue risk call for revisiting returns
Adjusting for inflation

- **Rate cases**
  - Effects on costs and possibly sales
  - Known and measurable standard
  - Cost adjustment vs. earnings attrition mechanisms

- **Inflation indexes**
  - Price-cap regulation
  - Small systems

- **Utilities may or may not track general inflation**
  - Indexing may not cover investment needs
  - May be self-fulfilling for subsectors
  - Adjustments undermine incentives
  - Shields utilities from risk
  - Possible over-mechanization
Revenue decoupling

- Decoupling is a revenue-assurance mechanism (the ultimate mechanism)
  - Compared to a cost-adjustment mechanism (e.g., DSIC)
  - Detaches sales from revenues and profit potential – caps revenues (vs. prices)
  - Similar to weather normalization or other revenue-related mechanisms
  - More than “just rate design”

- Meant to address the presumed “split” or “throughput” incentives (to sell more)
  - Reactive policy to address nonstationary declining usage and sales due to efficiency in the context of persistent capital intensity – lowering revenue risk
  - Addresses revenue erosion or attrition by maintaining revenue neutrality per-customer
  - Does not provide a positive incentive for efficiency (return incentives persist)

- Traditional rate formula
  - Revenues = fixed price * sales

- Decoupling rate formula
  - Price = fixed revenue / sales

- Alternatives
  - Better demand forecasting
  - Frequent rate adjustments
  - Rate or revenue stabilization funds
Concerns about decoupling

- **Decoupling conflicts with**
  - Consumer sovereignty and dynamic price signals about value
  - Concept of variable capacity costs and long-term optimization
  - Competition, market forces, and dynamic pricing (reinforces status quo)
  - Risk allocation under regulatory compact (guarantees of profit and recovery of uneconomic “stranded” costs)

- **Decoupling issues**
  - Public utilities are not meant to be “revenue maximizers”
  - Decoupling is largely reactive and compensatory
  - Water usage has fallen dramatically largely without decoupling
  - Utilities enjoy higher sales but can do little to actualize them, except under-price
  - Presumes utility role in conservation and need for special incentives (see water)
  - Publicly owned utilities can make more frequent adjustments
  - Mandates and standards are likely more effective to achieve efficiency goals
  - Too little attention to equitable alternatives to allocation based on sales
  - Methods of (de)coupling also matters to efficiency and equity
  - Rationale varies over time and by utility sector – and not all utilities favor
Concerns (continued)

- Reasons for changes in demand cannot be easily isolated
  - May be due to recession, price elasticity, or other forces
  - Partial decoupling attempts to targeting only purposive or mandated reductions
- Intractable problem for utilities is the investment (not sales) incentive
  - Private utilities are motivated by investment opportunity
  - Decoupling makes utilities indifferent about sales only if the allowed return is close to the cost of capital to minimize preference for capital spending (S. Kihm)
  - Revenue caps have been strongly criticized (M. Crew and P. Kleindorfer; K. Costello)
- A somewhat languid tool and not a panacea for the incentives problems
Alternatives to decoupling

To address revenue shortfall and compensate utilities (reactive)
- “Organic” decoupling with more efficiency and stability over time (i.e., do nothing)
- More frequent rate cases to address utility lag in strategic response (gradualism)
- Prospective (forward-looking) test year for both costs and sales
- Evidence-based rate design to provide stability from inelastic usage blocks
- Demand-suppression adjustments to account for price elasticity effects
- Cost or revenue adjustment mechanisms (with performance, earnings checks)
- Alternatives for recovery of fixed costs (e.g., service level, property value)
- Improved demand forecasting and modeling (beyond moving averages)
- Rate or revenue stabilization funds with appropriate ring--fencing

To encourage efficiency investment by utilities (proactive)
- Resource and asset planning that recognizes demand dynamics
- Conditional franchises to include resource efficiency goals
- Specification of reasonable capacity utilization profiles
- Application of prudence and used and useful standards
- Incentive-based returns based on performance and outcomes
- Use of incentives must consider risk and equity effects
A cautionary note about “best practices”

- Concept is inconsistent with sound policy analysis
  - Often appropriated by regulated and special interests that define and promote
  - 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
Regulatory incentives: parsing regulatory fact and fiction

- Incentives that favor capital expenditures: the spending propensity
- Incentives that favor rate base treatment: the technology neutrality issue
- Incentives that favor selling output: the throughput motive
- Incentives that favor high fixed charges: the rate-design dilemma
- Incentives that favor centralized technologies: the prosumer problem
- Incentives that favor the status quo: the innovation challenge
Poll 5: Do utilities need incentives?

- Do utilities need incentives to upgrade and modernize infrastructure?
  
  A. Yes
  
  B. No
  
  C. Sometimes
Incentives that favor capital expenditures: the spending propensity

- Given the strong incentives for capital investment under the RBROR model, the insinuation that it may stand in the way of grid modernization by regulated utilities seems a bit disingenuous

- Three spending propensities
  - Capital investment generally
  - Averch-Johnson effect (capex over opex)
  - Temptation to gold plate
Industry finances and investment (EEI data)

Industry Capital Expenditures

Chart represents total company spending of U.S. Investor-Owned Electric Utilities, consolidated at the parent or appropriate holding company.

Note: At the industry level, CapEx tends to be overestimated for the current, or first year’s projection and underestimated for the two following years. Although the chart indicates investments are trending down in 2024 relative to 2023 levels, we expect a continued level of elevated spending after accounting for the historical trend of over- and underestimation.

Source: EEI Finance Department, member company reports, and S&P Global Market Intelligence (updated Sept 2022).
Incentives that favor ratebase treatment: the tech-neutrality issue

- Ratebase treatment is a solution in search of all problems
- Cloud computing
  - Rare example of moving from capex to opex in the modernization context
  - Effectively “monopolizes” a nonmonopolistic (potentially competitive) function
- NARUC resolution (2016)
  - Supportive but maintains a prudent investment test: “Regardless of how cloud computing is treated for regulatory accounting purposes, regulators will still examine whether the investment is prudent…”
- Considerations
  - Advanced by interested parties – ethical issues
  - Illinois rejected the proposal in 2020
  - Need for regulatory professionals to weigh in

NARUC Urges State Regulators to Allow Utilities to Include Investments in SaaS in Rate Base, Unlock the Potential of Cloud Computing

Why NARUC wants state regulators to incentivize utility cloud computing

Allowing utilities to earn a return on cloud-based software could help them better serve customers and operate the modern grid.
Incentives that favor selling output: the throughput motive

- Is there a throughput motive?
  - Utilities enjoy higher sales but can do little to effect them but underprice
  - Between cases, they will focus more on what they can control – costs

- Decoupling is meant to “neutralize” the throughput incentive
  - Largely reactive and compensatory – utilities are not “revenue maximizers”
  - Demand may change due to changing preferences, elasticities, and economic forces
  - As a counterpoint, water usage has fallen dramatically largely without decoupling

- Theoretical issues
  - Disconnecting output from prices
  - Economics-based critique of revenue caps
  - Overwhelmed by investment incentive ($r > k$)
## Fixed vs. variable charges: tradeoffs

<table>
<thead>
<tr>
<th>Recovering more costs from fixed charges</th>
<th>Recovering more costs from variable charges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static view of infrastructure</td>
<td>Dynamic view of infrastructure</td>
</tr>
<tr>
<td>(more sunk costs)</td>
<td>(less sunk costs)</td>
</tr>
<tr>
<td>Enhances revenue stability</td>
<td>Reduces revenue stability</td>
</tr>
<tr>
<td>(less sales revenue risk to utility)</td>
<td>(more sales revenue risk to utility)</td>
</tr>
<tr>
<td>Weakens price signals</td>
<td>Strengthens price signals</td>
</tr>
<tr>
<td>(less resource efficiency)</td>
<td>(more resource efficiency)</td>
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<tr>
<td>Familiar &amp; understandable but less</td>
<td>Familiar &amp; understandable but more</td>
</tr>
<tr>
<td>acceptable (more predictable and less</td>
<td>acceptable (less predictable and more</td>
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<tr>
<td>controllable)</td>
<td>controllable)</td>
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<tr>
<td>Less affordable for low-income households</td>
<td>More affordable for low-income households</td>
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<tr>
<td>(more regressive)</td>
<td>(less regressive)</td>
</tr>
<tr>
<td>Encourages self supply and grid</td>
<td>Preserves grid supply and participation</td>
</tr>
<tr>
<td>defection (may raise some costs)</td>
<td>(may lower some costs)</td>
</tr>
<tr>
<td>Possible advantage for combined</td>
<td>Possible stability from first blocks</td>
</tr>
<tr>
<td>households (one fixed customer charge)</td>
<td>(relatively inelastic usage)</td>
</tr>
</tbody>
</table>
Incentives that favor centralized technologies: the prosumer problem

- Assumptions about scale are changing
  - Prosumerism appears to be on the rise
  - Other demographic trends may contradict

- Utility pricing must consider both efficiency and equity for different customers
  - Interclass and intraclass
  - Program participants and nonparticipants

- Alternative methods of rate design can be accommodated by the traditional paradigm
  - Emerging pricing models for net metering
Incentives that favor the status quo: the innovation challenge

- Innovation has always been a challenge for public utilities
  - Innovation is not necessarily incompatible with grids, monopoly, or regulation
  - Utilities will benefit from innovation that reduces costs between cases
  - Modernization will involve investment in innovative technologies
- Modern utilities are optimizers under dynamic supply and demand conditions
- New York’s REV and UK’s RIIO as case studies
Incentives to upgrade distribution infrastructure: DSIC

- Distribution system improvement charges (DSIC)
- Concerns
  - Overuse that shifts risks from shareholders to ratepayers
  - Narrows scope of review (single-issue ratemaking)
  - Asymmetrical and unidirectional (matching principle)
  - Neglects interrelated revenue and expenditure effects
  - Automates recovery and limits review of prudence
  - Distorts CAPEX vs. OPEX incentives and deployment
  - Rate-case savings at cost of performance
  - Weakens incentives for planning and optimization
  - Undermines disciplinary effect of lag
Poll 6: Valuation

- How should utility assets be valued?
  A. By original cost less depreciation
  B. By the cost of replacement
  C. By an independent appraisal
  D. By the agreed-to price of a buyer and seller
Incentives for acquisitions: fair market value

- Overturns firmly embedded policy, precedent, accepted practice (original cost)
- Undermines performance incentives under the regulatory compact
- Transfers wealth from ratepayers to taxpayers that may not be co-located
- Directly at odds with water affordability goals due to inflationary effects
- Requires repayment of prior federal grants used for infrastructure
- Invalidates consolidated pricing (STP) based on taxpayer and ratepayer equity
- Reflects political negotiation ("willingness to sell") rather than market proxies
- Presumes prudence of pending capital investment (pre-approval)
- Circumvents regulatory oversight of rates and other terms of service
- Aggressive pressure on legislatures, regulators, and municipalities
- Disregards alternative options for capturing scale and professional capacities
“Financially incentivized” (CT PURA & OCC, 2/19/19)

- “The approach contained in the proposed bill, often deemed a “Fair Value Legislation”, is contrary to long-standing and well-established regulatory precedents in Connecticut and most states nationally...

- Importantly, both the water utility and the municipality are financially incentivized towards a higher valuation and purchase price.

- Under this legislation, PURA would not be allowed to consider other relevant evidence or to adjust the purchase price if it finds that the purchase price or valuation is unreasonable.

- Additionally, the evaluation methodology prescribed in the proposed bill is flawed as it fails to adjust the system valuation for necessary future capital improvements or other problems and liabilities identified in the municipal system.

- While ten states have recently adopted some form of fair value methodology, the limited results of municipal system acquisitions in those states to date illustrate that this type of legislation results in inflated purchase prices and higher utility rates for state residents.

- PURA and OCC cannot support the valuation methodology and ratemaking approaches proposed in this bill.”

Inflationary effects on revenue requirements

- Ratepayers will pay for improvements and compliance regardless
  - Privatization is means of *financing* – not *funding*

- Fair market value compounds the effects of privatization and full-cost pricing
  - Offsetting efficiency gains and avoided costs may be marginal
  - Empirical evidence on the effect of ownership on performance is mixed
  - Advantages privatization over municipalization (uneven structural competition)

- Inflationary effects
  - Original cost less depreciation (rate base) *plus*
  - More depreciable rate base (return of capital) *plus*
  - Higher cost of private debt financing *plus*
  - Cost of equity capital (risk/return premia on capital) *plus*
  - Capital infusion (new rate base investment) *plus*
  - Spending propensity (RBROR incentives) *plus*
  - Income and other taxes on private corporations (vs. equivalents) *plus*
  - Overhead (holding company administrative & general expense)
Incentives for water conservation: expenses on balance sheet

- WaterNow Alliance
  - “Governmental Accounting Standards Board (GASB) standards allow water agencies to debt fund” conservation programs or “distributed infrastructure.”
  - “Water utilities with rates regulated by city councils, utility governing boards, or state commissions generally meet all three criteria, and therefore may apply GASB 62 where relevant.”

- A parallel argument has been made to count natural resources as assets
Incentives for prudence

- Prudence is expected
  - Earns the opportunity to earn a fair return under the compact
  - Bonus returns should be used very sparingly and could be targeted
  - Managerial incentives may be less expensive than shareholder incentives

- Reconciling concept of incentives for voluntary investments

**Brief**

Energy sector divided over transmission incentives for voluntary cybersecurity investments
Incentives under alternative regulatory models

- Many “alternatives” can be considered evolutionary vs. revolutionary
  - Performance-based (yardstick) regulation
  - Price-cap regulation
  - Revenue-cap regulation
  - Multi-year rates
  - Earnings bands
  - Revenue or profit sharing
  - Formula ratemaking
  - Bonus returns

- Hybrid model
  - RB/ROR for CAPEX
  - Price caps for OPEX
  - Performance metrics

- Emerging
  - Consumer-centric regulation
  - Alternative structural models

- Many alternatives raise issues about loss of regulatory oversight and discretion
From death spiral to electrification
Poll 7: COVID-19 impact

- Who should bear the cost of the COVID-19 crisis on utilities?
  - Delinquent ratepayers
  - All ratepayers
  - Shareholders
  - Taxpayers
  - All of the above
Institutional history and pandemic as a known risk (2005)

Resolution for State Commissions’ Action Relative to Pandemic Preparedness

WHEREAS, A Pandemic is a global disease outbreak caused by a virus for which there is little or no immunity in the human population that causes serious illness and then spreads person-to-person worldwide and many scientists believe it is only a matter of time until the next pandemic occurs; and

WHEREAS, During the 20th century there were 3 pandemics: the 1918 influenza pandemic caused at least 500,000 U.S. deaths and up to 40 million deaths worldwide; the 1957 influenza pandemic caused at least 70,000 U.S. deaths and 1-2 million deaths worldwide; and the 1968 influenza pandemic caused about 34,000 U.S. deaths and 700,000 deaths worldwide; and

WHEREAS, When a pandemic emerges, its global spread is considered inevitable and although measures such as border closures and travel restrictions may delay the arrival of the virus but cannot stop it; and

WHEREAS, When a pandemic occurs a substantial percentage of the world’s population will require some form of medical care and medical systems throughout the world will be severely depleted in the attempt to provide medical resources to the sick and dying of people who have

WHEREAS, A school, governr
absenteeism;
and
WHEREAS, W
in effectively re
WHEREAS, P
for continuity o
2001; now there

RESOLVED, That the National Association of Regulatory Utility Commissioners (NARUC), convened in its November 2005 Annual Convention in Indian Wells, California, encourages State commissions to initiate dialogue no later than first quarter 2006 and/or continue current communication with their regulated companies about their continuity of operations planning including ensuring that critical personnel receive inoculation on a priority basis as they relate to a potential pandemic; and be it further

RESOLVED, That such plans be reviewed and updated on an annual basis, be robust in assuring staffing for critical functions through cross training, permit modification of operation to enhance telecommuting or remote dispersal of personnel to minimize disease transmission, and be responsive to the potential of travel restrictions affecting the general movement of the population.

Sponsored by the Ad Hoc Committee on Critical Infrastructure
Recommended by the NARUC Board of Directors November 15, 2005
Adopted by the NARUC November 16, 2005
Avian (or bird) flu is an influenza virus that occur naturally among wild birds. The HSN1 variant is deadly to domestic fowl and can be transmitted from birds to humans. There is no human immunity and no vaccine is available. When bird-to-human transmission has occurred, it has resulted in a high rate of fatalities; however, there has been very little bird-to-human transmission of this virus to date.

Pandemic is any virulent human disease that causes a global outbreak of serious illness. Because there is little natural immunity, the disease can spread easily from person to person. Currently, there is no pandemic flu based on HN51, but it has qualities that have alerted public health and emergency management decision-makers to the importance of preparedness for this high-consequence, low-probability threat.

Critical Infrastructure Training Workshop for the NCSL Task Force on Energy Supply
San Antonio, TX, August 7, 2011
National Association of Regulatory Utility Commissioners
Miles Keogh
Christina Cody
Funded by a contract with the US Department of Homeland Security

Need for “all-threats” planning (2005-2016)

Conducting an Energy Emergency Tabletop Exercise in Your State: A Step By Step Guide

December 2010
Miles Keogh, Director, Grants & Research
The National Association of Regulatory Utility Commissioners (NARUC)

Funded under a cooperative agreement with the U.S. Department of Energy

One team’s ranking of risk for catastrophic events, Denver, 2016

<table>
<thead>
<tr>
<th>EVENT</th>
<th>PROBABILITY</th>
<th>VULNERABILITY</th>
<th>CONSEQUENCE</th>
<th>RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storms</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>High-medium</td>
</tr>
<tr>
<td>Cyber attack</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Electromagnetic pulse</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Downed trees</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Flooding</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Pandemic</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>
Impact on electricity usage (EIA)

Retail sales of electricity, United States, monthly

Electricity Use Before and During the COVID-19 Pandemic

Weather-adjusted electricity consumption relative to Feb. 2020

Source: Researcher's calculations using data from the Energy Information Administration

Stacked regions represent 95% confidence intervals
Load was less peaky and weekly demand is more even

Non-Residential Electricity Consumption in Texas

Source: This plot and the next one further below come from Steve Cicala “Powering Work from Home” and was constructed using data from Innowatts, a Houston-based energy data analytics company.

Residential Electricity Consumption in Texas
**Impact on emissions**

**EMISSIONS BOUNCE BACK**
After a sharp drop early in the pandemic, global CO₂ emissions rose as worldwide economic activity recovered in 2020. This trend continued even though some countries put fresh restrictions in place as coronavirus infections soared.

1. China imposes lockdown on Wuhan, where coronavirus was first detected.
2. Slammed by COVID, Italy issues a national lockdown.
3. California becomes first US state to impose a lockdown.
4. India begins its first nationwide lockdown.
5. As Europe surpasses 100,000 new daily infections, countries announce new wave of restrictions.
6. California imposes a 3-week lockdown after registering its highest daily total of new infections.

*Megatones carbon dioxide.
# Impact on revenues

## Expected Impact on Revenue for a Typical Large Electric Utility in the US

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Expected Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>The outbreak lasts three to four months</td>
<td>Less than $500 million</td>
</tr>
<tr>
<td>It takes six to twelve months to regain control</td>
<td>Between $500 million and $1 billion</td>
</tr>
<tr>
<td>The pandemic extends more than twelve months</td>
<td>Greater than $1 billion</td>
</tr>
</tbody>
</table>

Source: Credit Suisse, Oliver Wyman analysis

Cost-control measures

MEASURES UTILITIES CAN CONSIDER TO COUNTER CORONAVIRUS REVENUE IMPACT

- Long-term
  - Shut down / recover cost on uneconomic assets
  - Focus on regulatory relations and refresh cost recovery mechanisms
  - Consider opportunistic acquisitions

- Short-term
  - Renegotiate contractor agreements
  - Refinance debt
  - Tightly manage non-regulated businesses
  - Focus on enhancing D&M productivity
  - Implement hiring freeze

Ease of implementation
- Easy
- Hard

Source: Oliver Wyman analysis

### Impact on uncollectible accounts (Zarnikau, 2020)

<table>
<thead>
<tr>
<th>Pre-Pandemic Period</th>
<th>In 2020, year as a whole</th>
<th>Percent Increases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unemployment Rate for the year (%)</strong></td>
<td>3.7</td>
<td><strong>Input</strong></td>
</tr>
<tr>
<td>2019 Actual Value at end of year</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electric Utility Disconnects (%)</strong></td>
<td>3.91</td>
<td><strong>Output</strong></td>
</tr>
<tr>
<td>%, 2004 data adjusted for subsequent Unemployment Rate changes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Using the CPUC Relationship</strong></td>
</tr>
<tr>
<td><strong>Natural Gas Bill Disconnects (%)</strong></td>
<td>3.09</td>
<td><strong>Output</strong></td>
</tr>
<tr>
<td>%, 2004 data adjusted for subsequent Unemployment Rate changes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Residential Electric Accounts in Arrears (% at least 30 days overdue)</strong></td>
<td>12.76</td>
<td><strong>Output</strong></td>
</tr>
<tr>
<td>%, 2004 data adjusted for subsequent Unemployment Rate changes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Annual Uncollectible Debt ($Billion)</strong></td>
<td>1.87</td>
<td><strong>Output</strong></td>
</tr>
<tr>
<td>Bank of America report</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Jay Zarnikau (2020)
Response to payment difficulty due to COVID-19 (UCRC, n=30)

Changes in Response to the COVID-19 Pandemic

Service and Offerings Under Consideration
- Yes
- No
- To be determined

<table>
<thead>
<tr>
<th>Service Offerings</th>
<th>Yes</th>
<th>No</th>
<th>To be determined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial debt forgiveness</td>
<td>55%</td>
<td>24%</td>
<td>19%</td>
</tr>
<tr>
<td>Full debt forgiveness</td>
<td>81%</td>
<td>24%</td>
<td>19%</td>
</tr>
<tr>
<td>Access to security deposits</td>
<td>24%</td>
<td>21%</td>
<td>19%</td>
</tr>
<tr>
<td>New forms of energy assistance</td>
<td>38%</td>
<td>34%</td>
<td>24%</td>
</tr>
<tr>
<td>Additional energy assistance funding</td>
<td>38%</td>
<td>38%</td>
<td>24%</td>
</tr>
<tr>
<td>Significant energy assistance design changes</td>
<td>48%</td>
<td>34%</td>
<td>17%</td>
</tr>
<tr>
<td>Other Changes</td>
<td>47%</td>
<td>33%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Residential arrearages (New York)

**FIGURE 1 – Residential Utility Customers and Amount in Arrears by Quarter, 2018 – 2022**

Source: New York State Department of Public Service
Disconnection moratoriums
Impact on water finances (Raftelis/AWWA/AMWA, 2020)

Estimated Total Aggregate Financial Impact on Drinking Water Utilities

<table>
<thead>
<tr>
<th>Description</th>
<th>2 Months</th>
<th>4 Months</th>
<th>6 Months</th>
<th>Annualized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginal Cost of Non-Shut Offs</td>
<td>$0.10B</td>
<td>$0.19B</td>
<td>$0.29B</td>
<td>$0.57B</td>
</tr>
<tr>
<td>Revenue Loss Due to Increased Delinquencies</td>
<td>$0.82B</td>
<td>$1.64B</td>
<td>$2.46B</td>
<td>$4.92B</td>
</tr>
<tr>
<td>Reduction in Commercial Revenues</td>
<td>$1.23B</td>
<td>$2.46B</td>
<td>$3.69B</td>
<td>$7.38B</td>
</tr>
<tr>
<td>Increase in Residential Revenues</td>
<td>($0.44B)</td>
<td>($0.88B)</td>
<td>($1.32B)</td>
<td>($2.64B)</td>
</tr>
<tr>
<td>Increase in Personnel Expenses</td>
<td>$0.10B</td>
<td>$0.21B</td>
<td>$0.31B</td>
<td>$0.63B</td>
</tr>
<tr>
<td>Reduction in System Development Charges</td>
<td>$0.43B</td>
<td>$0.87B</td>
<td>$1.30B</td>
<td>$2.60B</td>
</tr>
<tr>
<td>Reduction in Revenues from Lower Customer Growth</td>
<td>$0.01B</td>
<td>$0.05B</td>
<td>$0.09B</td>
<td>$0.41B</td>
</tr>
<tr>
<td><strong>Total Aggregate Financial Impact</strong></td>
<td><strong>$2.3B</strong></td>
<td><strong>$4.5B</strong></td>
<td><strong>$6.8B</strong></td>
<td><strong>$13.9B</strong></td>
</tr>
</tbody>
</table>
Impact on finances (AWK investor report)

Third Quarter EPS Detail by Business

COVID-19 Financial Impact Details Through June 30, 2020

($0.05) Net EPS COVID-19 Impact
Utility stock prices
Consumer advocate perspective (Howat, 2020)

- Restore service where it has been cut without hefty fees
- Develop strong and comprehensive disconnection protections for vulnerable
- Waive late payment fees and prohibit such fees and security deposit tactics
- Provide affordable deferred payment plan options for past-due bills
- Use debt forgiveness to avoid compounding for low-income households
- Expand bill payment programs that reduce monthly bills to an affordable level
- Expand access to comprehensive whole-house energy efficiency and retrofits
Impacts on regulation and ratemaking

- What costs are recoverable – e.g., lost late fees?
- Risk sharing under the compact and investor disclosure
- Cost deferral, trackers, and ratemaking treatment
- Loss of commercial and industrial load at lower unit rates
- Increased residential load at higher unit rates
- Early plant retirements and delayed infrastructure projects
- Forward investments in reliability and resilience
- Cuts in spending on operation and maintenance
- Rate cases, lost revenues, regulatory assets, and rate design
- Consumer protection policies for rates and terms of service
- Securitization of bad customer debt
Pennsylvania PUC order in PA-AWK (2021)

- Petition of Pennsylvania-American Water Company for authority to defer, and record as regulatory assets for future recovery:
  - (1) incremental expenses that the Company has incurred, and will continue to incur, in providing water and wastewater service because of the effects of the COVID-19 emergency;
  - (2) water and wastewater revenues the Company has lost associated with forgone late payment charges and reconnection fees, and will continue to lose, that are attributable to the effects of the COVID-19 emergency; and
  - (3) carrying charges on the deferred amounts (together, COVID-19-related financial impacts) is granted, in part, to allow the deferral of COVID 19-related direct expenses and savings along with the incremental uncollectibles expense and carrying charges on the deferred amounts.

- Petition is denied, in part, with respect to the request to defer and record in a regulatory asset voluntarily foregone reconnection fees, late payment charges and term loan interest expense...

- The amounts and categories for incremental costs and cost savings identified to date by Pennsylvania-American Water Company should be subject to further detailed review and investigation in a general base rate proceeding, prior to being charged in any manner to Pennsylvania-American Water Company ratepayers...

- Pennsylvania-American Water Company should be required to seek recovery of deferred costs at its first available opportunity but no later than in its next general rate case. (Order in case P-2020-3022426 issued September 15, 2021.)
Post-COVID-19 grid: a note of optimism

- “Covid-19 and The Energy Transition” (Bloomberg, 2020)
  - Clean power and electric vehicles
  - Widening our scope
  - Energy efficiency
  - Electrify everything as much as possible
  - Hydrogen and fuels from electricity
  - Circularity, bio-based solutions and capturing carbon
  - Agriculture, food, and land use

Cheung: Covid-19 and The Energy Transition: Our Greatest Decade Awaits