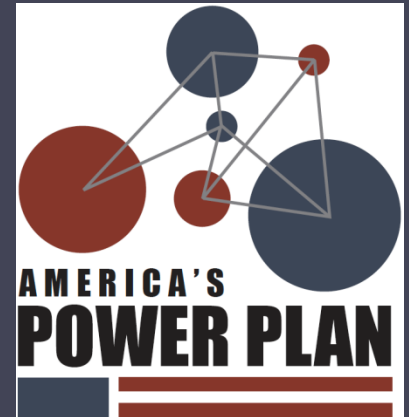


America's Power Plan



Utility and Regulatory Models for the Modern Era: Legislative Applications

Minnesota Legislative Energy Commission
St. Paul, Minnesota
August 14, 2014
Ronald L. Lehr

Thesis: Pressures on utilities to change

- Aging plant
 - Brattle Group: \$2 trillion investment over next 20 years
- Tougher environmental requirements
 - Criteria pollutants
 - Greenhouse gases
 - Coal ash
 - Water restrictions
- Flat to declining sales of electricity

Thesis: Pressures on utilities to change

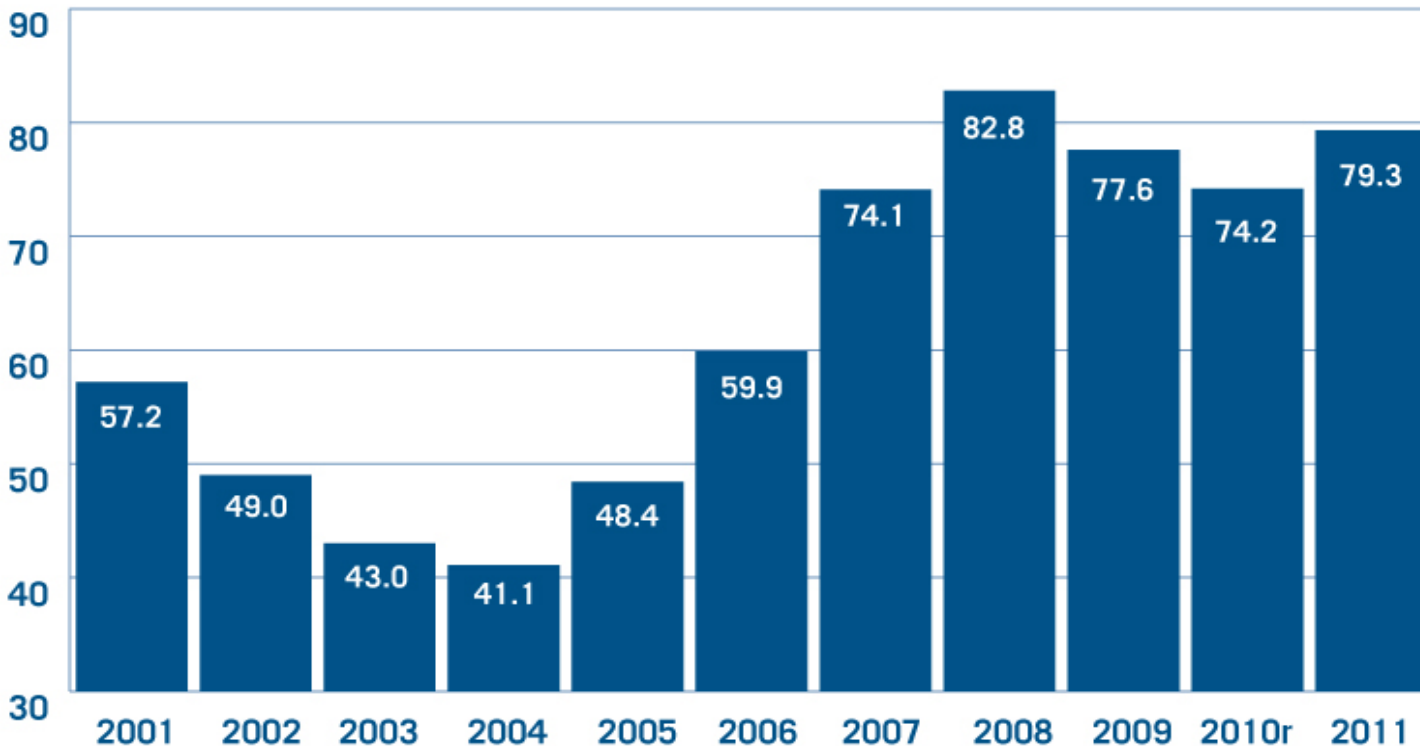
- New technologies
 - Smarter grid
 - Distributed generation: solar, CHP, micro turbines
 - Electric vehicles
 - Low cost wind and solar—Xcel example
- Changing consumer requirements
 - Disintermediation by third parties
- Weakened industry financial metrics

Pressures leading to “restructuring 2.0?”

Capital Expenditures 2001–2011

U.S. SHAREHOLDER-OWNED ELECTRIC UTILITIES

(\$ Billions)



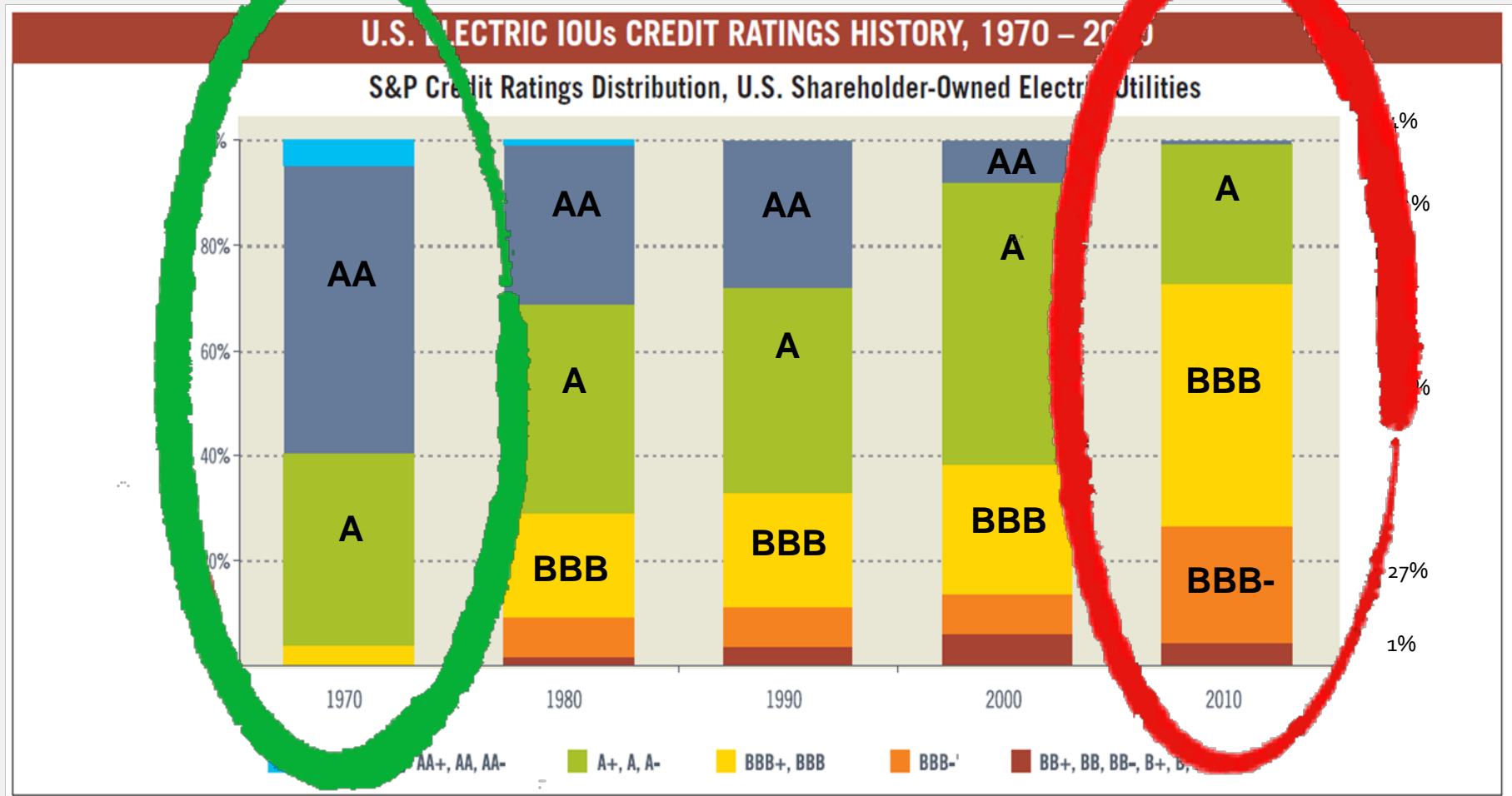
r = revised

Source: SNL Financial and EEI Finance Department

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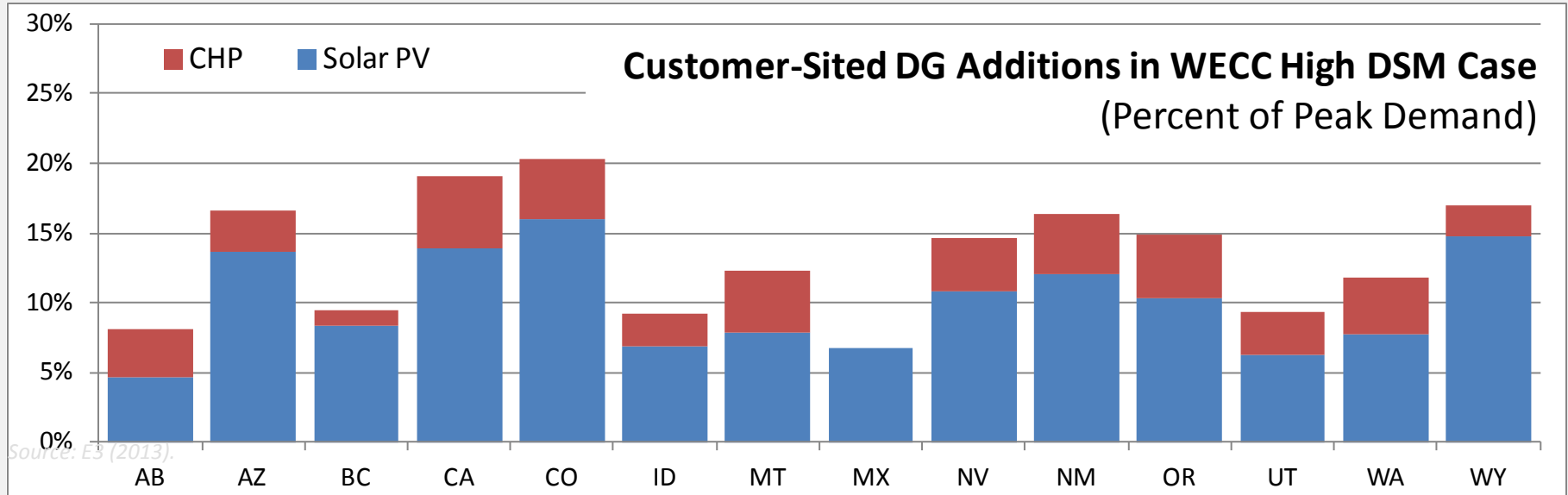
US Electric IOUs Rating History

1970 – 2010



Source: Standard & Poor's, Macquarie Capital

Potential Bypass Threats from Distributed Generation are Large



- WECC-wide Behind-the-Meter DG: 19 GW of solar PV + 7 GW of CHP
- Distributed PV based on “interconnection potential” (no back-flow through feeders), with adjustments to reflect relative economics among states
- CHP additions represent a fixed percentage (~40%) of technical potential in each state

Thesis: Regulation may not be up to the task

May not reward utilities for desired behaviors

Society's goals for utilities changing; regulation is not

Progress on demand side, not so much on supply side

Lack of incentives for

- firm efficiency
- clean energy investment
- energy efficiency
- innovation

Rate structures need revision

Balky processes

Examples of “poisoned” relationships

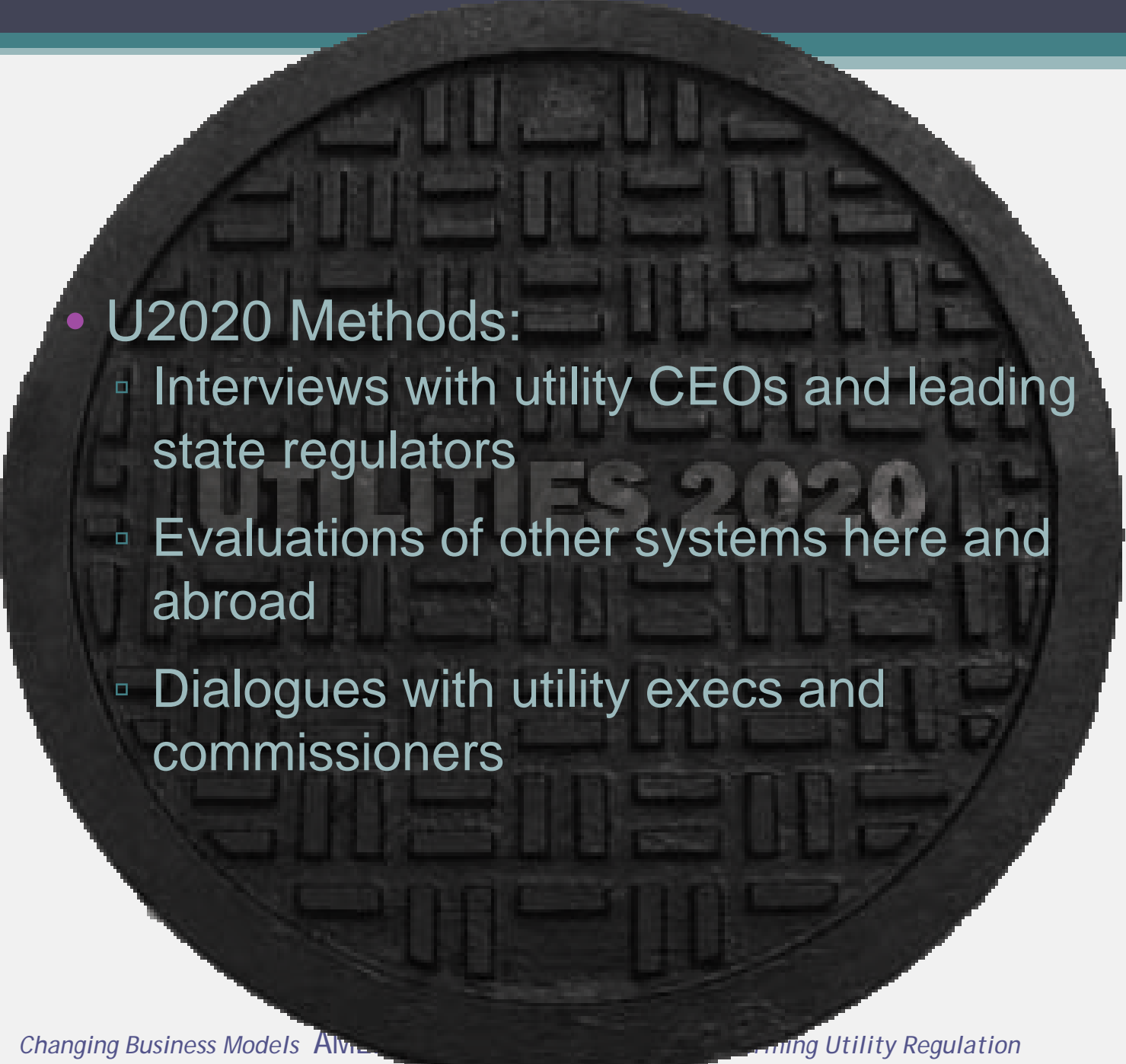
Orientation based on utility as commodity seller

Utilities 2020

- Foundation funded
- Run by two former Colorado utility regulators named Ron
- Advised by board of experts
- Goal: to explore new business models and advocate new regulatory models to enable new utility business models to evolve.

Advisory Council Members

- John Bohn
 - GlobalNet Partners, LLC
- Paul Bonavia
 - Tucson Electric Power
- Ashley Brown
 - Harvard Electricity Policy Group
- Ralph Cavanagh
 - NRDC
- Richard Cortright
 - Standard and Poor's
- Peter Fox-Penner
 - The Brattle Group
- James Newcomb and Lena Hansen
 - Rocky Mountain Institute
- John Nielsen
 - Western Resource Advocates
- Sonny Popowsky
 - PA Office of Consumer Advocate
- John Quackenbush
 - Michigan Public Service Commission
- Lisa Schwartz & Richard Sedano
 - Regulatory Assistance Project
- V. John White
 - CEERT

- 
- U2020 Methods:
 - Interviews with utility CEOs and leading state regulators
 - Evaluations of other systems here and abroad
 - Dialogues with utility execs and commissioners

Interviews

- Paul Bonavia
 - Tuscon Electric Power
- David Eves
 - Xcel Energy Colorado
- Greg Abel
 - MidAmerican Energy
- Susan Story
 - Southern Company Energy Services
- Michael Yackira (five senior staff)
 - NV Energy
- Bob Rowe
 - Northwestern Energy
- Lewis Hay
 - NextEra Energy
- Ralph Izzo
 - PSE&G
- Tom King
 - National Grid
- Colette Honorable
 - Arkansas PSC
- Susan Ackerman
 - Oregon PUC
- Phyllis Reha
 - Minnesota PUC
- Ellen Anderson
 - Minnesota PUC
- Joshua Epel
 - Colorado PUC
- John Quackenbush
 - Michigan PSC
- John Savage
 - Oregon PUC
- Jim Tarpey
 - Colorado PUC
- Ann Berwick
 - Massachusetts DPU

What we've heard from utility CEOs:

- CEOs want a clearer, more consistent direction from state energy policies
- Utilities have inadequate incentives for innovation, firm level efficiency
- Commissions need a better understanding of the utility business and its needs
- Utilities want certainty on climate policy
- Utilities want healthier working relationships with commissioners and staff

What we've heard from commissioners:

- A primary concern is with increasing utility rates
- Regulators are open to modifying the regulatory model; looking for ideas
- Some commissioners are dissatisfied with the adversarial process
- Many commissioners face severe barriers to communications with stakeholders, and even fellow commissioners
- Commissions have inadequate resources

Regulator-Utility-Stakeholder Dialogue

Dialogue among regulators, utility execs, environmental and consumer advocates. Themes that emerged:

- Participants “rarely have an opportunity” to engage directly
- Utilities: problems with regulatory structure, incentives
- Regulators: need better problem statement, lack of enthusiasm for upending familiar regulatory world
- “outside the box” regulatory options, role-playing exercises -- players fell back to familiar solutions
- Common feeling: “we’re doing OK now, but it’s hard to believe our regulatory system is capable of meeting the long term industry challenges”

Meeting of the “Tribal Elders”

- Peter Fox-Penner
- Tom King
- Ralph Cavanagh
- Lisa Wood
- Richard Sedano
- Ron Lehr
- Ron Binz
- Ashley Brown*
- Jim Kerr*
- Sue Tierney*

*Old enough, but unable to attend

Findings from the Elders

- The clean and efficient future is inevitable; utilities will need to adapt business models to accommodate the transformation.
- Regulation must be reinvented to allow and induce utilities to change.
- Load will likely be flat or declining in the future, but costs will not. Need to move away from consumption-based models toward service- and performance-based models.
- This transition is best done as a partnership, not a system that attempts to bypass or leave utilities behind.

Findings from the Elders, cont'd.

- Irreducible role for the utility as an “orchestra leader,” like “smart integrator” role in *Smart Power*.
- Regulation needs to move toward “output” regulation
 - Reward firms for outcomes, efficiency and innovation.
 - UK RIIO model with decoupling -- “revenue cap” model with incentives for various outputs.
 - *UK regulation: Did we pay for what we wanted?*
 - *US regulation: Did we pay correct amount for what we got?*
- Recommendations should be robust across different scenarios with or without wholesale or retail competition, IOU or public utility structure, etc.

Three Possible Utility Roles

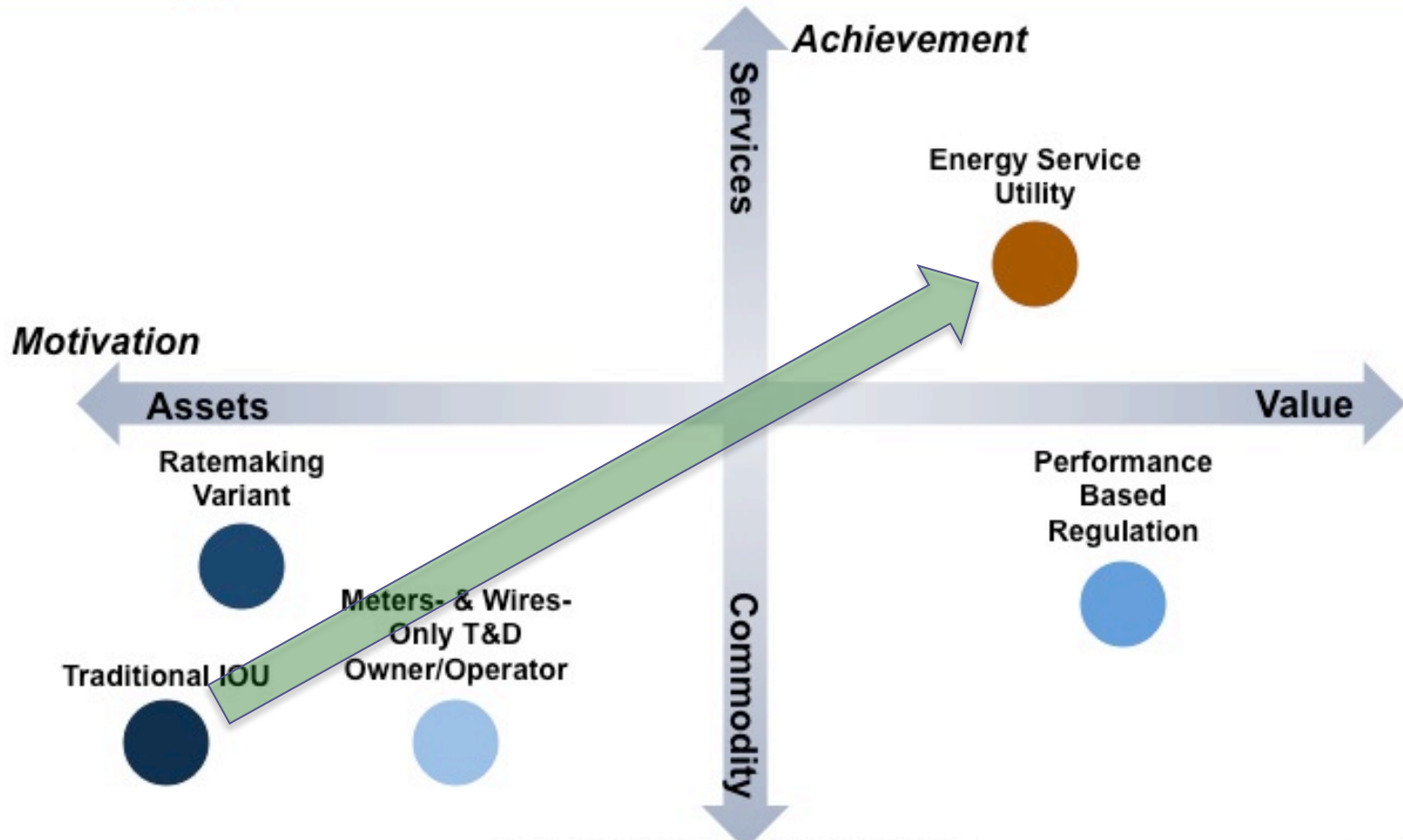
- Minimum: markets provide power and services, utilities manage wires
- Moderate: “orchestrator” “smart integrator”
 - Risk aware planning; regulated “make or buy” decisions; consumer service packages
- Maximum: Nebraska, NYPSC and Moorland Commission Reports
 - Disaster recovery
 - Climate adaptation

Three Potential Regulatory Models

- The UK “RIIO” model
 - Price cap built on RPI-X, with decoupling
 - Output regulation
 - Reliability, Environmental, Innovation, Price, Efficiency, Social Responsibility
- The “Iowa Model”
 - Seventeen years of constant rates, settlements, diminished focus on earnings levels
- The “Grand Bargain”
 - Comprehensive multi-year output-oriented deal
 - Regulator led



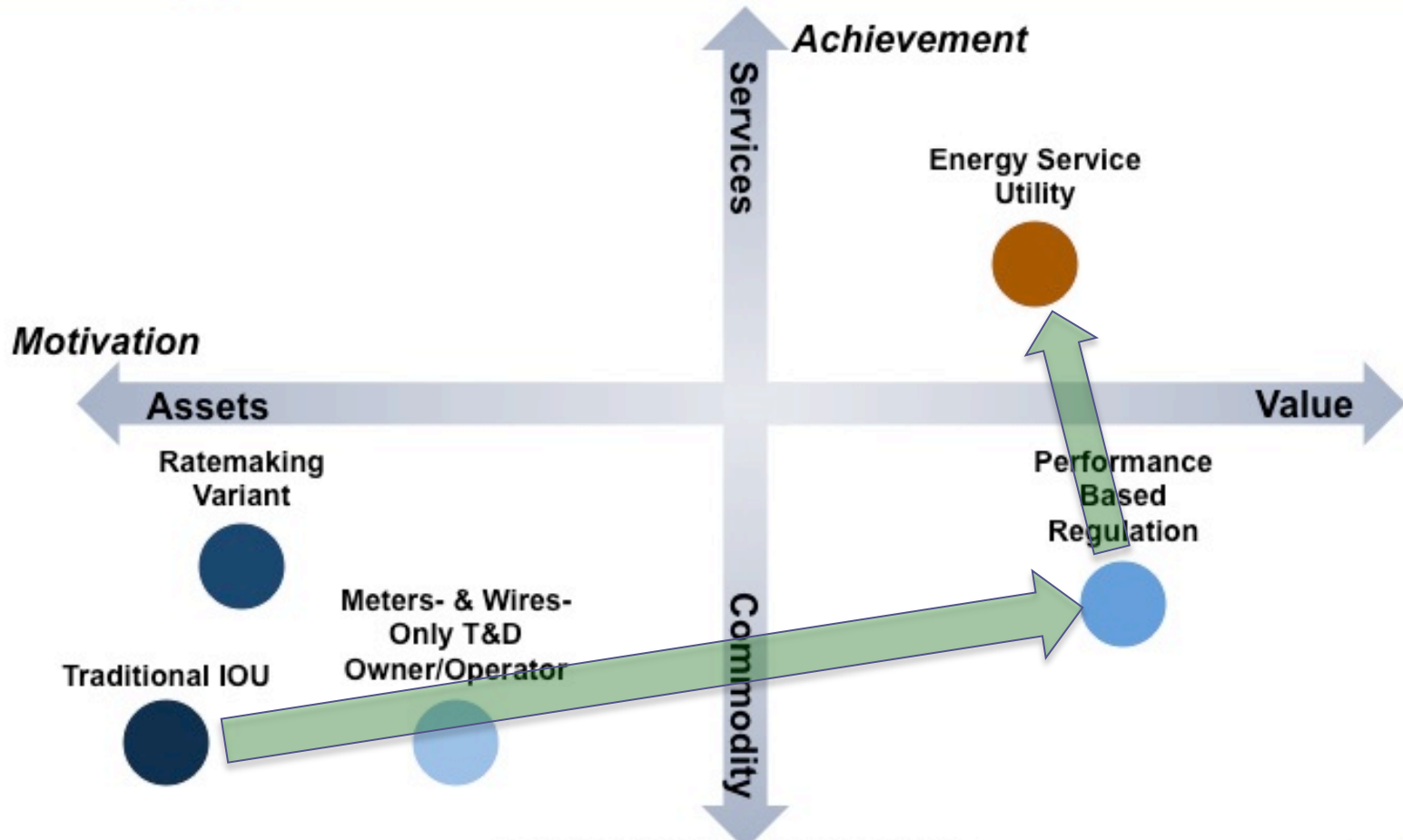
Continuum of Utility Business Models: Profit Motivation vs. Profit Achievement



Lawrence Berkeley National Laboratory

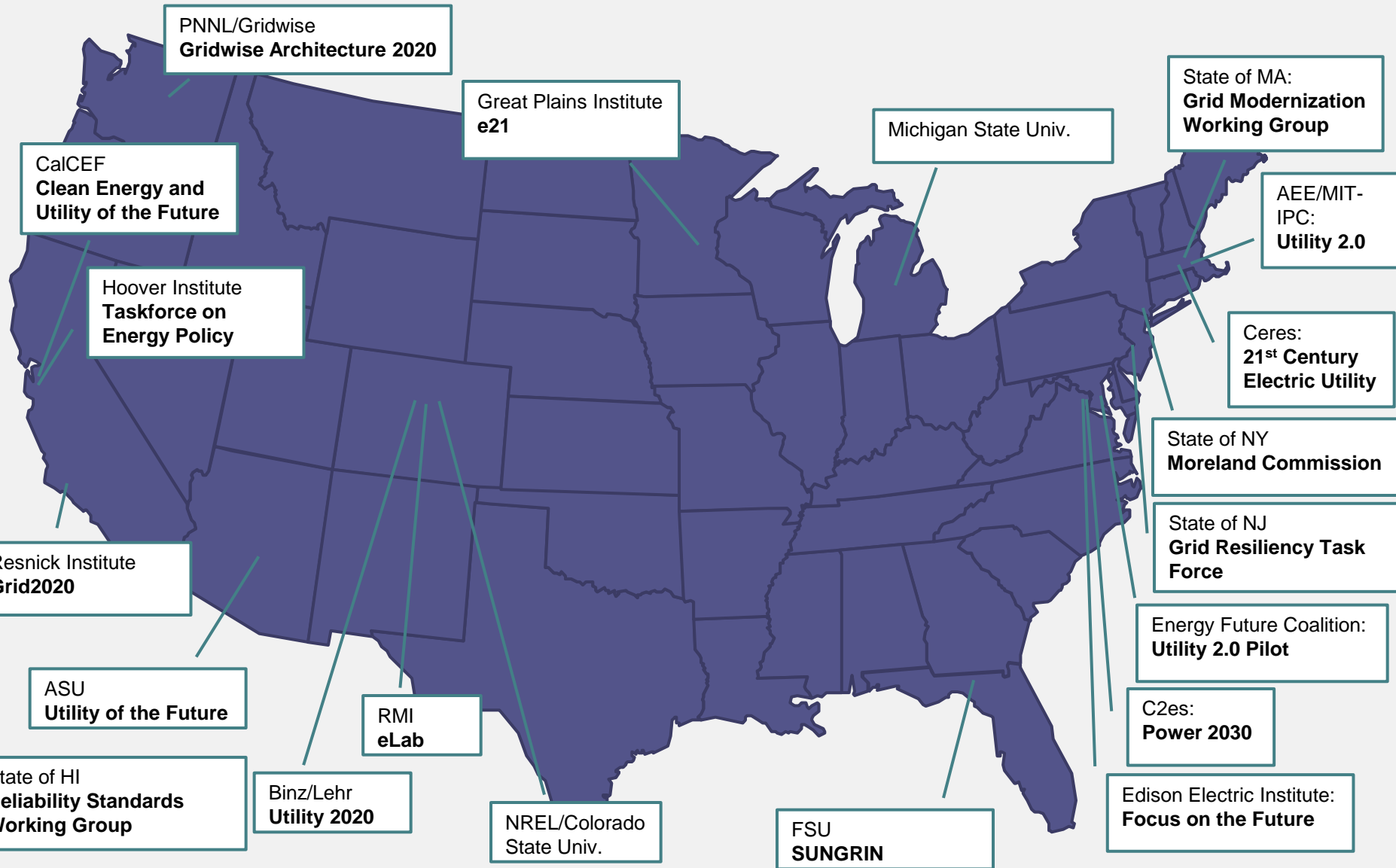


Continuum of Utility Business Models: Profit Motivation vs. Profit Achievement



“Business Models” Projects

- Ron Binz & Ron Lehr, Utilities 2020
- Rocky Mountain Institute, eLab
- Energy Futures Coalition Utility 2.0 Pilot
- Edison Electric Institute, Critical Consumer Issues Forum
- IEE – Edison Foundation, Focus on the Future
- Ceres, 21st Century Electric Utility, Risk-Aware Regulation
- Maryland, Grid Resiliency Task Force
- Arizona State University, Utility of the Future
- New York, Moreland Commission
- Department of Energy (former Advisor Richard Kaufmann)



America's Power Plan Resources

Western Interstate Energy Board

Performance Regulation Studies

America's Power Plan: “New Utility Business Models: Utility and Regulatory Models for the Modern Era”

<http://americaspowerplan.com/the-plan/utility-business-models>

WIEB: <http://westernenergyboard.org/western-energy-issues/resources/electricity/cost/new-utility-model/>
RFP for Phase II Performance Based Regulation report

Legislative Approaches

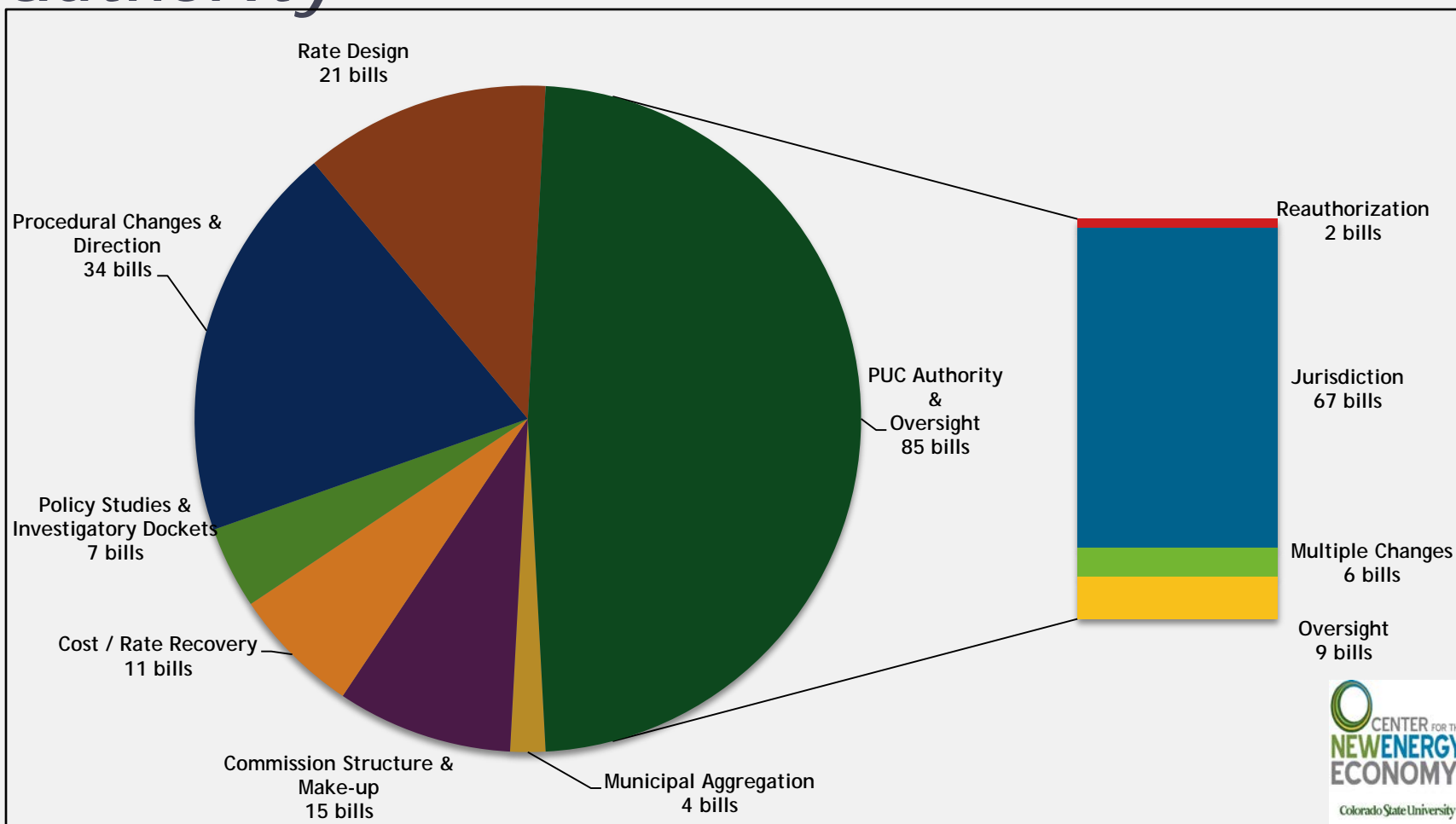
Process improvements

Substantive reforms: “form follows function”

Start with existing industry standards

Improve basics; build toward sustainable future

Breakdown of 170 bills in 2013 legislative session impacting PUC authority



Legislative Options

Study and Report: Colorado bill drafted

Eliminate automatic adjustments: Mich HB 5476
Rep. Stamas; KY: not without a hearing B110 of
2013

CA AB 327 Residential rate reform: fixed charges,
flattens tiered rates, preserves net metering

Illinois: recovery for infrastructure based on
performance, “smart grid electric system upgrades”
investment targets, job creation and training
“performance based formula rate tariff”

Legislative Options--Process

Recruiting, confirming excellent commissioners

Due process: notice, hearing, record, decision maker, appeal

Ex Parte—permit but disclose

Quasi judicial, quasi legislative

Joint hearings and records; separate decisions

Policy Dialogues

Settlements

Legislation--Substance

RIIO: Reliability, Environmental, Innovation, Price, Efficiency, Social Responsibility

Utility Viability—Capital structure, ROE and ROI, accounting treatment

Reliability and resiliency—match load and resources; frequency metrics (CPS 1, 2) outages and outage metrics, cyber security, physical security, storm damage hardening and recovery

Affordability and efficiency

“Least Cost”- Long Term vs. Short Term; “External Costs” - costs, but not in prices
Cost allocations: joint cost of production problem: “mutton, hide, and wool”
System load factors; generation use; EE, DR, DG incentives, rates
Planning: efficient portfolio, risk identification and management, WACC discounting, fuel price forecasts

Environmental performance: getting ahead of 111d, IPCC carbon goals; criteria pollutants; hazardous materials disposal

Innovation, economic opportunities, economic development, jobs and employment; utilities as “demonstrators” in R&D, Demonstration and Deployment

Legislative Option—Utility Viability

What role for utilities? What outcomes from utilities?
Reliability, Environmental, Innovation, Price, Efficiency,
Social Responsibility (RIIO's list)

What functions? Sole provider, partner, outsourcer?

Performance standards

- metrics and measurements
- RES, EEPS, consumer segments, satisfaction measures
- incentives and penalties

Capital recovery—out of market fossil, new renewables

Cost of service, value of service priced tariff offerings

Planning, capital cost and risk reduction strategies

Regional planning, operations, markets, and then
transmission

Affordability and Efficiency

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DG incentives, rates

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forecasts

Legislative Options—Planning, Portfolios, and Risk Management

Diversify to manage risk, example: RES

Least Cost. Least risk. Life cycle costs.

Discount rates and fuel cost projections.

“PRACTICING RISK-AWARE ELECTRICITY
REGULATION”

<http://www.ceres.org/resources/reports/practicing-risk-aware-electricity-regulation/view>

Fuel cost recovery—risk to consumers: eliminate all or part of fuel cost adjustment clauses

Reliability and Resiliency

- **Reliability:** match load and resources 24/7; frequency metrics (CPS 1, 2); outages and outage metrics; NERC, FERC, and regional reliability councils
 - Compliance to risk management
- **Resiliency:** cyber security, physical security, storm damage hardening and recovery
 - Improve returns from capital invested
 - Work boundaries across systems

Environmental Performance

Criteria pollutants, Oxone, particulates, CO, SOX, NOX, lead: upgrades for old plants; early retirements

EPA Carbon Dioxide Rules (“111d”):

economic and air regulators working together: joint notice, hearing, record use planning process to compete solutions
anticipate stronger restrictions

Colorado Clean Air Clean Jobs Act

CRS 40-3.2-201

903 MW Early Coal Retirements

Gas, Wind, Solar replacement

Xcel: 450 MW wind and 170 MW solar bids **lower cost than existing resources**

IPCC carbon goals: Clean Energy Vision for the West
(www.cleanenergyvision.org) 1/4 EE, 1/4 DG, 1/2 grid RE

Planning assumptions and methods drive outcomes.

Innovation, Economic Opportunities, Jobs

Innovation

- Segment clean energy standard, drive diversity
- Reduce risks for R&D to D&D technologies, investment, ownership, and markets
- Utility “safe harbor” demonstration projects
- Successful demonstrations set standards
- Standards for utility demonstrations: 40-2-123 CRS “Fullest Possible Consideration”

Legislative Options- “OMT”

Operations

- Least cost integration for VERS
- Get most from existing system
- Improve reliability, support markets

Markets

- LMP, five minute schedules, “real time grid awareness,” capacity and DSM, public policy

Transmission

- Integrate transmission plan with generation, demand
- Distribution system integrated planning
- “Smart from the start” siting, routing

FERC and the jurisdictional split with states.

Thanks for inviting me.

I look forward to our discussions.

Ron Lehr

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303 504 0940

AmericasPowerPlan.org

