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UTILITY FINANCIAL TRANSITION IMPACTS: FROM FOSSIL TO CLEAN

BY RON LEHR ● DECEMBER 2018

The rapid cost decline of renewable energy means the cost of running coal generation now exceeds the all-in cost of replacing it with wind and solar in many parts of the United States. This cost crossover is causing rapid reconsideration of the prudency of allowing existing coal generation to continue operating, particularly for regulated investor-owned utilities that recover plant costs through regulation. Untangling potentially stranded assets and transitioning this unproductive capital into new clean energy resources requires balancing consumer, environmental, investor, and local interests through complicated regulatory proceedings.

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This series of briefs can help regulators and utility stakeholders navigate these complex proceedings and achieve a fair balance of interests to accelerate the clean energy transition. This four-part series addresses the implications of financial transition, the "steel for fuel" investment strategy, debt for equity swaps to refinance uneconomic assets, and depreciation options and policies.

INSIGHTS FROM COLORADO

In late 2013, the Colorado Public Utilities Commission (PUC) approved a portfolio of new generation resources to meet future needs for Public Service Company of Colorado (PSCo). In that approved portfolio, 450 megawatts (MW) of wind and 170 MW of solar photovoltaics were chosen from a larger group of bids responding to the utility's Request for Proposals. The utility's

analysis showed that adding wind and solar would reduce costs of service for customers,[1] raising four questions:

- If new renewables could *reduce* customers' costs, what existing generation *increased* costs by comparison?
- Could generation that increased costs be identified using financial information and financial analysis?
- Could high-cost generation be retired early in favor of adding more clean resources at lower costs?
- Which options were available for refinancing utility capital investments out of old fossil and into new clean energy?

Since 2013, many answers have emerged for these questions. By analyzing publicly available financial information filed with the Federal Energy Regulatory Commission (FERC), policymakers and utility stakeholders can identify areas where running existing generation (particularly older, less efficient coal-fired plants) costs more than replacing it with wind or solar. In addition, a suite of financial instruments can facilitate and reduce costs of financial transition away from fossil toward cleaner resources.

Colorado's experience with financial transition from coal to cleaner energy is a case study for analyzing costs of existing generation and introducing financial tools available to manage the accelerating clean energy transition for electric utilities that own fossil generation. It introduces concepts that are more thoroughly covered in a series of technical briefs on three topics:

- Adjusting depreciation accounting to balance consumer, utility, and environmental interests
- Refinancing utility equity with debt securities
- Analyzing an investment strategy that swaps capital-intensive renewable assets for coal-fired generation, which Colorado utility Xcel Energy calls "steel for fuel."[2]

This package of policies can help electricity stakeholders understand which financial tools can accelerate the financial transition away from fuel-fired assets toward cheaper solar and wind generation, and other clean energy assets.

To this end, the briefs identify how these financial transition instruments can be used to generate diverse benefits – saving customers money, reducing investor risk and increasing

[1] A brief 2014 You Tube video by Ron Binz details how that analysis determined lower "present worth of revenue requirements" or lower customer costs when renewables were added to PSCo's generation fleet. https://www.youtube.com/watch?v=Ffgyhk2PuGE The video likely captures the leading position for You Tube videos that feature utility spread sheets. Current status of Colorado's transition to clean energy are detailed in a recent blog post: https://www.rmi.org/saving-colorado-customers-money-with-clean-energy/

[2] "Steel for Fuel" Issue Brief posted at: https://energyinnovation.org/wp-content/uploads/2018/11/Steel-for-Fuel-Brief_December-2018.pdf

returns, reducing harmful emissions from fossil-fueled generation, and addressing just transition concerns by mitigating impacts on communities and workers affected by early plant closures.

STEP ONE: ANALYZING COSTS OF EXISTING GENERATION

Obtaining information about relative marginal costs of energy (MCOE)[3] for existing utility-owned generation and potential replacements can be challenging, in large part due to information asymmetry. Utilities hold most of the information required to analyze comparative costs for energy from various resources while regulators, advocates, and consumers have less access to data required for analysis.

Utility-led production cost modeling, based on engineering methods and company economic data, represents the most common approach to determining MCOE for power plants. Production cost modeling comes with opportunities for utilities to select model inputs to condition analysis to produce desired results. Model inputs are subject to claims of confidentiality and models themselves are usually proprietary, subject to non-disclosure requirements, and expensive to license and use. As a result of these barriers, production cost modeling conflicts are common among utilities, their regulators, and various stakeholders.

Not included in "variable operating and maintenance costs" or "O&M" analyses are plant capital costs, what it costs to buy and own generating plants. These investment costs include money spent on capital assets, and interest and financial returns to pay for financing plant ownership, commonly referred to as return "of and on" invested capital.

Investment costs should be considered for economically rational decision-making, and they matter a great deal to utility investors. The specter of no longer earning returns on invested capital further deepens utility antipathy toward dispassionately examining cost-effective alternatives to existing generation.[4].

FINANCIAL ANALYSIS TO DERIVE PLANT-LEVEL MCOE

By contrast, financial analysis of publicly traded companies can be based on publicly available data[5] filed by utilities for use by investors, regulators, and tax collectors. Investors in particular expect these sources of utility data to be filed accurately, without self-serving compromises or omissions. Inaccurate financial filings can result in criminal indictments and investors would

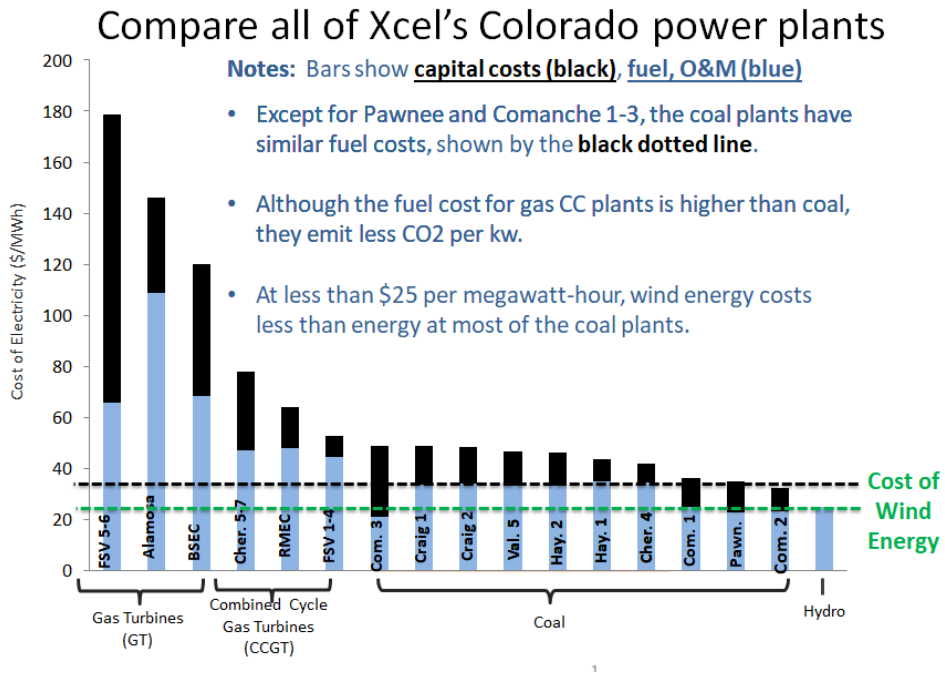
[3] The marginal cost of energy (MCOE) for any given power plant is the cost of generating an additional unit of output, usually measured in kilowatt-hours or megawatt-hours. The MCOE drives utility and market decision-making about which power plant to run at a given time. An economically optimal dispatch would minimize MCOE, meaning the last unit called upon to generate power has a lower MCOE than all other available units that were not called. If a new power plant becomes available with a lower MCOE than existing generation, it may impact the fleet-wide MCOE, lowering aggregate cost of energy and setting a new equilibrium.

[4] See "utility financial incentives" below.

[5] The Federal Energy Regulatory Commission, The United States Department of Energy's Energy Information Administration, and the Securities and Exchange Commission provide public financial data for utilities. Accessing this data for the purposes of providing plant level MCOE is a non-trivial exercise due to data inconsistencies and complexities, but it can be done: https://catalyst.coop/data-we-wrangle/

punish a utility that filed false financial information. Wall Street analysts construct their own utility corporate financial models and use them to support their advice about utility investment decisions. For these reasons, financial analysis can be a reliable resource to determine utility plant level MCOE.

Colorado stakeholders worked with financial analysts and data experts[6] to examine public financial data for each of PSCo's power plants, determining that plant-level MCOE for most of PSCo's coal fleet were more expensive to own and run than new wind power.[7] Wind power was assumed to be available at $25 per megawatt-hour (MWh), a figure which includes the federal production tax credit for wind.[8] More recent PSCo bids and evaluation of wind and solar costs have ratified that new wind and solar costs are lower than coal plant MCOE.[9,10]



Comparing the operating costs of fossil fueled power plants in Xcel Colorado's service territory with the projected all-in cost of wind energy in a long-term power purchase agreement in 2018.

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[6] Uday Varandaragan, then with Climate Policy Initiative, led the financial analysis team that created a full corporate financial model and used it to determine plant level MCOE. He has since joined Rocky Mountain Institute to further develop a range of financial modeling capabilities and alternatives. Public data base access and functionality was assisted by Catalyst Cooperative, see fn. 5

[7] https://www.greentechmedia.com/articles/read/wind-could-replace-6000-gigawatt-hours-of-coal-in-colorado.

[8] The production tax credit is phasing down from its original level.

[9] See, https://www.documentcloud.org/documents/4340162-Xcel-Solicitation-Report.html A later report slightly increased reported *median* bid prices.

[10] PSCo leads other utilities with regard to their efforts to integrate large proportions of wind and rightfully prides itself on its leadership. It reports no reason to believe that integration efforts won't continue to be successful as it moves toward 55% renewable energy, mostly wind. It is pursuing joining a broader and deeper wholesale market which would make more integration easier and cheaper. PSCo's CEO touts its "steel for fuel" program of replacing fossil with renewables as beneficial for shareholders.

STEP TWO: DEALING WITH UTILITY AND CUSTOMER FINANCIAL IMPACTS OF EARLY COAL RETIREMENTS

Comparing MCOE to the levelized cost of new renewable generation is necessary but not sufficient to justify replacing these assets – reliability depends on enough generation and ability to deliver power to customers being available at all times. Electric system modeling determining whether reliability can be maintained as some generation resources are retired and replaced with others can help assure the transition keeps the lights on. Portfolios constructed of a variety of resources (energy efficiency, demand management, wind, solar, storage, customer-sited and distributed resources, energy and system flexibility gained from implementing broader and more efficient wholesale markets, as well as conventional generation maintained to support transition) can provide modeling alternatives that reduce overall system operations, transition, and integration costs.[11]

UTILITY FINANCIAL INCENTIVES

Recordings of utility executives on quarterly earnings calls with investor analysts and presentations to utility financial conferences reveal company promises to maintain or improve "earnings per share" by making capital investments. Utility managers follow these promises with assurances they can obtain regulatory approvals.

These interactions with financial representatives reveal the basic financial incentive for investor owned utilities: Earn financial returns allowed by regulators on equity invested to provide utility services to customers. Since equity investors take ownership risks for buying and owning company shares, they expect to be rewarded with earnings per share passed on through stock dividends and growth in their stock price commensurate with their risk exposure.[12]

Earnings are not provided for operating expenses such as fuel purchases, employee compensation, or system monitoring. Neither do utility shareholders receive earnings on the portion of their investments financed by debt or bonds that represent loans utilities take from their bond investors. Instead, expenses and debt costs are returned to utilities "dollar for dollar" without additional earnings.

When early coal plant retirements are under discussion, utility financial incentives are on full display. First, the Uniform System of Accounts, mandated for use by all U.S. utilities, requires

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See also, Dyson, M., Engle, A, and Farbes, J., "The Economics of Clean Energy Portfolios", Rocky Mountain Insitute, 2018 https://rmi.org/insight/the-economics-of-clean-energy-portfolios/D

[12] A more detailed discussion of how utilities create value and make money is provided in Kihm, S., Aggarwal, S., Lehr, R., and Burgess, E., "You Get What You Pay For: Moving Toward Value in Utility Compensation" June, 2015 at http://investors.xcelenergy.com/

collection and reporting of plant asset values, found mainly in "Plant in Service" categories in the accounting system.[13] Together with accounts that track investment costs for generation plants, plant accounts are usually the largest amounts found in utility accounts.

For utilities that own generation, earning returns authorized by regulators on equity invested in generation plants is the very essence of the utility business. Discussions about retiring these plants early are, therefore, acutely sensitive for utility mangers who tend to assume that equity earnings will continue until plants reach full retirement age. Allowing utilities an opportunity to reinvest capital in new, productive renewable generation is one strategy for resolving this tension. [14]

UNDEPRECIATED PLANT BALANCES

If regulators decide to retire coal plants early, utilities will want to recover remaining, undepreciated plant balances on their books, including earning on equity investments reported in these account balances. This is understandable, given utility managers' constant interactions with investment analysts concerning earnings, but regulatory practice suggests these balances are recoverable only if attached to "used and useful" assets.

Plants are unlikely to be fully depreciated even if they are held in service until they reach the end of their estimated lifetimes, because utilities respond to incentives to continue to invest in plant to earn additional returns. Some plants are required to clean up pollution, requiring investment, and plant life estimates are subject to constant reevaluation and change.

If retired "early," plant in service accounts will likely have substantial remaining undepreciated amounts that must be addressed. Changes in depreciation amounts and schedules are likely to be proposed when early retirement is under discussion. A separate issue paper in this series fully considers approaches and implications for adjusting depreciation in the context of financial transition.[15]

REFINANCING UNDEPRECIATED PLANT BALANCES

Whether depreciation is accelerated or not, once a plant is retired, the remaining investment total becomes a "regulatory asset," held on the books of account for a regulated utility and recognized by their regulators as appropriate for inclusion in consumers' rates. Regulatory assets do not represent real assets like a generation plants in service, but rather are a regulatory construct to allow recovery in rates on the occasion of an early retirement of plants.

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[13] https://www.ferc.gov/enforcement/acct-matts/usofa.asp

[14] "Steel for Fuel" posted at https://energyinnovation.org/wp-content/uploads/2018/11/Steel-for-Fuel-Brief_December-2018.pdf

[15] Depreciation and Early Plant Retirements posted at: https://energyinnovation.org/wp-content/uploads/2018/11/Depreciation-and-Early-Plant-Retirements-Brief_December-2018.pdf

Regulatory assets can represent utility expectations that profits would flow from equity invested in operating plants for plants' expected lifetimes. Utility executives are unlikely to willingly give up expected profits unless some accommodation with their profit expectations is recognized in the form of earnings on new regulatory assets. **Questions that arise in resolving balancing of interests and expectations that accompanies decisions to retire plants early are whether, and if so, how much recovery of equity earnings is reasonable.** The answers will reflect accommodations made to address particular interests and circumstances.

Two approaches have emerged to use alternative financing mechanisms to reduce costs of holding regulatory assets – debt for equity swaps and securitization. Debt for equity swaps would eliminate or reduce equity on which utilities earn profits. Securitization returns utility investment as bond proceeds paid to a utility replace both debt and equity, with attendant earnings, requiring reinvestment if a utility wishes to earn profits on new equity invested in the business. Both effectively trade lower-cost debt for higher-cost shareholder equity in the regulatory asset, and both reduce utility profits.

Additional financial mechanisms are being discussed, such as applications of green bonds and green tariffs to add capital flexibility to utility fossil to clean transitions.[16]

Debt for equity

Financial leverage can potentially reduce consumers' costs by replacing the equity portion of a regulatory asset with corporate debt. Replacing equity with debt, known as "debt leverage," recognizes differences between owning and operating generation plants with their attendant risks,[17] and maintaining a regulatory asset where the only risk is that regulators might change their minds about allowing recovery.

Refinancing regulatory assets with new bonds can take some of the heat out of arguments among interests about deciding the balance of financial impacts. **Simply replacing some, or all, of the equity portion of regulatory assets with lower cost utility corporate debt could be a means of lowering costs of carrying these assets.** By itself, a higher debt margin might be a concern, but on balance when considered with other factors, it might not be too important. Swapping debt for equity could be a way to sweeten the overall deal for consumers, so where their interests need to be accommodated, corporate debt refinance might be an option to consider.[18]

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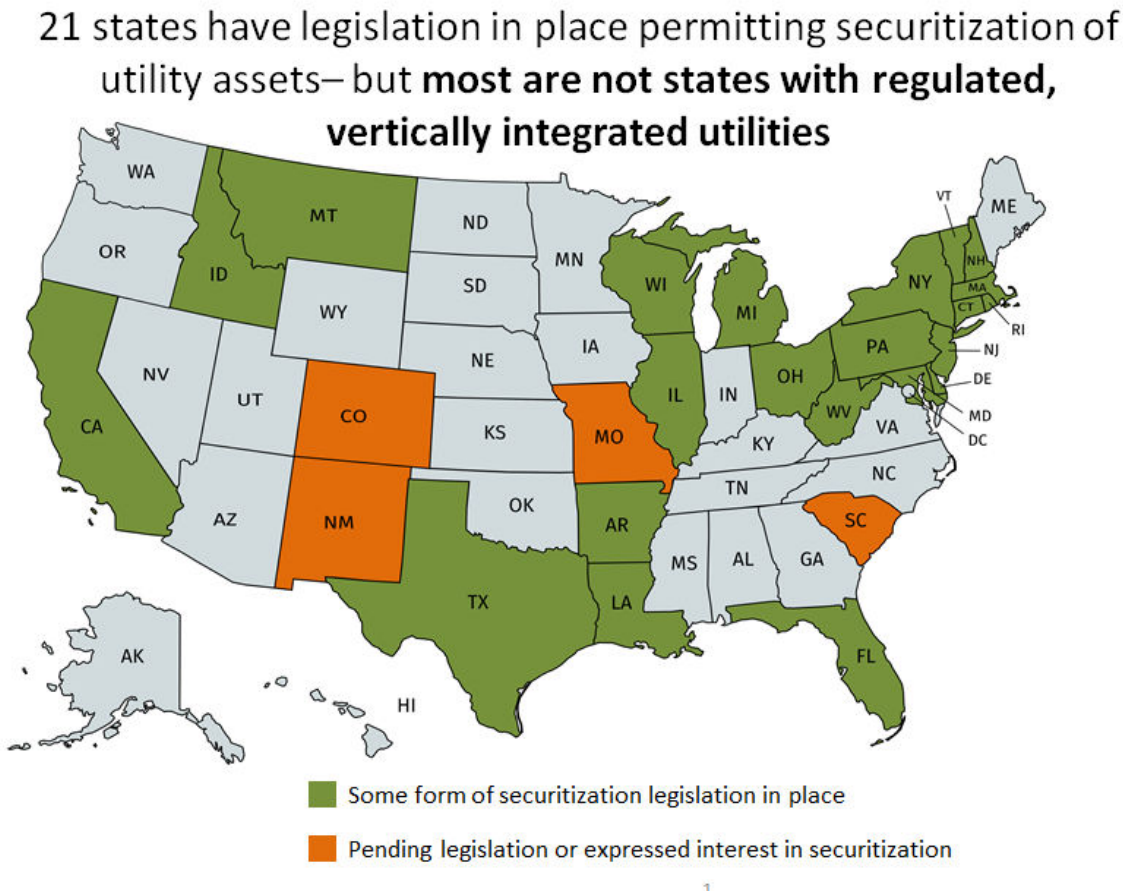
[16] See generally, Uday Varadarajan, et al., *Harnessing Financial Tools to Transform the Electric Sector*, Sierra Club, November 2018. Available at: https://www.sierraclub.org/sites/www.sierraclub.org/files/sierra-club-harnessing-financial-tools-electric-sector.pdf.

[17] These risks include the risk of malfunction, fuel risk, price risk, technology risk, and other risks that are fleshed out in the Debt for Equity issue brief at https://energyinnovation.org/wp-content/uploads/2018/11/Debt-for-Equity-Issue-Brief_December-2018.pdf

[18] Corporate debt refinance and attendant risks are addressed in greater depth in the Debt for Equity brief: https://energyinnovation.org/wp-content/uploads/2018/11/Debt-for-Equity-Issue-Brief_December-2018.pdf

Securitization

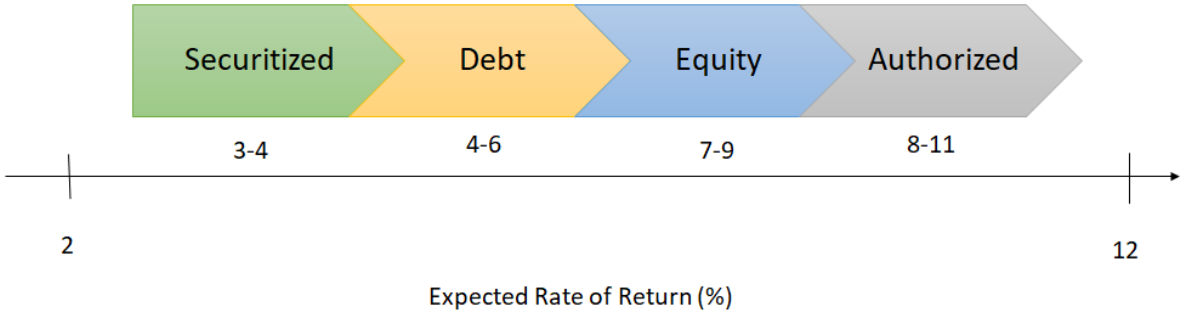
Authorizing and implementing securitized or ratepayer backed bonds is another approach to achieving financial leverage to reduce consumer costs for holding regulatory assets on a utility's books. These bonds, which may require new legislation in some states, refund utility debt and equity represented in accounts holding regulatory assets using the promise of repayment defined in state legislation and a commission financing order. This offers more security to bond investors—hence "securitization." Decades of experience with securitized utility bonds show they can achieve overall lower cost of capital and provide substantial consumer savings when compared to both corporate debt and equity.[19]



Summary of U.S. states where securitization is permitted.

[19] Bond rating agencies require the process of issuing these bonds to meet their exacting requirements to allow bonds to achieve AAA ratings and deliver the lowest possible interest rates. These requirements are well known, but complex when encountered initially, so achieving the right conditions in both legislation and in subsequent regulatory proceedings is also complicated. Many examples can help participants in these discussions understand the details. If stakeholders in this process can be brought to realize that refinancing with rate payer backed bonds creates substantial streams of savings that can be shared by all—including utility shareholders—then complexity can be understood as worth the efforts. See, e.g. Joe Fischera, *Securitization: Is it the Right Tool for Me Today?*, presentation to National Association of Regulatory Utility Commissioners, November 13, 2018. https://pubs.naruc.org/pub/F51B000A-EFC1-4568-1C63-764920117214.

Along with substantial consumer fuel cost savings from retiring fossil generation early and replacing it with fuel-free clean energy resources, interest rate savings are the largest source of potential consumer savings in financial transitions that move toward clean energy. The proposition that clean is less expensive than dirty is compelling on economic grounds alone wherever new clean energy can replace more expensive, old dirty energy. Adding regulatory asset securitization makes it a potential winning argument even where climate goals are not valued.



Comparing the relative costs of capital for securitized debt, corporate debt, equity, and regulator-authorized returns on equity.

STEP THREE: RECOGNIZING SAVINGS FROM EARLY RETIREMENTS AND MAKING A DEAL

Terms that can be considered in deal-making among stakeholders engaged in retirements and refinance include:

- Demonstrated fuel and other operations and maintenance savings through financial analysis of comparative, plant level marginal costs of energy
- Management of related depreciation changes to reflect both least cost and equitable cost responsibility
- Refinancing utility regulatory assets to achieve investment cost savings
- Reinvesting refinance proceeds to benefit shareholders, impacted communities, and consumers

Each of these terms can allow stakeholders to achieve an attractive balance between varied interests of consumers, clean energy supporters, displaced workers, utilities, and equity and bond holders.

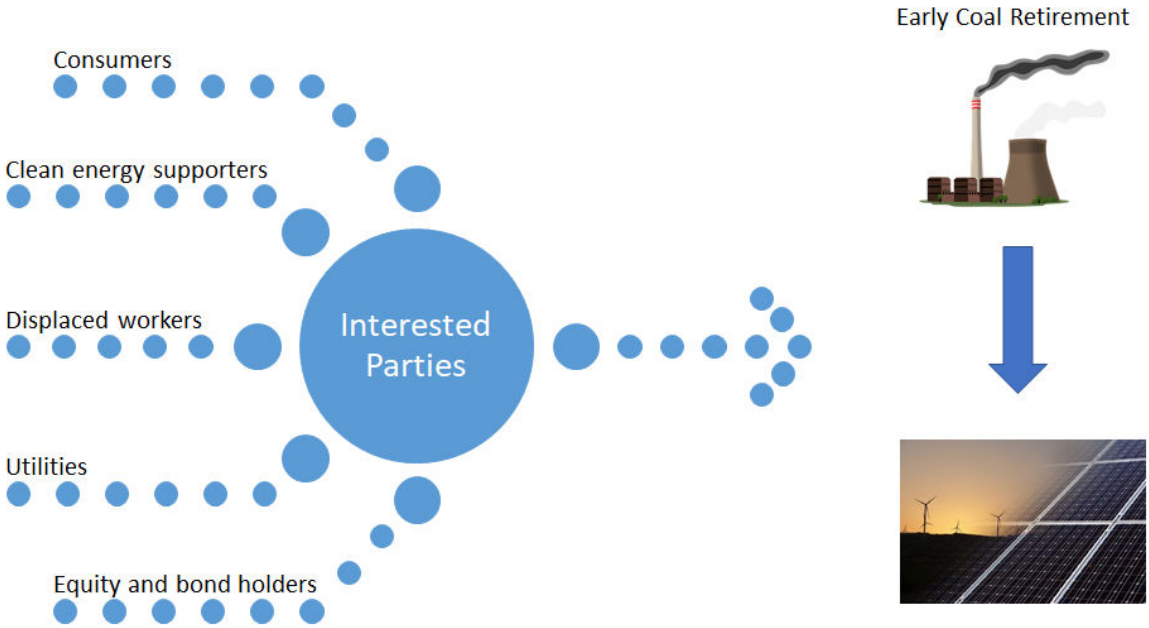
BALANCING INTERESTS

When early retirement is under discussion, various parties and stakeholder interests must be balanced, together with shareholders' earnings expectations. For example, where early retired coal plants can be replaced with lower cost wind and solar energy, consumers will also benefit from less pollution and more portfolio diversity.

Power supplies become arguably more reliable and less risky over the long term given that fuel cost and availability risks, usually passed onto consumers through fuel cost collection bill riders, will be avoided.

In setting depreciation accounting for early retired plants, stakeholders confront a series of tradeoffs. Utilities will have financial incentives to accelerate depreciation on their undepreciated plant balances since they would prefer to get return of and on their unpaid investments, both in full and sooner rather than later.

However, faster depreciation results in pressure for rate increases that consumers do not favor. A balance must be struck between these competing interests.



Regulators can balance an array of diverse interests to achieve positive outcomes through early coal retirement by replacing it with cheaper, cleaner resources through low-cost financing.

Some will argue that current consumers rather than future consumers should pay for undepreciated plant balances for early retired plants, since current consumers are closer in time to using these plant's outputs—they used it, so they should pay for it. It is also true, however, that future consumers will benefit from early plant retirements that avoid higher marginal costs of energy and instead use energy from lower marginal cost clean energy resources.

On this logic, future consumers might bear some responsibility for refinancing costs that got old plants out of the way so newer and less costly facilities could replace them. Again, room exists for compromise and recognition of a balance of interests among these competing claims and equities.

It is possible that some fuel cost and refinance savings could be shared to address external costs and community transition opportunities. In proposed Colorado securitization legislation, 15

percent of securitized bond totals was directed to mitigating transition costs and risks for communities and workers impacted by early plant retirements.[20]

A series of proposals is under development to associate some of these savings with new investments in clean energy options to help to speed the transition from fossil to clean energy. As potential savings in this financial transition are better understood and documented, more creative thinking about how to handle these investment opportunities is expected to expand the options that can be considered.[21]

Recognizing that early retirement can provide streams of savings makes balancing interests in early retirement much easier, as interested parties recognize that they will be better off if a balanced outcome that respects all claims can be reached.

UTILITY INVESTMENT IN NEW CLEAN ENERGY

Allowing utilities to own a portion of new clean energy investments also leaves shareholders better off, since new investments are more productive per dollar invested than old ones. Whatever compromise produces an overall deal that includes early plant retirements, it is clear that an easier pathway to a good deal will not involve utility equity owners giving up their earnings claims without getting something in return. Allowing utilities to own some resulting investment in new clean energy can compensate utility shareholders for foregoing earnings on early retired plants or regulatory assets, or some, or all, of both. Unusual coalitions supporting utility ownership outcomes can provide important support for regulatory approvals of such investments.

RECOMMENDATIONS FOR DECISION MAKERS

FOR UTILITY EXECUTIVES:

- Consider creating an explicit and public financial transition management strategy including financial analysis of MCOE resource alternatives, depreciation accounting that supports transition from fossil to clean resources, early fossil plant retirements, and reinvestment in clean resources
- Develop communications for financial analysts, state commissions and stakeholders, and shareholders and debt investors emphasizing how well-managed financial transition can increase overall benefits to accelerate capital movement from fossil to clean energy investments
- Develop competitive bidding for least-cost clean replacement energy that encourages abundant bids and drives low-cost clean energy bids

[20] HB07-1339 at: https://leg.colorado.gov/bills/hb17-1339.

[21] Uday Varadarajan, et al., *Harnessing Financial Tools to Transform the Electric Sector*, Sierra Club, November 2018. Available at: https://www.sierraclub.org/sites/www.sierraclub.org/files/sierra-club-harnessing-financial-tools-electric-sector.pdf.

- Develop standards for utility ownership of a portion of replacement power when fashioning deals that result in beneficial transition
- Recognize benefits from fuel and other operations and maintenance savings from early plant retirements and from refinancing undepreciated plant balances, then share savings with consumers and impacted communities and workers to facilitate balanced deal-making
- Analyze early retirement benefits that include positive investor financial results to justify balanced deal making to manage regulatory risks

FOR STATE REGULATORY COMMISSIONERS AND STAFF:

- Encourage regulated utilities to develop plans to manage financial transition using financial analysis showing least cost for consumers, fuel and O&M savings, refinancing savings, and investor benefits
- Allow utilities that strike deals for early plant retirements providing consumer fuel and operations and refinancing savings to own a portion of replacement resources, if they are shown to be competitively selected in fair and open bidding processes
- Provide tools regulators need (like authorizing securitized and ratepayer-backed bonds) in concert with active communications with commissioners and staff, then pursue enabling legislation if needed
- Encourage state policies to proactively address financial transition, thereby avoiding costs arising from utility credit ratings downgrades, negative equity advice, and bankruptcies that can result from inattention and delay in addressing transition issues
- Support constructive dialogue with commissions and staff, and among utilities and their stakeholders who can pursue transition management that makes everybody better off