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Decoupling Design: Customizing Revenue Regulation to Your State's Priorities

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Acronyms

BRRT	Base Rate Revenue Target
DER	Distributed Energy Resources
EERS	Energy Efficiency Resource Standards
EM&V	Evaluation, Measurement, and Verification
FAC	Fuel Adjustment Clause
HECO	Hawaii Electric Company
LDC	Local Distribution Company
LRAM	Lost Revenue Adjustment Mechanism
PG&E	Pacific Gas and Electric
PUC	Public Utilities Commission
PV	Photovoltaic
RAM	Revenue Adjustment Mechanism
RAP	The Regulatory Assistance Project
ROE	Return on Equity
RPC	Revenue per Customer
SFV	Straight Fixed/Variable
VEIU	Vertically Integrated Electric Utility

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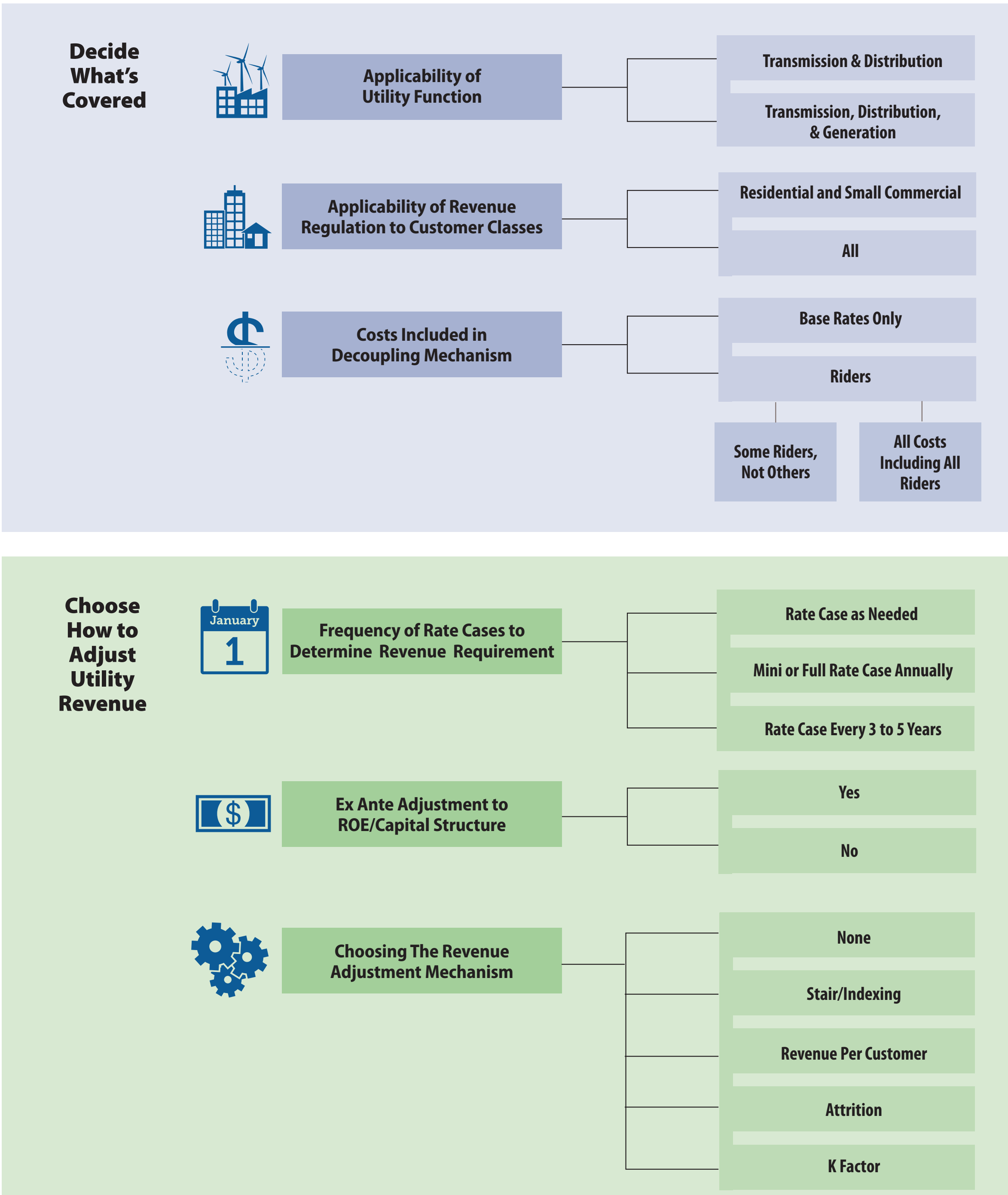
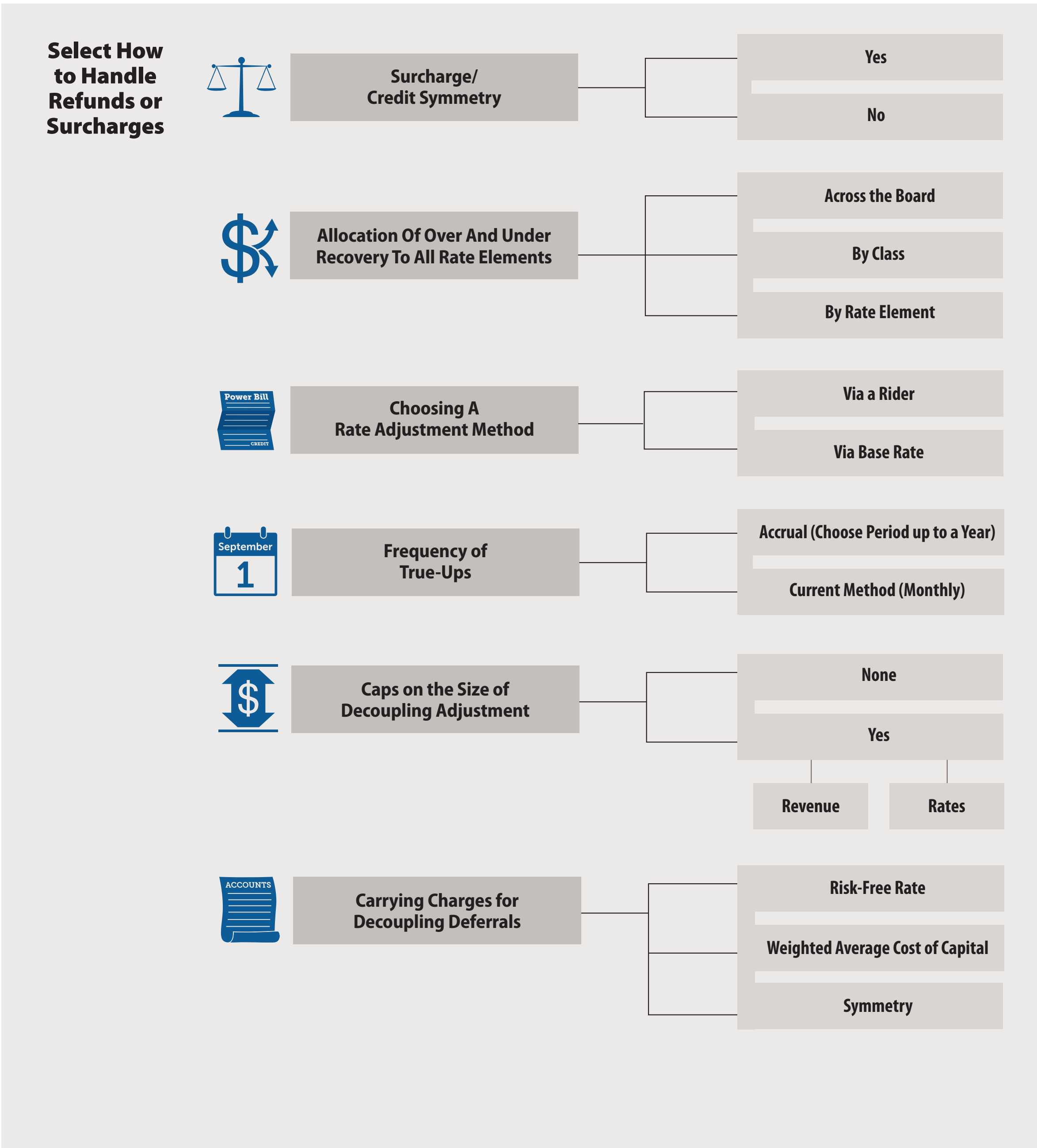
Figure 1

Decoupling Decision Points




Select How to Handle Refunds or Surcharges
Surcharge/ Credit Symmetry
Yes
No
Allocation Of Over And Under Recovery To All Rate Elements
Across the Board
By Class
By Rate Element
Power Bill
CREDIT
Choosing A Rate Adjustment Method
Via a Rider
Via Base Rate
September
1
Frequency of True-Ups
Accrual (Choose Period up to a Year)
Current Method (Monthly)
Caps on the Size of Decoupling Adjustment
None
Yes
Revenue
Rates
ACCOUNTS
Carrying Charges for Decoupling Deferrals
Risk-Free Rate
Weighted Average Cost of Capital
Symmetry

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Executive Summary

Introduction

Many states have adopted utility "decoupling,"[1] or revenue regulation, to address the impacts on utilities' revenues from factors that affect their sales levels. Originally, decoupling was conceived as a way to make utilities indifferent to annual sales volume and to address the net revenue losses associated with energy efficiency programs. More recently, it has been considered as one of many tools to mitigate revenue shortfalls from deployment of all distributed energy resources (DER).

The design process of a decoupling mechanism contains a number of decision points that address policy and stakeholder priorities. No two mechanisms are identical, and from an overall perspective of the good of the state, or from the distinct perspective of individual stakeholders, these decisions will enhance the decoupling mechanism or make it less attractive. Examples of the kinds of decisions regulators typically consider and for which stakeholders provide input include the design of the revenue adjustment mechanism, the frequency of adjustments, limits (caps) on the size of the adjustment, and other factors, which this paper will discuss in more detail.

Decoupling can increase the efficiency of utility operations, reduce risk (for both consumers and utilities), promote energy efficiency and conservation, and support deployment of DER.[2] RAP has written extensively on these benefits; this paper is the third in a trilogy of work on decoupling. The first covered the benefits of such a regulatory regime, and the second reviewed how it has worked on the ground in six states. The principal focus of this third paper will be how to make decoupling design decisions that best complement the facts on the ground and the goals of each state, each commission, and its stakeholders. It concludes with sample pathways that could be considered in designing and implementing decoupling. An appendix reviews the benefits of putting a decoupling mechanism in place.

Regulatory Conditions

Decoupling allows the utility to recover net lost revenues due to reduced sales. The concept was introduced to address a belief that it is anathema to the traditional utility business model to order a company to work hard to sell less of its product. The concept was first implemented for natural gas distribution utilities and later expanded to include vertically integrated electric utilities. Inherent downward pressure on utility sales from more efficient devices and processes, even as dependence on electricity increases, has made a difference[3] in utility attitudes toward decoupling. As the cost of renewable energy options declined, decoupling began also to be viewed in some quarters as a mechanism to deal with the impacts of distributed energy resources.[4]

1 Some also refer to decoupling as revenue regulation. These terms are used interchangeably in this paper. As used in this paper, decoupling (and revenue regulation) is defined as an adjustable price mechanism that breaks the link between the amount of energy sold and the actual (allowed) revenue collected by the utility. See Lazar, J., Weston, F., & Shirley, W. (2011). Revenue Regulation and Decoupling. Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/ knowledge-center/revenue-regulation-and-decoupling-a-guide-to-theory-and-application

2 Lazar, J., Weston, F., & Shirley, W. (2011). See also Migden-Ostrander, J., Watson, B., Lamont, D., & Sedano, R. (2014, July). *Decoupling Case Studies: Revenue Regulation Implementation in Six States.* Montpelier, VT: The Regulatory Assistance Project; plus numerous presentation slides available at www.raponline.org.

3 See Appendix for a discussion of the benefits of decoupling for customers and utilities.

4 For more on the treatment of DER in rates, see Hledik, R., & Lazar, J. (2016). *Distribution System Pricing With Distributed Energy Resources.* Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/distribution-system-pricing-with-distributed-energy-resources

Good customer service is important to customer advocates.[5] They are concerned that, if utilities are assured of revenue recovery, they may be tempted to reduce the costs necessary to maintain service quality and reliability. Along with performing well on energy efficiency, it may also be important to require that utilities under a decoupling regime meet a certain level of service and performance targets. To that end, many decoupling mechanisms include customer service quality or reliability indices.

There are a variety of ways to establish decoupling. One is by statute, which can either be an explicit direction to pursue decoupling or not, or implicit and fall under broader statutory powers granted to the utility commission (the latter is the most common). Without specific guidance, many regulators find that they have the broad statutory authority to establish a decoupling mechanism. However, others may argue that decoupling decisions must be made within the context of a rate case.

Decoupling can sometimes be achieved, as it was in Hawaii or Ohio, via a collaborative stakeholder process in which the details are negotiated among the utilities, commission staff, and intervenors. In Arkansas, the commission issued an order inviting the utilities to file a decoupling proposal with their next rate cases, stating suggested design parameters (such as low customer charges to encourage conservation) and left the rest to the utilities.[6] In Massachusetts, the Department of Public Utilities issued an order requiring electric and gas utilities to implement full decoupling and detailing how it should take place.[7] Decoupling can work well when it is part of a collaboration among parties and is supporting a comprehensive energy efficiency plan where program costs, net lost revenues[8], and incentives are addressed.

Decision Points

The issues that regulators will face, and the decisions they must make, fall into three broad categories, and which are also listed in Figure ES-1:

1. Applicability of revenue regulation: Decide what's covered

Regulators must first decide what (or who) a decoupling mechanism covers by answering a series of questions:

What utility functions are covered? For restructured utilities, the decision is simple: Decoupling would apply only to distribution, and in many cases to transmission, as the monopoly businesses of the utility. For vertically integrated utilities, it could apply to just distribution and transmission, or to all three functions, including generation. Pragmatically, the best result may be achieved by separating the distribution revenue requirement from the power supply revenue requirement, and implementing mechanisms to assure that both produce the correct amount of revenue.

What customer classes are covered? Decoupling is applied to the residential and small commercial classes because, as a group, they are fairly homogenous in their usage, no single customer's usage will account for a dominant portion of that customer class, and their rate designs are simple, making it easy to apply adjustments. Large industrial customers are usually excluded, particularly where there are only a few users in a given customer class, because decoupling can have too large an effect on other customers in the class due to sales increases or decreases by a single large customer. Still, these customers benefit from improved management focus on service and cost control.

Should all costs be included in a revenue decoupling mechanism or are there some that should be excluded?

5 For examples of good customer service plans, see Vermont Public Service Board. (2016). Service Quality Plan. Retrieved from: http://psb.vermont.gov/utilityindustries/electric/backgroundinfo/sqrp; and, New York Public Service Commission. (2004). *Order Adopting Changes to Standards on Reliability of Electric Service.* Retrieved from: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BD9001691-1895-462A-A827-1BC09245548F%7D

6 Arkansas Public Service Commission, In the Matter of the Consideration of Innovative Approaches to Ratebase Rate of Return Ratemaking Including, But Not Limited to, Annual Earnings Reviews, Formula Rates, and Incentive Rates for Jurisdictional Electric and Natural Gas Public Utilities, Docket No. 08-1137-U, Order No. 19, January 2, 2013.

7 MA DPU, Order No. 07-50A, Investigation by the Department of Public Utilities on its own Motion into Rate Structures that will Promote Efficient Deployment of Demand Resources, July 16, 2008.

8 "Net lost revenue adjustments" is the term of art that describes earlier methods of compensating a utility for the revenue to cover non-production costs that it would have collected had specified sales-reducing events or actions (e.g., cooler-than-expected summer weather, or government-mandated end-use energy investments) not occurred.

This answer depends in large measure on whether the utility is allowed to recover any specific categories of costs through a separate mechanism, such as a fuel and purchased power mechanism to recover a portion of power supply costs. If so, these costs are usually excluded.

2. How a decoupling mechanism works: Choose how to adjust utility revenue

The choice of the revenue adjustment mechanism (RAM) is perhaps the most significant decision that regulators must make in the course of a decoupling proceeding. It can also be the most controversial. Some revenue adjustments will allow for some adjustment to revenues in between cases, while others are tied to a rate case determination and possibly the frequency of rate cases. Also important in terms of the development of the revenue requirements are considerations of the capitalization ratio that reflects less risk to the utility as a result of decoupling. Finally, the mechanism should include steps to avoid double recovery of costs. RAM options include:

- ***No RAM:*** No adjustment is made to the revenue requirement until a utility files a rate case to increase it; in the meantime, rates are adjusted via periodic true-ups. Some consumer advocates support this out of concern over increasing rates and lack of opportunity to verify the increases.
- ***Stair-step:*** Adjustments are pre-determined in a rate case and are usually based on forecasts of projected cost increases. The benefit of this is that it can provide revenue stability based on pre-determined choices that translate into financial benefits for the utility and its customers. The downside is that costs are difficult to forecast accurately.
- ***Indexing:*** Adjustments are tied to multiple factors, such as general or industry inflation, industry productivity, customer growth, and changes in capital. This may be a reasonable compromise because it can account for known or likely utility cost changes without necessarily having major rate impacts.
- ***Revenue per customer (RPC):*** Regulators determine the revenue requirement on a per-customer basis (usually by customer class), and the total system revenue requirement is determined by multiplying the number of customers in each class by the revenue requirement for each customer in that class. This is frequently used for distribution utilities and is among the most popular mechanism; a benefit is that customers do not end up compensating a utility for lost revenues due to lost customers.
- ***Annual review (or attrition):*** Periodic reviews are used to adjust base rates for known and measurable changes in rate base and operating expense. More controversial larger changes, such as major plant additions, are left for a full rate case (unless there is an applicable tracker in place, in which case it would not be part of the decoupling mechanism).
- ***K factor:*** An adjustment is used to increase or decrease overall growth in revenues between rate cases, if a key assumption (such as increased efficiency or growth in rooftop solar) is likely to vary significantly during the decoupling period. The K factor can vary from year to year but is usually set at a prescribed level in between rate cases. A K factor coupled with an RPC can be convenient, while also addressing the challenge of tracking the effects of these changing cost drivers.
- ***Hybrid:*** Regulators may use a combination, or hybrid, of regulatory mechanisms. For example, a combination of RPC and K Factor may be used so that the allowed revenue per customer grows (or declines) according to a historical trend factor as the mix of customers changes over time.

After choosing the RAM, regulators must also consider:

How frequently should the revenue requirement of a utility should be reviewed? In some jurisdictions, such as New York, the regulators will not set a schedule and instead leave it to the utility to decide when it needs to file for a full rate case review. Most commissions have incorporated periodic reviews in their decoupling orders to ensure that underlying assumptions remain valid and rates are in line with costs. Another approach is what we refer to as "annual review" decoupling, used by California and Hawaii utilities, in which "mini rate cases" are built into the process.

How should utility risk factor into decoupling? Two mechanisms can address this. The more common is to reduce the cost of equity, which translates into a lower return to the utility and saves customers money. The utility return on equity (ROE) is intended to compensate shareholders for risk, and capital markets interpret the message embedded in a state's ROE decision and other regulatory decisions. A second mechanism is for regulators to adjust the capital structure to increase the debt portion (for which a lower return is required) and decrease the equity portion (for which a higher return is required).

3. Decoupling adjustments: Select how to handle refunds or surcharges

Decoupling is designed to assure that actual revenues match authorized revenues during the life of the mechanism. Typically, however, these do not line up exactly. Decoupling adjustments serve to either refund revenue surplus or recover revenue deficits. One of the key objectives of decoupling in the eyes of consumer representatives is a mechanism whose adjustments are *symmetrical,* which is to say that over-collections are treated in the equivalent, but opposite, manner as under-collections. A further series of regulatory decisions must be undertaken to ensure this:

Allocating over- and under-recoveries to customers: Methods include a uniform surcharge or credit per kilowatt-hour (kWh) to all decoupled classes; a uniform percentage surcharge or credit to all rate elements; or "class-by-class" decoupling, in which allowed revenue is computed separately for each class and used to produce a uniform adjustment (either by kWh or percentage) for all customers in that class. The decoupling mechanism generally leaves rate design unaffected by applying either a uniform $/kWh or uniform percentage adjustment, but this need not be the only option. The mechanism can change rate design to complement policy goals. It can, for example, reward lower-use customers on an inclining block rate by allocating any refund to the first block and applying surcharges to the tail block.

Adjustment to base rates or through a purpose-built rider: Unless there is a statute in place authorizing recoveries through a specific mechanism,[9] regulators normally will have the discretion to decide this issue. A factor may be the revenue adjustment mechanism chosen. For example, if the adjustment mechanism requires annual mini rate cases, regulators may opt to fold any adjustments into the rate case rather than into a separate rider. Conversely, if there is no mandate for frequent rate cases, a rider (which, as discussed in this paper, means an adjustment to base rates rolled into a customer's total rate, not a surcharge on a bill) may be a more practical approach to reconcile any adjustments.

Frequency of true-ups: The typical choices are monthly, quarterly, and annually. Monthly is the low limit because billing is monthly, while annual is the upper limit to avoid excessive divergence between expected and actual revenues. Monthly adjustments tend to be more accurate in matching actual and authorized revenues, while a longer period, such as a year, has the benefit of smoothing out shorter-term volatility and tends to result in smaller adjustments—positive or negative—overall. A weather-only normalization can be used as a form of real-time decoupling adjustment.

Caps on the size of decoupling adjustments: While adjustments resulting from a RAM tend to cluster in the -1 to +3 percent range, they can be larger or smaller, as either a surcharge or credit.[10] Many regulators adhere to the principle of gradualism so as to minimize rate shock and make it easier for consumers to adjust to new prices. A cap can manage customer expectations and impacts. Not all utilities have such caps; some regulators may not be fans of deferrals and may instead prefer to allow the true-up to reflect the full extent of any adjustment, and some have limited surcharges but allowed full flow-through of credits. For those that prefer to limit rate impacts, there are various mechanisms for capping rates, from a cap on the percentage of a permissible rate change, to a cap on total revenue increases (as opposed to rate increases), to setting the cap in dollars, not as a percentage. Unrecovered amounts must be considered, usually via the handling of deferral balances and true-ups.

Carrying charges: With the exception of decoupling mechanisms that adjust rates monthly, the utility will either carry a deferred balance for collection or refund to customers.[11] There are two instances in which carrying charges could be considered: if true-up of charges occurs over an interval, such as a year, so that a portion of the accumulated true-up amount remains unrecovered between reconciliation, or if there is a cap on the size of the reconciliation adjustment permitted in any given adjustment period and the unrecovered portion of the adjustment is carried over for the subsequent time period. Regulators will need to decide if carrying costs should apply to one or both instances and how much those costs should be.

Additional Considerations

Revenue regulation does not need to be accompanied by other policies and can be implemented on a stand-alone basis. However, consideration of some of the implications of decoupling in terms of benefits to the utilities, policy goals,

9 A state may have a prohibition from adjusting base rates outside of a full revenue requirement investigation, but this may allow for an adjustment of a rider in a decoupling mechanism.

10 See Figure 3 on p19.

11 Even in the case of current method decoupling (see p26), a balancing account may be needed if the cap is invoked in a month of extreme volatility.

and rate designs may result in regulators making certain decisions with regard to complementary policies and the conditions for decoupling.

Performance evaluation: Decoupling is sometimes associated with performance- or outcome-based regulation. Why? If the utility is no longer worried about sales because the throughput incentive is neutralized, management is then ready to hear government priorities conveyed in the form of goals and financial incentives that promote excellence and innovation. The periodic rate reconciliation is also an opportunity to apply performance-based rewards and penalties to rates. Some, however, believe that the performance system is a distraction, that utilities should perform with excellence without the need for rewards, and that the existing powers of regulation provide penalties for poor performance. Under any regulatory paradigm, decoupling is a distinct issue from performance metrics.[12]

Rate design: As energy efficiency deployment grows and

Table ES-1

Representative Pathways: Three Straw Scenarios

Element	Scenario 1	Scenario 2	Scenario 3
Applicability	Retail choice or VIEU*	Retail choice or VIEU	VIEU
Function	Distribution	Distribution	Distribution and generation
Customer Class	Residential and small commercial	Residential, commercial, and industrial	Residential, commercial, and industrial
Excluded Costs	All distribution-related tariff riders	All distribution-related tariff riders	All costs addressed by tariff riders
Rate Case Frequency	No requirement	Full scale every 3 to 5 years	Annual mini rate case
Revenue Adjustment	RPC with K Factor	No RAM	Annual review decoupling
Symmetry	Yes	Yes	Yes
Recovery Allocation	Across the board to residential and small commercial	Customer class contribution to total revenue defines amount for each class	Customer class contribution to total revenue defines amount for each class
How Recovered	Rider	Rider	Base rates
Frequency of True-Ups	Monthly	Annually	Monthly
Carrying Costs	No	Yes	Yes
Caps	10% rate difference	3% rate difference	No cap
Regulatory Conditions	Energy efficiency programs, customer service quality, and other distributed energy resource programs	Energy efficiency programs, distributed energy resources, and customer service quality	Energy efficiency programs, distributed energy resources, and customer service quality
Rate Design and Allocation of Reconciliation	Inclining block; credits on first block; surcharge on second block	Inclining block; credit on first block; surcharge on second block; *or* time-of-use; refund on off-peak; surcharge on on-peak	Inclining block; credit on first block; surcharge on second block; *or* time-of-use; refund on off-peak; surcharge on on-peak
Return on Equity	No change	No change	No change
Capital Structure	Reduce equity ratio	Reduce equity ratio	Reduce equity ratio within annual review

** VIEU: vertically integrated electric utility.*

12 Lazar, J. (2014). *Performance-Based Regulation for EU Electric Distribution Utilities.* Retrieved from: http://www.raponline.org/knowledge-center/performance-based-regulation-for-eu-distribution-system-operators

the cost of customer-sited alternatives such as rooftop photovoltaics (PV) continue to decline, there is a growing debate over utility revenue collection and customer compensation. Decoupling is a tool regulators can use to manage this conflict, leaving the focus of rate design on customer price signals and other policy priorities. If a regulator has ordered the utility to adopt decoupling, the need for high fixed charges or demand charges becomes inconsequential to shareholder earnings, because, at least in the short term, the utility has a greater ability to recover its revenue requirement.

Bill simplification: Decoupling requires periodic adjustments in customer rates. It is important for the rates, as they appear on the customer bill, to be understandable. Many utilities' bills include separately stated line items for various charges, usually linked to specific tariff riders, which can cause customer confusion. It is essential that bills show just the effective rate, which includes all surcharges, credits, and taxes, so that customers understand how much they will save if they use less electricity, and how much they will pay if they use more.

Potential Decoupling Pathways

Considering all the options outlined above, RAP has put together for consideration three scenarios that include the major elements of decoupling (See Table ES-1):

- ***Scenario 1*** applies to a distribution-only utility or a vertically integrated electric utility that has adopted decoupling for distribution services only. This scenario differs from the others in that it has a monthly true-up recovered through a rider. As a result, there are no carrying costs, but rates are subject to larger monthly fluctuations that may be necessary to explain to customers. We also added a performance metric for customer care and reliability; although a performance metric is not integral to a decoupling mechanism (which is the reason for its absence from Scenarios 2 and 3), it is certainly worthy of consideration.
- ***Scenario 2*** is similar to Scenario 1 in that it applies to the distribution function only. A distinguishing factor, however, is that this decoupling mechanism applies to all customer classes, including industrial. In this case, as in Scenario 3, there is a significant number of industrial customers to warrant their inclusion in the decoupling mechanism.
- ***Scenario 3*** differs from the first two scenarios in that it applies to a vertically integrated utility and to its distribution and generation functions. Unlike Scenarios 1 and 2, which rely on riders for recovery of over- and under-recoveries, Scenario 3 requires annual mini rate cases to adjust revenues and reconcile rates with revenue requirements.

Across the board, there is no adjustment in any scenario to the return on equity. Return on equity adjustments are poorly received by the utility and the investment communities and could contribute to an investment downgrading, which then could increase the cost of borrowing—a cost passed on to consumers. A better way to reflect the reduction in risk is through a change in the capital structure that reduces the equity ratio.

Conclusions

On a macro level, decoupling separates sales from revenue. However, on a micro level, there are myriad details in how that is done. Assumptions about these details influence the wide variety of viewpoints about this issue, both supportive and critical, that are seen in the power sector. Understanding decoupling, therefore, perhaps should start with an understanding of these assumptions.

This paper points to certain pathways that RAP would recommend over others. They include:

- Symmetry in over- and under-recoveries;
- Exclusion of costs recovered through separate tariff riders, to avoid over-collection of costs;
- Reduction in equity ratio, rather than an adjustment of the return on equity, to reflect lower risk; and
- Performance requirements to foster energy efficiency, the development of distributed resources, and quality service levels.

Other factors vary by jurisdiction and need to be decided as well, including, most importantly, which RAM to use, but also cost allocation by customer class, mechanisms for and frequency of cost recovery, caps, and the issue of carrying costs.

Decoupling can be applied to any utility. While it may be a more obvious option for a regulated utility, it can also be applied to municipal utilities (munis) and co-operatives (co-ops). In any event, there is no one answer to the question, "How should this utility decouple revenues from sales?" For each company, state, and time, the answer should represent the priorities of the day, guided by the framework laid out here.

Ultimately, a good decoupling mechanism may best be driven by a consensus among the stakeholders, reached via a collaborative process in which the mechanism chosen and the decisions made balances the interests of all parties.

I. Introduction

Decoupling[13] mechanisms have been adopted in many states as a means of addressing the impacts on utilities' revenues from factors affecting the levels of their sales. Originally conceived as a way to make utilities indifferent to annual sales volume and to address the net revenue losses associated with energy efficiency programs, it has more recently been considered to be one of many tools to mitigate revenue shortfalls from deployment of all distributed energy resources (DER). A decoupling mechanism contains a number of decision points in its design that address policy and stakeholder priorities. A decoupling mechanism is not static; rather, it offers a multitude of design options. No two decoupling mechanisms seem to be identical. From an overall perspective of the good of the state, or from the distinct perspective of individual stakeholders, these decisions will enhance the decoupling mechanism or make it less attractive. Examples of the kinds of decisions regulators typically consider and for which stakeholders provide input include the design of the revenue adjustment mechanism, the frequency of adjustments, limits (caps) on the size of the adjustment, and other factors that are discussed in more detail herein.

The Regulatory Assistance Project (RAP) has written frequently on decoupling over the course of the past few years because of its importance as a tool to achieve the public policy objectives of, among other things, improving the efficiency of utility operations, reducing risk (for both consumers and utilities), promoting energy efficiency and conservation, and supporting deployment of DER.[14] The benefits of a well-designed decoupling mechanism are manifold and are discussed briefly; however, the principal focus of this paper is on the various decisions in how to design decoupling so that it can best complement the facts on the ground and the goals of each state, each commission, and its stakeholders. This paper then concludes with sample pathways that could be considered in designing and implementing decoupling. For the reader who is unsure of the benefits of decoupling, we have attached a discussion (see Appendix).

A. The Regulatory Conditions for Decoupling

Decoupling is a tool that allows the utility to recover net lost revenues attributable to reduced sales. Its genesis was in energy efficiency programs under the premise that it is anathema to the traditional utility business model to order a company to work hard to sell less of its product. Regulators who believe that energy efficiency is in the public interest often decide to implement a mechanism to make the utility whole for any net lost revenues resulting from its government-mandated efficiency efforts. Decoupling offers an elegant method for this purpose. Other stakeholders who supported decoupling often did so with the understanding that the utility would be obligated to deliver a comprehensive portfolio of energy efficiency programs.

The first decoupling mechanisms were created for natural gas distribution utilities, which do not have "production" plants in their company-owned asset base (and hence resemble a restructured, wires-only electric utility). They were later extended to include vertically integrated electric utilities. Inherent downward pressure on utility sales from more efficient devices and processes, even as dependence on electricity and the number of devices

13 See Lazar, J., Weston, F., & Shirley, W. (2011). *Revenue Regulation and Decoupling.* Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/ knowledge-center/revenue-regulation-and-decoupling-aguide-to-theory-and-application

14 Lazar, J., Weston, F., & Shirley, W. (2011). See also Migden-Ostrander, J., Watson, B., Lamont, D., & Sedano, R. (2014). *Decoupling Case Studies: Revenue Regulation Implementation in Six States.* Montpelier, VT: The Regulatory Assistance Project; plus numerous presentation slides available at www.raponline.org.

increases, has made a difference[15] in utility attitudes toward decoupling.

Later, as the cost of renewable energy options declined, decoupling began to be viewed in some quarters as a mechanism to deal with the impacts of DER.[16] Decoupling offers the distinct advantage of reducing risk and ensuring revenue recovery, consistent with the setting of "just and reasonable" rates, which does not change with decoupling. This has value to consumers, who also benefit from reduced risk, as it can lower the cost of borrowing for the utility. Decoupling enables a commitment within utility management along with the execution of substantial energy efficiency, which is the benefit of the bargain that will accrue to all stakeholders.[17] In future decoupling plans, conditions pertaining to enabling other DER may appear.

Good customer service is important to customer advocates.[18] They are concerned that, if utilities are assured of revenue recovery, they may be tempted to reduce costs by cutting services necessary to maintain service quality and reliability. Along with performing well on energy efficiency, it may be important to also require that utilities meet a certain level of service as part of the exchange in obtaining decoupling. Many decoupling mechanisms include customer service quality or reliability indices, which penalize utilities if service falls below a defined threshold.

15 See Appendix for a discussion of the benefits of decoupling for customers and utilities.

16 For more on the treatment of DER in rates, see Hledik, R., & Lazar, J. (2016). *Distribution System Pricing With Distributed Energy Resources.* Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/distribution-system-pricing-with-distributed-energy-resources/

17 For more on the benefits of energy efficiency, see Lazar, J., & Colburn, K. (2013). *Recognizing the Full Value of Energy Efficiency.* Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/recognizing-the-full-value-of-energy-efficiency

18 For examples of good customer service plans, see Vermont Public Service Board. (2016). Service Quality Plan. Retrieved from: http://psb.vermont.gov/utilityindustries/electric/backgroundinfo/sqrp; and New York Public Service Commission. (2004). Order Adopting Changes to Standards on Reliability of Electric Service. Retrieved from: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BD9001691-1895-462A-A827-1BC09245548F%7D

Designing Decoupling

1. Decide what's covered

Decoupling can be applied to:

- Distribution alone
- Distribution and transmission
- Distribution, transmission, and generation

It can cover residential, commercial, and industrial customers or apply selectively. Exclude fuel or power purchase costs if they are already covered in a rider, fuel adjustment mechanism, etc.

2. Choose how to adjust utility revenue

There are about a half-dozen options for "Revenue Adjustment Mechanisms" (RAMs) to adjust utility revenue to provide stability to utilities and customers. Among them:

- Revenue per customer
- Annual review decoupling
- No adjustment at all

Power Bill

CREDIT

3. Select how to handle refunds or surcharges

Truing up actual utility revenues with what utilities are allowed to earn can be done monthly or at longer intervals. Refunds or charges can be applied to all customers evenly or be allocated to customer classes. They can also be directed to encourage a particular policy goal, like rewarding low energy usage.

Customer Considerations

- Refunds if utilities over-collect
- Caps on rate increases or decreases?
- More energy efficiency
- Reducing cost of capital

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II. Decoupling Design: Decision Points

This paper is the third in a trilogy of RAP papers on decoupling. In the first, we explained the intricacies of decoupling: how it works and what it accomplishes. In the second, we conducted six case studies of decoupling mechanisms around the United States.[19] This third paper examines how to construct a decoupling mechanism: it identifies the many decision points that regulators will want to address when designing a decoupling regime.

The issues that regulators face and the decisions they must make fall into three broad categories:

1. Applicability of revenue regulation: decide what's covered
2. How a decoupling mechanism works
3. Decoupling adjustments: select how to handle refunds or surcharges

A. Legal Authority to Establish Decoupling

Before we dive into the decisions necessary to create a decoupling mechanism, it is important to address the variety of ways to establish decoupling. One method of establishment is by statute, which can either be an explicit direction to pursue decoupling (or not), or it can be implicit and fall under broader statutory powers granted to the commission, which is the most common. If it is explicit in the statute, it becomes a *fait accompli,* but how the mechanism works will be determined in a commission proceeding and may depend on any statutory requirements that might be included in the legislation. Without specific statutory guidance, many regulators find that they have the authority to establish a decoupling mechanism under their broad statutory authority to regulate public utilities. However, where there is no specific statutory grant of authority, others may interpret a prohibition on changing base rates outside a rate case, and limit commission authority. In this case, decoupling would have to take place in a rate case, with any adjustment to the revenue requirements occurring in a subsequent rate case.

Decoupling mechanisms can be accomplished in a variety of ways at the regulatory level. Decoupling can sometimes be achieved when the utilities, commission staff, and the interveners collaborate to develop a proposal to which all parties can agree and that addresses the concerns of a range of stakeholders. This can occur through negotiations in a rulemaking or in a utility case-specific proceeding. In Hawaii, the governor, Hawaii Electric Company (HECO), and the consumer advocate entered into an agreement called the Clean Energy Initiative. The commission in turn opened a docket on revenue regulation and ordered HECO, the state, and the consumer advocate to develop a joint recommendation in 60 days.[20]

In Ohio, after Energy Efficiency Resource Standards (EERS) were enacted by the legislature, the Ohio Consumers' Counsel and American Electric Power Company negotiated a decoupling agreement as part of a rate case settlement.[21]

Arkansas took a different approach. Wanting to encourage its utilities to file for decoupling, the Arkansas Public Service

19 Lazar, J., Weston, F., & Shirley, W. (2011). See also Migden-Ostrander, J., Wason, B., Lamont, D., & Sedano, R. (2014); plus numerous presentation slides available at www.raponline.org

20 Hawaii Public Utilities Commission, Docket 2008-0274.

21 SB 221 resulted in the passage of the EERS in 2008. Despite overwhelming evidence of the success of the EERS in terms of customer savings, the legislature froze the EERS in SB 310 in 2014. The case that approved the decoupling mechanism for American Electric Power Company was Public Utility Commission of Ohio (PUCO) Case No 11-351-EL-AIR, Opinion and Order, December 14, 2011. Although the decoupling mechanism is still in effect and is working well, the Commission has ordered all the electric utilities to file straight fixed/variable rates instead of decoupling in their next case. PUCO Case No. 10-3126-EL-UNC Order, August 21, 2013.

Commission issued an order inviting the utilities to file a decoupling proposal with their next rate cases.[22] In the order, the commission specified certain design parameters that it believed were in the public interest, but left the rest of the design decisions to the utility and required them to provide the rationale for their design recommendations. Specifically, the commission ordered: (1) that the customer charge be set low enough to encourage customer conservation; (2) that the utility establish separate revenue-per-customer amounts for, at a minimum, residential, small commercial, and demand-metered commercial customers; and (3) that the true-up mechanism be symmetrical to adjust for over- and under-recoveries. In Washington, the Utilities and Transportation Commission issued a policy statement on November 4, 2010, that expressed their views on several design elements for decoupling.[23]

In Massachusetts, the Department of Public Utilities issued an order requiring decoupling and detailing how it should take place. Decoupling is still in effect in Massachusetts.[24] That order required electric and gas utilities to implement full decoupling, with an annual reconciliation to help implement the "Green Communities Act" that had been passed by the Massachusetts legislature to promote energy efficiency, demand response, and distributed generation.[25]

Decoupling can work well when it is part of a collaboration among parties and supports a comprehensive energy efficiency plan in which program costs, net lost revenues, and incentives are addressed to encourage utility progress and provide benefits to customers.

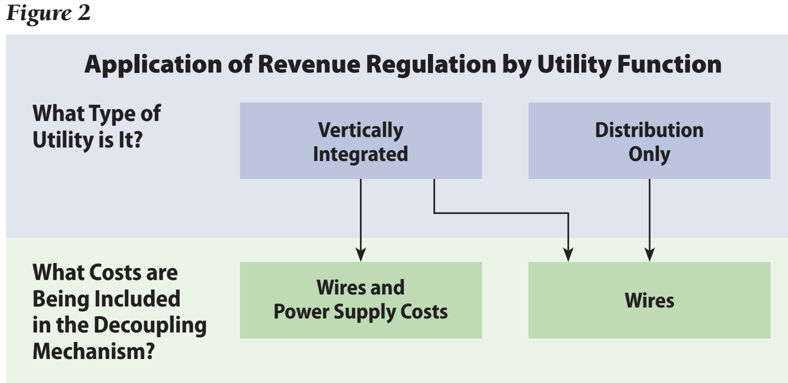
B. Applicability of Revenue Regulation: Decide What's Covered

Deciding what (or who) is covered by a decoupling mechanism is the first category of decisions to make. The effects of the decoupling mechanism will vary widely depending on what utility functions are covered (generation, transmission, and distribution); which customer classes are covered (residential, small commercial, or all customer classes); which costs are included and excluded; and by utility type. This section describes the options under each category and relevant considerations for each choice.

1. Applicability of Revenue Regulation by Utility Function

Revenue regulation can be applied to any and all utility functions (generation, transmission, and distribution). For restructured utilities the decision is simple. Decoupling would apply only to distribution and in many cases to transmission as the monopoly businesses of the utility. For vertically integrated utilities, it could apply to just

Figure 2



22 Arkansas Public Service Commission, In the Matter of the Consideration of Innovative Approaches to Ratebase Rate of Return Ratemaking Including, But Not Limited to, Annual Earnings Reviews, Formula Rates, and Incentive Rates for Jurisdictional Electric and Natural Gas Public Utilities, Docket No. 08-1137-U, Order No. 19, January 2, 2013.

23 Washington State Utilities and Transportation Commission, Docket No. U-100522, Report and Policy Statement on Regulatory Mechanisms, including decoupling, to encourage utilities to meet or exceed their conservation targets, November 4, 2010.

24 MA DPU, Order No. 07-50A, Investigation by the Department of Public Utilities on its own Motion into Rate Structures that will Promote Efficient Deployment of Demand Resources, July 16, 2008.

25 Commonwealth of Massachusetts, Chapter 169 of the Acts of 2008.

26 "Net lost revenue adjustments" is the term of art that describes earlier methods of compensating a utility for the revenue to cover non-production costs that it would have collected had specified sales-reducing events or actions (e.g., cooler than expected summer weather or government-mandated end-use energy investments) not occurred.

distribution and transmission, or to all three functions, including generation. Figure 2 illustrates this application of decoupling mechanism by utility function.

Pragmatically, the best result may be achieved by separating the distribution revenue requirement from the power supply revenue requirement, and implementing mechanisms to assure that both produce the correct amount of revenue. The Washington Utilities and Transportation Commission (WUTC) implemented such a mechanism for Puget Sound Energy; the distribution revenue requirement is subject to a decoupling mechanism, and the power supply revenue requirement is subject to a power cost adjustment mechanism.[27]

2. Applicability of Revenue Regulation to Customer Classes

Decoupling is applied to the residential and small commercial classes, because as groups they are fairly homogenous in their usage, unlike the industrial class, in which there are large differences among customers in how they use electricity. Moreover, for the residential and small commercial class, there is no single customer whose usage requirements comprise a dominant portion of that customer class. The simplicity of their rate designs usually makes it easy to calculate an adjustment to a volumetric rate that is fair for all customers in that rate class.

For larger customers who have special contracts that

Gas Decoupling

The focus of this paper is on electric decoupling; however, a word about gas decoupling for local distribution companies (LDCs) is in order, especially because there are many utilities that have adopted it. Gas utility structure and operations lend themselves more easily to decoupling than perhaps the more complex and diverse structures in place in the electric industry, which have far more capital-intensive costs for production resources.

Today, practically all gas utility companies are distribution-only companies. Distribution costs are generally stable in the short-run. Natural gas is procured by the LDC for the customer in one of two ways: either the LDC directly procures the gas on the market or it procures it through a competitive bid auction. In either event, the LDC recovers the cost of gas through an adjustment clause. It is a pure pass-through in which the LDC neither earns nor loses money. A third method exists in states with retail gas competition in which the end-use customer contracts with a third-party supplier, a gas marketer, to provide their gas. Examples include Texas, Georgia, and Ohio. In this case, like the two examples mentioned earlier, the LDC does not earn or lose money on gas sales. Thus, the focus for the LDC is the distribution rate and ensuring that it covers its costs and earns a reasonable return for shareholders. This simplifies the decoupling process.

Gas companies worry more about sales volatility caused by weather than do electric companies. Although a long, cold winter helps increase sales and thus revenues, a short, warmer winter results in reduced sales and less revenues. By the same token, customers worry about the size of their gas bill. A particularly cold winter can result in higher than average winter gas bills. Decoupling eliminates the risk for both the utility and the consumer caused by weather volatility by basing utility revenues on the amount authorized by the commission in a rate case and not on weather conditions. Because many gas utilities already have weather normalization mechanisms, moving to gas decoupling does not represent a major shift from how rates are determined currently for those utilities.

Many of the same decision points discussed in this paper on electric decoupling are also applicable to gas decoupling, such as the frequency of true-ups, but many are straight-forward, such as applying the mechanism to all customer classes and ensuring symmetry to reflect both under- and over-recoveries. Requiring a certain frequency of rate cases should be included to periodically reconcile rates with costs, but this is not always done. Furthermore, because of the relative simplicity of gas decoupling as compared to electric decoupling, the discussion of costs to be included or excluded from the decoupling mechanism falls away, as it is really just a question of addressing the revenue requirements for the distribution service.

27 See WUTC v. Puget Sound Energy, Docket No. 12 1697; also see discussion further in this paper, in text box on page 20: "Avoiding Double Recovery."

might include an economic development or curtailable rate, applicability can be more complicated. In situations in which there are very large industrial customers in the class, especially in the case where there may be only a few customers in the industrial class, decoupling can have too large an effect on other customers in the class, owing to sales increases or decreases by a single large customer. In these cases, industrial customers are nearly always excluded from the decoupling mechanism (even as these customers benefit from improved management focus on service and cost control).

Idaho Power and Light applies decoupling to only residential and small commercial customers, whereas National Grid in Massachusetts applies it to all customer classes.[28]

3. Applicability to Cost Categories: Costs Included in or Excluded From the Decoupling Mechanism

Should all costs be included in a revenue decoupling mechanism or are there some that should be excluded? The answer depends in large measure on whether the utility is allowed to recover any specific categories of costs through a separate mechanism. If the utility has a separate mechanism to track discrete costs that are recovered on a fairly regular basis, these costs are usually excluded from a decoupling mechanism to avoid the risk of double counting.

For example, if a fuel and purchased power mechanism recovers a portion of power supply costs, all power supply costs should be removed from the decoupling mechanism to avoid risk of double recovery. If an infrastructure tracker is in place to address replacement of older distribution plant or to manage an escalating capital investment need, that category of distribution plant should be removed from the decoupling mechanism to avoid double recovery of those costs. The bottom line is that if there is a tracker to permit accelerated recovery of discrete costs, those costs should be excluded from a decoupling mechanism because they are accounted for elsewhere. When it comes to surcharges in general, any surcharge added to customer bills is troublesome because it is generally additive to rates; adjustment mechanisms are seldom requested by utilities to track costs that are decreasing owing to productivity and technology improvements. In that vein, there may a preference for including as much into base rates and removing trackers when possible. The decoupling mechanism is different in that it is based on revenue requirements and not a cost added to revenue requirements. Thus, it can reduce rates if the utility has over-recovered.

4. Applicability of Decoupling to Utility Type

Decoupling is applicable for utilities without shareholders, such as municipal electric systems that are government-owned and cooperative electric companies that are member-owned and also need to ensure adequate revenues. With some adaptation, the decision steps covered in this paper can be applied to these companies as they face the same challenges when there is a reduction in sales owing to energy efficiency and other customer actions. Companies with no equity shareholders remain concerned about revenue adequacy to cover bond covenants, are deploying distributed energy resources, want efficient regulation, and the rest.[29] For these companies, adjustments to the return on equity would not be applicable, nor might it be necessary to regiment the frequency of rate cases. On the issue of performance, an adaption for these utilities could be the opportunity to reward employees who contribute to exemplary utility results.

Recently the Los Angeles Department of Water and Power adopted a decoupling mechanism known as the "Base Rate Revenue Target" (BRRT). The BRRT is described as a mechanism to encourage water and power conservation while recovering the utility's fixed costs of providing service. Under the BRRT, revenues above the sales target will be returned to customers, while revenues below the sales target will be recovered from customers through charges over the next calendar year.[30]

28 Idaho Public Utilities Commission, IPC-E-04-15 – Idaho Power – Investigation of Financial Disincentives; Massachusetts Department of Public Utilities, Docket 09-39, Petition of Massachusetts Electric Company, November 30, 2009.

29 Although municipal utilities do not have equity shareholders, they typically have significant equity (retained earnings). This is measured as the difference between net plant in service and outstanding debt.

30 Los Angeles Department of Water and Power, 2016-2020 Rate Changes Fact Sheet. Retrieved from: http://www.myladwp.com/2016_2020_rate_request

C. How a Decoupling Mechanism Works

1. Choosing the Revenue Adjustment Mechanism

The determination of the revenue requirement and how and when it is adjusted is inextricably tied to the revenue adjustment mechanism selected. Some revenue adjustments allow for some adjustment to revenues in between cases, whereas others are tied to a rate case determination and possibly the frequency of rate cases. Also important in terms of the development of the revenue requirements are considerations of the capitalization ratio that reflects less risk to the utility as a result of decoupling.

The choice of the revenue adjustment mechanism is at the heart of decoupling and perhaps the most significant decision that regulators have to make in the course of a decoupling proceeding. It can also be the most controversial. At the conclusion of a rate case, regulators establish the revenue requirements. The revenue requirement is not static and will grow as utility costs increase over time (at least from inflation plus other pressures). In the absence of decoupling, the utility tends to work to increase sales within the capacity of existing assets to generate additional net revenues to offset upward rate pressures. When cost increases associated with operating the utility overwhelm the impact of sales growth and reach a critical level, the utility then files for a rate increase. The Revenue Adjustment Mechanism (RAM) allows the utility to adjust for some or all of these costs (depending on the RAM chosen) in order to reflect the growth in revenue requirements without a full-blown rate case. Nevertheless, a RAM is not necessary to have a fully functional decoupling mechanism in place. Table 1 provides a simple illustration.

Table 1

Periodic Decoupling Calculation	
From the Rate Case	
Target Revenues	$10,000,000
Test Year Unit Sales	100,000,000
Price	$0.10000
Post Rate Case Calculation	
Actual Unit Sales	99,500,000
Required Total Price	$0.1005025
Decoupling Price Adjustment	$0.0005025

The RAM options include:[31]

- No RAM
- Stair-Step
- Indexing
- Revenue Per Customer
- Annual Review Decoupling (also known as Attrition Decoupling)
- K Factor
- Hybrid

Each is discussed in more detail here.

No RAM

A no-RAM mechanism is based on the supposition that no adjustment is made to the revenue requirement. Rates are periodically adjusted in a true-up based on the revenue requirement approved by the regulator in the last rate case. The revenue requirements are not adjusted until the utility files a rate case to increase its revenue requirement. Increasing rates is a cause for consumer concern, especially if there is an insufficient opportunity to verify the increases. Furthermore, consumers worry about selective adjustments that only increase rates without accounting for cost reductions, because there is no opportunity to net decreased costs against increased costs. For this reason, some consumer advocates support having no revenue adjustment mechanism. This problem can be particularly acute if some rising costs are addressed by separate tracker mechanisms.

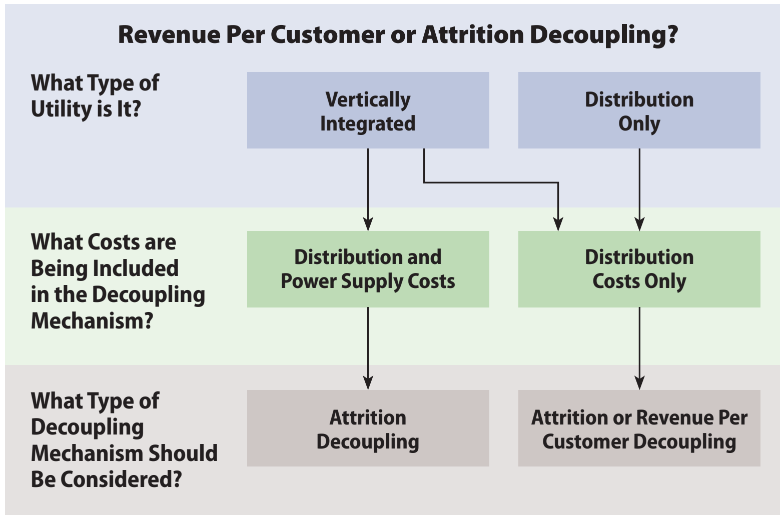
Stair-Step

Stair-step adjustments are predetermined in a rate case and are usually based on forecasts of projected cost increases. The benefit of this revenue adjustment mechanism is that it can provide revenue stability based on predetermined choices that translate into financial benefits for the utility and its customers. The downside of this kind of adjustment is accuracy in determining actual costs in that forecasts are never entirely accurate. In jurisdictions that use a future test year, this may seem to be just an extension of current

31 For more on these definitions, see Lazar, J., Weston, F., & Shirley, W. (2011).

practice. It may be viewed elsewhere as problematic in that, by the nature of it being based on forecasts, it lacks the qualities of being known and measurable. Generally, any revenue adjustment mechanism should account for known and measureable increases. Thus a true-up between actual and forecasted increase is advised.

Figure 3



Indexing

Under indexing, adjustments to the revenue requirement are tied to multiple factors, such as general or industry inflation, industry productivity, customer growth, and changes in capital. The indexing adjustment can account for known or likely utility cost changes without necessarily having major rate impacts. As such, it may be a reasonable compromise to account for some cost increases without re-evaluating the entire revenue requirement.

Revenue Per Customer

The Revenue Per Customer (RPC) mechanism adjusts the revenue requirement for the total number of customers served. Regulators determine the revenue requirement on a per-customer basis (usually by customer class) so that the total system revenue requirement is determined by multiplying the number of customers in each class by the revenue requirement for each customer in that class. Table 2 illustrates how this works.

Table 2

Revenue Per Customer Periodic Decoupling Calculation

From the Rate Case	
Target Revenues	$10,000,000
Test Year Unit Sales	100,000,000
Price	$0.10000
Number of Customers	200,000
Revenue per Customer (RPC)	$50.00
Post Rate Case Calculation	
Number of Customers	200,500
Target Revenues ($50 x 200,500)	$10,025,000
Actual Unit Sales	99,750,000
Required Total Price	$0.1005013
Decoupling Price "Adjustment"	$0.0005013

An RPC adjustment is frequently used for distribution utilities and is among the most popular mechanisms. As part of a rate case, an RPC calculation is made for each relevant class. As illustrated in Table 2, after a period of time, the RPC is multiplied by the total number of customers in the relevant class to produce the revenue requirement. Thus the RPC takes into account not only the change in sales, but also the change in the number of customers, which impacts both sales and revenues required to serve the changed customer level. One of the benefits of an RPC mechanism is that customers do not end up compensating a utility for lost revenues from lost customers. The industrial customer class may have too few and too diverse customers for this method to work well.

Figure 3 illustrates how the type of utility and the type of costs included in the mechanism will influence the type of decoupling mechanism that should be considered.

Annual Review Decoupling (Also Known as Attrition Decoupling)

Under annual review decoupling, periodic reviews are used to adjust base rates for incremental and decremental known and measurable changes in rate base and operating expense. More controversial larger changes, such as major plant additions, are left for a full rate case (unless there is an applicable tracker in place, in which case it would not be part of the decoupling mechanism). An attrition adjustment (see text box below) is a useful solution to over-recovery of costs that can occur under a power adjustment clause.

K Factor

The K Factor is an adjustment used to increase or decrease overall growth in revenues between rate cases. It can vary from year to year but is usually set at a prescribed

Avoiding Double Recovery

A distribution and transmission decoupling mechanism will not address generation revenue changes for a vertically regulated utility. If generation investment-related costs are included in an RPC decoupling mechanism, there is a risk of double recovery of investment-related costs, because the customer count normally rises between rate cases, whereas the investment-related generation costs normally decline between rate cases, as existing power plants are depreciated. Rising fuel and purchased power costs will be recovered in a fuel adjustment mechanism, without the offset of declining investment-related costs, which would be captured in a general rate case. Thus, if regulators desire to retain a fuel adjustment mechanism under RPC decoupling (because utilities are altogether unwilling to bear such a broad fuel price volatility risk), it is important to have a properly designed power cost adjustment clause that accounts for changes in both investment-related costs and operating costs such as fuel. The power cost adjustment clause must be structured to take account of the normal decline in generation investment-related costs between rate cases to address this.

If sales go down, the vertically integrated utility will be able to avoid some costs (fuel or power costs, most notably), and the distribution-only utility may be able to avoid costs as well (although these would be expected to be small). The utility can reduce purchases of energy, reduce fuel usage in expensive marginal power plants, or sell excess generation into the market and avoid or recover part of (or more than) the revenues lost. To encourage the utility to obtain the best deal possible in its power supply management and off-system sales transactions, the regulator could allow the utility to keep a modest percentage of the off-system sales revenues sufficient to motivate profit-maximizing behavior. If these costs are managed with a fuel clause, they should be excluded from the decoupling mechanism.

For illustration purposes, for a typical utility, the costs established in a rate case are currently broken up more or less as shown in Table 3.

Table 3

Costs Established in a Rate Case

Costs	Amount	What it Covers
Base rates for power for vertically integrated utilities only	$0.04/kWh	Investment costs in power plants and transmission lines; non-fuel O&M for power plants and transmission lines
Base rates (delivery)	$0.04/kWh	Investment costs in distribution facilities; O&M for distribution facilities; all overhead costs (often including those attributable to power supply)
Fuel rate (subject to adjustment in the fuel adjustment clause [FAC]) – applicable to vertically integrated utilities	$0.02/kWh	All fuel and purchased power expense, net of sales for resale, plus transmission by others
Total rate to consumer	$0.10/kWh for vertically integrated utilities; $0.04 for distribution-only utilities	

level between rate cases. A K Factor coupled with an RPC can address the challenge of tracking the effects of cost drivers that are changing, while also using the convenient RPC device. This is because the K Factor is used to increase or decrease revenues between rate cases. The K Factor would reflect declining generation and transmission costs between rate cases, whereas the RPC would reflect rising customer counts and distribution costs.

The K Factor can be used if an important assumption is likely to vary in some meaningful way during the period the decoupling plan is in effect e.g., if average residential consumption is changing (either because of larger houses and associated growth in plug-in loads or because end-uses are getting more efficient) or PV growth is significant.

Hybrid

The hybrid mechanism is basically a combination of mechanisms that are used by a regulator. For example, a combination of RPC and K Factor may be used, so that the allowed RPC grows (or declines) according to a historical trend factor as the mix of customers changes over time.

2. Choosing the Frequency of Rate Cases to Determine Revenue Requirements

How frequently should the revenue requirement of a utility be reviewed? In some instances, regulators do not set a schedule for how frequently revenue requirements should be reviewed and instead leave it to the utility to decide when it needs to file for a full rate case review. This is the practice in New York.[32] The benefit of requiring a rate case review within a period of years is to capture any reductions or increases in utility costs that were not covered when the revenue requirement was established. A drawback of scheduled rate cases is the drain on resources resulting from a full rate case review if there has been little change. Additionally, from a consumer perspective, scheduled rate cases could mean the likelihood that rates will increase if the revenue adjustment mechanism does not account for inflation, or known and measureable increases in costs.

Most commissions have incorporated periodic reviews in their orders approving decoupling. Periodic reviews of the revenue requirement assure that underlying assumptions are still sufficiently valid to support rates and serve to assure that rates are in line with costs. For example, Wisconsin Public Service Corp. has annual rate cases with its decoupling mechanism.[33] Most decoupling mechanisms prescribe a specific multiyear duration and an expectation of a full "soup to nuts" rate case after a specific time with the understanding that the utility will not seek a rate case before the prescribed period. This approach can avoid significant financial and other costs associated with rate cases. Periodic reviews allow for adjustments to the revenue requirements to ensure that they accurately reflect the appropriate amount of revenue that the utility should collect as determined by the regulator.

Another approach is to build "mini rate cases" into the decoupling process as California and Hawaii regulators have done with the Pacific Gas and Electric (PG&E) and HECO decoupling programs, which resulted in abbreviated annual rate reviews and a triennial rate case, respectively.[34] We call this approach "annual review" decoupling, because it calls for reviews of changes in costs between rate cases, but not for re-litigation of issues such as rate of return, capital structure, or regulatory disallowances. It is also sometimes known as "attrition." These mechanisms can become fairly complex and require considerable attention (although less than a full rate case); however, they result in a more accurate accounting of what a utility's revenue requirements should be on an annual basis than does the reconciliation approach that is more typical.

Regulators value having precision in ratemaking to capture the major changes in the test year revenue requirements on an annual basis, and the multiyear mechanism should be expected to produce rates that approximate what annual rate cases would have produced. Naturally, in the absence of decoupling, rate adjustments (other than through separate riders) do not occur unless unless a rate case is adjudicated.

A "stay-out" provision, which prohibits utilities from filing a new rate case within some multi-year period, is a typical part of the decoupling package. A common exception to such a provision is to allow the utility to file in response to events that are outside its control.[35]

32 NY PSC. Docket Nos. 03-E-0640 and 06-G-0746. Order Requiring Proposals for Revenue Decoupling Mechanisms. April 20, 2007.

33 WI PSC, Docket No. 6690-UR-121. Application of Wisconsin Public Service Corporation for Authority to Adjust Electric and Natural Gas Rates, 2012.

34 CPUC, Decision 93887, December 31, 1981; Hawaii Public Utilities Commission, Docket 2008-0274.

35 Stay-out provisions may not be legally enforceable; the utility always has the right to request an amendment to the stay-out provision, and the regulator always has the authority to grant that request.

3. Adjustments to Reflect Reduced Risk: Return on Equity/Capital Structure Benefits

Decoupling tends to reduce utility risk by providing revenue stability. How should utility risk factor into the decoupling mechanism? There are two mechanisms that can address this. The more common is to reduce the cost of equity, which translates into a lower return to the utility and saves customers money. The utility return on equity (ROE) is intended to compensate shareholders for risk, and capital markets interpret the message embedded in a state's ROE decision and other regulatory decisions. A second mechanism is for regulators to adjust the capital structure so as to increase the debt portion (for which a lower return is required) and decrease the equity portion (for which a higher return is required). Either mechanism returns benefits to the customer.

For decoupling to have its effect on capital markets, it needs to be allowed to work, and it needs to be perceived as part of the regulatory environment. For these reasons, its full potential may not be evident when a utility starts decoupling for the first time. Its effects are associated with whether the utility and the state appear (to financial market analysts) committed to decoupling, as well as how the state resolves other pressing regulatory matters. Regulators have tested methods to assess the appropriate ROE, and can use them after decoupling has taken effect to evaluate utility risk and the required ROE to maintain safe and reliable service.

Regulators may find that they want an ex ante reflection of the anticipated risk reduction from decoupling when the mechanism is approved. If regulators find that the risk of the firm calls for a reduced cost of capital, the regulator can choose to change the capital structure to require less equity. This change can be phased in during the life of the mechanism. Standard and Poor's has acknowledged that a utility with stable earnings will be able to maintain the same bond rating with less equity in its capital structure than a non-decoupled utility with more volatile earnings.[36] Equity is more costly to consumers, both because of the higher cost of equity and because of federal income tax treatment of utility equity. Because decoupling stabilizes the income stream to the utility (at least with respect to sales levels), it can provide this benefit of allowing a lower equity ratio. Rather than reduce the allowed return on equity, a step generally opposed by investor-owned utilities, regulators would simply adopt a slightly more leveraged capital structure, reflecting the lower earnings volatility. This produces economic benefits to consumers with no adverse impact on utility shareholders. The shift in the debt/equity ratio as illustrated in Table 4 can translate into approximately $3 million in lower revenue requirements for every $1 billion of utility rate base, a 0.3-percent reduction. In Table 4, the reduced equity capitalization ratio produces about the same benefit to consumers as a 0.4-percent reduction in the allowed return on equity would produce, but without the adverse impact on shareholders.

Table 4

Illustration of Debt/Equity Ratio Shift

Without Decoupling	Ratio	Cost	Weighted with-tax cost of capital
Equity	48%	10%	7.38%
Debt	52%	7%	2.37%
Weighted cost			9.75%
Revenue requirement: $1 Billion Rate Base			$97,506.154
With Decoupling			
Equity	45%	10%	6.92%
Debt	55%	7%	2.5%
Weighted cost			9.43%
Revenue Requirement: $1 Billion Rate Base			$94,255,769
Savings Due to Decoupling Cost of Capital Benefit:			**$3,250,385**

D. Decoupling Adjustments: Select How To Handle Refunds Or Surcharges

1. Symmetry and Equity in Over- and Under-Recoveries

Decoupling mechanisms are designed to assure that actual revenues match authorized revenues during the life of the mechanism. Typically, however, actual revenues are either over or under authorized revenues. Decoupling

36 See: Standard and Poor's. (2004). *New Business Profile Scores Assigned for US Utility and Power Companies: Financial Guidelines;* Moody's Investor Services. (2006). *Local Gas Distribution Companies: Update on Revenue Decoupling and Implications for Credit Ratings;* and Standard and Poor's. (2010, December 10). *Industry Report Card: U.S. Electric Utilities Well Positioned For 2011 Challenges.*

adjustments serve to correct actual revenues that are above or below the authorized revenue by either refunding revenue surplus or recovering revenue deficits. One of the key objectives of decoupling in the eyes of consumer representatives is a mechanism whose adjustments are symmetric, which is to say that over-collections are treated in the equivalent (but opposite) manner as under-collections (i.e., so that any over-recovery can flow back to consumers in the same way that any under-recovery is charged to them). Thus, if decoupling adjustments allow utilities to recover 100 percent of under-recovery, then adjustments should also refund ratepayers 100 percent of over-recovery. This contrasts with a lost revenue adjustment mechanism (LRAM), in which the utility gains recovery of additional margins from any increased sales, while also recovering hypothetical lost margins from the decreased sales resulting from programmatic energy efficiency. Under decoupling, the utility is entitled to its revenue requirement, nothing more and nothing less. This kind of outcome is the most common among decoupling mechanisms currently in force, but it bears mentioning here to ensure that symmetry in this form is included in formulating a decoupling mechanism.

2. Allocation and Rate Design of Over- and Under-Recoveries

The regulator must also decide how any over- or under-recoveries are allocated to customers. Some methods include:

- **Uniform surcharge (or credit) per kWh to all decoupled classes.** The total decoupled revenue requirement is computed on a consolidated basis for all classes; the excess or deficiency in revenue compared with revenue requirement is divided by total sales to produce a uniform $/kWh adjustment.
- **Uniform percentage surcharge (or credit) to all rate elements.** The total decoupled revenue requirement is computed on a consolidated basis for all classes; the excess or deficiency in revenue compared with revenue requirement is divided by the revenue requirement to produce a uniform percentage adjustment; that adjustment is then applied to each element of the rate design for each class of customers, including the customer charge, demand charge (if any), and energy charge(s).
- **Class-by-class decoupling.** The allowed revenue is computed separately for each customer class; the difference between actual revenue (by class) and allowed revenue (by class) is used to produce either a uniform $/kWh adjustment for all customers in that class, or a uniform percent adjustment to each rate element for all customers in that class.

a) Complementary Rate Design Considerations

The decoupling mechanism generally leaves rate design unaffected by applying either a uniform $/kWh or uniform percentage adjustment, but this need not be the only option. The mechanism can change rate design in the interest of complementing policy goals. The mechanism can reward customer classes in an inclining block rate by, for example, allocating any refund to the first block and applying surcharges to the tail block. This will apply to high-use customers, thereby sparing low-use customers of any additional rate increases from the mechanism.[37] There is likely some tolerance in the rate design for this approach, but it should be periodically reviewed and reset as necessary. In a business class with a three-part rate, rate changes can be channeled to the demand charge or the volumetric charge, depending on policy goals. Table 5, which comes from a Tucson Electric proposal some years ago, illustrates this point. Tucson had a seasonal inverted rate structure in which the summer rate was higher than the winter rate. Note that where there are homes on

Table 5

Using Rate Design and Decoupling Surcharges to Effect Policy Goals

	Summer	Winter	
Customer Charge	$7.00	$7.00	
First 500 kWh	$0.80	$0.073	Minus any decoupling credit
Next 2,500 kWh	$0.102	$0.093	Plus any decoupling surcharge
Over 3,000 kWh	$0.120	$0.113	Plus any decoupling surcharge

37 Studies have demonstrated a correlation between usage and income, such that low-income customers tend to use less than high-income customers. Colton, R. (2002, March). Energy Consumption and Expenditures by Low-Income Households. *Electricity Journal.* In current-day usage, this has a certain logic in that with the proliferation of a variety of electronic gadgets from cell phones to flat-screen televisions, it is the higher-income customers who can afford these more and in greater quantity.

Table 6

Decoupling and Rate Design: Surcharges On-Peak, Credits Off-Peak

Costs to Connect to the Grid	Charge	Decoupling Adjustment
Billing and collection	$4.00/month	None
Transformer demand charge	$1.00/kVa/month	None
Power Supply and Distribution: Bidirectional	**Charge**	**Decoupling Adjustment**
Off-peak	$0.07/kWh	Minus any decoupling credit
Mid-peak	$0.10/kWh	None
On-peak	$0.15/kWh	Plus any decoupling surcharge
Critical periods	$0.75/kWh	None

electric heating, it is important to design the rate so as to appropriately insulate all-electric homeowners from bearing more than a fair share of the decoupling surcharge during the winter heating months.

For customers on a time-of-use rate, the adjustment could work so that surcharges are applied to on-peak usage and credits on off-peak usage if this serves to make the resulting rates more cost based, as illustrated in Table 6.[38]

Thus, the allocation of costs associated with any credit or surcharge can be designed to complement other policy objectives embedded in the rate design. Depending on whether rates are on an inclining or time-of-use basis, the reconciliation could be designed in a fashion so as to encourage customers to use energy more efficiently and/or to discourage on-peak usage.

Another option is to evenly allocate surcharges and refunds across the first block of usage so all customers pay and benefit equally, irrespective of how much and when they consume electricity. This is how Idaho Power and Light allocates the adjustments.[39]

A more general discussion of the relationship between rate design and decoupling can be found in Section III B.

3. Adjustment through Base Rates or a Purpose-built Rider

During a decoupling plan, base rates can be adjusted or a specific rider can manage the changes. As discussed in this paper, a rider is an adjustment to base rates that gets rolled into the total rate a customer pays. It is not a surcharge that appears on a bill.[40] Unless there is a statute in place authorizing recoveries through a specific mechanism,[41] regulators normally have the discretion to decide this issue. A factor in the decision may be the revenue adjustment mechanism chosen. For example, if the adjustment mechanism requires annual mini rate cases, the commission may opt to fold any adjustments into the rate case rather than into a separate rider. Conversely, if there is no mandate for frequent rate cases, a rider may be a more practical approach to reconcile any adjustments.

4. Frequency of True-Ups

Regulators can decide the frequency of the revenue reconciliation. The typical choices are monthly, quarterly, and annually, although any option can work within these boundaries. Monthly reconciliation is the lower limit, because billing is monthly, whereas annual reconciliation is the upper limit to avoid excessive divergence between expected and actual revenues.

More frequent adjustments minimize the divergence between actual and authorized revenues; however, it can expose consumers to volatility from such factors as swings in weather that can cause unusually high or low revenues unless a cap is used (see Section 5 for a discussion of caps).[42] For example, Baltimore Gas and Electric Company

38 The rate design in this illustration comes from Lazar, J., & Gonzalez, W. (2015). *Smart Rate Design for a Smart Future.* Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/smart-rate-design-for-a-smart-future. The authors have added to that the column on rate adjustments.

39 Idaho Public Utilities Commission, IPC-E-04-15 – Idaho Power – Investigation of Financial Disincentives.

40 Rolling the rider adjustments into base rates is done to minimize bill complexity (see the section on Bill Simplification).

41 A state may have a prohibition from adjusting base rates outside of a full revenue requirement investigation, but this may allow for an adjustment of a rider in a decoupling mechanism.

42 An argument against decoupling and in favor of straight fixed/variable rates is that calculating the adjustment to rates is complex and a lot of work. The fact that some utilities do so monthly belies this concern.

reconciles rates monthly, but caps the size of a monthly adjustment at ten percent, with anything above that being carried over to the next period for reconciliation.[43] Month-to-month sales variations may tend to balance out over time.

The advantage of monthly adjustments is that they have the effect of moderating the impacts of significant and unusual factors, such as extreme weather, on utility bills. In a very cold winter month or a very warm summer month, usage tends to increase. Under such circumstances, decoupling reduces the price per unit, thereby mitigating the bill impact. Conversely, in winter or summer months with unusually mild weather, customers tend to use less energy. Decoupling raises the rate at a time when bills are more affordable because customer usage is down. The vast majority of limited decoupling mechanisms that address

Weather-Only Normalization as a Real-Time Decoupling Adjustment

Weather variation accounts for the vast majority of deviation in utility sales compared with the assumptions made in general rate cases. Rate cases use weather normalization (typically a 20- to 40-year average) to determine base rates. Between rate cases, sales vary because of weather, conservation, economic conditions, the deployment of DERs, and other factors. But weather is probably the largest of these, responsible for perhaps 80 percent of decoupling cost deferrals.[44]

More than 40 natural gas utilities have weather normalization mechanisms in place to adjust their rates to reflect weather conditions that vary from the "normalized" weather data. Weather normalization is a form of limited decoupling.[45] It protects utility earnings from sales variations from one cause (weather) but not from other causes (conservation, business cycles, DERs). For most of these, the adjustments operate within the billing cycle, meaning rates are adjusted daily for sales variations attributable to weather. This has been mechanical in nature and generally well received by regulators and consumers.

For both electric and natural gas companies, weather normalization is a component of determining the pro forma revenue requirement used by regulators in rate cases. For gas utilities, it is tied to the heating degree-days; for electric utilities, it is affected by both heating degree-days and cooling degree-days.

Because the adjustment in sales volume is directly tied to factors that can be measured on a daily basis (temperature), it is possible for an adjustment mechanism to operate within the utility billing cycle, meaning costs do not need to be deferred for later recovery. If the rate case weather normalization calculation determines that sales vary by 1,000 MWh for each cooling degree-day, and a given billing cycle has 30 fewer (or more) cooling degree-days than the long-term average used in the rate case, the allowed margin would change by 30,000 MWh multiplied by the base cost per kWh included in rates. The next billing cycle (typically starting and ending one day later) might be 29 or 31 degree-days different from the average. The same arithmetic would apply.

It would be relatively straightforward to establish a decoupling mechanism that had two components:

a) Weather normalization, completed within each billing cycle; and
b) Deferral decoupling for all other variations in sales, calculated annually.

In this approach, customers would see immediate changes in rates each billing cycle to reflect the difference in weather compared with the baseline. The benefit of this for consumers is that rates would go down when usage (and bills) go up, so sharp bill increases would be moderated. The benefits of this for utilities is that rates would go up when usage (and bills) go down, so earnings are stabilized, allowing a more leveraged and lower-cost capital structure that ultimately saves consumers money.

43 BGE. (2007, October 26). Filing 102607F; Maryland Public Service Commission.

44 In reviewing the material in the report *A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs and Observations* by Pamela Morgan, Graceful Systems, LLC, it appears that for natural gas utilities, decoupling adjustments have been 49 percent surcharges and 51 percent credits, whereas for electric utilities, it is more like 34 percent credits and 66 percent surcharges. Gas utilities are much more weather-dependent (two-thirds of their sales are for space heat). Id. December, 2012.

45 See definitions for full, limited, and partial decoupling in *Revenue Regulation and Decoupling* (2011), pp11–13.

only weather are gas utility decoupling mechanisms. They typically operate on a monthly basis.[46]

a) Accrual or Current Method for Rate Adjustments

Although all monthly mechanisms determine a varying month-by-month allowed revenue requirement, there are two approaches to the monthly adjustment. In one, the billing information is collected and processed, and the rate is changed for the next month. The customer is given notice of the rate change. By this method, for example, January's usage will affect March's rate. Over- and under-collections are accrued (although for a much shorter period than an annual adjustment) and this is known as the "accrual method." In the other, the billing information is collected and the rate is changed to apply retroactively to the usage from that month. In this method, January's usage will affect January's rate. This approach allows very accurate utility revenue collection and is known as the "current method."

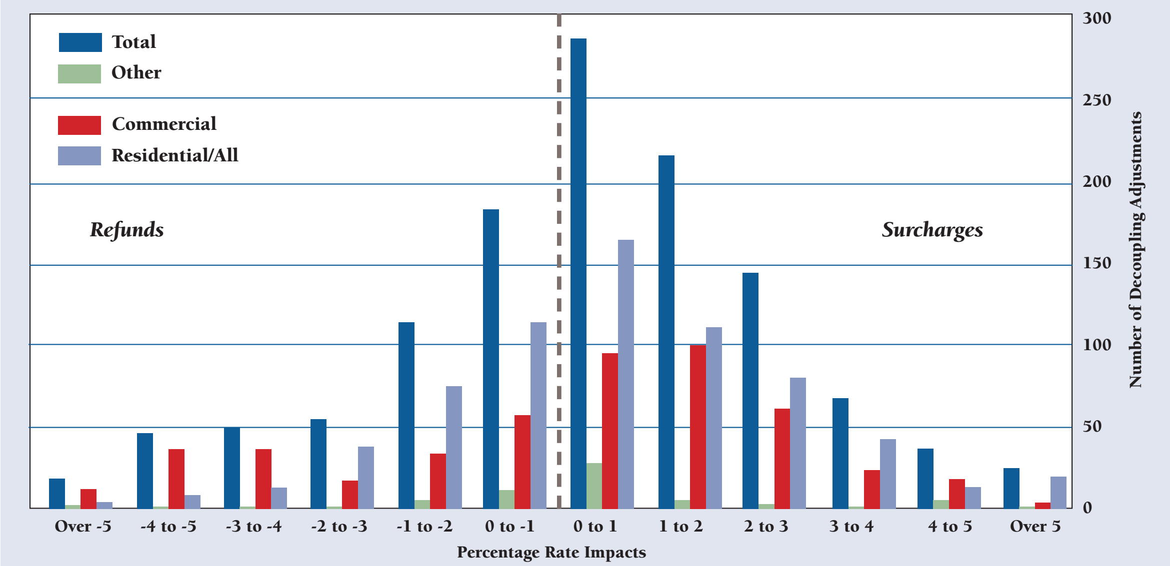
A longer period, such as a year, has the benefit of smoothing out shorter-term volatility and tends to result in smaller adjustments—positive or negative—overall, but is less accurate on a timescale basis in matching actual and authorized revenues. A longer period between reconciliations also creates a greater mismatch between the prices being paid in a period and the long-run marginal cost of service in that period (because the rates are adjusted for last year's revenue shortfalls or overages, which are different from today's long-run marginal cost). Where true-ups occur annually, the creation of a balancing account to track surpluses and deficits, and a cap to manage exceptional volatility, are typical.

5. Caps on the Size of Decoupling Adjustments

Although reconciliation adjustments resulting from a revenue adjustment mechanism tend to cluster in the −2 to +3 percent range, they can be larger or smaller, as either a surcharge or credit.[47] Figure 4 shows the experience with decoupling rate adjustments. Regulators and consumer

Figure 4

Changes in Rates From Decoupling Mechanisms 2005 to 2011[48]



46 Black and Veatch compiles a list of gas utilities with weather normalization mechanisms; this is a form of limited decoupling. As of November 2015, they listed 64 mechanisms in 26 states. The majority of these operate in "real time," meaning within the customer billing cycle.

47 See Figure 3.

48 Morgan, P., (2013). *A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs and Observations.* Retrieved from: www.raponline.org

advocates may be concerned about large increases resulting from decoupling. This concern is heightened for consumer advocates if the tariff permits pancaking of multiple adjustments to the revenue requirement via riders in addition to decoupling, as discussed in Section 6. Many regulators adhere to the regulatory principle of gradualism in that rate increases are modulated so as to not create rate shock and so that consumers can adjust to the new prices. A rate cap can manage customer expectations and impacts.

Not all utilities with decoupling mechanisms have caps on the magnitude of annual adjustments. Some regulators may not be fans of deferrals and may instead prefer to allow the true-up to reflect the full extent of any adjustment and avoid carrying costs that may be imposed by limiting the amount of the credit or surcharge. Some have limited surcharges, but allowed full flow-through of credits.

For those who prefer to limit the rate impacts, there are various mechanisms for capping rates. One often used is a cap on the percentage of a permissible rate change. For example, Idaho Power and Light caps the change at a plus-or-minus three percent, with any excess carried over to the next year.[49] Another is a cap on total revenue increases (as opposed to rate increases), as was ordered by the Massachusetts Department of Utilities and used by National Grid in Massachusetts, which has a one-percent revenue cap.[50] Still another mechanism is to set the cap in dollars, not as a percentage. This in fact is how the Wisconsin Public Service Commission (PSC) has capped Wisconsin Public Service Corporation's annual decoupling adjustments: they are constrained to $14 million.[51]

Setting the amount of the cap, whether it is a percentage increase or another mechanism, will depend on the stakeholders' and ultimately the regulator's view of the amount of the change in rate the public and the utility (if the adjustment is a credit to customers) can tolerate. It can range from very small to a higher amount and may depend on the level of existing rates, if they are comparatively high or low, and what other rate impacts are on the horizon. For example, if a regulator knows that a utility is about to request cost recovery for new investments, that could figure into a decision to regulate how much of an increase customers must absorb and under what timeline. The rate of general inflation may influence this choice.

If a cap is imposed, there is the issue of what happens to the unrecovered amounts. Mostly this question revolves around the time period for the deferral and how deferral balances are handled (Section E6). If in the next reconciliation period the utility does not hit the same cap, then it is an easy matter to allow the unrecovered amounts to be folded into the subsequent period's true-up. However, if there are several sequential cycles of exceeding the cap, the issue becomes more complex, especially with carrying costs over multiple periods. Should this be a concern, there may be a desire to place a timeframe of several years over which under- or over-recoveries may be permissible. This decision should be made with awareness of the risk implications.

Carryovers can range from one to several years to however long it takes to get full recovery. It is worth noting that to date the issue of carryovers has hardly arisen. It is mentioned merely as a factor to consider when designing a complete decoupling mechanism to ensure that all the elements fit together and work to accomplish the goal of the regulator.

The size of the cap and the chosen revenue adjustment mechanism are related by the resulting magnitude of rate impacts.

6. Carrying Charges for Decoupling Deferrals

With the exception of decoupling mechanisms that adjust rates monthly, under decoupling, the utility is either carrying a deferred balance for collection or refund to customers.[52] There are two instances in which carrying charges could be considered. The first is if the reconciliation or true-up of charges occurs over an interval, such as a year, so that a portion of the accumulated true-up amount remains unrecovered between reconciliation

49 Lazar, J. (2013). *The Specter of Straight Fixed/Variable Rate Designs and the Exercise of Monopoly Power* (Appendix D of *Smart Rate Design* for a Smart Future). Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/the-specter-of-straight-fixedvariable-rate-designs-and-the-exercise-of-monopoly-power

50 Id. Note that National Grid also has annual mini rate cases to adjust rates.

51 Morgan, P. (2013)..

52 Even in the case of current method decoupling (see p26), a balancing account may be needed if the cap is invoked in a month of extreme volatility.

periods. The second is if there is a cap on the size of the reconciliation adjustment permitted in any given adjustment period (see Section E5) and the unrecovered portion of the adjustment is carried over for the subsequent time period. Regulators will need to decide if carrying costs should apply to one or both instances.

If they are applied, then logically, assuming a symmetric approach to over- and under-recoveries, the carrying charges should attach equally in both directions. Although applying carrying charges will more accurately compensate the party who is entitled to a refund, it does add a modest level of complexity to the calculation of refunds.

Where carrying charges are applied, the next question is how much should they be. Because the mechanism tends to roll forward administratively, there is generally no risk to deferred balances, so a risk-free rate is appropriate. Options include the utility's short-term debt rate or the customer deposit rate; however, regulators are free to choose whatever rate they believe is reasonable. Unless it is expected that there will be a permanent deferral, or if some atypical risk is attached to the reconciliation process, the utility will not require permanent financing for the deferrals, so the weighted cost of long-term debt and permanent equity financing is unlikely to be the appropriate capital source to cover the deferral amounts.

III. Additional Considerations

Revenue regulation does not need to be accompanied by other policies and can be implemented on a stand-alone basis. However, consideration of some of the implications of decoupling in terms of benefits to the utilities, policy goals, and rate designs may result in regulators making certain decisions with regard to complementary policies and the conditions for decoupling.

A. Performance Evaluation System Applied to Decoupling

Decoupling is sometimes associated with performance- or outcome-based regulation. Why is that? If the utility is no longer worried about sales because the throughput incentive is neutralized, management is then ready for a positive message from government about priorities conveyed in the form of goals and financial incentives that promote excellence and innovation. There is also a pragmatic reason: the periodic rate reconciliation provides a coincident opportunity to apply rewards and penalties to utility rates based on utility performance.

Some believe that the performance system is a distraction and that utilities should perform with excellence without the need for rewards, and that the existing powers of regulation provide penalties for poor performance. They suggest that decoupling should strictly govern the recovery of costs already incurred. Decoupling under any regulatory paradigm is a distinct issue from performance metrics.[53]

B. Rate Design

Rate design has emerged as a major discussion point in regulation. As energy efficiency deployment grows and the cost of customer-sided alternatives like rooftop photovoltaic (PV) continue to decline, there is a growing debate over how the utilities collect their revenues from more diverse

Table 7a

Example of an Electric Bill That Lists All Adjustments to a Customer's Bill

Your Usage: 1,266 kWh

Base Rate	Rate	Usage	Amount
Customer Charge	$5.00	1	$5.00
First 500 kWh	$0.05000	500	$25.00
Next 500 kWh	$0.10000	500	$50.00
Over 1,000 kWh	$0.15000	266	$39.90
Fuel Adjustment Charge	$0.01230	1,266	$15.57
Infrastructure Tracker	$0.00234	1,266	$2.96
Decoupling Adjustment	$(0.00057)	1,266	$(0.72)
Conservation Program Charge	$0.00123	1,266	$1.56
Nuclear Decommissioning	$0.00037	1,266	$0.47
Subtotal:			$139.74
State Tax	5%		$6.99
City Tax	6%		$8.80
Total Due			**$155.53**

Table 7b

The Rate Above, With All of the Surcharges, Credits, and Taxes Applied To Each of the Usage-Related Components of the Rate Design

Base Rate	Rate	Usage	Amount
Customer Charge	$5.56500	1	$ 5.56
First 500 kWh	$0.07309	500	$ 36.55
Next 500 kWh	$0.12874	500	$ 64.37
Over 1,000 kWh	$0.18439	266	$ 49.05
Total Due			**$155.53**

53 For a detailed discussion of how performance-based regulation can work hand-in-hand with decoupling, see Lazar, J. (2014). *Performance Based Regulation for EU Electric Distribution Utilities.* Retrieved from: http://www.raponline.org

customers and how customers should be compensated for what they produce.

Decoupling is a tool that regulators can use to manage utility revenue adequacy, leaving the focus of rate design on customer price signals and other policy priorities. Price signals are increasingly important with customers, especially mass market customers, making more energy investments than ever before. By combining aggressive deployment of cost-effective energy efficiency and distributed energy resources without disrupting revenue adequacy, total consumer power costs can be reduced. And, by also reducing the risk of insufficient revenue recovery by the utility, reliable service supported by reasonably priced capital can be assured.

If a regulator has ordered the utility to adopt decoupling, the need for high fixed charges or demand charges becomes inconsequential to shareholder earnings, because at least in the short-term, the utility has a greater ability to recover its revenue requirement, assuming it has acted reasonably and prudently. Other longer-term tools need to be explored to further ensure that long-term utility revenue requirements and pursuit of public interest objectives are met in the most efficacious way.

C. Bill Simplification

Decoupling requires periodic adjustments in customer rates. It is important for the rates, as they appear on the customer bill, to be understandable to the customer. Many utilities' bills include separately stated line items for various charges, usually linked to specific tariff riders; this is undesirable for many reasons, of which customer confusion is the most important.

Table 7a shows how some bills would appear with itemization of five tariff riders (of which decoupling is one), plus two taxes. Below that in Table 7b is the "effective rate" that customers would actually pay. It is essential that bills show just the effective rate, which includes all surcharges, credits, and taxes, so that customers understand how much they will save if they use less electricity, and how much they will pay if they use more electricity. Having multiple charges on a bill makes doing such a calculation more difficult for the customer.

IV. Summary of Potential Pathways

Table 8, on the following page, is a summary of the elements described previously. In designing a decoupling mechanism, regulators may want to consider each of these categories of elements and decide, for each, which option works best. There will be some natural flow of decisions once certain elements are chosen. However, for the most part each element is independent of the others.

Table 8

Summary of Potential Elements

Element	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7
Function	Distribution	Distribution and transmission	All functions				
Customer Class	Residential and small commercial	All but large industrial	All classes				
Excluded Costs	Costs in riders	Riders plus production costs	All variable costs	Other			
Rate Case Frequency	No requirement	Annually	Every 3 to 5 years	Mini rate cases	Every 4 to 7 years	Other	
How Established	Negotiations in rate case	Statute	Rulemaking	Commission order			
RAM	None	Stair-step	Indexing	RPC	Annual review decoupling	K Factor	Hybrid
Symmetry	Yes	No					
Recovery Allocation	Across the board equally	Customer class contribution	Credit in first block	Surcharge in last block	Combination between options 1 and 4	Other, such as judgments on which rate elements receive surcharges and credits and which do not	Other
How Recovered	Rate case	Rider					
Frequency of True-Ups	Annually	Quarterly	Monthly	Other			
Carrying Costs	No	Yes, short-term debt	Yes, customer deposit	Yes, other			
Cap Methodology[54]	None	Percentage rate increase	Percentage revenue increase	Dollar amount	Other		
Regulatory Conditions	None	Energy efficiency requirement	Customer service	Distributed generation interconnection	Other		
Rate Design	Maintain customer connection-based fixed charge	Coupled with inclining block	Coupled with time-of-use	Combination	Other		
Rate of Return	No adjustment (wait for effects to play out)	ROE reduction ex ante	Capital structure adjustment ex ante	Other			
Performance Metrics	Applied to decoupling	Not applied	Negative only	Positive and negative			

54 Note that for the cap methodology, there is also the question of how much. On a percentage increase basis, for example, the range could be one to three percent.

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V. Representative Pathways: Straw Scenarios

From among all of these options, RAP has put together for consideration three scenarios that include the major elements of decoupling.

Scenario 1 applies to a distribution-only utility or a vertically integrated electric utility that has adopted decoupling for distribution services only. In this example, the decoupling is only being applied to residential and small commercial customers. One reason for this not applying to larger customers could be because of the presence of an industrial opt-out program and because there are too few industrial customers who are not under a special contract with the utility. In this scenario, as in all the scenarios, distribution-related tariff riders are excluded because those costs are being recovered elsewhere, outside of base rates. The revenue adjustment mechanism is an RPC mechanism, which is currently widely in use. A K Factor is used with this mechanism to adjust for increases and decreases in the growth in revenues per customer. As with all the decoupling scenarios below, this one requires symmetry to ensure fairness in the treatment of over- and under-collections. There is no requirement to file a rate case in this scenario. There are pros and cons to this, and the commission could decide either way on this point. As the revenue decoupling mechanism applies only to small residential and commercial customers, a simple mechanism of applying adjustments across the board to residential and small commercial customers was chosen; however, an allocation based on customer class contribution to total revenues could also be used.

This scenario differs from the others in that it has a monthly true-up recovered through a rider. As a result, there are no carrying costs, but rates are subject to larger monthly fluctuations that may be necessary to explain to customers. There is a ten-percent cap on the size of the monthly adjustment, which is larger than what would be expected in an annual true-up, because the revenue swings can be larger over shorter periods of time, without the benefit of a longer period to smooth out anomalies. Amounts exceeding the cap would be carried over to the following month, and because of the short duration, as noted previously, no carrying charges would apply. A regulatory condition that would be required as a condition of decoupling would include the utility's compliance with energy efficiency programs and other distributed energy resource programs, along with meeting customer service quality standards. This would help provide assurance to customers that the utility will meet its commitments to embark on cost-effective programs and good customer service.

In this scenario, the assumption is made that the utility has inclining block rates—an assumption made for all of the scenarios, as that is the most common rate design and better aligns cost with causation than would flat rates or declining block rates. With this rate design, as a further conservation inducement for customers, credits are provided in the first block, benefiting all customers, but surcharges are allocated to the higher-use customers in the second block.

In Scenario 1 under Performance, we added a performance metric for customer care and reliability. Although a performance metric is not integral to a decoupling mechanism (which is the reason for its absence from Scenarios 2 and 3), it is certainly worthy of consideration. Changing the utility mindset through rewards and penalties toward a customer-service-driven approach that can still benefit shareholders is a better direction for the future.

Across the board, there is no adjustment in any scenario to the ROE. ROE adjustments are poorly received by the utility and the investment communities and could contribute to an investment downgrading that then could increase the cost of borrowing—a cost passed on to consumers. A better way to reflect the reduction in risk is through a change in the capital structure that reduces the equity ratio. Because equity is more costly to consumers than debt, reducing the ratio of equity to debt can save customers money without jeopardizing the utility's ratings.

Scenario 2 is similar to Scenario 1 in that it applies to the distribution function only. A distinguishing factor, however, is that this decoupling mechanism applies to all customer classes, including industrial. In this case, as in Scenario 3, there are a significant number of industrial customers to warrant their inclusion in the decoupling mechanism. This scenario includes a requirement to have a full rate case every three to five years. (The regulator can decide the frequency with which it is comfortable.) No revenue adjustment mechanism is used; the utility would be required to file a rate case to adjust the revenue requirement. Consumer advocates may prefer no revenue adjustments between cases, so that was represented in this scenario. In the interim between rate cases, the utility would charge or credit customers through a rider for any differences between actual revenues and authorized revenues. The amount of the rider would be set annually, based on the preceding year. As discussed in Scenario 1, all distribution-related tariff riders would be excluded and the application of the decoupling rider would be symmetric. Because of the applicability of the decoupling mechanism to all customer classes, the surcharges and credits would be

Table 9

Representative Pathways: Three Straw Scenarios

Element	Scenario 1	Scenario 2	Scenario 3
Applicability	Retail choice or VIEU*	Retail choice or VIEU	VIEU
Function	Distribution	Distribution	Distribution and generation
Customer Class	Residential and small commercial	Residential, commercial, and industrial	Residential, commercial, and industrial
Excluded Costs	All distribution-related tariff riders	All distribution-related tariff riders	All costs addressed by tariff riders
Rate Case Frequency	No requirement	Full scale every 3 to 5 years	Annual mini rate case
Revenue Adjustment	RPC with K Factor	No RAM	Annual review decoupling
Symmetry	Yes	Yes	Yes
Recovery Allocation	Across the board to residential and small commercial	Customer class contribution to total revenue defines amount for each class	Customer class contribution to total revenue defines amount for each class
How Recovered	Rider	Rider	Base rates
Frequency of True-Ups	Monthly	Annually	Monthly
Carrying Costs	No	Yes	Yes
Caps	10% rate difference	3% rate difference	No cap
Regulatory Conditions	Energy efficiency programs, customer service quality, and other distributed energy resource programs	Energy efficiency programs, distributed energy resources, and customer service quality	Energy efficiency programs, distributed energy resources, and customer service quality
Rate Design and Allocation of Reconciliation	Inclining block; credits on first block; surcharge on second block	IInclining block; credit on first block; surcharge on second block; *or* time-of-use; refund on off-peak; surcharge on on-peak	Inclining block; credit on first block; surcharge on second block; *or* time-of-use; refund on off-peak; surcharge on on-peak
Return on Equity	No change	No change	No change
Capital Structure	Reduce equity ratio	Reduce equity ratio	Reduce equity ratio within annual review

** VIEU: vertically integrated electric utility.*

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allocated based on the customer class contribution to total revenue.

Because a rider is deployed and is adjusted annually with a cap on rate increases of three percent, carrying charges are applied to both the amounts being held for recovery or credit during the course of the year, and to any amounts exceeding the three-percent rate differential that are carried over to the next year. A modest and reasonable rate used is this scenario is the customer deposit rate. This scenario also requires a utility commitment to energy efficiency, distributed energy resources, and customer service quality. The rate allocation is the same as discussed in Scenario 1. This scenario rejects a reduction on the ROE in favor of a reduction in the equity portion of the capital structure.

Scenario 3 differs from the first two scenarios in that it applies to a vertically integrated utility and to its distribution and generation functions. All customer classes are included in this scenario, and therefore the allocation of surcharges or credits is based on class contributions to total revenues. This scenario uses an annual revenue decoupling mechanism in which all tariff riders and costs addressed by the tariff riders are excluded to avoid any risk of over-recovery of certain production-related and other costs. Unlike Scenarios 1 and 2, which rely on riders to recoup over- and under-recoveries, Scenario 3 requires annual mini rate cases to adjust revenues and reconcile rates with revenue requirements. This is consistent with choosing an annual revenue decoupling mechanism that calls for periodic reviews and adjustments to base rates for incremental and decremental known and measurable changes to base rates. As with the other scenarios, symmetry in terms of over- and under-recoveries is applied. A carrying charge based on the customer deposit rate is used, and because new revenue requirements are established annually in the mini rate case, no cap is applied. This mechanism is contingent on the utility engaging in energy efficiency, DER, and providing quality customer service. No adjustment to the ROE is applied; instead a reduction in the equity ratio is recommended. Finally, the rate design is the same as that reflected in Scenarios 1 and 2, with the addition that, if a time-of-use rate is in place, the credit should apply to off-peak usage and the surcharge to on-peak usage.

VI. Conclusions

When industry people gather and talk about decoupling, one might hear a wide range of views from support to skepticism. Everyone has their own perception of what decoupling is and what it does that is foundational to their view. On a macro level, decoupling separates sales from revenue. However, on a micro level, there are myriad details in how that is done that influence people's viewpoints. Often these details are assumed and not expressed, and it is easy for a conversation about decoupling to result in talking past each other for lack of clarifying foundational assumptions. Decoupling is not one thing, but a vehicle with many, many options.

In understanding decoupling, perhaps one should start with an understanding of what is being assumed about decoupling and how it works. Which attributes are viewed favorably and which are viewed unfavorably, and why? For an unacceptable attribute, is there an option that works better? Is there room in a negotiation on decoupling to find solutions to stakeholders' most serious concerns and develop a consensus mechanism that everyone can accept?

In this paper, a number of decision paths to designing decoupling have been discussed. Regulators and stakeholders can choose among the options to find the path that works best for their jurisdiction. Although there are a number of variables, there are certain pathways that RAP would recommend over others. They include:

- The decoupling mechanism should be symmetric so that over- and under-recoveries are charged or credited. This is basic fairness.
- All costs recovered through a separate tariff rider should be excluded from the decoupling mechanism to avoid over-collection of costs.
- In lieu of an ROE adjustment to reflect lower risk, a reduction in the equity ratio should be considered instead, as that will save customers money without the adverse impacts on a utility's financial picture that a reduction in the ROE would engender.
- Regulatory requirements of performance should be a condition of decoupling such that: (1) the utility engages in energy efficiency at the prescribed level, (2) the utility assists in the development of distributed energy resources, and (3) the utility provides quality service to the customer at the levels dictated by regulators.

Other factors vary by jurisdiction and need to be decided as well:

- Perhaps the most critical decision is which revenue adjustment mechanism to use. Although all have their pros and cons and have been put in place in various jurisdictions, RAP chose two mechanisms for distribution-only decoupling and a third for vertically integrated utilities. RAP chose an RPC approach with a K Factor for one of the examples, because RPCs allow the revenues to be adjusted based on the number of actual customers, which will reflect increases or decreases in the cost to serve. To that, a K Factor was added to reflect growth in revenues between rate cases. The size of the K Factor is another decision point that can impact the frequency with which a utility might need to apply for a rate increase. The other option is no revenue adjustment mechanism. The revenues are as authorized in the last rate case and any change has to be accomplished through a rate case. Finally, for the vertically integrated utility, an annual review decoupling mechanism is the best option to ensure there is no over-collection of production costs. With an annual review decoupling mechanism, as the name implies, comes annual reviews with mini rate case adjustments to the revenue requirement. The frequency of rate cases is another variable in terms of whether the regulator or the stakeholders in the process want to agree on the frequency of rate cases or just let the utility decide when it needs to file a rate case application.
- The allocation of costs by customer class is another variable. If the decoupling mechanism is only

applying to residential and small commercial customers, it may be simpler and easier to just apply the adjustments across all customers. A more precise way to do it, which is recommended if all customer classes are involved, is to allocate the adjustment based on the customer classes' percentage contribution to total revenues.

- The mechanism for recovery of the adjustments and the frequency are also variable. If the annual review decoupling mechanism is used, it makes sense then to roll any adjustment into the base rates, as they are reset annually. For other revenue adjustment mechanisms, a separate rider is an option, including how frequently to reconcile the over- and under-recoveries, whether it is monthly, annually, or over another period of time.
- Caps on the amount of variation in rates, up or down, are another decision point. Caps are used to moderate the amount of fluctuation in rates to which customers or the utility may be subject from year to year, between rate cases.
- Carrying costs, in terms of whether to have them and at what rate is another decision, including to what they may be applied. Are they applied every month when adjustments are made annually, or are they only applied if there is an amount that exceeds the cap? The size of the carrying cost will also impact the size of the rate adjustment.

This paper has unpacked how to do decoupling. Each choice means something about what decision-makers prioritize and what managers are willing to change. It aspires to make conversations about decoupling and related issues as informed and constructive as possible. There is no one answer for the question, "How should this utility decouple revenues from sales?" For each company, state, and time, the answer should represent the priorities of the day, guided by the framework laid out here.

Decoupling can be applied to any utility. Although it may be a more obvious option for a regulated utility, it can also be applied to municipal utilities (munis) and co-operatives (co-ops). They equally have a need to ensure adequate revenues while implementing energy efficiency and other policies that result in lower costs for the system in the long-run and are better for the environment. The difference with munis and co-ops is that, because these systems are owned by the government or the customers themselves, respectively, there is no need to include performance incentives as part of the decoupling mechanism. The decoupling design decisions may be different for these entities as well. For example, in addition to not needing to address performance measurements, the ROE considerations would not be necessary. Nor might it be necessary to require rate cases at any interval to adjust rates downward for any rate changes, as it would be more likely that these would be done as a matter of course, because there are no shareholders to answer to.

Ultimately, a good decoupling mechanism that will work in a jurisdiction may best be driven by a consensus among the stakeholders in a case or collaborative process in which the mechanism chosen and the decisions made balance the interests of all parties.

VII. Appendix: The Benefits of Decoupling

Under traditional regulation, utility companies ensure their financial health and earn a profit by investing in assets (plant in service) on which they can earn a return, increasing sales within the capability of existing assets or decreasing their costs. The profit incentive to increase sales when revenues are determined solely by sales is known as the "throughput incentive."

Decoupling addresses the throughput incentive by breaking the link between sales and revenues, thereby removing utility management emphasis on sales. This is significant because utilities, like most businesses, view their core goal as selling product to make money. Making the utility indifferent to changes in sales paves the way for utilities to support consumer energy self-reliance and to deploy cost-effective energy efficiency on the customer's side of the meter. Decoupling allows management to focus on what customers care most about—service and cost control—which benefits all customers. As the regulatory paradigm shifts more toward customer participation and control in energy decisions, decoupling helps shift corporate thinking in a direction that is more compatible with consumer interests.

If the underlying costs are not changing quickly and significantly and the main reason for revenue deficiencies is attributable to the deployment of distributed energy resource (DER) options, then decoupling could be a good solution to address those changes. However, if costs are changing significantly and quickly and due to factors other than DER or, if because of the size of the revenue deficiency, it is difficult to design a decoupling mechanism, then annual rate cases (while avoiding pancaking of rates) may be an option.

A frequently misunderstood aspect of decoupling is the belief that decoupling also removes the incentive for the utility to be more efficient and lower its costs. Decoupling does not adversely impact the incentive for utilities to be efficient, because the utility has regulatory confidence that, assuming it acts reasonably and prudently, it will obtain its authorized revenue requirement. Thus, if expenses are decreased by the utility's efforts to lower its costs, this could translate into higher returns for shareholders because the difference between revenues and operating costs has increased. Table 10 illustrates this point, in which the utility's return is based on the difference between the authorized revenue requirement and all operating and maintenance expenses. Two scenarios are shown: one in which the utility maintains the status quo and one in which the utility acts to achieve efficiencies for its company.

Table 10

Illustration of Status Quo vs. Cost-Efficient Efforts

	Revenues	Costs	Earnings
Status Quo	100	90	10
Cost-Efficient Efforts	100	88	12

Thus, decoupling does not minimize the incentive for utilities to manage their companies well and to be good stewards any more than the absence of decoupling does. In fact, it could well increase the incentive to operate efficiently because it provides a means to increase net income. The only impact that decoupling has on how a utility operates is to remove the relationship between sales and earnings. In the long run, growth in sales could result in increased investments in generation, transmission, and distribution that will raise revenue requirements and rates.[55] On the other hand, a focus on net income can increase operational efficiency.

55 For vertically integrated states, the increased cost of new capacity additions is passed on to the consumers by their incumbent utility. In restructured states, the demand for capacity will raise rates and the marginal cost of that capacity is likely to be greater than the embedded cost of the existing generation.

Of all the available resource options, cost-effective energy efficiency is almost always least cost[56] and plentiful.[57] However, of all the resource options, energy efficiency is the only one for which utilities generally earn zero return on investment and also face the financial risk of reduced sales, reduced revenues, and reduced earnings.[58] There is little argument in most quarters that energy efficiency has value for the consumer and for society as a whole.[59]

If we accept the premise that energy efficiency benefits society, then it is important to develop this resource in a manner that does not hinder the utility's ability to complete its mission and maintain its financial health. Moreover, to make energy efficiency as successful as possible, policymakers have a stake in seeing utilities embrace it wholeheartedly. Decoupling removes the utility disincentive to engage in making energy efficiency a part of its portfolio.[60]

Regulators have considered and adopted several options for addressing utility net lost revenues. They include decoupling, lost revenue adjustment mechanisms (LRAMs), and higher fixed customer charges. A few words of comparison of these mechanisms are appropriate here to understand why RAP views decoupling as the superior mechanism.

Lost Revenue Adjustment Mechanism. A formula that computes the amount of net lost distribution revenue that occurs as a result of reductions in usage owing to programmatic energy efficiency and allows subsequent surcharges to recover this lost revenue.

Revenue Regulation (Decoupling). A mechanism that relies on a utility's allowed distribution service revenue requirement and allows surcharges or credits, if actual sales are lower or greater than projected sales, to address under- or over-collections.

Higher Fixed Charges. A rate design that collects a larger portion of the utility distribution revenue requirement in monthly fixed charges that do not vary with usage. One example is the straight fixed/variable (SFV) rate design, which is intended to recover 100 percent of the distribution and often transmission revenue requirement in monthly fixed charges.

56 Lazard. (2014). *Lazard's Levelized Cost of Energy Analysis – Version 8.0.* Retrieved from: https://www.lazard.com/media/1777/levelized_cost_of_energy_-_version_80.pdf

57 Neme, C., & Grevatt, J. (2016). *The Next Quantum Leap in Energy Efficiency: Getting to 30 Percent in Ten Years.* Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/the-next-quantum-leap-in-efficiency-30-percent-electric-savings-in-ten-years/

58 Utilities earn a return on investment in plant. However, for energy efficiency, unless an incentive payment is included, utilities will not earn a return. Even when they do, it is usually less in actual dollars for energy efficiency than it may be in capital investments.

59 For an in-depth discussion of the utility, participant, and societal value of energy efficiency, see Lazar, J., & Colburn, K. (2013). *Recognizing the Full Value of Energy Efficiency.* Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/recognizing-the-full-value-of-energy-efficiency; see also United States Environmental Protection Agency. (2015). *The National Action Plan for Energy Efficiency,* Retrieved from: https://www.epa.gov/sites/production/files/2015-08/documents/vision.pdf

60 Although decoupling removes the utility disincentive to do energy efficiency, it does not create an incentive by giving the utility an opportunity to earn a return in the way that investment in physical plant does. Therefore, many regulators have put in place various incentive mechanisms to encourage greater participation by utilities. Because a discussion of incentives is not a part of this paper, the reader can refer to other publications, such as a presentation by Richard Sedano and David Littell at the NJ Electric Utility Regulation Workshop on December 3, 2015, entitled *Utility Performance and Redefining the Utility Role.* Retrieved from: http://www.raponline.org/knowledge-center/nj-electric-utility-regulation-workshop-part-4-utility-performance-and-redefining-the-utility-role. Also see Lazar, *Performance-Based Regulation for EU Distribution System Operators;* Sedano, R., & Systems Integration Rhode Island. (2016). Systems Integration Rhode Island (SIRI) Vision Document. Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/systems-integration-rhode-island-siri-vision-document; and Sedano, R. (2014). *Experience with Performance Regulation in the US.* Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/experience-with-performance-regulation-in-the-us

LRAM requires an accurate accounting of the net lost revenues associated with each utility program or measure through an evaluation, measurement, and verification (EM&V) process. This is a labor-intensive exercise that can be contentious and litigious if parties disagree on the accounting of lost revenues or the measurement of energy efficiency program results. Moreover, LRAM can result in customers paying the utility for the net lost revenues associated with decreased sales from the utility energy efficiency programs without netting or taking into account increased sales in other areas (such as growth in electric appliance usage or the addition of electric vehicle charging loads) as the utility retains the incentive to increase sales—which is anathema to the conservation goals embedded in energy efficiency.

High fixed charges do reduce or eliminate the throughput incentive, but only in a manner that does not provide much accountability.[61] Unlike decoupling and LRAM, high fixed charges reduce the customer's incentive to conserve by increasing the payback period on energy efficiency and distributed generation investments.[62] Rates should reflect long-run marginal costs for new generation, transmission, and distribution resources and, thereby, be avoidable; high fixed charges have the effect of pricing incremental purchases of electricity (which require additions of generation, transmission, and distribution facilities) far below the long-run marginal cost.

By sending customers inaccurate price signals and, in the extreme, creating an "all you can consume" rate, it gives customers the false sense that long-run costs for new resources that will be needed to meet future demand will be inconsequential. Based on data on the elasticity of electric demand, the increased consumption will erode over time the savings garnered through energy efficiency programs for which ratepayers have paid. For low-income advocates, there is significant concern around the perverse subsidy that high fixed charges create in which a customer living in a large suburban home pays the same high monthly fixed charge as a low-income customer in a one-bedroom or studio apartment, even though the costs for the utility to serve these customers are dramatically different in that the cost to serve customers in densely populated areas is generally less than in more spread-out residential neighborhoods.[63]

A well-designed decoupling mechanism both removes the utility throughput incentive and allows rates to be set at or very near long-run marginal costs. These are the two key policy objectives that are integral to the successful implementation and sustainability of energy efficiency.

Rating agencies have recognized that decoupling reduces the risk to the utility by providing stable revenues. It enables utilities to project cash flow more accurately and avoid much of the earnings volatility from changes that occur under traditional regulation due to policy goals and other influences such as weather or the economy. It also reduces the need for more frequent rate cases, thereby lowering overall utility costs.[64] When there is less risk to creditors, it can be reflected in the cost of borrowing, by bringing down the overall cost of capital as discussed in Section II.D.3.

From a consumer perspective, decoupling can offer a powerful tool not often available to ratepayers to ensure that the utility is not over-earning. One critical protection is that the decoupling mechanism be symmetric; that is, that just as rates get adjusted upward if actual revenues are less than authorized revenues, rates should be adjusted downward if actual revenues exceed authorized revenues. Currently, this actually occurs a fair amount of the time, as Table 11 demonstrates.[65]

61 Because SFV reduces and perhaps eliminates the throughput incentive, some consider it to be a form of decoupling. It is not. Decoupling is an adjustable price mechanism to achieve a certain level of revenues. Under SFV there is no price adjustment to reflect revenue requirements—just a guarantee of a certain level of revenues based on the number of customers. There are no price adjustments involved.

62 Weston, F. (2000). *Charging for Distribution Utility Services: Issues in Rate Design.* Montpelier, VT: The Regulatory Assistance Project. Retrieved from: http://www.raponline.org/knowledge-center/charging-for-distribution-utility-services-issues-in-rate-design

63 See footnote 49.

64 Moody's Investor Services. (2011). *Decoupling and 21st Century Ratemaking: Increased Use of Decoupling Mechanisms is Credit Positive.*

65 Morgan, P., (2013). *A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs and Observations.* Retrieved from: www.raponline.org

Typically utilities do not seek adjustments in rates unless they are under-earning. They can go a long time before seeking a rate increase in those cases. Consumer advocates as a whole generally do not have the resources to file complaints seeking a rate decrease, as the burden of proof is usually on them and they have neither the resources nor the data to put together such a case. Decoupling changes that whole paradigm by requiring periodic true-ups to match revenue collections with targeted (i.e., allowed) revenues. Although the utility has the assurance that it will receive its revenue requirement, consumer advocates have the assurance that it will be that and nothing more. Earnings above the revenue requirement amount are not kept by the utility, as has occurred so regularly for so long; instead, over-earnings are returned to the customer.

Table 11

Impact on Earnings of Sales Decline for Illustrative SW Electric Utility

% Change in Sales	Revenue Change: Pre-tax	Revenue Change: After-tax	Impact on Earnings: Net Earnings	Impact on Earnings: % Change	Impact on Earnings: Actual ROE
5.00%	$9,047,538	$5,880,900	$15,780,900	**59.40%**	17.53%
4.00%	$7,238,031	$4,704,720	$14,604,720	**47.52%**	16.23%
3.00%	$5,428,523	$3,528,540	$13,428,540	**35.64%**	14.92%
2.00%	$3,619,015	$2,352,360	$12,252,360	**23.76%**	13.61%
1.00%	$1,809,508	$1,176,180	$11,076,180	**11.88%**	12.31%
0.00%	$0	$0	$9,900,000	**0.00%**	11.00%
-1.00%	-$1,809,508	-$1,176,180	$8,723,820	**-11.88%**	9.69%
-2.00%	-$3,619,015	-$2,352,360	$7,547,640	**-23.76%**	8.39%
-3.00%	-$5,428,523	-$3,528,540	$6,371,460	**-35.64%**	7.08%
-4.00%	-$7,238,031	-$4,704,720	$5,195,280	**-47.52%**	5.77%
-5.00%	-$9,047,538	-$5,880,900	$4,019,100	**-59.40%**	4.47%

The impact of net lost revenues on utilities may not be trivial. Nor are the over-earnings associated with utilities exceeding their revenue requirements. Table 11 demonstrates the effect—all else being equal—of small sales variations on an illustrative utility's earnings.

In this example, a change in sales will have a disproportionately large (by a factor of ten) impact on net revenues. Thus, decoupling serves to moderate the utility's ROE so that it is in alignment with what regulators deemed reasonable.

References

Revenue Regulation and Decoupling: A Guide to Theory and Application

www.raponline.org/knowledge-center/revenue-regulation-and-decoupling-a-guide-to-theory-and-application-incl-case-studies

This is an updated version of a guidebook originally published by RAP in 2011, targeted at members of the regulatory community who need to understand both the mechanics of decoupling and the policy issues associated with its use. While this guide is somewhat technical at points, we have tried to make it accessible to a broad audience, to make comprehensible the underlying concepts and the implications of different design choices. Appended to this version of the guidebook is a subsequent work, *Decoupling Case Studies: Revenue Regulation Implementation in Six States,* which examines the details of decoupling regimes put in place for utilities in California, Idaho, Maryland, Wisconsin, Massachusetts, and Hawaii.

Decoupling Case Studies: Revenue Regulation Implementation in Six States

http://www.raponline.org/knowledge-center/decoupling-case-studies-revenue-regulation-implementation-in-six-states/

This paper examines revenue regulation, popularly known as decoupling, and the various elements of revenue regulation that can be assembled in numerous ways based on state priorities and preferences to eliminate the throughput incentive. This publication focuses on six utilities: Pacific Gas and Electric Company, Idaho Power Company, Baltimore Gas and Electric Company, Wisconsin Public Service Company, National Grid – Massachusetts, and Hawaiian Electric Company, and the different forms of revenue regulation their regulators have implemented. These examples examine the details of revenue regulation and provide a range of options on how to implement revenue regulation. These specific utilities were chosen in order to represent a range of mechanisms used throughout the US and to contrast differences to provide a broader overview of the options available in designing decoupling mechanisms and to describe how they have worked to assist state regulators and utilities considering implementing revenue regulation.

Charging for Distribution Utility Services: Issues in Rate Design.

http://www.raponline.org/knowledge-center/charging-for-distribution-utility-services-issues-in-rate-design/

In this report, we evaluate rate structures for electric distribution services, including embedded and marginal cost valuation methods, approaches and principles of rate design, and interactions with competitive markets.

Distribution System Pricing With Distributed Energy Resources

http://www.raponline.org/knowledge-center/distribution-system-pricing-with-distributed-energy-resources/

Technological changes in the electric utility industry bring tremendous opportunities and can also create significant challenges. Rooftop solar photovoltaic (PV) systems and smart appliances and control systems that communicate with the grid can improve system reliability, enable a cleaner and more diverse power system, and create the potential for lower total costs. At the same time, these new resources must be integrated thoughtfully in order to maintain system reliability, provide an equitable sharing of system costs, and avoid unbalanced impacts on different groups of customers, including those who install distributed energy resources (DERs).

Authors Ryan Hledik of Brattle Group and Jim Lazar of Regulatory Assistance Project examine pricing issues related to the business relationship between electric distribution utilities and the owners of DERs. They use specific resources as examples— including grid-integrated water heaters, ice storage air conditioners, PV systems with smart inverters, backup generators, and battery and inverter-based storage systems—to evaluate a variety of different pricing models for their economic efficiency, fairness to all customers, customer satisfaction, ability to generate stable utility revenue, and effect on bill stability. The report also provides recommendations for exploring ideas presented through field pilot testing and rigorous analysis. Carefully designed pilot programs and adequately funded evaluation efforts are needed to ascertain which approaches meet the needs of all participants.

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