Massachusetts Grid Modernization Working Group
Regulatory Model Option

Title: Distribution Services Pricing
Author: National Grid
Date: 4-17-13

1. Summary of Regulatory Model

Regulatory Elements:	**Description:**
Customer-facing, grid-facing or both	Both
Rationale for, or summary of, model	With advent of customer-based energy technologies, pricing for services provided by the distribution grid should recognize Distribution's transformation from delivery to an integration of load and generation, i.e new services
Regulatory Oversight:	
Utility pre-implementation filing requirement	File proposal and implementation plan for approval
Regulatory review and approval of filing	Yes. DPU review and approval of a utility proposal for changes to distribution pricing would occur in the context of an adjudicatory proceeding with set time frames for review and receipt of a final order to enable timely and efficient implementation of approved changes.
Utility request for pre-approved GM budgets	Maybe: Depends on need for new technology, outreach efforts to customers
Stakeholder input	Yes. Interested stakeholders can during the DPU adjudicatory proceeding.
Utility reporting requirements	Determined during DPU proceeding, if necessary
Cost-Effectiveness:	
Explicit, public cost-effectiveness requirement	Cost causation and rate design principles of appropriate price signals would apply
Internal analysis by utility	Bill impacts to customers from the proposed changes in prices.
Ratemaking and Cost Recovery:	
General ratemaking (historic, future test years)	Historic usage and customer information can be used or forecast year information
Frequency of rate cases	As necessary, present rules apply.
Cost recovery (e.g., base rates, trackers)	As necessary if investment or costs incurred to engage customers or implement new prices.
Cost allocation (among customer classes)	This would be addressed in the context of the DPU proceeding with the general principles for allocations that reflect cost causation, fairness and equitable responsibility.
Cost assignment (e.g., to third party)	Determined through cost allocation and pricing
Rate design	This would be a rate design (pricing) filing.
Utility incentives (e.g. ROE, rewards/penalties)	Not applicable

Performance Targets or Metrics:	
Role of performance targets	Not applicable
Performance targets that will be used	Not applicable

2. Description of Regulatory Model

Executive Summary

Distribution systems are built to meet peak demands on each feeder and substation while managing the stability of the system. These demands are specific to the type and number of customers on the particular facilities. Current pricing for recovery of distribution costs is based primarily on delivery throughput. Modernization of the distribution grid will lead to improvements in knowledge regarding capability of the system, may contribute to improved efficiency in operation of the grid and capital investment and may facilitate promotion of renewable and other types of distributed generation.

Modernizing the grid will allow for greater understanding how customers use the delivery grid for their home or business. This knowledge will allow greater understanding regarding cost causation by customers. Which customers are demanding greater amounts of which product (e.g. kilowatts or kilovolt-amperes)? If a customer causes the distribution grid to increase investment due to their usage pattern, should the customer pay for those costs instead of socializing those costs. Which costs should be paid for by all customers since all customers use the facilities? What new product offerings that are provided at the distribution grid level are demanded by customers as they connect to the distribution grid?

The state of Massachusetts has the opportunity to undertake an effort to design distribution pricing for the future and lead the industry in this effort. The Department could undertake a generic docket to investigate potential product offerings for all types of customers, including those with/without generation and those with/without load. These designs would allow customers to pay for services specifically requested by customers instead of socializing the costs across all customers without recognizing the need for a specific tariff.

Two examples are available for explanation of the potential. During the 1980s, the Department recognized the need to provide larger industrial customers a price for their use of KVA in excess of their KW demands. Large KVA demands create voltage issues at the local level and result in a system built to meet the KVA demands which are higher than the KW demands. The Department required all electric utilities to design demand rates that charged large customers if they took a large amount of KVA relative to their KW demand. For National Grid, customers would pay for about $10 every month for the greater of their largest KW demand during the peak period or 90% of the largest KVA demand during the peak period. Customers who used a lot of KVA relative to KW would h ave an economic incentive to install their own equipment to serve their KVA needs because it was much cheaper than the Company's charges. This rate design internalized to the customer the economics of the specific costs they were imposing on the system.

Another example is National Grid's Second Feeder Service offering. Customers can request reservation of capacity on a second feeder in order to obtain immediate switch of service to the second feeder in the event of an outage on the first feeder. The customer pays for this reserved capacity every month as a capacity charge. Both of these examples internalize to the customers their costs from the company for comparison to economic alternatives. In addition, the offerings provide revenues to the Company to offset the costs of these services in the event the services are necessary.

The distribution grid is the area of the electric system that has the greatest impact on daily reliable service to customers. Thus, it is important to allow the design of the grid to provide reliable

service. At present, the approach to cost recovery does not recognize a future that is about connections and capability, not simply delivery.

The Department could investigate the new services that will be necessary to allow the integration of generation and load on the distribution system. For example, who is responsible for managing power quality on the system from the introduction of generators to the distribution grid. Should tariffs be developed that reflect voltage management and if so who should pay those tariffs? Should wheeling tariffs be developed for generators located on one Company's distribution grid but delivering power to a customer on another utility's distribution grid?

Some, but not all, potential design characteristics could be:

1. Size of customer (kWh range, demand (kW or kVa), service amp level, requested service level);
2. Wheeling capacity requested;
3. Requested reservation assurance level (Second Feeder Service as an example);
4. Discounts for physical assurance that generation will remove demands from the distribution grid;
5. Time varying pricing to allow scheduling of customer access to the Distribution grid to allow maintenance or to take advantage of economic pricing from the market;
6. Power quality management services (e.g. management of excess voltage from customer generation that flows onto the distribution grid); or
7. Rebates or lower costs for demand management

Regulatory Oversight

A proposed rate design can be filed as a component of a rate case, a proposal for metering systems or independently. Utilities would file a proposal once they determine a valid business case for the new pricing offering (rate design). The filing would include reasoning and analysis for the offering accompanied by the a presentation of benefits to customers.

An alternative approach would be for the DPU to open an investigation into potential rate designs and their benefits/costs from implementation.

A change in rate design may require time for customers to comprehend the change. The principle of rate continuity may require a phase-in period for those customers receiving full distribution service.

Stakeholders would provide input to the filing by intervening in the docket before the DPU. In this way, stakeholders would be entitled to file formal comments and briefs, and all other privileges afforded to interveners for consideration in the Department's Order prior to implementation.

Also, a utility (utilities) and stakeholders may come to agreement on a proposal which becomes a settlement filed at the Department for its review.

Cost Effectiveness

Any pricing proposal would demonstrate cost effectiveness through analytical review of cost causation leading to the need for the offering. In addition, the price structure would be designed on the appropriate cost to deliver the service to requesting customers.

Ratemaking & Cost Recovery

Any incremental costs would be paid for by customers on the proposed service offering. Cost recovery for all elements of grid modernization would be facilitated by the addition of appropriate service offerings that increase the revenue opportunites for the company to pay for grid modernization.

Performance Targets or Metrics

These are not foreseen as part of this model. However, any request for metrics or targets would be discussed during a proceeding before the Department.

3. Strengths and Weaknesses of the Regulatory Model

Strengths

2. The model provides the opportunity to recognize the additional services provided by the distribution utility and charge the appropriate customers for those services.
3. It minimizes cross-subsidies that will occur if these new service offerings or requirements are not recognized as a new service and charged appropriately.
4. Provides economic basis for customers to determine whether utility provided service is more economic that own provision of service or third party provision.
5. Provides the opportunity through physical assurance requirements to ensure the value claimed by local generation in terms of distribution savings by lowering the need for capacity.

Weaknesses

1. The ability to change the present distribution rate structures to reflect cost causation may take a period of time due to rate continuity considerations.
2. Concerns regarding incentives for energy efficiency in present rate structures will need to be understood as changes in rate structures are evaluated

Massachusetts Grid Modernization Working Group
Regulatory Model Option

Title: Demand Response Model including TOU and DLC Date: 2/22/12
Author: National Grid

Table 1: Summary of Regulatory Model (not to exceed this page)

Regulatory Elements:	**Description**:
Rationale for, Summary of, Model	Receive approval for plan to roll-out of new product opportunities (rate designs) to assist customers in managing their energy use
Utility pre-implementation filing requirement	File implementation plan for approval
Regulatory review and approval of filing	Yes
Stakeholder input to filing	Yes, during the regulatory proceeding
Utility request for pre-approved budgets for GM measures	Maybe: Depends on need for new technology, outreach efforts to customers
Explicit, public cost-effectiveness requirement	Yes
Utility reporting requirements	Determined during DPU proceeding, if necessary
Cost recovery mechanism (capital and O&M)	Yes, separate mechanism, forward looking
Cost allocation (among customer classes)	Determined as a part of regulatory proceeding
Cost assignment (e.g., to third party)	
Rate design	
Utility incentives (e.g. ROE, rewards/penalties)	
Performance targets or metrics	
Ratesetting (general rates)	Historic test year or forecast rate year method may apply
Frequency of rate cases	Present rules apply.
Comments/Major issues	Interaction of proposed rate design and wholesale commodity prices

Description of Regulatory Model (not to exceed two pages)[1]

Summary:

Rate design options may be filed for approval included as part of a rate case or apart from a formal rate case. Rate design options could be filed as part of a proposal to convert metering to advanced systems with greater capability to provide certain opportunities to customers. These rate options would be designed to be revenue neutral to approved rates on a class basis. The rate options could include Time-of-Use rates such as fixed period TOU, fixed period critical peak pricing (CPP), variable period CPP, hourly pricing of demand response credits for load control options, etc..

Regulatory process:

A proposed rate design can be filed as a component of a rate case, a proposal for metering systems or independently. Utilities would file a proposal once they determine a valid business case for the rate design. The filing would include reasoning and analysis for the rate design accompanied by the a presentation of benefits to customers.

An alternative approach would be for the DPU to open an investigation into potential rate designs and their benefits/costs from implementation.

Stakeholder input to filing:

Stakeholders would provide input to the filing by intervening in the docket before the DPU. In this way, stakeholders would be entitled to file formal comments and briefs, and all other privileges afforded to interveners for consideration in the Department's Order prior to implementation.

Cost effectiveness:

Utility proposals would need to include justification for the rate designs and associated costs for implementation, customer outreach and enabling technologies. A demonstration of benefit would be provided as part of the filing.

Utility reporting requirements:

Reporting requirements may be determined as a result of utility proposals and DPU deliberations in the proceeding.

Cost recovery:

Utilities may request recovery of costs associated with implementation of the rate design, outreach to customers and enabling technologies.

Utility incentives:

Incentives would be addressed in the context of the DPU proceeding and be specific to the nature of the investment.

Comments/Major issues:

New rate designs have to consider the interaction of the rate design with the costs as incurred and billed in the ISO-NE wholesale market. This interaction creates risks that must be considered during any investigation.

[1] Expand upon the key regulatory elements listed in Table 1. Provide examples where available.

Table 2: Summary Evaluation (not to exceed this page)[2]

Overarching Criteria:	
Ability to achieve Grid Mod Goals	Moderate
Feasibility; i.e., difficulty of implementation	Good
Timeframe for implementation and results	Good
Consistent with relevant statutes	Good
Timing & flexibility to address dynamic options	Good
Costs and Customer Concerns:	
Consumer protection - low-income	Good
Consumer protection - other residential	Good
Consumer protection - C&I	Good
Customer class cross-subsidy impacts	To be determined
Likely bill impacts	To be determined
Utility shareholder impacts	Good
Address risks - to customers and to utility	Good
General Criteria:	
Empowerment (i.e., will it empower customers, utilities, vendors?)	Good
Enablement (i.e., will it result in a sufficient platform?)	Moderate
Support innovation by utilities	Moderate
Identify performance objectives, has transparent measurement and symmetrical rewards based on performance	Good
Provide process stability, lowers regulatory uncertainty	Moderate
Common value measurement model (e.g., business case, NPV to consumers, society)	Good
Risk - to different parties	Good

[2] Choose one of the following: good; moderate; bad; don't know; not applicable; to be determined.

Massachusetts Grid Modernization Working Group
Regulatory Model Option

Title: Metering model Date: 2/22/12
Author: National Grid

Table 1: Summary of Regulatory Model (not to exceed this page)

Regulatory Elements:	**Description**:
Rationale for, Summary of, Model	Receive approval for plan to roll-out of new metering systems with associated communications capability
Utility pre-implementation filing requirement	File implementation plan for approval
Regulatory review and approval of filing	Yes
Stakeholder input to filing	Yes, during the regulatory proceeding
Utility request for pre-approved budgets for GM measures	Yes.
Explicit, public cost-effectiveness requirement	Yes
Utility reporting requirements	Annual
Cost recovery mechanism (capital and O&M)	Yes, separate mechanism, forward looking
Cost allocation (among customer classes)	Determined as a part of regulatory proceeding
Cost assignment (e.g., to third party)	
Rate design	
Utility incentives (e.g. ROE, rewards/penalties)	
Performance targets or metrics	
Ratesetting (general rates)	Historic test year or forecast rate year method may apply
Frequency of rate cases	Present rules apply.
Comments/Major issues	Creates multi-year rate review

Description of Regulatory Model (not to exceed two pages)[1]

Summary:

This model separates the decision to implement new metering and associated communications systems from the regulatory review of the remainder of the business. Thus, the provision of safe, reliable service to customers can continue while consideration of any proposal for these systems is underway. This model simplifies the regulatory review by allowing focus on a metering/communication roll-out proposal. The review can consider the issues regarding timing of the roll-out, technology selection, cost, benefits from the technology (demand response, outage investigation, energy efficiency, etc).

Regulatory process:

Under this model, utilities would file a proposal once they determine a valid business case for the change in metering systems. This would allow regulatory review of each utility's proposal to consider specific issues with any conversion and the specific benefits from the conversion to their customers. The filing would include a budget for every year of implementation as well as a request for cost recovery for the costs of implementation. The filing would also include a demonstration of the benefits to customers from the change in technology. Interested stakeholders could intervene and provide input to the plan in the form of testimony and briefs.

An alternative approach would be for the DPU to open an investigation into meter and communication deployment. A similar filing would be required from the utilities although time would be necessary to determine whether a business case exists for the conversion.

Stakeholder input to filing:

Assuming the plan would be filed at the DPU first, stakeholders would provide input to the filing by intervening in the docket before the DPU. In this way, stakeholders would be entitled to file formal comments and briefs, and all other privileges afforded to interveners for consideration in the Department's Order prior to implementation.

Cost effectiveness:

Utility proposals would need to include justification for the conversion of metering technologies and associated communication technologies. A demonstration of benefit would be provided as part of the filing. The conversion should create enough benefits to justify the investment.

If the DPU requests utility proposals, utilities would prepare a best case at the time which may or may not provide adequate benefits for customers.

Utility reporting requirements:

Reporting requirements may be determined as a result of utility proposals and DPU deliberations in the proceeding.

Cost recovery:

Since utilities would be proposing a separate plan for implementation, utilities may choose to request a separate regulatory review and recovery process to provide funding for metering and communication investments. The recovery mechanism should allow for timely recovery and be subject to reconciliation and prudence review.

[1] Expand upon the key regulatory elements listed in Table 1. Provide examples where available.

Utility incentives:

Incentives would be addressed in the context of the DPU proceeding and be specific to the nature of the investment.

Comments/Major issues:

If a plan is approved, this approach may result in a multi-year regulatory review of the implementation plan and subsequent cost recovery. In addition, benefits may be reviewed to ascertain success in delivery of those benefits.

Table 2: Summary Evaluation (not to exceed this page)[2]

Overarching Criteria:	
Ability to achieve Grid Mod Goals	Moderate (meters only)
Feasibility; i.e., difficulty of implementation	Good
Timeframe for implementation and results	Good
Consistent with relevant statutes	Good
Timing & flexibility to address dynamic options	Good
Costs and Customer Concerns:	
Consumer protection - low-income	Good
Consumer protection - other residential	Good
Consumer protection - C&I	Good
Customer class cross-subsidy impacts	To be determined
Likely bill impacts	To be determined
Utility shareholder impacts	Good
Address risks - to customers and to utility	Good
General Criteria:	
Empowerment (i.e., will it empower customers, utilities, vendors?)	To be determined
Enablement (i.e., will it result in a sufficient platform?)	Good
Support innovation by utilities	Good
Identify performance objectives, has transparent measurement and symmetrical rewards based on performance	Good
Provide process stability, lowers regulatory uncertainty	Good
Common value measurement model (e.g., business case, NPV to consumers, society)	Good
Risk - to different parties	Good

[2] Choose one of the following: good; moderate; bad; don't know; not applicable; to be determined.

Massachusetts Grid Modernization Working Group
Regulatory Model Option

Title: Utility Proposal
Author: Northeast Utilities, National Grid, Unitil
Date: April 16, 2013

1. Summary of Regulatory Model

Regulatory Elements:	**Description:**
Customer-facing, grid-facing or both	Both
Rationale for, or summary of, model	Utilities submit proposals for grid modernization investments prior to initiating the plan.
Regulatory Oversight:	
Utility pre-implementation filing requirement	Filing required prior to implementation.
Regulatory review and approval of filing	Yes. DPU review and approval of a utility grid modernization proposal would occur in the context of an adjudicatory proceeding with set time frames for review and receipt of a final order to enable timely and efficient implementation of grid modernization initiatives.
Utility request for pre-approved GM budgets	Yes.
Stakeholder input	Yes. During the DPU adjudicatory proceeding interested stakeholders can participate.
Utility reporting requirements	Annual or as determined during the DPU proceeding. Utilities may report on progress (e.g., budget and installation status) as well as evaluation criteria. Depending on the nature of the grid modernization investment, a variety of reporting elements may be applicable.
Cost-Effectiveness:	
Explicit, public cost-effectiveness requirement	Traditional standards for reviewing projects necessary to maintain the safety and reliability of service to customers would remain in place. Cost-effectiveness tests may be applicable for certain customer and grid-facing investments in order to demonstrate the benefits exceed the costs. However, it is not appropriate to apply those tests uniformly across all investment types. As such, these tests should be included in the context of a utility filing, as appropriate. Following DPU approval of grid modernization initiatives, utilities shall pursue such initiatives efficiently.
Internal analysis by utility	Traditional standards for reviewing projects necessary to maintain the safety and reliability of service to customers would remain in place.
Ratemaking and Cost Recovery:	
General ratemaking (historic, future test years)	The process for general utility ratesetting does not

	change from the process that exists today. Base distribution rates will be set in the context of a general rate proceeding. As necessary for grid modernization investments, a separate funding mechanism outside of base rates will apply.
Frequency of rate cases	Present rules apply.
Cost recovery (e.g., base rates, trackers)	As necessary, utilities should be permitted to request recovery of grid modernization investments through mechanisms outside of base rates, as determined by the Department.
Cost allocation (among customer classes)	This would be addressed in the context of the DPU proceeding. A principle of the utility's proposal will be to consider the need for affordability for low-income customers.
Cost assignment (e.g., to third party)	The beneficiary of an investment in grid modernization should pay the costs, wherever it is feasible to do so.
Rate design	This would be addressed in the context of the DPU proceeding. A principle of the utility's proposal will be to consider the need for affordability for low-income customers.
Utility incentives (e.g. ROE, rewards/penalties)	This would be addressed in the context of the DPU proceeding.
Performance Targets or Metrics:	
Role of performance targets	This would be addressed in the context of the DPU proceeding.
Performance targets that will be used	Targets and goals would be an element of each utility proposal. Given that grid modernization investments serve to accomplish a variety of targets and goals, these would vary depending on the nature, scope, size, and timing of the investment. As such, it is premature to identify in this document specific targets or goals that should be considered.
Comments/Major issues	To enable timely implementation of grid modernization initiatives, specific timeframes should be established for DPU review and approval of utility grid modernization proposals.

2. Description of Regulatory Model

Executive Summary

Utilities would be allowed to submit plans to the Department of Public Utilities ("DPU") that meet the DPU's grid modernization objectives in a manner suitable for the unique characteristics of each system and rate plan. An individual utility approach accounts for the unique service territory characteristics and various technologies deployed by each utility currently. After receiving a utility proposal, the DPU would open an adjudicatory proceeding to investigate the plan. The establishment of specific timeframes for review and approval of utility plans is critical to ensuring the timely and efficient implementation of grid modernization initiatives.

Regulatory Oversight

The utilities would file proposals with the DPU that meet the DPU's grid modernization objectives in a manner suitable for the unique characteristics of each system and rate plan.

Rules regarding stakeholder participation in the DPU review process would be identical to current rights afforded to participants in adjudicatory proceedings before the DPU.

Cost Effectiveness

Traditional standards for reviewing projects necessary to maintain the safety and reliability of service to customers would remain in place. Cost-effectiveness tests may be applicable for certain customer and grid-facing investments in order to demonstrate the benefits exceed the costs. However, it is not appropriate to apply those tests uniformly across all investment types. As such, these tests should be included in the context of a utility filing, as appropriate. Following DPU approval of grid modernization initiatives, utilities shall pursue such initiatives efficiently.

Ratemaking & Cost Recovery

As necessary, utilities should be permitted to request recovery of grid modernization investments through mechanisms outside of base rates, as determined by the Department.

Performance Targets or Metrics

Incentives would be addressed in the context of the DPU proceeding and would be specific to the nature of the investment.

Stakeholder input to filing:

Stakeholders would provide input by intervening in the docket before the DPU. In this way, stakeholders would be entitled to all privileges afforded to interveners for providing input to inform the DPU's review of a utility proposal prior to approval.

A formal requirement for obtaining stakeholder input prior to a utility filing would interfere with a utility's planning processes. This approach is consistent with current regulatory practice.

Utility reporting requirements:

Reporting requirements should be specific to each plan but at least annually. Depending on the grid modernization objectives ultimately endorsed by the Department, investments might span a variety of technologies and horizons, so allowing for flexibility to address in the context of a specific proposal is appropriate.

Utilities may report on progress (e.g., budget and installation status) as well as evaluation criteria. The nature of the grid modernization investment may warrant a variety of variables and elements for reporting (e.g., technologies with different lead times, installation times, and evaluation

criteria, as well as other complexities). Reporting requirements would be proposed by the utility in its initial filing.

If a cost recovery mechanism is approved by the Department, annual reporting to request cost recovery would be necessary.

Comments/Major issues:

The DPU's review and approval process must contain specific timeframes for review and approval of grid modernization investments. A protracted review and approval process with no clear end-date for issuance of a final order jeopardizes the utility's ability to make efficient and timely investments in grid modernization.

3. Strengths and Weaknesses of the Regulatory Model

Strengths

This framework will allow for utility specific proposals to satisfy the DPU's grid modernization objectives while providing the following regulatory process benefits:.

- Provide the DPU with the opportunity for a full review of any proposal prior to implementation.
- Allow stakeholder input to the proposal via participation in the DPU adjudicatory proceeding.
- This would provide an opportunity to address a number of stakeholder issues, for instance:
    - Review of consumer protections and bill impacts;
    - Empowerment and enablement issues; and
    - Risks to various parties.
- Allow each utility to expeditiously achieve grid modernization objectives by providing pre-approval of a proposal in a timely manner, and in a way that is suitable for the unique characteristics of each system and rate plan.
- Support innovation in the industry as a whole and by utilities individually by enabling an incremental approach to infrastructure investment that allows for flexibility by the utility in the face of rapidly changing technologies while providing a mechanism for timely cost recovery of investments.
- Enable opportunities for review and approval of pilots of new technologies and innovative methods to provide safe, reliable service or to achieve other grid modernization objectives.

Weaknesses

This proposal as constituted does not include a specific requirement for a date by which utilities should file a plan, which could potentially delay implementation of a plan.

Massachusetts Grid Modernization Working Group
Regulatory Model Option

Title: Grid Modernization Advisory Council Model
Author: ENE
Date: April 9, 2013

1. Summary of Regulatory Model

Regulatory Elements:	**Description:**
Customer-facing, grid-facing or both	Customer-facing (or both)
Rationale for, or summary of, model	Grid Modernization Advisory Council (GMAC) helps facilitate stakeholder input before proposals reach the DPU.
Regulatory Oversight:	
Utility pre-implementation filing requirement	Multi-year plans and budgets filed with DPU, process for mid-course corrections.
Regulatory review and approval of filing	Yes, in advance.
Utility request for pre-approved GM budgets	Yes, from DPU
Stakeholder input	Yes, through GMAC
Utility reporting requirements	Annual to DPU and GMAC
Cost-Effectiveness:	
Explicit, public cost-effectiveness requirement	Yes, analytical model to be approved by DPU, also reviewed in advance by GMAC
Internal analysis by utility	
Ratemaking and Cost Recovery:	
General ratemaking (historic, future test years)	
Frequency of rate cases	
Cost recovery (e.g., base rates, trackers)	Yes, DPU to determine depreciation schedules to limit ratepayer exposure, only net costs eligible for recovery.
Cost allocation (among customer classes)	Cost-recovery would reflect the benefits to an individual consumer and the electric system as a whole.
Cost assignment (e.g., to third party)	
Rate design	
Utility incentives (e.g. ROE, rewards/penalties)	Yes, based on ROE with performance-based rewards and penalties determined by DPU
Performance Targets or Metrics:	
Role of performance targets	
Performance targets that will be used	The GMAC will provide recommendations to the DPU on performance targets and metrics.

2. Description of Regulatory Model

Executive Summary

In the spirit of fostering a robust discussion of regulatory options for grid modernization, ENE offers this Straw Proposal.[1] At the outset, we believe that participants in this Grid Modernization Proceeding should advance strategies in a balanced manner that encourages innovation while maximizing consumer and environmental benefits.

In order to encourage utilities to adopt innovative strategies and take reasonable risks, and to ensure that utilities continue to adopt policies and strategies that advance the ability of third parties to provide services to customers, ENE's Straw Proposal would employ a Grid Modernization Advisory Council ("Advisory Council") to help the utilities shape their smart grid decision-making. The Advisory Council would be composed of stakeholders representing a variety of interests and would be charged with providing input to utilities and the Department in a number of areas, including, but not limited to: (a) customer and vendor protection and education; (b) technology functionality and value; (c) environmental benefits; (d) technology deployment and rollout issues; and selection of the analytical cost-benefit model. Annually, utilities must file a report with the Council and the DPU detailing expenditures to date and progress toward meeting performance goals.

The DPU will retain all of its regulatory roles, and the Advisory Council will serve as a facilitator for stakeholder input, working to resolve issues before utility proposals come before the Department.[2]

Regulatory Oversight

- The DPU requires utilities to develop and implement guidelines for meaningful and comparable consideration of non-wires alternatives as possible solutions to planning and reliability issues in distribution planning. [3,4] This process would include an analytical process for screening non-wires alternatives and the comparison of feasible wires and non-wires alternatives, and a framework within which such

[1] ENE does not contend that this Straw Proposal represents the only reasonable path forward, but does encourage the participants to consider the elements contained herein in the context of this proceeding.

[2] Similar to the existing energy efficiency council model, stakeholder input will be facilitated by the GMAC, and stakeholders will have additional opportunity to comment when filings are made at the DPU.

[3] Non-wires alternatives may be defined as demand side management and distributed energy resources that leverage customer/third party resources and complement and improve operation of existing distribution systems, and that individually or in combination defer the need for upgrades to the distribution system.

[4] Non-wires alternatives may include, but are not limited to, energy efficiency, direct load control, distributed energy resources (distributed generation generally, as well as combined heat & power, and energy storage), demand response, peak demand and geographically focused energy efficiency strategies, alternative tariff options.

comparisons can be made. [5]The DPU would require these guidelines to be updated periodically based on experience in analyzing and implementing non-wires projects.[6]

- The DPU defines the scope of grid modernization and objectives, requirements, and/or necessary functionalities of the modern grid for the Commonwealth.
- Utilities submit multi-year plans and budgets to the DPU to achieve the defined grid modernization objectives. Utilities are able to receive advance approval for grid modernization investments. The process also would allow for mid-term course corrections.
- Stakeholders provide input to the multi-year plan and budget filing as part of the Grid Modernization Advisory Council. Early stakeholder input will expedite and reduce the cost of the DPU approval process prior to implementation.
- The regulatory review process shall provide reasonable review and approval timeframes to approve plans prior to implementation.

Cost Effectiveness

- There will be a threshold requirement for cost-effectiveness as well as an effort to maximize cost-effectiveness and customer value.
- Financial analyses of proposed investments will be conducted to the extent feasible. The selection of analytical model(s) will be subject to DPU review and approval.
- The Grid Modernization Advisory Council shall provide input to the DPU and utilities on the selection of the analytical cost-benefit model.
- Selection or approval of grid modernization investments shall be informed by the considerations approved by the DPU (see footnote4), and an evaluation of costs and benefits according to the approved analytical model.

Ratemaking & Cost Recovery

- Grid modernization investments eligible for cost-recovery are defined by the DPU and are consistent with the objectives, requirements, and functionalities of grid modernization as defined by the DPU.
- The DPU sets reasonable limits for cost-recovery, depreciation schedules to limit rate-payer exposure to stranded costs due to obsolescence.
- Cost-recovery would reflect the benefits to an individual consumer and the electric system as a whole.
- Only net costs will be eligible for recovery, and any cost overruns or benefits shortfalls will be the responsibility of the utility shareholders, not ratepayers.
- The DPU would determine the appropriate rate design.

[5] Proposed non-wires alternatives and other grid modernization strategies should be evaluated on their ability to meet the identified system needs; anticipated reliability of the alternatives; risks associated with each alternative; potential for synergies that meet multiple grid modernization objectives; operational complexity and flexibility; implementation issues; customer impacts; and other relevant factors.

[6] It may be instructive for the Steering Committee and DPU to review the proceedings of RI PUC Docket No. 4202, specifically with regard to the Standards for System Reliability Procurement Standards. See: http://www.ripuc.org/eventsactions/docket/4202-EERMC-RevSRP(3-1-11).pdf

Performance Targets or Metrics

Incentives would be based on ROE with performance-based rewards and or penalties, as determined by the DPU. The GMAC will provide recommendations to the DPU on performance targets and metrics.

3. Strengths and Weaknesses of the Regulatory Model (compared to status quo)

Strengths

- The Grid Modernization Advisory Council ensures that diverse stakeholder interests- including business, technology, consumer, and environmental- are and continue to be represented throughout the grid modernization planning process.
- Use of a Grid Modernization Advisory Council will facilitate the DPU review and approval process to encourage timely grid modernization investments and limit lengthy, contested regulatory processes.
- The Grid Modernization Advisory Council can institutionalize the stakeholder engagement started in current DPU Grid Modernization process, including assuming responsibility for updating and revising the taxonomy and functionality matrices.
- This model requires utilities to develop and implement guidelines and an analytical framework for comparing the costs, benefits, and risks of various grid modernization strategies, including non-wires alternatives and traditional investments.

Weaknesses

- Introduction of Grid Modernization Advisory Council could be time consuming.
- If the Grid Modernization Advisory Council is not properly implemented, it could create delay and uncertainty.
- The costs of the Grid Modernization Advisory Council will need to be recovered.

Massachusetts Grid Modernization Working Group
Regulatory Model Option

Title: PBR
Author: David O'Brien

Bridge Energy Group
Date: March 28, 2013

1. Summary of Regulatory Model

Regulatory Elements:	**Description:**
Customer-facing, grid-facing or both	Both
Rationale for, or summary of, model	Performance focus, Clarity of recovery to attract capital
Regulatory Oversight:	
Utility pre-implementation filing requirement	MA Framework compliance, NPV analysis
Regulatory review and approval of filing	Yes at plan initiation,
Utility request for pre-approved GM budgets	Yes, must adhere to MA Framework, NPV Analysis
Stakeholder input	Yes, extensive. During plan initiation and annual reports
Utility reporting requirements	Annual performance reports, capital plans, rate updates
Cost-Effectiveness:	
Explicit, public cost-effectiveness requirement	Yes, MA Framework
Internal analysis by utility	
Ratemaking and Cost Recovery:	
General ratemaking (historic, future test years)	Cap Ex based on annual projection & reconciliation
Frequency of rate cases	Rate cases occur at initiation of plan, rates based on formula during plan.
Cost recovery (e.g., base rates, trackers)	Base rates based on formula, cap ex rider based on annual projection
Cost allocation (among customer classes)	Traditional cost causation rate design
Cost assignment (e.g., to third party)	Traditional cost causation
Rate design	Diverse offering of dynamic rates (PTR, CPP, VPP)
Utility incentives (e.g. ROE, rewards/penalties)	Symmetrical ROE adjustment based on performance
Performance Targets or Metrics:	
Role of performance targets	Dictate level of ROE
Performance targets that will be used	Extensive covering operating efficiency, asset management, customer demand response, reliability & outage restoration, environmental, DG, customer satisfaction etc. See *Performance Measure Illustration*

2. Description of Regulatory Model

Executive Summary

The PBR model is oriented towards multi-year plans that are much more dynamic than traditional litigated rate cases to establish utility cost of service. There is a heightened degree of clarity of cost recovery and a flexibility in what is spent or how dollars are spent year to year to empower utilities and to help attract the considerable capital required to implement Grid Modernization.

The assumption is that capital spending, while more flexible (based on projections rather than historic test year) is based on furthering what we refer to as the *Mass Framework.* The Framework sets forth the functional expectations such as peak load reduction, carbon emission reduction, levels of reliability, etc. The burden is on the utilities to tailor their spending on their core network and for grid modernization that meets state goals. Further there is considerable accountability in the form of performance metrics that are reviewed annually.

The heightened degree of accountability for outcomes is the counterweight to the greater flexibility the utilities are provided. The focus shifts from whittling away the revenue requirement to an assessment that the revenue requirement delivers requisite value to consumers and the state as a whole. The model taps into and leverages the functional capabilities inherent in Grid Modernization that can increase productivity, reliability, customer efficiency and integrate renewables, amongst many outcomes from an advanced grid.

Core values of this model include:

- a focus on outcomes for customers and society
- providing clarity of recovery to attract capital
- Flexibility for utility managers closest to the customer to adapt investment to achieve the desired performance
- Regulatory clarity in terms of desired form, scale and function of Grid Modernization

What is gained in return for the flexibility is a much heightened level of accountability for performance. The development of performance metrics and regular reporting of them greatly increases the focus on quality and outcomes. The Performance Measurement Schedule becomes the living documentation of the effects of Grid Modernization on customers and the system as a whole. For utilities the introduction of a clear and adaptable means to recover capital investment and the prospect of increased earnings will have a profound effect on access to capital.

Regulatory Oversight

- ✓ Utilities would develop their multi-year investment plans that would be divided into two distinct areas, Core Network and Grid Modernization. Core Network is ongoing investment in traditional infrastructure (poles, wires, etc.) while the Grid Modernization would be incremental to that and be based on *Mass Framework.*
- ✓ Utilities would submit to DPU their proposed *Initial Revenue Requirement,* which would reflect their non-capital costs to serve customers at the outset of the plan plus a *Projected Capital Investment* for that year.
- ✓ At the end of each year utilities would submit to the DPU a reconciliation of actual cap ex to projected, with any over or under collection plus interest at WACC recovered in rates going forward.
- ✓ The assumed duration of the plan is five years with options for renewal. Rate investigations would take place at the outset of each plan period. Base rates would be

adjusted annually during the plan based on pre-determined factors (inflation, exogenous events, productivity). Base rate reviews would be limited to 60 days.

Cost Effectiveness

Cost effectiveness is addressed in two ways. First capital investment plans must connect to the Mass Framework that includes expectations around state policy goals, functional capability and particular outcomes. One form of cost effectiveness of utility spending is that it furthers defined expectations of the public and customers. Second, grid modernization plans that would entail items such as advanced metering and distribution automation should be presented as a cohesive platform that has a supporting NPV analysis or "business case" that details the value streams and cost savings that stem from the investment and to what degree they exceed the up front investment.

Ratemaking & Cost Recovery

- ✓ Base Rates would recover operating costs, while a *Capital Rider* would recover the funds to support the projected cap ex.
- ✓ Base ROE would be set according to a statutory formula (working assumption would be Treasury + x basis points).
- ✓ The utilities would be eligible for financial incentives based on demonstrated performance under the established metrics. The performance would be benchmarked to industry data with a range of possible incentive from zero to X basis points added to the Base ROE. Underperformance would similarly result in reductions in ROE.
- ✓ Detailed rate reviews would occur at the outset of a plan period, much the same as a traditional rate case. Once the plan is in effect rates would be updated annually based on prescribed formula (CPI +) and subject to a expedited review.

Performance Targets or Metrics

A central component of the plan would be a *Performance Measurement Schedule* that would detail all of the performance measurements to be tracked and reported upon by the utility annually. The metrics could be established as part of the *Mass Framework.* They would be well beyond what is measured today in service quality plans and would be across the entire utility operation from customer engagement to reliability. Many of the metrics would track values that populated the initial Grid Mod Business Case but would also track the value of investment in *Core Network*.

3. Strengths and Weaknesses of the Regulatory Model

Strengths

1) Performance focus places dramatic emphasis on customer and societal outcomes
2) Financial incentives reward excellence and support innovation
3) Capital investment is grounded in a state Framework that ensures rate funded investment is furthering desired outcomes
4) Degree of accountability for quality of system and customer performance is greatly enhanced.

5) Detailed metrics and annual reporting on performance provide transparency.

Weaknesses

1) Dramatic change in regulatory approach. For some stakeholders moving away from litigation will be seen as a lessening of scrutiny or accountability.

Massachusetts Grid Modernization Working Group
Regulatory Model Option

Title: Combined Pre-approval and PBR Model
Author: Henry Yoshimura, ISO New England
Date: April 3, 2013

1. Summary of Regulatory Model

Regulatory Elements:	**Description:**
Customer-facing, grid-facing or both	Both
Rationale for, or summary of, model	To encourage cost-effective grid modernization (GM) efforts, this regulatory model utilizes elements of pre-approval and performance-based ratemaking (PBR). Under the pre-approval element, the utility files its GM plan. The DPU approves the plan if found to be cost-effective. If the plan is approved, capital cost recovery (return of and on invested capital) is pre-approved. Capital costs enter rates when authorized investments are used and useful. Cost under- or over-runs are borne by the utility. Under the PBR element, operational costs are recovered with service quality adjustments to give utilities the incentive to improve service quality. Cost under- or over-runs are borne by the utility during the tenure of its DPU-approved PBR plan.
Regulatory Oversight:	
Utility pre-implementation filing requirement	Elements of the GM plan filed by the utility with the DPU should include: description of the purpose and scope of the plan, itemized benefits and costs with supporting documentation, cost-effectiveness analysis, cost recovery proposal, class ratepayer impact analysis, and implementation/deployment plan. If the grid modernization plan includes deployment of more advanced metering that accommodates time-based rates, a separate default service rate design plan, including a plan for low-income customer protection, should be filed as well.
Regulatory review and approval of filing	The DPU reviews and holds a proceeding on the utility's GM plan. Alternative proposals may be filed by interveners. Standard administrative procedures are followed.
Utility request for pre-approved GM budgets	As previously described, the GM plan will include a pre-approval request.
Stakeholder input	Utilities should be required to present its GM plan to stakeholders before filing the plan with the DPU. Utilities should be encouraged to modify plans based on stakeholder comments or proposals. The GM plan filing by the utility should identify areas of substantive disagreement, and the utility's reasoning for pursuing its proposed course of action instead of accommodating the stakeholder's comment or proposal.

Utility reporting requirements	Utility reports on progress on implementing the GM plan. Rates adjusted to reflect used and useful investments. Performance metrics filed in accordance with the PBR plan.
Cost-Effectiveness:	
Explicit, public cost-effectiveness requirement	The utility must quantify benefits and costs of the GM plan and apply an appropriate discount rate to determine net present value of benefits and costs over the expected service life of the investments. A societal approach to cost-effectiveness should be used. The data and analysis used to develop each benefit and cost element should be provided, including risk elements.
Internal analysis by utility	Any relevant analyses by the utility are discoverable.
Ratemaking and Cost Recovery:	
General ratemaking (historic, future test years)	Pre-approval approach with PBR element.
Frequency of rate cases	Investment costs (depreciation and return components) enter base rates on a pre-approved basis once the investments are used and useful. Operational costs are recovered as part of a Performance-Based Ratemaking (PBR) scheme – the frequency of rate review is determined by the DPU upfront in the PBR proceeding (e.g., the PBR plan should be revisited at intervals of about five years).
Cost recovery (e.g., base rates, trackers)	Base rates
Cost allocation (among customer classes)	GM investment and operational costs should be allocated to the customer classes that benefit from the investments/services.
Cost assignment (e.g., to third party)	Not sure what this means.
Rate design	Default rates for all customer classes should be based on time-specific marginal costs for each function of service (e.g., customer, distribution, transmission, commodity) if the GM plan includes the installation of time-based metering. Low-income customer rates should provide affordability and stability, but also should enable low-income customers to benefit from shifting consumption to lower-cost periods.
Utility incentives (e.g. ROE, rewards/penalties)	Standard ROE for regulated utility distribution service would be applied to the utility's non-depreciated invested capital. Utility must bear risk of cost overruns.
Performance Targets or Metrics:	
Role of performance targets	Give utilities incentives to improve service quality given the cap on the regulated portion prices/revenues.
Performance targets that will be used	Performance metrics should be modified to reflect the expected improved service quality resulting from GM investments.

2. Description of Regulatory Model

Executive Summary

To encourage cost-effective grid modernization (GM) efforts, this regulatory model utilizes elements of pre-approval and performance-based ratemaking (PBR).

Under the pre-approval element, the utility files its GM plan – the plan may be comprehensive (both customer- and grid-facing elements), separate, or filed in phases depending on the specific circumstances of the utility (e.g., current state of metering and/or grid monitoring technology, pilot program status, etc.). The utility files its business case for the plan (filing elements described below). The DPU approves the plan if found to be cost-effective. If the DPU approves the plan, capital cost recovery associated with the plan is pre-approved. That is, investments authorized by the plan are deemed to be prudent and in the public interest, and return of and on authorized investments are reflected in regulated distribution rates once the investments are used and useful. The amount of cost recovery reflected in rates is determined by the DPU at the time of GM plan approval – cost under- or over-runs are borne by the utility.

Under the PBR element, operational costs are recovered with service quality adjustments to give utilities the incentive to improve service quality. GM costs approved by the DPU at the time of GM plan approval are incorporated into initial PBR distribution rates. Cost under- or over-runs are borne by the utility during the tenure of its DPU-approved PBR plan. Operational costs are revisited and the PBR plan is modified at intervals determined by the DPU (e.g., about five years).

Regulatory Oversight

Elements of the GM plan filed by the utility with the DPU should include: description of the purpose and scope of the plan, itemized benefits and costs with supporting documentation, cost-effectiveness analysis, cost recovery proposal, class ratepayer impact analysis, and implementation/deployment plan. If the grid modernization plan includes deployment of more advanced metering that accommodates time-based rates, a separate default service rate design plan, including a plan for low-income customer protection, should be filed as well.

DPU reviews and holds a proceeding on the utility's GM plan. Alternative proposals may be filed by interveners. Standard administrative procedures are followed.

Utilities should be required to present its GM plan to stakeholders before filing the plan with the DPU. Utilities should be encouraged to modify plans based on stakeholder comments or proposals. The GM plan filing by the utility should identify areas of substantive disagreement, and the utility's reasoning for pursuing its proposed course of action instead of accommodating the stakeholder's comment or proposal.

Cost Effectiveness

The utility must quantify benefits and costs of the GM plan and apply an appropriate discount rate to determine net present value of benefits and costs over the expected service life of the investments. A societal approach to cost-effectiveness should be used. The data and analysis used to develop each benefit and cost element should be provided, including risk elements.

Ratemaking & Cost Recovery

As described in the summary above, investment costs (depreciation and return components) enter base rates on a pre-approved basis once the investments are used and useful. Operational costs are recovered as part of a Performance-Based Ratemaking (PBR) scheme – the frequency of rate review is determined by the DPU upfront in the PBR proceeding (e.g., the PBR plan should be revisited at intervals of about five years).

Base rates

GM investment and operational costs should be allocated to the customer classes that benefit from the investments/services.

Default rates for all customer classes should be based on time-specific marginal costs for each function of service (e.g., customer, distribution, transmission, commodity) if the GM plan includes the installation of time-based metering. Low-income customer rates should provide affordability and stability, but also should enable low-income customers to benefit from shifting consumption to lower-cost periods.

Standard ROE for regulated utility distribution service would be applied to the utility's non-depreciated invested capital. Utility must bear risk of cost overruns.

Performance Targets or Metrics

Give utilities incentives to improve service quality given the cap on the regulated portion prices/revenues.

Performance metrics should be modified to reflect the expected improved service quality resulting from GM investments.

3. Strengths and Weaknesses of the Regulatory Model (compared to status quo)

Strengths

Since the primary mission of a distribution utility can be accomplished without GM, and since the incremental benefits of GM investments tend to accrue to others (i.e., customers, energy service and technology providers, and society in general) and not the utility, the risk of disallowance under traditional ratemaking practices (e.g., historical test-year approaches) discourages utilities from pursuing GM investments. This model addresses this shortcoming by requiring the utility to analyze GM investments from a broader societal point of view and giving the utility a degree of certainty regarding GM cost-recovery before making GM investments.

Weaknesses

The focus of this model is the pre-approval process. Instead of reviewing the prudency of actual, booked costs, the focus is on reviewing forward-looking cost and risk assumptions in the cost-effectiveness analysis. This shifts the type of expertise needed to review GM plans. Determining the reasonableness of cost projections becomes important because the prudency of investments authorized by the plan is presumed once a GM plan has been approved.