**UTILITY FILING REQUIREMENTS FOR SMART GRID INVESTMENTS**

**Scope and Objectives**

This chapter focuses on the identification of filing requirements for a utility seeking non-traditional (that is, any type outside the normal base rate case) ~~special rate treatment (outside the normal base rate case)~~ cost recovery in the State of Illinois for smart grid investments. The list of requirements identified below represent the Collaborative’s recommendations on information that a utility must provide in testimony should the utility seek any non-traditional (non-base rate) recovery of smart grid costs. The recommended filing requirements identified in this chapter fall into the three categories:

* + Cost-Benefit Requirements
	+ Technical Requirements
	+ Cost Recovery-Related Informational Requirements.

The recommended filing requirements for the first two categories have been extracted from filing requirements identified in the Cost-Benefit Framework chapter and Technical Characteristics and Requirements chapter of this Report. Recommended Cost Recovery Informational Requirements were identified separately from and are in addition to the cost-benefit and technical requirements.

**Recommended Cost-Benefit Filing Requirements**

The recommended cost-benefit filing requirements have been extracted from filing requirements identified in the Cost-Benefit Framework chapter of this Report.

The Collaborative was able to achieve consensus on these recommended requirements.

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| **Cost-Benefit Requirements** |
| Requirement | Additional Information |
| 1. Provide cost-benefit analyses of the investment(s), including a Total Resource Cost test:
 | Incorporate all costs and benefits meeting the following criteria:* They can be expected to have a meaningful economic impact on the utility’s investment decision or are relevant to the Commission’s approval decisions
* They can be reasonably and transparently quantified and monetized
* They are relevant to the analysis, specifically including the costs of achieving claimed benefits.

Among the costs that should be included and clearly identified are those in the following categories:* Capital
* O&M
* Consumer education
* Stranded costs that may be created by the investment
* Potential negative impacts, e.g., potential adverse customer/society, technology, and/or safety effects.

Separately identify those costs and benefits that will be directly incurred or realized by ratepayers through the traditional ratemaking structure, those costs that can be expected to be incurred by non-utility parties, those benefits that will flow, if at all, through the wholesale price of energy or other markets, and those benefits associated with broader societal objectives or results that are not necessarily reflected in regulated customer rates.Cost-benefit analysis may bundle or package together investments in several applications if those applications are needed to function together or provide otherwise unachievable synergies, or if they are reliant on a common infrastructure investment.To the extent that it is feasible to separate underlying platforms from individual applications, smart grid applications contained within a package should still be subject to individual cost-benefit analysis based on their stand-alone incremental costs and benefits. Cost-benefit analysis should provide a calculation of a payback period based on the present value of the annual cash flows of the Smart Grid investment or package |
| 1. Provide documentation supporting the cost-benefit analyses
 | * Discussion of the rationale behind the packaging or bundling of applications in the analyses
* Documentation of the discount rates used in the analyses and a discussion of the rationale for their use
* Documentation of the investment’s useful life and the basis for its determination
* Documentation of the length of time over which reasonable customer benefits can be reliably estimated
* Documentation of key assumptions underlying the analyses, particularly of those factors that may have a high degree of variability and/or uncertainty
* Discussion of the uncertainties associated with estimates of costs and benefits over the term of the payback period
* Documentation of a sensitivity analysis of the investment. While reasonable discretion should be provided in terms of the variables and assumptions to be included, the sensitivity analysis should:
* Identify the key variables from the cost-benefit analysis that merit sensitivity analysis. The degree of participation, assumed behavioral impacts, and persistence of customer behavior changes should be among the variables included in sensitivity analyses. Other candidates for inclusion are variables (such as emission costs and reliability) that have a wide range of potential values and/or are more subjective in nature.
* Produce cost-benefit results using alternate values for the variables in order to demonstrate the sensitivity/impact various scenarios might have on the economic profile of the Smart Grid investments.
* Documentation of assumptions regarding any environmental benefits incorporated in the analysis (e.g., emissions reduced, values of emissions/allowances)
* Discussion of the methodology and assumptions used in deriving the estimates of benefits associated with changes in the load profile. This discussion should describe the model(s) used, model inputs and outputs, model logic (at a high level), scenarios performed, and how model results are to be interpreted
* Identification and discussion of other investments or approaches (if any) that reasonably might achieve similar benefits
* A discussion of the potential change in benefits and costs that may occur over time assuming various implementation schedules
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**Recommended Technical Filing Requirements**

The recommended technical filing requirements have been extracted from filing requirements identified in the Technical Characteristics and Requirements chapter of this Report. The Collaborative was able to achieve consensus on these recommended requirements.

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| **Technical Requirements** |
| Requirement | Additional Information |
| 1. Provide a description of each smart grid application included in the investment and a discussion of the technical design of the application
 | * Discussion of technical design should include utility plans to address each of the following design issues:
* Capacity, including the factors of latency, data volume, and event rate
* Technical Maturity and Risk
* Identification of the criteria used to evaluate technical maturity and risk
* Discussion of the measures that will be put in place to make it possible for the functions of the smart grid components to continue to be maintained and supported
* Openness and Standardization
* Identification of specific standards used in the technology to be deployed
* Discussion supporting why any of the following types of standards, technologies or specifications are used:
* those that are proprietary or non-standard
* those requiring royalty fees
* those not listed in the NIST Interoperability Framework
* Discussion of the level of interoperability required for the application
* Description of utility’s plan to ensure that there are published specifications for the applicable customer end devices and third parties to communicate with the utility
* Security
* Discussion of application security, addressing the following questions:
* How is the data protected from eavesdropping (confidentiality)?
* How are the sources and destinations of data verified (authentication)?
* How is the data prevented from modification or loss (integrity)?
* Which NERC Critical Infrastructure Protection (CIP) requirements apply to this application?
* Which NIST security requirements apply to this application?

[Note: This requirement does not ask that the utility identify security vulnerabilities. Only the general techniques, standards and methods used by the utility need to be described]* Manageability
* Discussion of how the performance and health of the smart grid system will be maintained
* Upgradeability
* Discussion of how the system has been designed with sufficient capabilities and resources to adapt to future conditions, in particular those areas known to be barriers to expansion, such as disk space, memory space, bandwidth, processing power, and tools
* Discussion of how the system will integrate with existing systems, if applicable, for each application
* Scalability
* If applicable, utilities shall explain why any application cannot be made available to all customers
* Reliability
* Identification of applications and functions that are critical during power failures, and discussion of the design choices made to ensure that they continue to operate
* Interactivity
* Discussion of technical design should provide answers to the following questions for each design issue:
* How does the smart grid investment address this design issue for this application?
* Does this design issue present a challenge for this application? If not, why not? If so, how is the challenge being addressed?
* What is the basis behind the technology selections as they relate to cost and benefits?
* Under what conditions will the requirements and the importance of this issue vary?
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| 1. Provide confirmation and/or discussion of application-specific requirements, if applicable
 | **Advanced Metering*** At a minimum, the system shall permit a complete validated read of all meters 12 times a year within the normal monthly billing windows.
* Customer usage and billing data shall be kept confidential and managed in conformance with regulatory policies regarding data access and data protection
* The system shall retain usage data for the time required by regulations

**Remote Connect/Disconnect*** The utility shall have a process defined for authenticating the identity of any customer requesting a service connection or disconnection
* The electronic command to connect or disconnect shall be confidential, authenticated and checked for integrity
* The meter shall confirm the connect or disconnect and report it with a timestamp to the meter data management system within the regular reporting interval
* The system shall provide the necessary technical capabilities to meet the remote connect/disconnect requirements set forth by applicable laws and regulations.

**Customer Prepayment Using AMI*** The prepayment control system shall have the capability to perform the following tasks if specified by policy and regulations:
* Prevention of disconnection due to seasonal rules
* Prevention of disconnection for medical reasons
* Prevention of disconnection at the request of a third-party, other than through requests of law enforcement agencies using established procedures
* Validation of payment and reconnection of service within periods defined by applicable laws and regulations.

**In-Premises Devices for Energy Usage Data*** Utilities shall explain whether security is established end-to-end between customer devices and the back-office systems, and if so, how
* The customer device and the utility should be mutually authenticated
* The utility systems shall be able to detect when a customer device has been connected and when it has been successfully authenticated and configured; information respecting customers’ ownership and use of such devices shall be treated as confidential customer information.
* Customer usage data transmitted to the customer device shall be confidential, authenticated, and checked for integrity
* In order to fulfill its duty to ensure security, the utility shall specify the reasonable interface requirements for a customer device, including security considerations. The utility side of this interface shall conform to open standards and best security practices
* The customer devices shall not have access to other customers’ individual usage information

**Customer Web Portal for Energy and Cost Data*** Customer usage data transmitted to the customer through the web portal shall be confidential, authenticated, and checked for integrity

**Third Party or Government Use of Data*** The system must be capable of enforcing the security policy defined by laws and regulations regarding third-party access
* The default for third-party access must be that all access to customer usage data is restricted
* The system shall be able to provide customer usage reports for the length of time that are at least equal to data retention requirements set out in applicable laws and regulations

**Pricing Information to In-Premises Devices*** The pricing information provided to in-premises devices shall be confidential, authenticated and checked for integrity
* The customer’s usage data when participating in a demand response program shall be authenticated, checked for integrity, and kept confidential
* Pricing information shall be delivered reliably and accurately to in-premises devices
* The utility shall be able to verify that the demand response event indication was received by the energy services interface (e.g. the meter) or a third-party provider. Ideally this verification should include the time at which the event notification was received

**Direct Load Control*** The direct load control message shall be authenticated and checked for integrity
* The customer’s usage data when participating in a demand response program shall be authenticated, checked for integrity, and kept confidential
* Direct load control messages and signals shall be delivered reliably. The utility shall be able to verify that the demand response event indication was received by the energy services interface (e.g. the meter) or a third-party provider. Ideally this verification should include the time at which the event signal was received

**Automatic Circuit Reconfiguration*** Utilities shall explain how they will keep auto-restoration commands secure

**Dynamic System Protection for Two-Way Power Flows and Distributed Resources*** The knowledge of which equipment and which DER is energized/de-energized is a critical safety issue. Latency shall be “non-real-time” or better (<30 seconds) for information regarding this status.
* The utility must have a plan to address the issues of back-feeding and micro-grids with DER

**Dynamic Volt-VAR Management and Conservation Voltage Optimization*** Control signals shall be secured

**Asset Condition Monitoring*** Alarm information from asset condition monitoring must be secure

**Customer Distributed Resource Interconnection*** It shall be possible for a meter capable of performing net metering to be installed at any customer site

**Wide Area (Phasor) Measurement*** If the phasor measurement data is used to operate controls, the data shall be confidential, authenticated, and checked for integrity

**Wide Scale Outage Recovery*** The communication system shall be maintained during a wide-scale outage in order to permit wide-scale outage recovery to be performed

**Enhanced Physical Security*** Enhanced physical security services shall be protected from eavesdropping, spoofing, and denial of service
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**Recommended Cost Recovery Filing Requirements**

The recommended Cost Recovery Filing Requirements do not appear elsewhere in the Report. The Collaborative was able to achieve consensus on most of the recommended Cost Recovery Filing Requirements, including those listed in the following table.

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| **Cost Recovery Requirements** |
| Requirement |
| 1. Provide current credit rating reports from Standard & Poor’s, Moody’s Investors Service and Fitch Ratings
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| 1. Provide full set of bill impacts by customer class of anticipated smart grid expenditures
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| 1. Provide changes to existing tariffs or proposed new tariffs in Word format
 |
| 1. Provide a current cost of capital summary.  Additionally, describe how capital expenditures will be financed by source, including a breakdown of capital supplied by investors (e.g., debt and common equity), customers (e.g., advances and contributions) and government (e.g., matching funds, tax credits, and direct loans). Please provide this breakdown in dollars and percentages
 |
| 1. Provide all analyses performed regarding the rate of return requested in cost recovery proposal, including, specifically, the effects of any reduced risk attributable to any non-traditional cost recovery approved for the Smart Grid investment on the utility’s rate of return
 |
| 1. Provide forecasts of expenses and capital expenditures
 |
| 1. Provide a list of reports relied upon by management when deciding to pursue the project and alternatives considered and the reasons for rejecting each alternative
 |
| 1. Describe how the utility proposes that prudence and reasonable cost issues be handled
 |
| 1. Describe the cost recovery mechanism proposed to recover smart grid costs.  To the extent a utility requests an automatic cost recovery mechanism or formula as part of its tariff proposal, the utility shall provide an explanation with supporting financial documentation of why the mechanism is warranted, and why traditional rate case recovery of costs associated with the investment is not appropriate and the proposed cost recovery mechanism is preferred
 |
| 1. Provide an explanation of how the proposed recovery mechanism appropriately reflects the causation of these costs by each customer class
 |
| 1. Provide anticipated rates under the proposed recovery mechanism with all supporting work papers
 |
| 1. If incentive compensation costs are requested in rate recovery as part of the Company’s Smart Grid Cost Recovery Proposal, the utility must provide (i) all related incentive compensation plans (ii) testimony demonstrating all ratepayer benefits of such plans (iii) testimony that includes a full quantification of the amount of incentive compensation expense rate recovery requested by ICC account, by year and for the project in total
 |
| 1. Provide Excel files with working formulas for all above items, as applicable
 |
| 1. An explanation of how it will assure that discretionary SG investment receiving the proposed non-traditional cost recovery treatment will not diminish investments necessary for adequate, safe, and reliable service mandated by the PUA.
 |
| 1. An explanation of how the investments for which it proposes non-traditional cost recovery treatment are distinctive, using articulated objective criteria, from ordinary system modernization – so that traditional recovery is maintained for traditional investments. [This is redundant (See #13) and should be deleted]
 |
| 1. Demonstrate that (to the maximum extent practicable, fair, and equitable) its cost recovery proposal matches the range of cost recovery burdens with the range of beneficiaries (cost-causers), for those benefits used to justify the investment. [This is redundant (See #13 and #14) and should be deleted]
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[Comment – Paragraphs #13 and #14 state in plain terms that a utility must explain why it needs a automatic cost recovery mechanism or formula and also must explain how its rate design takes into account allocation of costs to customer classes. #19 invites unproductive litigation as to what is “articulated objective criteria” and what is “ordinary system modernization.” If a party wants to make a case that a particular smart grid investment is “ordinary” and for that reason doesn’t warrant the approval of a automatic cost recovery tariff, then it is free to do so and refute the utilities statement made pursuant to #13.]

Stakeholder response to comment above:

The gist of Items #19 and #20 in the Table is not covered by Items #13 and #14.  They should not be eliminated.

  1)  Eliminating #19 would avoid (again) addressing the problem of distinguishing Smart Grid investments -- here, even in the context of a filing that is made expressly for the purpose of requesting special treatment for this (without #19) undefined, undistinguished set of investments.  Since the Public Utilities Act places the burden of proof on utilities in all aspects of rate setting proceedings, that burden should not be shifted to non-utility stakeholders.  Eliminating Item #19 could be interpreted as requiring non-utility stakeholders to prove that an investment is not appropriate for special recovery treatment, when no objective criteria have been defined.  Note Item #13's reference to utility preference).  Resolution of this point (even if through litigation) would not be "unproductive" from the ratepayer perspective.

2)   Item #20 addresses the expanded scope of expected benefits from Smart Grid investments (beyond the usual utility and ratepayer groups) that is being used to justify these investments.  Specifically, how that wider range of beneficiaries (cost-causers) is recognized in the scope of cost recovery.  (See related questions in the cost recovery piece.)  In contrast, Item #14 is explicitly confined to traditional tariff rate customer classes.

The Collaborative discussed the possibility of modifying the existing filing requirements identified in 83 Illinois Administrative Code 285 (“Part 285”), which are the mandatory information requirements for public utilities in filing for an increase in rates. Three different views were expressed by Collaborative stakeholders in reference to the Part 285 filing requirements summarized as follows:

One group of stakeholders contends that, since the specific nature and magnitude of a future smart grid cost recovery filing cannot be known in advance, it is necessary for the utilities to provide all Part 285 information in order for parties to fully analyze all impacts of the cost recovery proposal. These stakeholders contend it would be inappropriate to reject any or all of the Part 285 filing requirements in advance. This group feels that the Part 285 requirements should be maintained for non-traditional (non-base rate) filings associated with cost recovery of smart grid investments. However, this group allows that some of the Part 285 filing requirements may prove unnecessary for particular future filings. In such case, this group of stakeholders recommends that the utility be allowed to request a waiver of schedules that the utility believes are not applicable to its smart grid cost recovery proposal.

A second group of stakeholders contends that Part 285 was intended to apply to utilities seeking traditional cost recovery of smart grid costs and that these requirements, in the context of a non-traditional recovery filing, are excessive and burdensome, and would ultimately serve as a deterrent to a utility contemplating smart grid investments.

A third group of stakeholders agrees that utilities should provide Part 285 schedules related to its non-traditional (non-base rate) smart grid cost recovery proposal. However, this group also contends that a subset of Part 285 schedules would not be applicable to any non-traditional (non-base rate) filings associated with cost recovery of smart grid investments. This group recommends that the following schedules be excluded from smart grid filing requirements and, therefore, excluded from the need for submitting a waiver request.

* + Section 285.2040  Schedule B-5.2: Property Merged or Acquired from Other Utilities
	+ Section 285.2045  Schedule B-5.3: Leased Property Included in Rate Base
	+ Section 285.2100  Schedule B-11: Property Held for Future Use Included in Rate Base
	+ Section 285.2105  Schedule B-12: Analysis of Activity in Property Held for Future Use
	+ Section 285.2110  Schedule B-13: Customer Deposits
	+ Section 285.2115  Schedule B-14: Budget Payment Plan Balances
	+ Section 285.3020  Schedule C-3: Sales Statistics
	+ Section 285.3065  Schedule C-6: Social and Service Club Membership Dues
	+ Section 285.3066  Schedule C-6.1: Industry Association Dues
	+ Section 285.3070  Schedule C-7: Charitable Contributions
	+ Section 285.3180  Schedule C-19: Property Taxes
	+ Section 285.3185  Schedule C-20: Local Taxes, Municipal Taxes, and Franchise Taxes
	+ Section 285.3300  Schedule C-27: Fuel Adjustment Clause Revenues and Expenses – Electric Utilities
	+ Section 285.3305  Schedule C-28: Fuel Transportation Expense – Electric Utilities
	+ Section 285.3310  Schedule C-29: Decommissioning Expense – Electric Utilities with Nuclear Facilities
	+ Section 285.3600  Schedule C-32: Non-utility Operations