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National  
Association of  
Regulatory  
Utility  
Commissioners

# Energy Efficiency: Development of Cost Recovery Tariffs

NARUC/Nigeria Electricity Regulatory Partnership  
Dubai, United Arab Emirates  
3-5 December, 2014

Paul Roberti, Commissioner  
Rhode Island Public Utilities Commission

# Outline

- Customer Classes and Bills
- Base Rates and Other Cost Recovery Mechanisms
- Regulatory Process
- Appendix

# Customer Classes

## □ Electric Rates

### □ Residential

- Regular
- Low Income

### □ Commercial/Industrial

- Small
- Medium
- Large
- Optional Large

## □ Gas Rates

### □ Residential

- Residential non-heating
- Residential non-heating low income
- Residential heating
- Residential heating low income

### □ Commercial

- Small Commercial
- Medium Commercial
- Large Commercial (high and low load factor)
- Xlarge Commercial (high and low load factor)

# Electric Service Bill

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SERVICE FOR: [REDACTED] BILLING PERIOD: Aug 2, 2013 to Sep 3, 2013 PAGE 2 of 2

ACCOUNT NUMBER: [REDACTED] PLEASE PAY BY: Sep 28, 2013 AMOUNT DUE: \$ 100.98

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**Enrollment Information**

To enroll with a supplier or change to another supplier, you will need the following information about your account:

Location: Rhode Island

Acct No: [REDACTED] Cycle: 3, SMT

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**Electric Usage History**

Month	kWh	Month	kWh
Sep 12	906	Apr 13	126
Oct 12	660	May 13	121
Nov 12	254	Jun 13	131
Dec 12	128	Jul 13	172
Jan 13	133	Aug 13	317
Feb 13	129	Sep 13	651
Mar 13	140		

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**Right To Dispute Your Bill And To An Impartial Hearing**

If you believe your bill is inaccurate or for any reason payment may be withheld, you should first contact our Customer Service Department at 1-800-322-3223. If a mutually satisfactory settlement of this matter cannot be made, you have the right to submit this matter to: Reviewing Officer, Division of Public Utilities and Carriers, 89 Jefferson Blvd., Warwick, Rhode Island 02888

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**DETAIL OF CURRENT CHARGES**

**Delivery Services**

Service Period	No. of days	Current Reading	Previous Reading	Total Usage
Aug 2 - Sep 3	32	55089 Actual	54448 Actual	651 kWh

METER NUMBER: 39179437 NEXT SCHEDULED READ DATE: Oct 2

RATE: Basic Residential Rate A-16

Customer Charge		5.00	A
LIHEAP Enhancement Charge		0.83	B
Distribution Energy Chg	0.03812 x 651 kWh	24.81	C & D
Energy Efficiency Prgrms	0.00906 x 651 kWh	5.90	E
Renewable Egy Dist Chg	0.00002 x 651 kWh	0.01	F
Transmission Charge	0.02036 x 651 kWh	13.26	G
Transition Charge	0.00162 x 651 kWh	1.05	H
<b>Total Delivery Services</b>		<b>\$ 50.86</b>	

**Supply Services**

SUPPLIER: National Grid

Energy Charge	0.06567 x 651 kWh	42.75	I
Renewable Energy Chg	0.00512 x 651 kWh	3.33	J
<b>Total Supply Services</b>		<b>\$ 46.08</b>	

**Other Charges/Adjustments**

Gross Earnings Tax	4.04
<b>Total Other Charges/Adjustments</b>	<b>\$ 4.04</b>

- Delivery Services Charges
  - Cost of delivering power to customers
  - Cost of programs mandated by law
- Supply Services Charges
  - Commodity provided by National Grid (Standard Offer Service) or competitive market supplier

# Cost Recovery Mechanisms

## □ Distribution Rates (Base Rates)

- Recover normally recurring operating and maintenance costs
- May recover extraordinary, non-recurring costs, amortized over reasonable time period, as approved by Regulatory Agency (*rate case expense*)
- Recover revenue requirement associated with rate base, including depreciation and return
- Fixed cost recovery between rate cases, so actual costs will vary from amount recovered

## □ Reconciling Mechanisms

- Recover costs subject to substantial fluctuation outside company control
- Recover costs of new public policy initiatives between rate cases; specific initiatives may remain outside of base rates
- Actual cost is typically recovered annually, on a 100% reconciling basis, trued-up each year
- Ensures customers are billed no more or no less than actual Company cost

# Tariffs

- Schedule of rates that detail the Company's charges for delivering electric and gas service to customers
- Also detail the Company's terms and conditions, rules, and procedures for delivering electric and gas service to customers
- May be revised, amended, supplemented or supplanted in whole or in part
- Governed by Commission Rule 1.9(c) and made pursuant to the General Laws of Rhode Island and the rules and regulations of the Commission and Division

# Tariff Advice - How Tariffs are Filed and/or Amended

- ❑ Procedures detailed in Commission Rule 1.9(c)
- ❑ Public utilities may file tariffs adding new services, providing for new rules, or otherwise adding to their tariff schedules without amending existing tariffs by tariff advice.
- ❑ Public utilities may also file minor changes to existing tariffs by tariff advice.
- ❑ Tariff advice must include letter from the utility listing all tariff pages changed or added by the tariff advice and stating briefly the reason for filing the tariff advice.

# When Tariffs are Effective

- ❑ No tariff advice can be effective unless thirty (30) days' notice is given to the public, the Division, the Attorney General, and any other known parties, by the utility.
- ❑ In the absence of an order approving or suspending the tariff advice, the tariff advice not suspended or approved goes into effect thirty (30) days after notice or on the proposed effective date, whichever is later.
- ❑ If a tariff advice is suspended, the Commission will open a formal proceeding and treat the tariff advice as an application.



# Electric Service Bill

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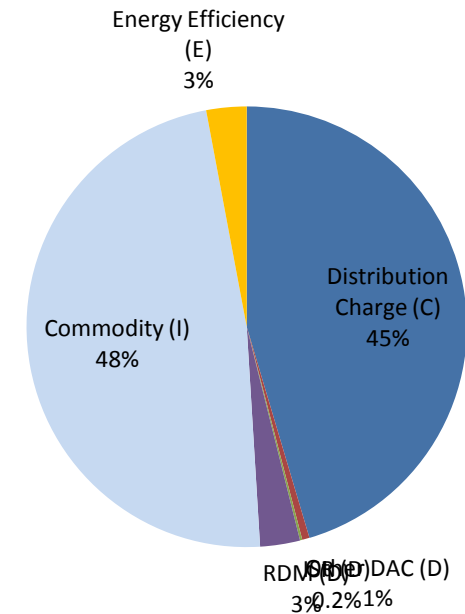
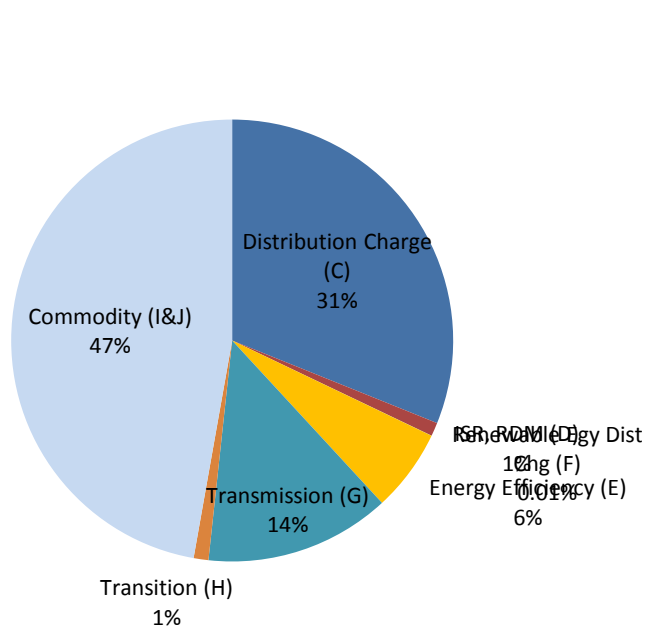
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# Service Bill by Component

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# Company's Usual Procedures Before The Commission

- Governed by Commission's rules of practice and procedure
- Company makes filing, which may/may not include pre-filed testimony
- Scheduling conference
- Discovery
- Company's discovery responses are usually sponsored by one or two people who are responsible for testifying about the responses, if necessary, at the hearing

# Evaluation, Measurement & Verification

- Evaluation most often looks retrospectively at previous year's programs in order to gauge:
  - + Measure Performance
  - + Program Influence
  - + Benefits
  - + Market behavior

# Evaluation Measurement and Verification

- EM&V serves as a critical foundation for all of the regulatory policies and utility activities related to efficiency programs.
  - To document and measure the effect of efficiency programs.
  - To identify whether there are ways to improve upon the programs.
- Three types of evaluations:
  - Impact evaluations.
  - Process evaluations.
  - Market effect evaluations.
- Sufficient funding for EM&V should be provided from the energy efficiency program budgets.
  - Rule of thumb: 3%-5% of program budgets.

# EM&V Principles

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- EM&V studies should be conducted by third-party contractors, that are financially independent of the utilities.
- EM&V studies should use protocols and best practices that have been developed nationally and internationally.
- EM&V studies should be an integral part of an overall planning-budgeting-implementation-evaluation process.
- EM&V activities should encourage state cooperation, to reduce costs and increase consistency.
- EM&V activities should allow for stakeholder input.

# Important Value of EM&V

- Evaluation adjusts the savings reported to regulatory bodies to reflect *accurate, actual energy savings* achieved *due to the influence of our programs*
- Evaluation also informs design of the coming year's programs and improved performance
- Evaluation provides information on incremental costs, market characterization, internal processes, market potential, viability of new technologies...
- Evaluation supports claim of shareholder incentive

# Overview of Terms:

## Realization Rate

- Ratio of the evaluated savings to savings claimed at year end for a statistically representative random sample of projects
- Developed for more than kWh savings- also for kW, therms, % On Peak, NEIs
- Expressed as a percent – could be over 100%, under 100%, or 100% on the button
- Used in InDemand to adjust savings for all applicable projects
- Determined based on engineering analysis and metering on past year's programs
- Captures mis-estimation of performance, errors in data entry, count variation, technology misapplication, improper operation, and unexplained factors**

$$RR = \frac{\text{Evaluated}}{\text{Estimated}}$$

$$RR = \frac{\text{As Found}}{\text{As Envisioned}}$$

$$RR = \frac{\text{Reality}}{\text{Dream}}$$



# Overview of Terms: Free-Ridership and Spillover

National Grid

- Free-Rider (FR): someone who was going to do the project independent of the incentive
- Spillover (SO, the “opposite” of a free-rider): Spillover represents customers were not given an incentive, but who installed more efficient equipment due to our influence
- These terms are referred to together as “Net-to-Gross” or NTG factors
  - +  $NTG = 1 - FR + SO$
- **These are important because our states give us credit only for what we influence**



Free-rider



Spillover

- Non Energy Impacts (aka NEIs) – Include tangible savings (water, oil, O&M reductions, etc) and less tangible benefits (increased comfort).
- Value (aka benefits) – Dollar value of avoided supply costs and non-resource impacts over the lifetime of the measure or program.
- Peak Energy – kWh savings occurring weekdays between 6am-10pm. Peak energy has a higher value (benefit) than off peak savings.
- Peak Demand – Demand savings occurring on summer weekdays between 1-5pm. Peak demand has a higher value (benefit) than off peak savings.

# Other impact factors

- Coincidence Factors – factor that adjusts connected kW savings to the peak demand savings
- Persistence – portion of annual savings expected to persist over lifetime of measures
- In Service Rate – portion of units that are actually installed
- Measure Life – average length of time measure is installed and operational
- Baselines – Technology specific efficiency level assumed for standard equipment; in many cases, we only take credit for savings above baseline

# Calculating Net Savings

- The most important impact factors for all programs are realization rates, free ridership, and spillover
  - + Some programs may actively use other impact factors, such as the In Service Rate
- **Demand and energy realization rates can be different and performance can vary during the day**
- **Net Energy Savings = Gross Savings \* Energy RR \* NTG**
- **Net Demand Savings = Gross Savings \* CF \* Demand RR \* NTG**

# Calculating Net Benefits

## Gross Savings

- Entered into tracking systems by field personnel

## Net Savings

- Calculated by applying impact factors to gross savings

## Benefits

- Calculated by applying avoided costs (\$/unit of savings) to net savings, summing, and present-valuing over life of measure

## Benefit/Cost Ratio

- $\text{Net benefits} / \text{Total Program Costs}$ , including customer contribution

# Application of New Evaluation Results

- Evaluation results are applied in the next program design cycle
  - + Evaluation results are applied prospectively in Rhode Island, so that goals and actual reported savings are on same basis
  - + Some states require retrospective application as well

# **APPENDIX: TYPES OF EVALUATION STUDIES**

# Impact Evaluation

- An evaluation of the savings (e.g. kWh, kW, and therms) and impact parameters (e.g. measure life, install rate) attributable to an energy efficiency program.
- Methods
  - + Site visits for inspection, measurement
  - + End-use metering-for consumption, hours of use
  - + Revised engineering estimates using above
  - + Statistical billing analysis to measure change in usage
  - + Phone surveys aimed at quantification of measure usage/performance and program attribution
  - + Secondary research (borrowing someone else's results)



# Overview of Impact Evaluation Process - C&I

- Select a program to evaluate based on when it was last evaluated, how much savings that program represents, how much the program has changed since last evaluation, available budget.
- Random representative sample of program projects is selected from the previous year
- Evaluator given project files and utility usage
- Evaluator does detailed analysis of projects using as much data as fits into the evaluation budget
- All project evaluation results are combined using weights based on project size
- After review by internal evaluation, finalize evaluation report (with buy-in from relevant parties) and file it in appropriate jurisdiction with our program plan
- Evaluation results are updated prospectively in tracking system
- Review study results and findings with execution and strategy to give feedback on what's working and inform future program design

## Evaluation overview:

- Select a program
- Draw a sample
- Get project files
- Do field work
- Run calculations
- Draft report
- NGrid review
- Final report
- Update NG impacts
- Refine program(s)

# Notes on Sampling and Weighting nationalgrid

- Sampling is done to ensure unbiased results that represent our savings claims on the whole range of projects
- Total population of projects are split into strata
  - + The total savings in each strata is approximately the same
  - + Strata 1 has a large number of small projects, the highest strata has a small (maybe even 1) number of big projects
- Sampling is done from each strata
  - + There is a higher probability of a large project being chosen for evaluation, since there are fewer projects in the larger strata
- Weighting is determined and applied by strata
- Weighting factors are used to ensure the results from a small project have as large an impact on final results as results from a big project
  - + Remember, we have many more small projects than we do large, so our final RR needs to reflect both!

- An assessment of an energy efficiency program that documents program operations and recommends improvements to increase the program's efficiency or effectiveness for acquiring energy resources, while maintaining high levels of participant satisfaction.
- Methods
  - + In-depth interviews with program staff and program actors
  - + Phone surveys with customers, market actors, etc.



# Market Evaluation

- An analysis that generally includes:
  - + a characterization of the specific market or market segments, including a description of the types and number of buyers and sellers in the market;
  - + the key actors that influence the market, the type and number of transactions that occur on an annual basis
  - + and the extent to which market participants consider energy efficiency as an important part of these transactions.
- Types of Market Assessment Studies:
  - + Market Transformation
  - + Baseline Studies
  - + Market Characterization/Potential

# QUESTIONS?