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Overview of RI Test

Rhode Island Public Utilities Commission

Technical Session

RIPUC Docket No. 4684

September 13, 2017

Agenda

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PART 1. Introduction to RI Test

- Revisions to Standards
- Overview of RI Test
- Components of TRC and RI Test

Part 2. Impact of RI Test on Three-Year Plan B/C Ratio

Part 3. Overview of New Benefits

- Value of greenhouse gas reductions not embedded in current avoided costs
- Economic development impacts

Part 4. Future impacts of Docket 4600 on RI Test

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Part 1. Introduction to RI Test

Revisions to Standards

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- Approved EE Standards create a new cost-benefit test, the RI Test
  - Rationale was to create a test that "more fully reflects the policy objectives of the state with regard to energy, its costs, benefits, and environmental and societal impacts."
  - "The distribution company shall, after consultation with the Council, propose the specific benefits and costs to be reported, and factors to be included, in the Rhode Island Benefit Cost Test (RI Test) and include them in Energy Efficiency Plans."
- For 3-year plan and 2018 Plan - taking incremental steps to include additional benefits detailed in RI Test:
  - Value of greenhouse gas reductions not embedded in current avoided costs.
  - Economic development impacts.

Overview of RI Test

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- What the RI Test does
  - Provides a more holistic view of EE by accounting for additional benefits and costs.
  - The two new benefits create an upward swing on B/C ratios.
- What the RI Test does not impact
  - EE measures must still be proven in marketplace, measurable, and have evaluated savings.
  - LCP statute requires plans to be both cost-effective and less than supply.
  - Budgets and customer bill impacts still need to be prudent.

Components of TRC and RI Test

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	TRC Test	RI Test
Energy Efficiency Program Benefits		
Avoided Energy Costs	Yes	Yes
Avoided Capacity Costs	Yes	Yes
Avoided Transmission and Distribution Costs	Yes	Yes
Avoided Natural Gas Costs	Yes	Yes
Avoided Delivered Fuel Costs	Yes	Yes
Demand-Reduction-Induced Price Effect (DRIPE)	Yes	Yes
Water and Sewer Benefits	Yes	Yes
Non-Energy Impacts	Yes	Yes
Avoided cost of Environmental Compliance	Yes	Yes
Non-embedded Greenhouse Gas Reduction Benefits	No	Yes
Economic Development Benefits	Only for CHP	Yes
Other emissions generated or reduced through LCP	CHP - Yes EE – Not specified (compliance costs embedded)	Yes*
Energy Efficiency Program Costs		
Utility Costs (Marketing, PP&A, STAT, Incentive, Evaluation, Shareholder Incentive)	Yes	Yes
Customer Cost	Yes	Yes

*Non-embedded health impacts from other emissions reduced or generated through LCP are not included as benefits in Three-Year Plan except for CHP. Further analysis is needed.

How Does the RI Test Determine Cost Effectiveness?

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- Same as the TRC Test
- RI Test is applied by dividing the total lifetime **benefits** of a program by the total **costs** of the program, to create a Benefit Cost Ratio (BCR):

$$BCR = \frac{\text{Total benefits (\$)}}{\text{Total costs (\$)}}$$

If the BCR is	it is considered	because
≥ 1.0	cost effective	benefits exceed costs
< 1.0	not cost effective	costs exceed benefits

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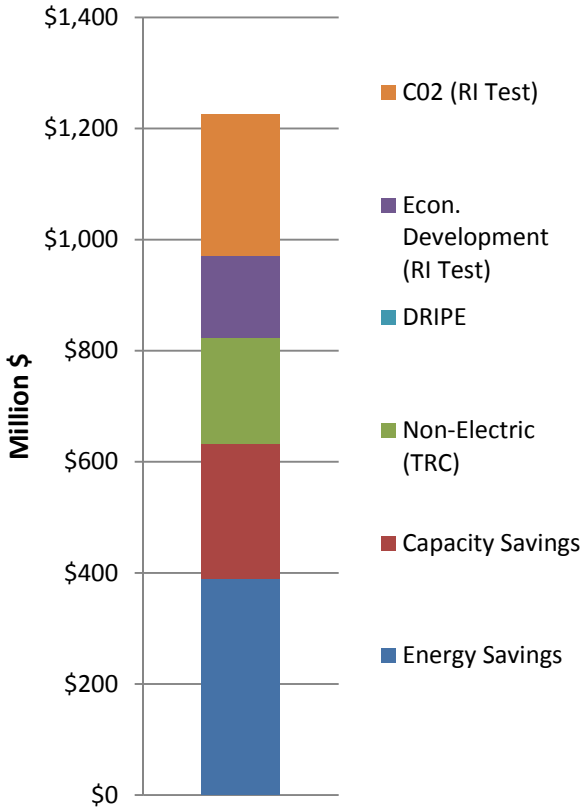
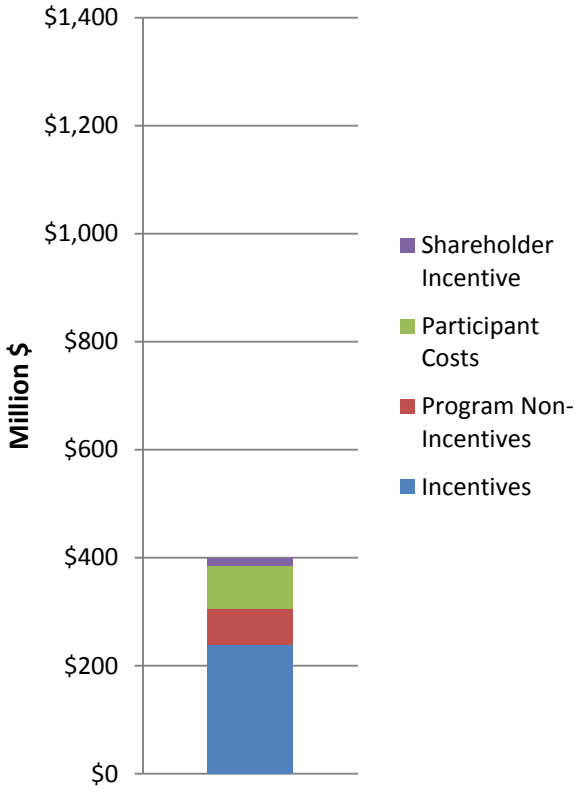
Part 2. Impact of RI Test on Three-Year Plan B/C Ratio

RI Test 3-YP Electric Benefits and Costs

Cumulative Benefits from Electric Programs (2018-2020)

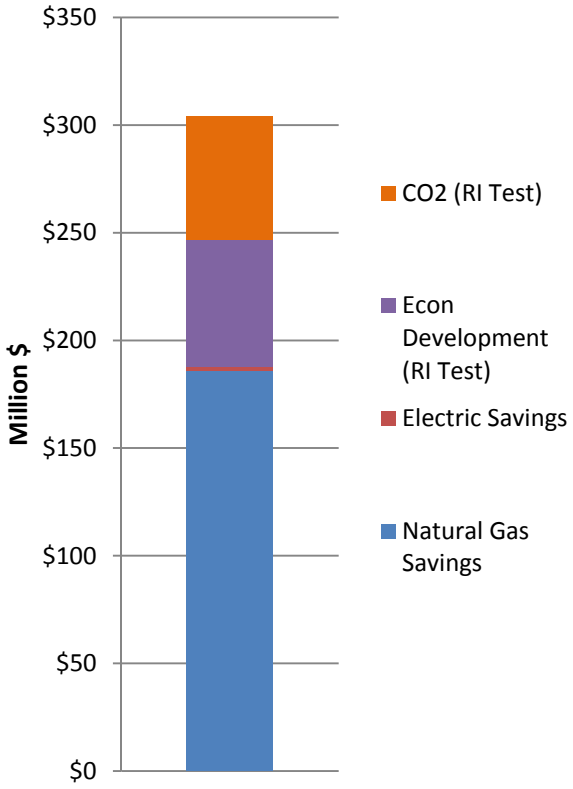


Cumulative Costs from Electric Programs (2018-2020)

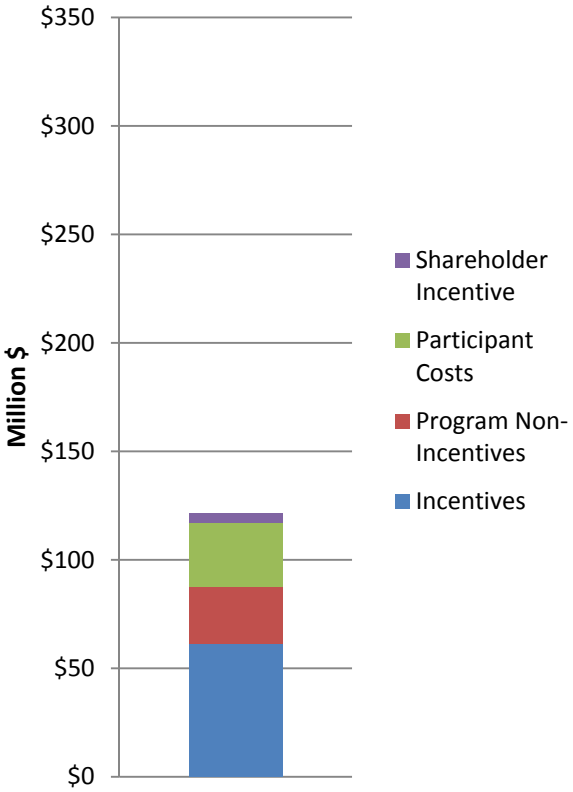


RI Test 3-YP Gas Benefits and Costs

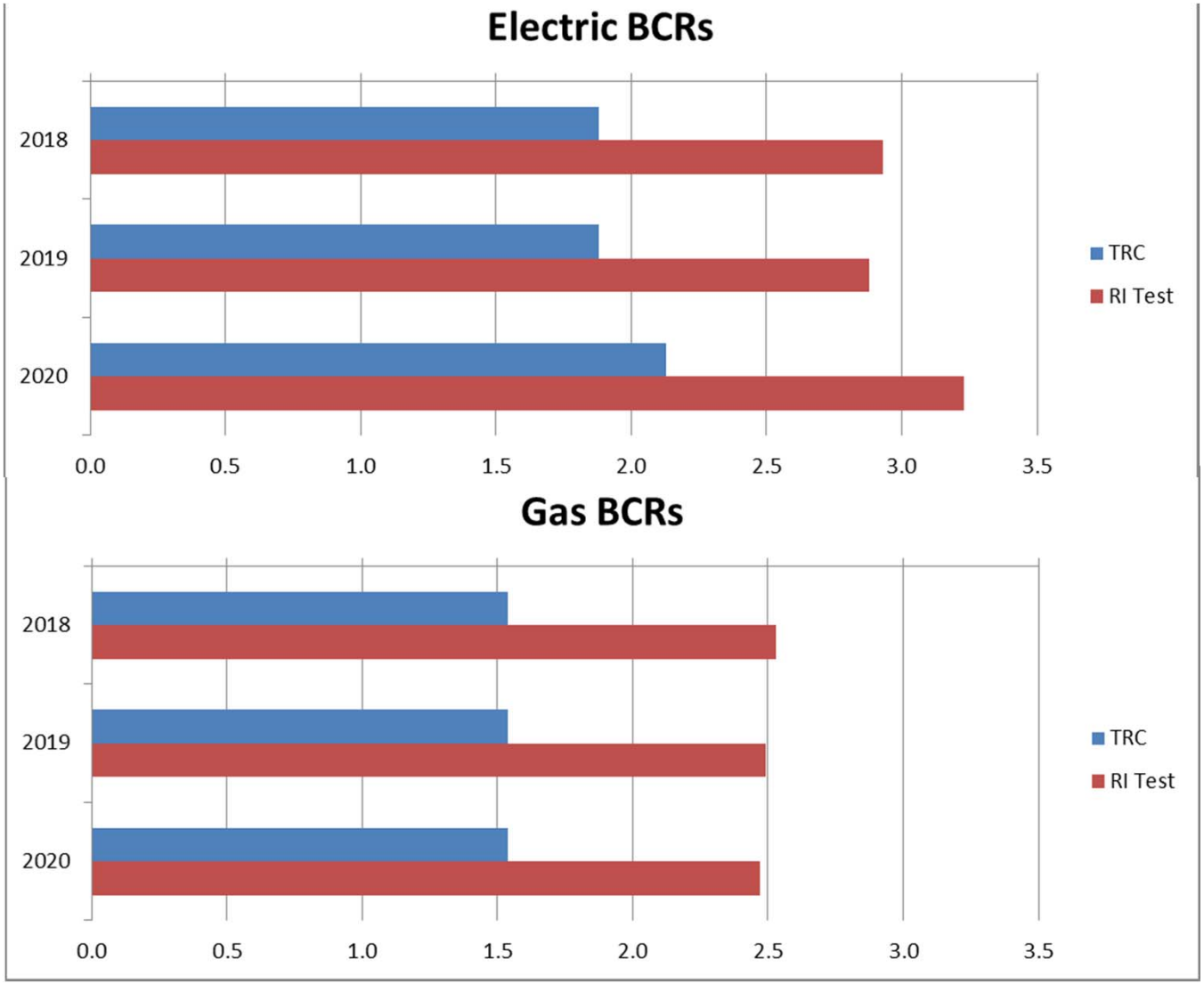
Cumulative Benefits from Gas Programs (2018-2020)



Cumulative Costs from Gas Programs (2018-2020)



Comparison of TRC and RI Test 3-YP Benefit-Cost Ratios



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Part 3. Overview of New Benefits

Proposed Non-Embedded Carbon Costs

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- Current TRC Test includes cost of carbon mitigation from RGGI and reasonably anticipated future federal regulations.
- 2015 AESC Report also includes a value of $100/ton.
- Proposal is to use $100/ton net of embedded costs.

Exhibit 4-7. AESC 2015 Non-Embedded CO_2 Costs (2015 dollars per short ton CO_2)

	Marginal Abatement Cost	Allowance Price	Externality
	a	b	c = a - b
2015	$100	$6.28	$93.72
2016	$100	$7.26	$92.74
2017	$100	$7.87	$92.13
2018	$100	$8.47	$91.53
2019	$100	$9.32	$90.68
2020	$100	$10.16	$89.84
2021	$100	$12.54	$87.46
2022	$100	$14.92	$85.08
2023	$100	$17.30	$82.70
2024	$100	$19.67	$80.33
2025	$100	$22.05	$77.95
2026	$100	$24.43	$75.57
2027	$100	$26.80	$73.20
2028	$100	$29.18	$70.82
2029	$100	$31.56	$68.44
2030	$100	$33.94	$66.06

AESC Report Methodology

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- Two ways to calculate non-embedded carbon costs:
  - Damage cost: assigning a value to damages associated with a particular pollutant (social cost of carbon).
  - Control cost: quantifying the marginal cost of controlling a particular pollutant.
- AESC Report estimates non-embedded carbon by determining the last (or most expensive) unit of emissions reduction required to reach needed emissions reductions.
  - It calculated marginal cost of stabilizing CO_2 emissions at 80% below 1990 levels by 2050 will be $100 per short ton.
  - It concludes this is a practical and reasonable measure of the total societal cost of carbon dioxide emissions.
  - Benefit of EE is avoiding that highest cost abatement strategy.

Rationale for AESC Carbon Values

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- AESC Report was vetted by New England program administrators and is based on sound methods.
- $100 per ton reflects state policy goals.
  - Value supports RI policy commitment to carbon reductions with GHG reduction goals of 80% below 1990 levels by 2050.
  - RI as a coastal state is likely to experience higher damage from climate change.
- Future refinement and vetting as part of 2018 AESC Report.

Economic Development Impacts

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- EE programs impact the local economy in three ways.
  1. Program and participant spending represents a direct investment in RI EE infrastructure, creating jobs ("construction impacts").
  2. Bill savings to participants have positive economic impacts over the life of the EE measures resulting in more spend on goods and services.
  3. Rate increases and customer contributions create short-term cost and reduce spend on goods and services.
- 2014 REMI analysis conducted by National Grid found that, as a whole, these impacts for EE Plan resulted in a multiplier of 4.2 increase in state GDP per $ of program spend.

Applying Economic Benefits to the B/C Test

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- How do we ensure there is no double counting of benefits?
  - Bill savings to customers are likely already accounted for in B/C Test – we count value of all energy savings as a $ benefit.
  - Customer costs are also reflected in screening as negative benefit.
  - That leaves construction impacts – program spend.
    - We know that increased spending from installing EE measures creates jobs and this benefit is not accounted for currently in the B/C test.
    - Construction impacts are the most common economic impacts traditionally accounted for in economic studies.
    - The REMI model takes into account impacts likely to occur in RI vs out of state.

EE Economic Multiplier

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GDP Multipliers for Construction Impacts		GDP/$ Spending	
		Electric	Natural Gas
Residential	Program Spending	0.71	0.71
	Participant Spending	0.75	0.75
Commercial	Program Spending	0.56	0.56
	Participant Spending	0.58	0.58

- Future refinement planned for 2019 Annual Plan.
  - In 2018, Company will commission third-party study to refine multiplier.

CHP Economic Multiplier Update

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- Legislation previously required that economic benefits be included in B/C screen for CHP.
- Company was applying a 2.73 economic multiplier from 2014 REMI study in TRC Test.
- For consistency with EE, Company will now apply the "Construction Impacts" component for CHP (0.8 multiplier).

CHP PROJECT ECONOMIC MULTIPLIERS							
CHP Project Data		Job Years/$m	Job Years	GDP/$	GDP	Income/$	Income
Construction Spending	$3,761,172	12.4	47	0.8	$3,034,363	0.6	$2,244,149
Total Savings	$12,042,883	14.1	170	1.5	$17,568,939	1.1	$12,703,018
Total Cost	$6,268,620	-6.6	-41	-0.5	-$3,506,352	-0.3	-$2,126,284
		Total	175	Total	$17,096,950	Total	$12,820,883
TOTAL SPENDING MULTIPLIERS							
		Jobs/$m	Job Years	GDP/$	GDP	Income/$	Income
Total Spending	$6,268,620	28.0	175	2.73	$17,096,950	2.0	$12,820,883