ACADIAN CONSULTING GROUP

Analysis of Vermont Gas Systems' Docket 8698 Alternative Regulation Plan

Prepared on the behalf of AARP-VT
November 15, 2016

David E. Dismukes, Ph.D.
Acadian Consulting Group

EXECUTIVE SUMMARY

- VGS' Alternative Regulation Plan ("ARP") contains an abnormally low productivity offset that prejudices ratepayers and reduces the Company's incentive to seek efficiencies.
  - VGS' current plan's productivity offset of 0.39% is less than half the established offsets used in other recent North American rate plans for gas and electric utilities.
  - VGS proposes to reduce this offset even further to 0.20%.
  - The Board itself noted in 2012 that VGS' prior productivity offset was low, and ordered the Company to provide reasons to demonstrate that the productivity offset should not be increased to 1.00 percent; a level considered by the Board as its historic practice.

EXECUTIVE SUMMARY

- VGS' ARP contains other elements that reduces the Company's incentive to seek efficiencies and create ratepayer benefits.
  - VGS' plan contains three separate exogenous adjustments, who expenses are not subject to revenue caps. VGS has used its "exclusion" provision to recover demand-side management ("DSM") and Integrity Management Plan ("IMP") expenses.
  - DSM for the Company has consistently been between $1 and $2 million, creating questions as to "exclusion" need. Likewise, VGS has no priority or leak-prone infrastructure, also creating questions as to "exclusion" need. These exclusions are not needed and should not be part of the ARP.
- VGS and its shareholders have benefitted from the ARP while ratepayers have seen higher than regional average rate incrasese.
  - VGS' limited performance within the ARP's deadband, and the significant variance in year-to-year earnings indicates that the ARP's earnings deadband of 75 basis points is too narrow.

TABLE OF CONTENTS

1. Alternative Regulation Theory
2. Detail Review of ARP Variables
3. Earnings Sharing Adjustment
4. Other ARP Modifications
5. Conclusions

1. Alternative Regulation Theory

Performance Based Regulation – Revenue Caps (Review)

Revenue Caps

- Cap restricts the rate of growth in average revenues; accounting for inflation, growth in productivity and output, and various exogenous factors.
- Basic, overly-simplified form: $\frac{\sum_i p_i q_i}{Q} \leq p^0$

  Where p_i is the price of service i, q_i is the quantity demanded at price p_i, Q is an aggregate index of outputs, and p^0 is the maximum average price.

- Revenue Caps have been utilized to limited degree in California and outside of the United States. Not as widespread as price caps.

Performance Based Regulation – Revenue Caps

Revenue Caps in Practice

- In practice, revenue caps are not as simple to implement as shown by the simplistic equation presented in pervious slides.

- A more accurate presentation:

$$\overline{R}_t = (\overline{R}_{t-1} + CGA \times \Delta Cust) \times (1 + I - X) \pm Z$$

Where:

$\overline{R}_t$ = authorized utility revenues for time t

CGA = customer growth adjustment factor ($/customer)

$\Delta Cust$ = Annual change in the number of customers

I = Annual percent change in prices (change in inflation index)

X = Productivity offset

Z = Adjustments for unforeseen events beyond management's control

Performance Based Regulation – Price Caps (Review)

Price Caps

- Designed to limit the ability of utilities to earn more than normal profit, while incentivizing the utility to attempt to reduce input costs and invest in productivity improvements.

- Price Caps typically take the following form (expanded from earlier equations):

$$\overline{P}_{m,t} = \overline{P}_{m,t-1} \times (1 + I - X) \pm Z$$

Where:
$\overline{P}_{m,t}$ = Utility price for market basket m in time t
I = Annual percent change in prices (Inflation index)
X = An index of expected efficiency gains (Productivity offset)
Z = Adjustments for unforeseen events beyond management's control

Performance Based Regulation – Revenue and Price Cap Formula

Revenue Cap

$$\overline{R}_t = (\overline{R}_{t-1} + CGA * \Delta Cust) * (1 + I - X) \pm Z$$

Price Cap

$$\overline{P}_{m,t} = \overline{P}_{m,t-1} * (1 + I - X) \pm Z$$

Where:

I = Annual percent change in prices (Inflation index)

X = An index of expected efficiency gains (Productivity offset)

Z = Adjustments for unforeseen events beyond management's control

Vermont Gas Systems Revenue Cap Formula

Hypothetical Revenue Cap

$$\overline{R}_t = (\overline{R}_{t-1} + CGA * \Delta Cust) * (1 + I - X) \pm Z$$

VGS' Revenue Cap

$$\overline{R}_t = (OC_{t-1} * Cust_t) * (1 + I - X) + NonOperating\ Costs + Exogenous\ Factors + Exclusions$$

Where:

OC_{t-1} = Operating Costs for rate year t-1

$Cust$ = Projected customers for rate year t

I = Annual percent change in prices (Inflation index)

X = An index of expected efficiency gains (Productivity offset)

Alternative Regulation Theory

Differences between Hypothetical Revenue Cap and VGS' Revenue Cap

VGS' Revenue Cap contains many of the same features as a standard revenue cap. However, it importantly contains two differences from what is traditionally seen in revenue cap regulation.

Focus on Operation Costs:
VGS' Revenue Cap does not apply to all Company costs as envisioned by revenue cap regulation theory. Instead, VGS' Revenue Cap is only applied to "Operating Costs," while "Non-Operating Costs" are not subject to the cap. Non-Operating Costs are defined as gas costs, depreciation, amortization, property taxes, income taxes, other taxes, return on rate base, interest expenses, and other income.

Per-Customer Revenue Cap:
In theory a revenue cap contains an adjustment to the revenue cap to account for growth in customer base. VGS' Revenue Cap is calculated on a per-customer basis, and thus does not need to be adjusted for customer growth, and furthermore insulates the Company financially from changes in customer counts.

In the end, VGS' Revenue Cap follows the same basic formula key to all revenue cap regulation:

$$\overline{R}_t = \overline{R}_{t-1} * (1 + I - X) \pm Z$$

2. Detail Review of ARP Variables

I Factor: Inflation

Inflation Factor:

The inflation factor in VGS' Revenue Cap formula is based on the historic rate of inflation for New England for the 12 months ending before VGS's annual rate filings. Inflation will be calculated using Consumer Price Inflation ("CPI") data for the Northeast published by the US Department of Labor – Bureau of Labor Statistics.

VGS' proposed inflation factor remains unchanged from that utilized in prior alternative regulation plans, and is a fairly conventional measure of inflationary forces present in New England.

X Factor: Productivity Offset

Productivity Offset:

In VGS' previous ARP, the X-Factor or annual productivity offset was set at 0.39 percent. This rate was initially set in 2006 with the adoption of VGS' initial alternative regulation plant. In the current proposal, VGS proposes this factor be reduced to 0.2 percent.

VGS Claims:

As noted by the Company, the X-Factor is intended to create an incentive to increase productivity by capping the escalation of operating expenses at a level below inflation. VGS claims that the magnitude of the X-Factor depends on the inflation rate attached to the rate. The five year average inflation level preceding the establishment of alternative regulation had an average annual inflation rate of 3.12 percent, however, the current five year average of annual inflation is now 1.52 percent. VGS claims that lowering the ARP productivity offset from 0.39 to 0.2 percent will maintain an identical 12.5 percent reduction to annual inflation present with the ARP was originally adopted.

Fallacy of VGS' Proposed Productivity Offset Change

The Productivity Offset, or "X-Factor," is perhaps the most important factor in alternative regulation. In general, the X-Factor represents productivity growth regulators expect a utility to achieve through alternative regulation.

No where is the concept of an X-Factor dependent on the rate of general inflation seen in the economy. In other words, a utility's ability to increase its cost efficiencies and productivity should not increase as inflation increases, nor decrease as inflation decreases. VGS' proposed rationale is simply not supported by regulatory theory, or common sense for that matter.

Other North American Productivity Offsets

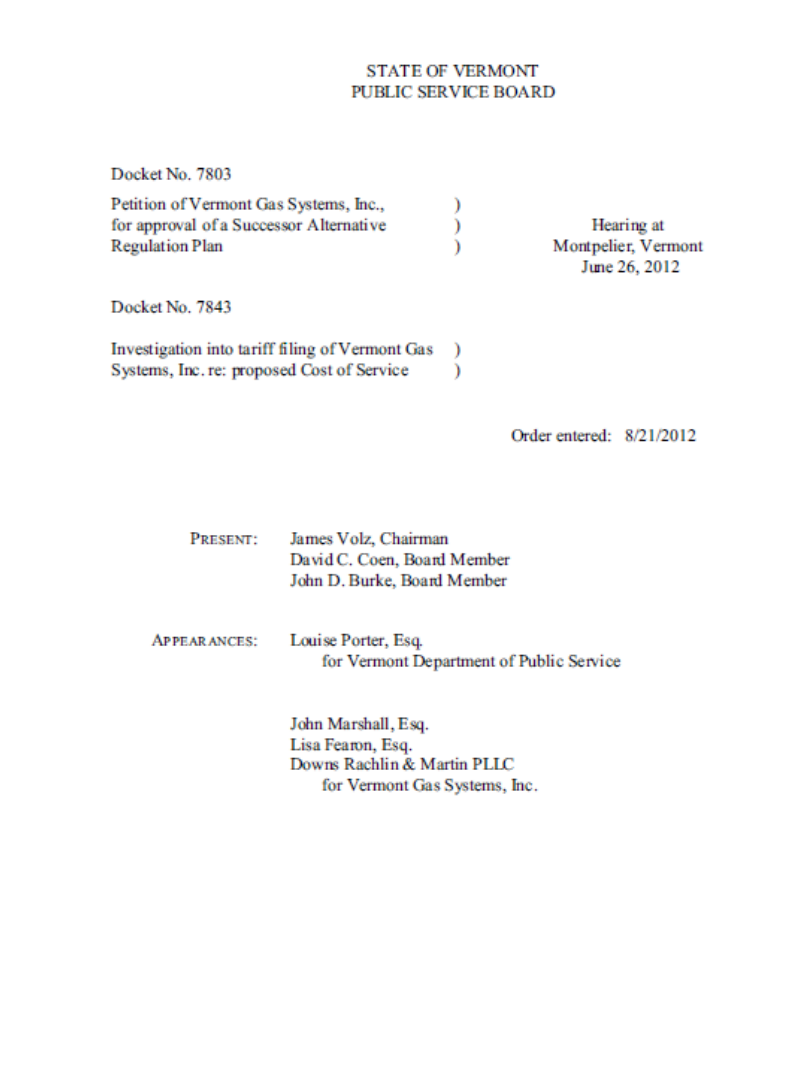
The Productivity Offset, or "X-Factor," is perhaps the most important factor in alternative regulation. In general, the X-Factor represents productivity growth regulators expect a utility to achieve through alternative regulation.

Utility	State / Provence	Productivity Offset	Stretch Factor	Combined Productivity Offset
Vermont Gas System ("VGS") Historical	VT	0.39%	None	0.39%
Green Mountain Power ("GMP")	VT	1.00%	None	1.00%
PacifiCorp	CA	0.50%	None	0.50%
Central Maine Power ("CMP")	ME	1.00%	None	1.00%
Enmax	Alberta	0.80%	0.40%	1.20%
All Other Alberta Electric and Gas Utilities	Alberta	0.96%	0.20%	1.16%
All Ontario Electric Distribution Utilities	Ontario	0.00%	Variable: 0.00% - 0.60%	0.30%
			Average Non-Vermont Productivity Offsets:	0.83%

VGS' current ARP all ready possess a productivity offset lower than nearly any other recent North American utility, with the average rate adopted being slightly more than 0.80 percent. This is a full four times higher than the 0.2 percent proposed by VGS.

Note: CMP and Enmax's mechanisms both expired in 2013. For purposes of averaging, Ontario's combined productivity offset is valued at the median performance metric for stretch factors.

Public Service Board Final Order in Docket No. 7803



STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7803

Petition of Vermont Gas Systems, Inc.,)
for approval of a Successor Alternative)
Regulation Plan)

Hearing at
Montpelier, Vermont
June 26, 2012

Docket No. 7843

Investigation into tariff filing of Vermont Gas)
Systems, Inc. re: proposed Cost of Service)

Order entered: 8/21/2012

PRESENT: James Volz, Chairman
David C. Coen, Board Member
John D. Burke, Board Member

APPEARANCES: Louise Porter, Esq.
for Vermont Department of Public Service

John Marshall, Esq.
Lisa Fearon, Esq.
Downs Rachlin & Martin PLLC
for Vermont Gas Systems, Inc.

In its last Order concerning VGS' ARP, the Board noted the extremely low productivity offset included within VGS' ARP. The Board required VGS to demonstrate why its productivity offset should not be changed to 1.0 percent if the utility ever sought to renew alternative regulation.

"For purposes of the initial 3-year term of the Successor Plan, we will permit the Company to use 0.39% as its productivity "X" factor because it is a term of the parties' settlement. However, should VGS seek to renew the Successor Plan at the end of the initial term, we hereby put the Company on notice that we will require a showing at that time as to why the "X" factor should not be changed to 1.0%, which would be in line with other alternative regulation plans now in effect in this jurisdiction."

-Final Order, Docket No. 7803/7843 (August 12, 2012) , p. 16.

Z Factor: Exogenous Adjustments

Exogenous Adjustments:

VGS' ARP contains three separate exogenous adjustments or "Z Factors."

Non-Operating Costs:
Unlike most alternative regulation plans, VGS' ARP applies to only operating costs, with non-operating costs being recovered on a one-to-one basis. Non-Operating Costs are defined as depreciation, amortization, property taxes, income taxes, other taxes, and interest expenses. Additionally, Non-Operating Costs includes allow return on rate base and other income.

Exogenous Factors:
Exogenous Factors are defined as expenses in excess of $50,000 that are outside of VGS' control. VGS has never sought recovery of any expenses through this provision.

Exclusions:
Exclusions are specific expenses that are removed from the ARP to prevent creating incentives to avoid otherwise desirable expenses. Additionally, the Earnings Sharing Adjustment ("ESA") and System Expansion and Reliability Fund (SERF") are considered exclusions.

Alternative Regulation Plan Exclusions

VGS' ARP is unclear as to what may or may not be considered an "exclusion." However, historically this provision has been used to recover costs associated with the Company's energy efficiency offerings (i.e. Demand-Side Management) and Integrity Management Plan, in addition to the ESA and SERF.

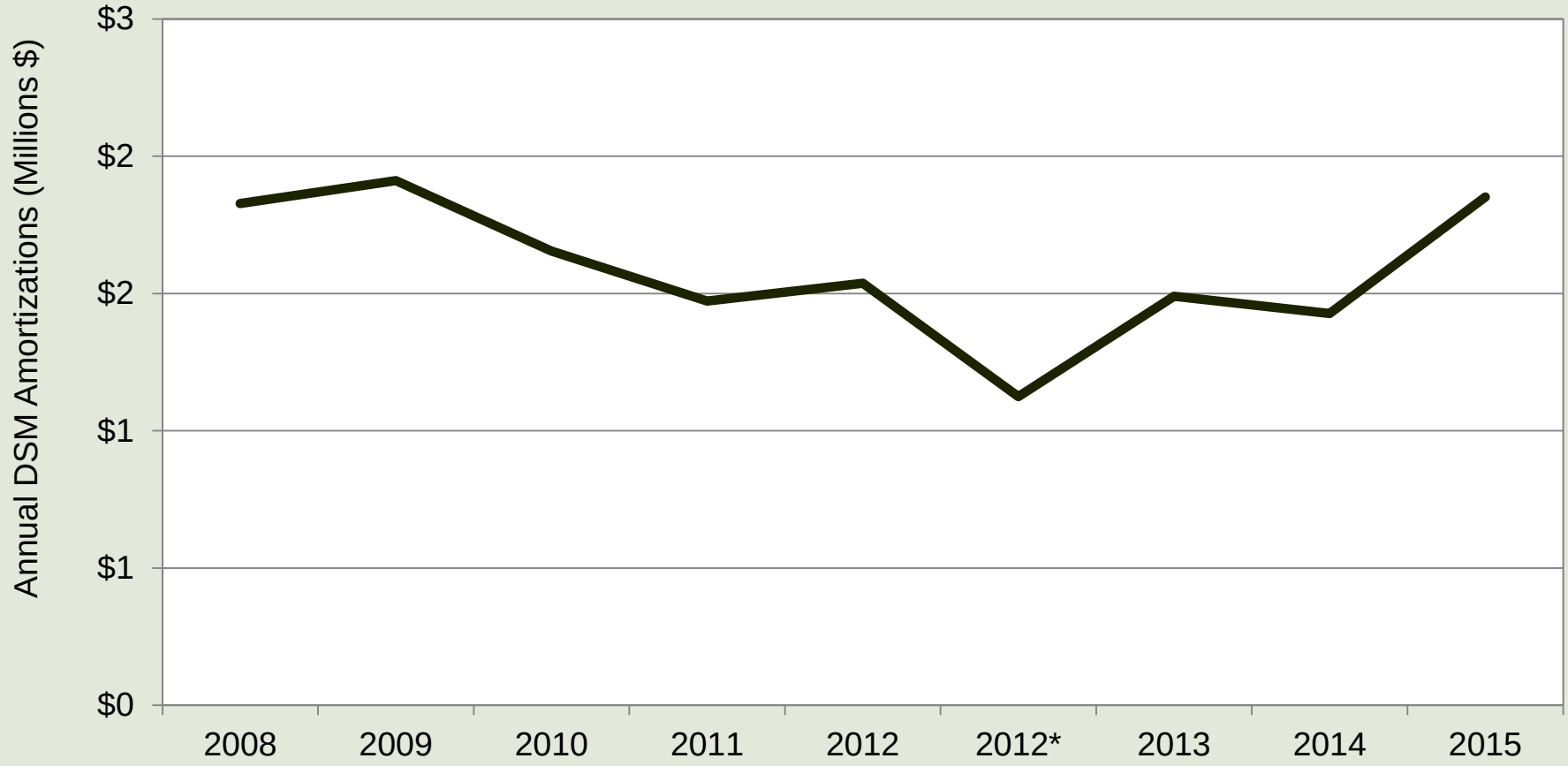
	2008	2009	2010	2011	2012	2012*	2013	2014	2015
Demand-Side Management Amortization	$1,828,007	$1,911,630	$1,654,995	$1,471,966	$1,537,711	$1,124,755	$1,489,989	$1,427,177	$1,851,048
Integrity Management Plan	$200,000	$250,000	$275,000	$350,000	$440,000	$440,000	$340,000	$838,000	$610,447
System Expansion and Reliability Fund						$4,402,100	$4,548,054	$4,744,536	$4,981,819
Earnings Sharing Adjustment	$192,817		-$13,953		-$620,230	-$155,058	$973,774	-$2,395,437	-$2,086,758
Total	**$2,220,824**	**$2,161,630**	**$1,916,042**	**$1,821,966**	**$1,357,481**	**$5,811,797**	**$7,351,817**	**$4,614,276**	**$5,356,556**

Note: In 2012 VGS changed the effective date of annual rate changes from January 1st to November 1st.

Source: Docket No. 8698, Company's response to AARP 2-012, Attachment "d."

Historic Demand-Side Management Amortizations

VGS has consistently had between $1 and $2 million of annual amortized expenses associated with DSM activities. As part of its current filing, VGS proposes to eliminate the existing policy of amortizing DSM expenses over three years. As VGS has had consistent expenses historically, this should only affect ratepayers marginally.



Source: Docket No. 8698, Company's response to AARP 2-012, Attachment "d."

Priority Main Shares: VGS v. New England Utilities

VGS has no priority or leak-prone infrastructure (cast iron, bare steel) raising significant questions about the need to exclude its integrity management program.

		2011	2012	2013	2014	2015
Vermont	**Vermont Gas Systems**	**0%**	**0%**	**0%**	**0%**	**0%**
Massachusetts	Berkshire Gas Company	20%	19%	18%	16%	15%
Massachusetts	Boston Gas D/B/A National Grid	51%	50%	48%	47%	46%
Connecticut	Connecticut Natural Gas	20%	19%	18%	18%	17%
New Hampshire	EnergyNorth Natural Gas D/B/A Liberty Utilities	11%	11%	10%	10%	9%
Massachusetts	Fitchburg Gas & Electric D/B/A Unitil	27%	26%	29%	25%	24%
Massachusetts	Liberty Utilities	41%	40%	38%	36%	35%
New Hampshire	Northern Utilities D/B/A Unitil	14%	13%	12%	11%	11%
Maine	Northern Utilities D/B/A Unitil	8%	6%	5%	3%	2%
Massachusetts	Nstar Gas	37%	36%	35%	34%	33%
Connecticut	Southern Connecticut Gas	34%	34%	33%	32%	31%
Connecticut	Yankee Gas	17%	16%	15%	14%	13%

Source: Department of Transportation. Pipeline and Hazardous Materials Safety Administration. Office of Pipeline Safety.

3. Earnings Sharing Adjustment

Alternative Regulation – Revenue Sharing and ROE Deadbands

Revenue Sharing and ROE Deadbands

- Alternative regulation by definition give opportunities for regulated utilities to earn greater than normal profits.
    - This is a good thing, as it gives regulated utilities an incentive to pursue effective cost controls as a means of creating higher profits.
    - As the old saying goes, too much of a good thing can be bad.
- As a consumer protection mechanism against utilities earning windfall profits, most alternative regulation plans include a revenue or profit sharing mechanism.
- Another approach which additionally protects against prolonged utility under-earning are ROE deadbands.

Earnings Sharing Adjustment

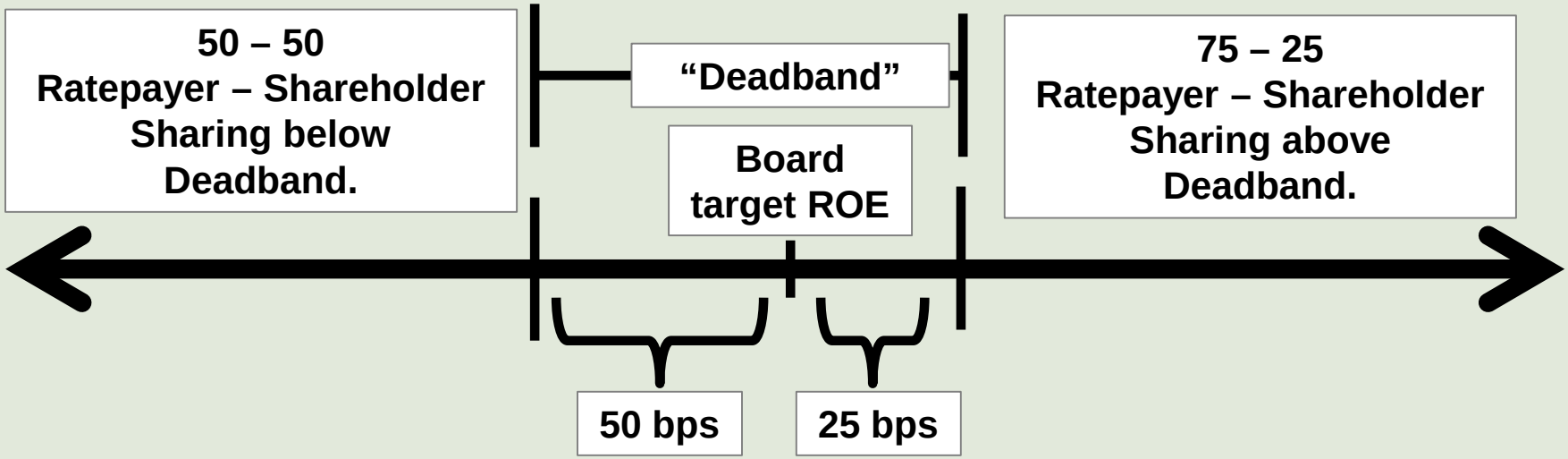
Dead Bands (Formula-Rate Plans) and Revenue Sharing

Company	State	Alternative Regulation Mechanism Description
Georgia Power	GA	GP is not permitted to file a general rate case during the pendency of the ARP unless earnings are projected to fall below a 10.25% ROE. Two-thirds of any earnings above a 12.25% ROE are to be refunded to customers, with the remaining one-third retained by GP. There is no automatic recovery by GP of any earnings shortfall below a 10.25% ROE.
Washington Gas Light	VA	In 2007, the SCC adopted an ARP for Washington Gas under which base rates will be frozen through September 30, 2011, with earnings above a 10.5% ROE to be allocated 25% to shareholders and 75% to ratepayers.
Hawaiian Electric Company	HI	Under the ESM, HECO is to allocate earnings such that: incremental earnings during the evaluation period that exceed the company's authorized ROE (as approved by the PUC in the most recent rate case) by up to 100 basis points are to be allocated 75% to shareholders and 25% to ratepayers; incremental earnings between 100 and 300 basis points above the authorized ROE are to be allocated evenly between ratepayers and shareholders; and, incremental earnings in excess of 300 basis points above the authorized ROE are to be allocated 90%/10% to ratepayers and shareholders, respectively. No rate adjustments are to be made if HECO earns below its authorized ROE.
Connecticut Power & Light	CT	Since 2003, Connecticut Power & Light (CL&P) has operated under an ESM, whereby earnings in excess of a benchmark return on equity (ROE) are shared equally with ratepayers. The disposition of any shared earnings is to be determined by the Department. The current benchmark ROE is 9.4%.
NSTAR	MA	The plan includes an earnings sharing mechanism (ESM) for electric distribution service that provides for earnings outside of an 8.5%-to-12.5% return on equity (ROE) range to be shared equally with ratepayers.
CenterPoint Energy Resources	OK	As modified in 2009, the PBR plan includes a 100 basis point deadband around a 10.5% return on equity (ROE), i.e., no rate changes are to be implemented if the company's actual ROE in a given year falls between 10% and 11%. If the earned return were to fall below 10%, CenterPoint would be permitted to increase rates to have an opportunity to achieve a 10.5% ROE prospectively. There is no "make-up" provision for years in which earnings fall short. All incremental earnings above an 11% ROE are to be allocated 75% to ratepayers and 25% to shareholders.
Cleco Power	LA	The FRP incorporates a 10.7% ROE benchmark, and provides for: Cleco to retain incremental earnings up to an 11.3% ROE; incremental earnings between an 11.3% and 12.3% ROE to be allocated 40%/60% to shareholders and ratepayers, respectively; and, 100% of incremental earnings in excess of 12.3% to be refunded to ratepayers.
Alabama Power Company	AL	If Alabama Power's projected ROE is outside the allowed ROE range of 13% to 14.5%, rates are to be adjusted, subject to the above limits on rate increases, to establish a 13.75% ROE. If the actual earned ROE was above 14.5%, Alabama Power is to refund to customers the revenues that caused the earned ROE to exceed 14.5%. However, there is no provision for recovering prior-year shortfalls if the earned ROE was below 13%.

Source: Innovative Regulation: A Survey of Remedies for Regulatory Lag, Prepared by Pacific Economics Group Research LLC and Prepared for Edison Electric Institute, April 2011; and Alternative Regulation, Missouri Public Service Commission, EFIS: https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=935593339.

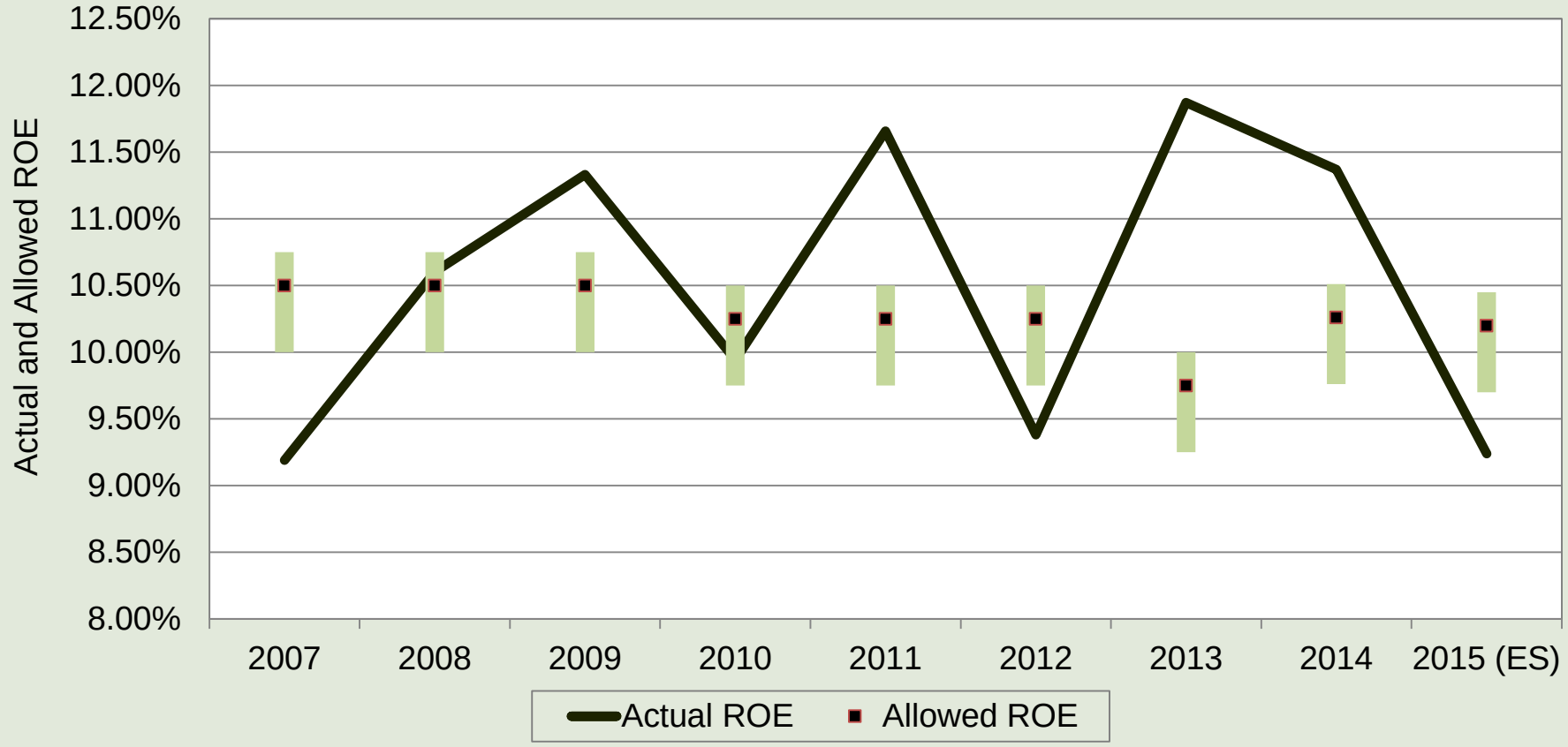
VGS ARP Earnings Sharing Adjustment

VGS' Earning Sharing Adjustment ("ESA") is an asymmetric mechanism that allows for a 50 – 50 sharing of utility loses below a 50 basis point ("bps" or 0.50 percent) "deadband," and a 75 – 25 sharing of utility profits in excess of a 25 basis point dead band. Beyond 200 basis points above or below the Board's target ROE, 100 percent of over or under earnings are collected from or return to ratepayers through the ESA. VGS' actual ROE has never deviated from the Board's target by more than 131 basis points since VGS has operated under alternative regulation.



VGS Return on Equity Compared to Board Allowed

VGS' ROE has historically been quite good under alternative regulation. Since 2007, VGS' Achieved ROE has never been less than 9.19 percent seen in 2007, while being as high as 11.87 percent in 2013. On average, VGS' ROE has seen an ROE of 10.51 percent from 2007 through 2015.



Source: Docket No. 8698, Company's Response to AARP 2-14.

Earnings Sharing Adjustment

VGS Return on Equity Compared to ESA Deadband

Under the ESA, VGS is granted a 50 basis point, or 0.50 percent, deadband before earnings/losses are shared with ratepayers. However, VGS' earnings have only twice fallen in this range since 2007. In all the Company has had four years of earnings above the deadband, three years of earnings below the deadband, and two years of earnings within the deadband since 2007.

	Actual Earnings	Actual ROE	Allowed ROE	Deadband	
2007	$4,371,677	9.19%	10.50%	10.00% -- 10.75%	Below Deadband
2008	$5,455,194	10.60%	10.50%	10.00% -- 10.75%	
2009	$6,078,315	11.33%	10.50%	10.00% -- 10.75%	Above Deadband
2010	$5,458,048	9.94%	10.25%	9.75% -- 10.50%	
2011	$6,370,382	11.66%	10.25%	9.75% -- 10.50%	Above Deadband
2012	$5,184,456	9.38%	10.25%	9.75% -- 10.50%	Below Deadband
2013	$6,694,367	11.87%	9.75%	9.25% -- 10.00%	Above Deadband
2014	$7,429,613	11.37%	10.26%	9.76% -- 10.51%	Above Deadband
2015 (ES)	$6,427,690	9.24%	10.20%	9.70% -- 10.45%	Below Deadband

Source: Docket No. 8698, Company's Response to AARP 2-14.

4. Other ARP Modifications

Other ARP Modifications

Other Notable Changes Proposed to ARP

In addition to the previous discussions, VGS proposes two additional notable changes to its current alternative regulation plan.

Incorporates Weather Variance Adjustment with Purchase Gas Adjustment ("PGA"):

Under VGS' proposal, the annual weather variance adjustment to modify rates for the effects of weather are incorporated into the larger PGA. This will allow the Company to adjust rates for the effect of weather quarterly (i.e. four times a year), rather than the current annual adjustment.

Changed Extension Option

Under VGS' current ARP, the Company is allowed to petition the Board to extend the ARP after its conclusion for up to three consecutive one-year terms, each requiring Board approval. VGS proposes to modify this extension option to allow it to petition the Board for a single three year extension to the ARP upon the conclusion of the ARP on October 1, 2019. This effectively would allow for VGS to implement a second three-year ARP with the same terms as the current plan with expedited Board approval.

5. Conclusions

Conclusions

- VGS' Alternative Regulation Plan ("ARP") contains an abnormally low productivity offset that prejudices ratepayers and reduces the Company's incentive to seek efficiencies.
  - VGS' current plan's productivity offset of 0.39% is less than half the established offsets used in other recent North American rate plans for gas and electric utilities.
  - VGS proposes to reduce this offset even further to 0.20%.
  - The Board itself noted in 2012 that VGS' prior productivity offset was low, and ordered the Company to provide reasons to demonstrate that the productivity offset should not be increased to 1.00 percent; a level considered by the Board as its historic practice.

Conclusions

- VGS' ARP contains other elements that reduces the Company's incentive to seek efficiencies and create ratepayer benefits.
  - VGS' plan contains three separate exogenous adjustments, who expenses are not subject to revenue caps. VGS has used its "exclusion" provision to recover demand-side management ("DSM") and Integrity Management Plan ("IMP") expenses.
  - DSM for the Company has consistently been between $1 and $2 million, creating questions as to "exclusion" need. Likewise, VGS has no priority or leak-prone infrastructure, also creating questions as to "exclusion" need. These exclusions are not needed and should not be part of the ARP.
- VGS and its shareholders have benefitted from the ARP while ratepayers have seen higher than regional average rate incrasese.
  - VGS' limited performance within the ARP's deadband, and the significant variance in year-to-year earnings indicates that the ARP's earnings deadband of 75 basis points is too narrow.