Review of Distribution Revenue Decoupling Mechanisms

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Introduction

Spurred by recent legislation, Ontario is redoubling efforts to promote CDM/DSM

Slow growth in utility base rate revenue (“margin”) can cause earnings attrition

Many North American regulators use revenue decoupling measures to address this situation

Project considered what decoupling approach(es) are best for Ontario

Plan of Presentation

Session 1	What is Decoupling?	
	Rationale	
	Criteria for Choosing a Decoupling Strategy	
	Established Decoupling Approaches	
Session 2	Decoupling Experience in Other Jurisdictions	
Session 3	Ontario Context	Gas Electric

What is Decoupling?

Standard Regulation

"Base" rates recover cost of non-energy inputs

Revenue requirement recovered with mix of fixed (*e.g*. customer) and variable (*e.g*. volumetric) charges

Rates trued up to utility cost in occasional rate rebasings

Rates may be adjusted automatically for changing external business conditions between rate cases

>>> Utility earnings linked to trends in system use

Revenue Decoupling

Supplemental provisions of regulatory systems designed to weaken or eliminate link between revenue and system use

Three established decoupling approaches

- Lost revenue adjustment mechanisms ("LRAMs") compensate utility for lost revenue from CDM/DSM programs
- Straight fixed variable ("SFV") pricing collects less revenue from charges that vary with system use
- Decoupling true up plans can adjust revenue for wider range of demand developments

Decoupling Rationale

Energy utilities grappling today with slowing growth in system use

Utility earnings depend on *base rate revenue - base rate cost*

Bulk of base rate revenue typically gathered from “variable” (*e.g*. $/kWh) charges of small volume customers

Base rate cost sensitive in short run only to *customer* growth

>>> Utility earnings

- enhanced by higher energy sales
- diminished by CDM/DSM measures

Decoupling Rationale (cont'd)

growth Rates
= growth Unit Cost
= growth Input Prices – growth Productivity – growth Average Use

Inflation typically exceeds productivity growth by 150 basis points

>>> Earnings attrition occurs if growth in average use doesn't offset productivity shortfall

Need for rate cases increases as average use declines

Problem amplified with *historic* test years

Decoupling Benefits

Remove utility disincentive to promote CDM & DSM

Alleviate financial attrition between rate cases

- Multiyear rate plans more just and reasonable
- Reduced earnings risk reduces capital cost

Simplify regulation

- Fewer rate cases reduce regulatory cost, strengthen utility performance incentives
- Less controversy over volume forecasts & lost margins

Arguments Against Decoupling

Reduced incentives for effective marketing

- Price-sensitive (*e.g.* large volume) customers
- Environmentally-benign uses (*e.g.* electric vehicles)

Can service quality be compromised?

Can *increase* rate case frequency if sales/customer are growing

Criteria for Selecting a Decoupling Approach

- Removes disincentives for *wide range* of utility CDM/DSM initiatives
- Decouples earnings from *external* drivers of average use declines
- Low administrative cost
- Few undesirable idiosyncrasies

Weights placed on these criteria vary by jurisdiction

e.g. Weight on administrative cost matters more where there are many utilities to regulate

LRAMs

Basic Idea

Compensate utilities for margins lost due to *their* CDM/DSM initiatives

Requires estimates of CDM/DSM savings, which are often used in "shared savings" incentive mechanisms

Distributors

- assume risk of conventional demand fluctuations
- retain rate design freedom

Available to all Ontario gas and electric distributors

SFV Pricing

Basic Idea

Variable (*e.g.* volumetric & demand) charges reflect short run marginal cost (close to zero)

Fixed costs recovered from fixed charges

- Customer charges
- Reservation charges vary with expected peak demand

Customer charges may vary in some rough fashion with historical usage ("sliding scale")

Limited rate design freedom

Decoupling True Up Plans

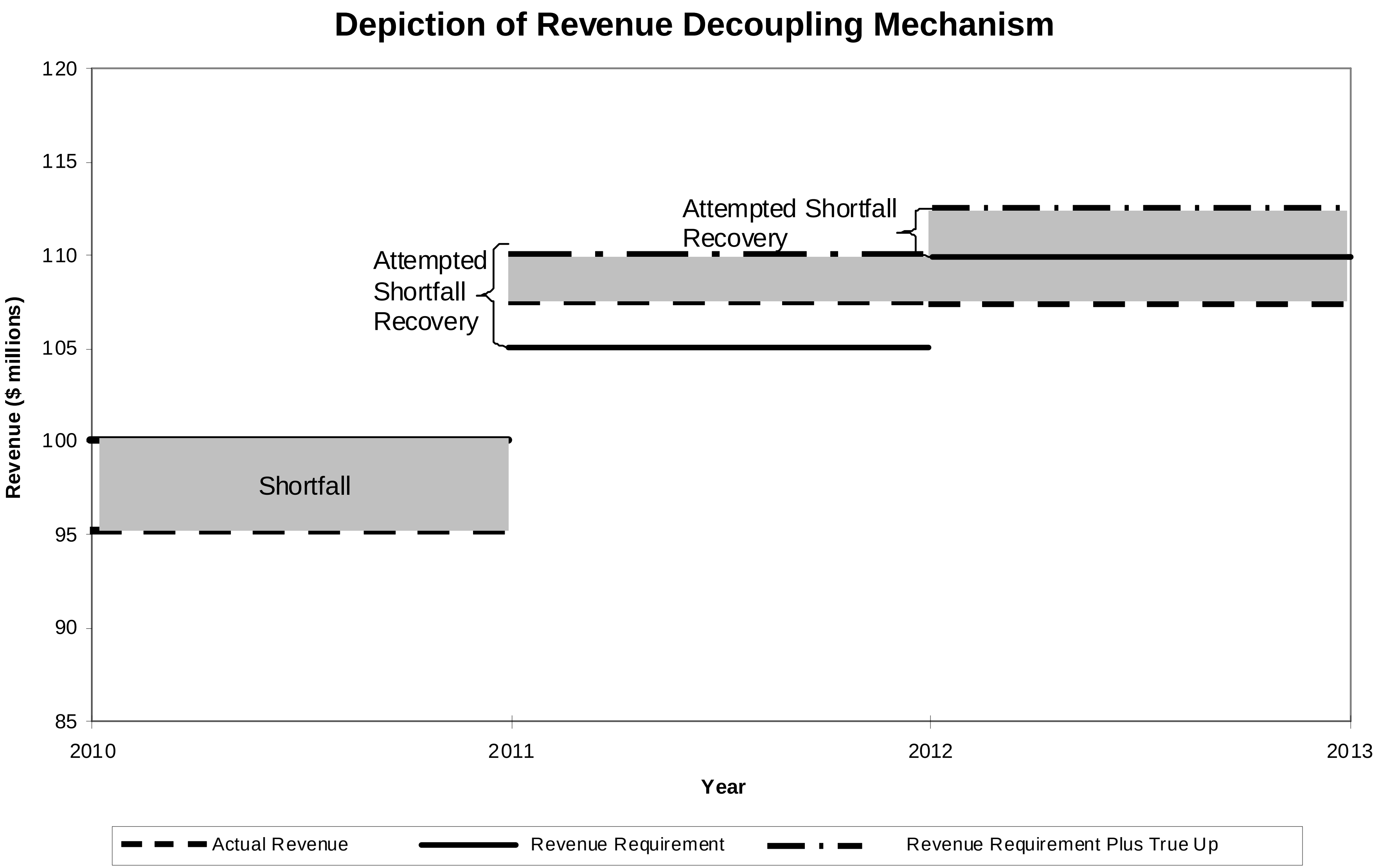
Basic Idea

Revenue decoupling mechanism ("RDM") helps revenue track allowed cost of service

Revenue Adjustment Mechanism ("RAM") adjusts rates for escalating cost pressures between rate cases

Utility retains rate design freedom

Figure 1


Depiction of Revenue Decoupling Mechanism
120
115
110
105
100
95
90
85
Revenue ($ millions)
2010
2011
2012
2013
Year
Shortfall
Attempted Shortfall Recovery
Attempted Shortfall Recovery
Actual Revenue
Revenue Requirement
Revenue Requirement Plus True Up

Decoupling True Up Plans (cont'd)

RDM Design Issues

Full or partial decoupling?

Full	Earnings decoupled from revenue variances from all sources (*e.g.* weather, economy, CDM)
Partial	Earnings not decoupled from revenue variances from some sources (*e.g.* weather)

Scope: Should decoupling apply to all service classes?

Decoupling True Up Plans (cont'd)

RDM Design Issues (cont'd)

Baskets: Should customers in a service class subject to decoupling be exposed to rate adjustments for revenue variances in other classes?

Or should there be multiple service "baskets" to limit exposure?

Cap the size of revenue requirement true ups?

Soft Cap	Defer unrecoverable adjustments for later recovery
Hard Cap	No deferrals

Decoupling True Up Plans (cont'd)

Revenue Adjustment Mechanism

Two basic approaches, both used in Ontario

Revenue Cap (most common *e.g.* Enbridge)

Escalate *revenue requirement* for increasing cost pressures, then adjust rates to recover

Price Cap (*e.g.* Union)

Escalate *rates* for increasing cost pressures

Revenue Cap Design

Under decoupling,

growth Rates = growth Revenue Requirement
– growth Billing Determinants
(*e.g.* customers, volumes)

\>>> If billing determinants rise, rates would *decline* with fixed revenue requirement

Revenue requirement should, in any event, grow with cost

\>>> Utilities experience financial "attrition" without revenue requirement escalation

Solutions: Frequent rate cases ("Groundhog Day" scenario)
Multiyear RAM

3 established approaches to revenue cap design

1. Formulaic Approaches

Basic Idea Use formulas to make real-time adjustments for changes in external cost "drivers"

Index logic provides rationale for RAM formula

trend Cost = trend Input Prices – trend Productivity
+ trend Customers

>>> A fully compensatory RAM adjusts for input price, productivity, and output growth

1. Formulaic Approaches (cont'd)

>>> "Full indexation" RAM

$$growth\ Revenue = P - X + N +/- Z$$

P = Price inflation
X = X-factor (aka "productivity" factor)
N = customer growth
Z = Z-factor (adjusts for miscellaneous events)

This can be expressed equivalently as

$$growth\ (Revenue/Customer) = P - X +/- Z$$

Precedents: SoCalGas, Enbridge Gas Distribution, Vermont Gas

Simplifications to RAM formula are common

If P (inflation) = X (productivity target)

Growth Revenue = growth Customers +/- Z

Equivalently,

growth (Revenue/Customer) = 0 +/- Z

>>> Revenue per customer ("RPC") *freeze*

Precedents: gas LDCs (*e.g.* BG&E), Idaho Power, PEPCO (MD)

Problem: Inflation exceeds productivity growth

1. Formulaic Approaches (cont'd)

If X (productivity target) = N (customer growth)

growth Revenue = P +/- Z

>>> "Inflation only" RAM

Problems:

- *over*compensates when customer growth *slow*
- *under*compensates when customer growth *rapid*
- GDP IPI tends to understate input price inflation

Precedents: Recently expired plans of California utilities

2. All Forecast Approach

Attrition adjustment based on multiple forward test years

Forecast cost over *next 3-5 years*

Focus on “controllable costs”

- O&M expenses
- Capital spending

Cost of capital otherwise computed by traditional means

Produces revenue requirement “stairsteps”

Precedents: Numerous current revenue caps in NY & CA

3. Hybrid Approach

Hybrid approaches combine elements of indexing & forecasts

O&M expenses	Formulaic escalators with inflation indexes
Capital Cost	Capex budget often fixed in real terms, indexed for construction cost inflation
	Depreciation & return on rate base otherwise calculated traditionally
	Target rate of return can be separately regulated

3. Hybrid Approach (cont'd)

Precedents — "Old school" California approach, BC, HI

Pro — Uses indexes where indexing least controversial, most needed (O&M expenses)

Uses traditional ratemaking methods where these work best (utility plant)

Accommodates

- Major plant additions
- Separate cost of funds adjustments

Con — Complicated!

Pros and Cons of Alternative Approaches

LRAM Pro

Effectively removes disincentives for utility CDM/DSM programs

Narrow focus on these programs sometimes desirable

LRAM Con

CDM/DSM savings estimates can be complex & controversial

High administrative cost discourages use of this approach for less conventional CDM/DSM initiatives

No relief for adverse external demand trends

SFV Pro

Removes disincentives for wide range of utility CDM/DSM efforts

Mitigates earnings attrition from adverse external demand trends

Lowest administrative cost

Stable rates

SFV Con

Uniform high customer charges disadvantage low usage customers

Low variable charges don't promote conservation

Jeopardizes marketing to price-sensitive customers

Decoupling True Up Pro

Removes disincentives for *all* utility CDM/DSM initiatives

Mitigates attrition from *external* sources of average use decline

Reasonable administrative cost

Decoupling True Up Con

Stabilization of *revenue* destabilizes *rates*

Jeopardizes marketing to price-sensitive customers

Decoupling Experience

California

California has world's longest, most varied decoupling experience

- Began in gas industry in 1970s
- Extended to electric utilities in 1982 ("ERAMs")
- Operative in most years since
- Recently extended to *water* utilities

California (cont'd)

Features of California's regulatory environment have shaped gas & electric decoupling approach

- Serious commitment to energy conservation
- Big utility CDM/DSM programs
- Inverted block rates
- Other risks (*e.g.* nuclear financing)
- Rate cases every 3-5 years under rate case cycle
- Rapid price inflation in 70s & 80s
- Electrics originally vertically integrated, then restructured

>>> Decoupling true up plans used

Extensive experimentation with revenue cap design

Revenue caps include inflation relief

Other Early Electric Decoupling Plans

Other states had large DSM programs in 90s
(*e.g.* CT, MA, NY, WA)

Mix of LRAMs & decoupling true up plans

Decoupling later suspended for miscellaneous reasons

- Prepare for restructuring
- Reduced CDM/DSM emphasis
- Utility not interested
- Too complicated
- Decoupling coincided with recessions, high fuel prices

Decoupling Experience (cont'd)

Gas Decoupling Plans

Outside California, true up plans most common in gas distribution

Early Adopters: BG&E (MD), Northwest Natural (OR), BC Gas

Serious problem of declining average use

- Better insulation
- More efficient furnace and appliance technologies
- Rising gas prices
- Milder winters

Decoupling Experience (cont'd)

BC Gas

BC commission lists grounds for decoupling plan approval

- Remove disincentive for DSM
- Alleviate financial attrition
- Encourage better rate designs
- Reduce rate case controversy

Decoupling Experience (cont'd)

Electric Renaissance

Recent resurgence of interest by electric utilities (*e.g*. CT, HI, ID, MA, MD, MI, NY, WI)

Decoupling true up plans mandatory in MA, NY

Reasons:

- Slowdown in average use
- Increased policy emphasis on energy conservation

Trends in Average Use by US Small Volume Electric Customers

Average Annual Growth Rate	Residential		Commercial	
	Raw	Normalized	Raw	Normalized
1995-2008	0.56%	0.53%	0.55%	0.52%
1995-2003	0.74%	0.91%	1.16%	1.13%
2003-2008	0.26%	0.28%	0.06%	0.03%
Other utilities	0.29%	0.36%	0.11%	0.07%
High DSM utilities	0.03%	-0.25%	-0.23%	-0.25%

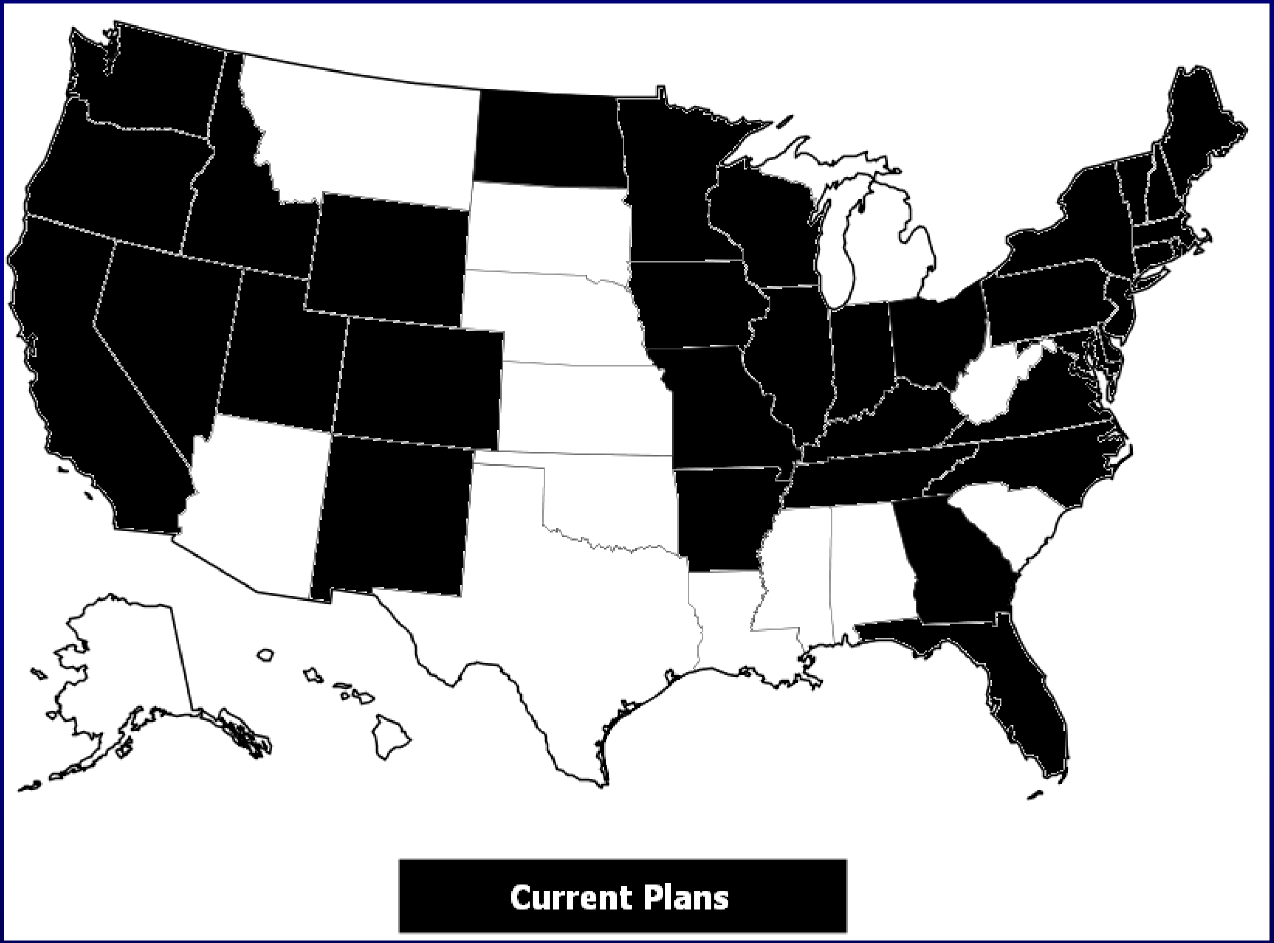
Source: FERC Form 1 data, with weather adjustments made by PEG Research using econometric demand models.

Decoupling Experience (cont'd)

Decoupling in some form now widespread in states with large-scale CDM/DSM programs and/or material average use declines for any other reason

CDM/DSM performance incentives *even more* widespread, and have played a key role in encouraging large programs

U.S. Precedents by State: CDM/DSM Incentive Mechanisms



Decoupling Experience (cont'd)

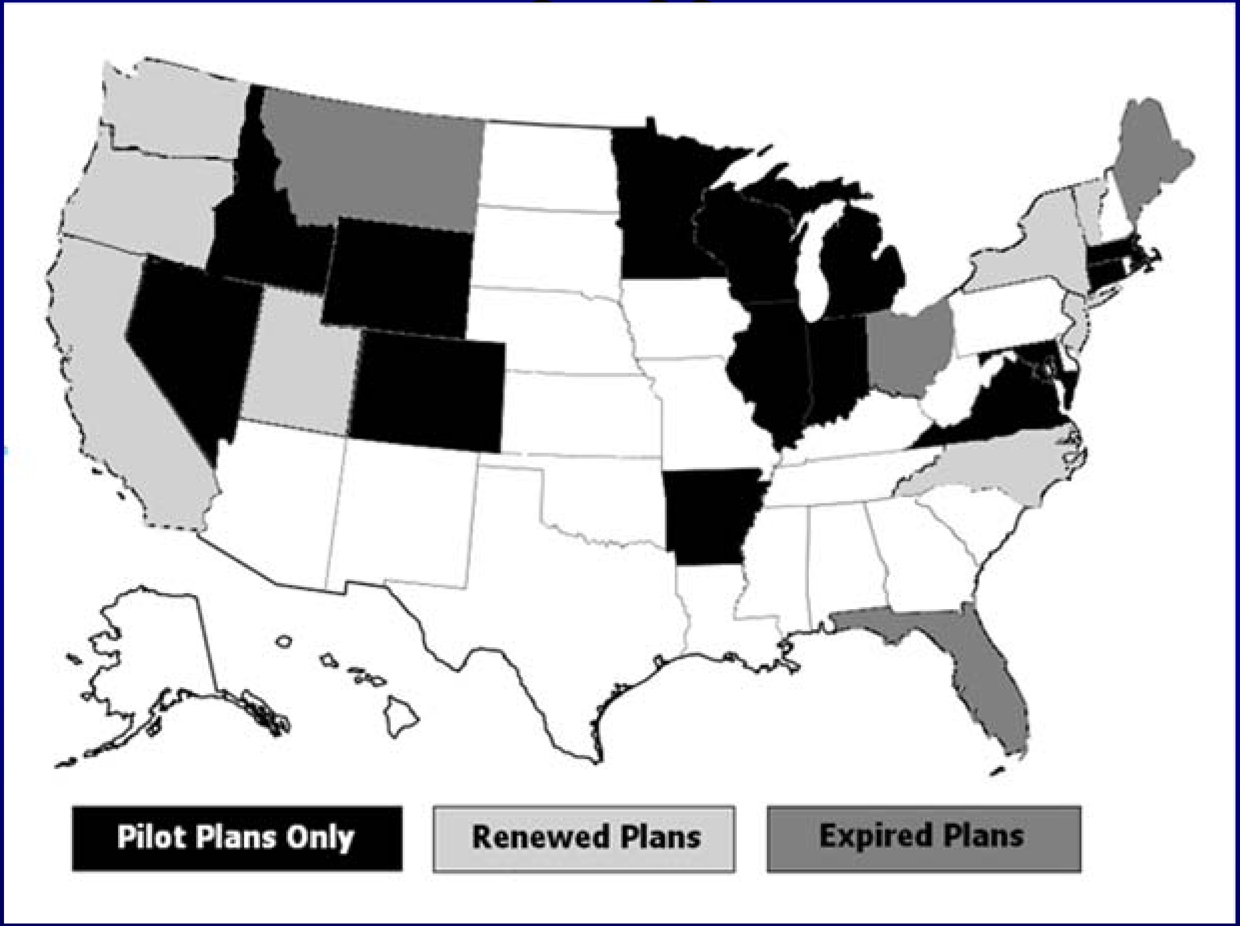
True up plans most popular approach to decoupling in States

- LRAMs not applicable where CDM/DSM programs independently administered
- Lower administrative cost than LRAMs
- Disincentives removed for widest range of utility initiatives
- Avoids sharp hikes in fixed charges, low usage charges that discourage CDM/DSM
- States with few utilities have less need for SFV's cost advantage

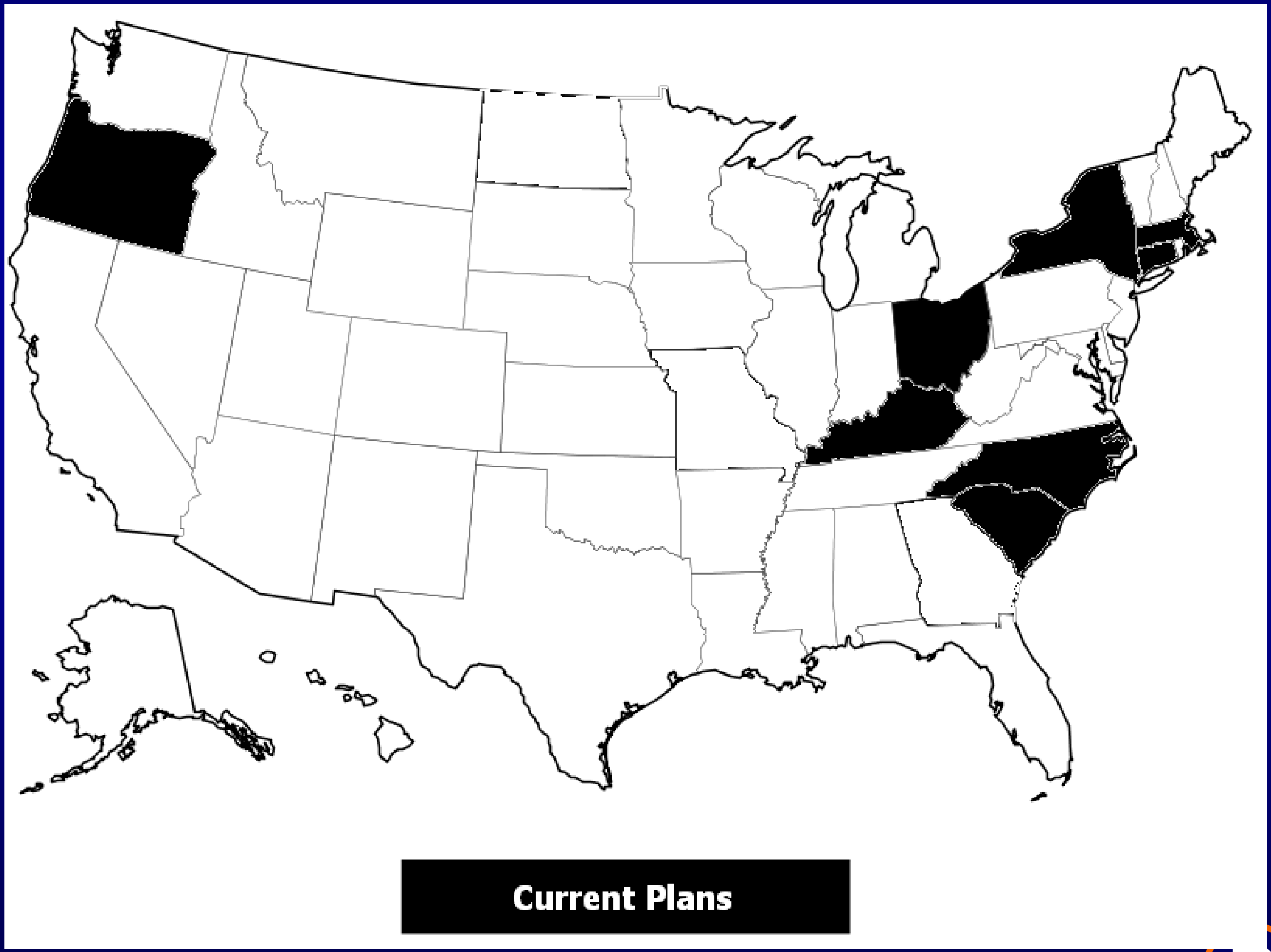
Scope of decoupling true ups often limited to small volume customers

Full and partial decoupling mechanisms both popular

U.S. Decoupling Precedents by State: True Up Approach



U.S. Decoupling Precedents by State: LRAM Approach



Decoupling Experience (cont'd)

SFV Pricing

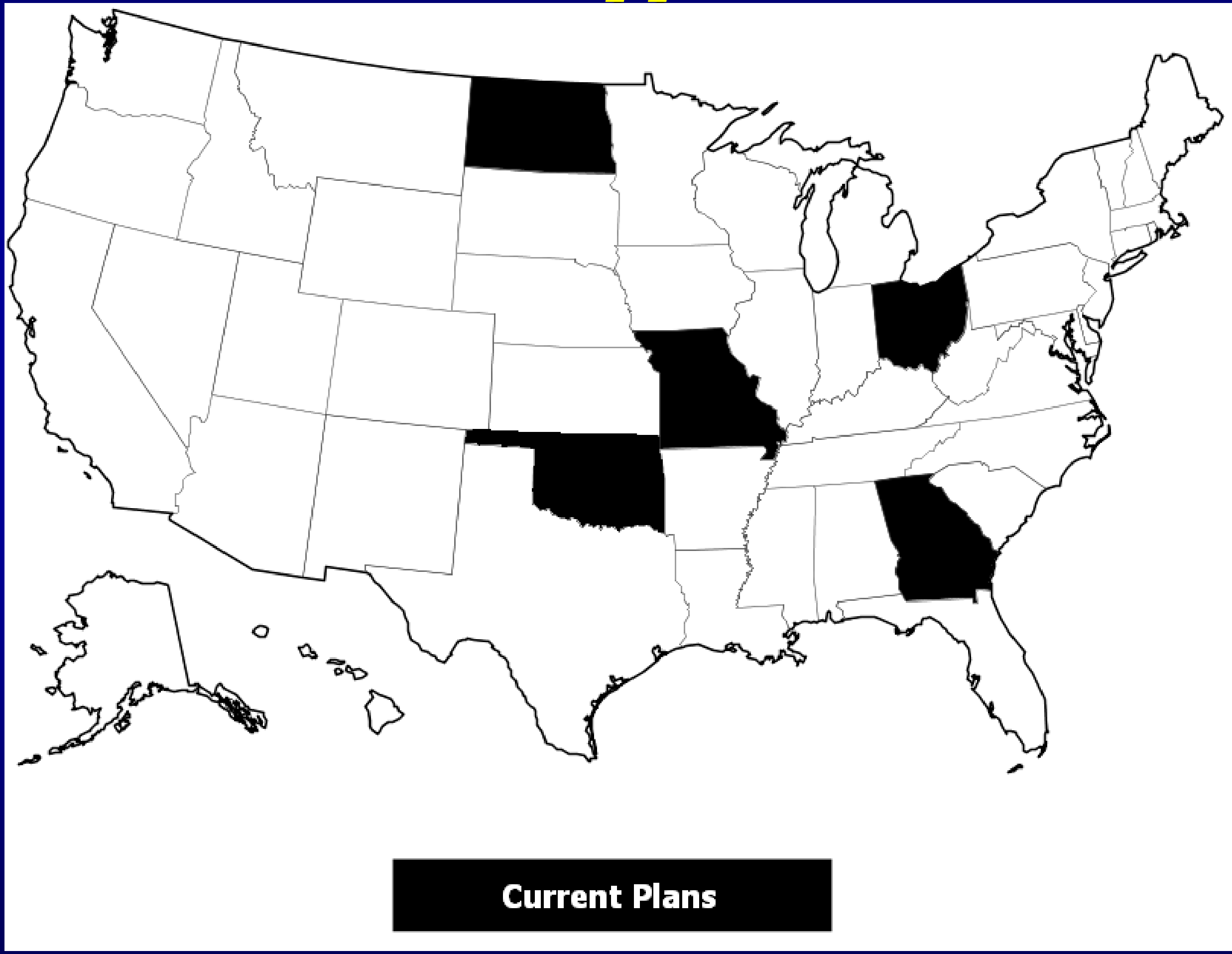
Widely used only in interstate gas *transmission*

SFV there has bolstered system use (*e.g.* gas-fired generation)

SFV pricing used in a few states for gas *distribution*

In Ohio, SFV pricing produced sharp hikes in customer charges, Supreme Court case

U.S. Decoupling Precedents by State: SFV Approach



Ontario Context

Gas

<u>Situation</u>

Utilities have large scale DSM programs

For this and other reasons, average use by residential customers declining

Board prefers multiyear rate plans

Few utilities to regulate

Table 3

Trends in Average Use of Small Volume Customers of Enbridge and Union

Year	Residential		Small Business	
	Actual [1]	Normalized [1]	Actual [2]	Normalized [2]
1992	2.50%	2.95%	3.20%	3.66%
1993	-0.91%	-0.46%	-0.29%	0.18%
1994	-1.43%	-0.98%	0.29%	0.76%
1995	-2.86%	-2.40%	-0.77%	-0.30%
1996	2.50%	2.96%	4.50%	4.97%
1997	-3.73%	-3.27%	-4.61%	-4.13%
1998	-21.91%	-21.44%	-18.95%	-18.46%
1999	4.40%	4.87%	5.33%	5.81%
2000	9.54%	10.01%	6.77%	7.26%
2001	-9.38%	-8.90%	-8.43%	-7.94%
2002	4.32%	4.80%	5.77%	6.27%
2003	3.94%	4.42%	3.80%	4.29%
2004	-5.67%	-5.19%	-5.41%	-4.91%
2005	-2.94%	-2.45%	-1.16%	-0.65%
2006	-11.56%	-11.07%	-9.49%	-8.99%
2007	7.90%	8.40%	9.52%	10.03%
2008	2.66%	3.16%	6.18%	6.69%
Averages				
1991-2008	**-1.33%**	**-0.86%**	**-0.22%**	**0.27%**
2000-2008	**-1.34%**	**-0.86%**	**0.10%**	**0.60%**
2003-2008	**-1.92%**	**-1.43%**	**-0.07%**	**0.43%**

[1] These are average growth rates in actual and weather normalized deliveries per customer of Enbridge's revenue class 20, and Union's residential revenue classes 01 and M2.

[2] These are average growth rates in actual and weather normalized deliveries per customer of Enbridge's revenue class 48, and Union's small business revenue classes 01, M2 and 10.

Ontario Context (cont'd)

Gas (cont'd)

Current Regulatory Approach

- Forward test years
- LRAMs
- "Shared Savings" DSM incentive mechanism
- Partial (weather normalized) decoupling true up plans

Union: growth Rates = growth GDPIPI – 1.82%

Enbridge: growth Revenue/Customer
= "Inflation Coefficient" x growth GDPIPI

- High fixed charges for residential distribution service

Recent Monthly Customer Charges of Residential and Commercial Gas Customers

Distributor	Service Class	Current Customer Charge	Share of Revenue Requirement	Customer Charge under SFV Pricing
Union				
	Rate 01	$19.00	49.8%	$38.15
	Rate 10	$70.00	11.0%	$636.76
	Rate M1	$19.00	66.4%	$28.62
	Rate M2	$70.00	13.2%	$530.22
Enbridge				
	Rate 1	$16.00	48.5%	$33.00
	Rate 6	$55.00	33.9%	$162.17

Source for Union Rate Data: EB-2009-0275, Union Gas Draft Rate Order Working Papers, Schedule 4.
Source for Enbridge Rate Data: EB-2008-0219, Enbridge Exhibit B, Tab 3, Schedule 8.

Ontario Context (cont'd)

Gas (cont'd)

Possible Improvements

Eliminate LRAMs to simplify regulation

Eliminate weather normalization

Rate designs that better encourage provincial DSM goals

- Higher volumetric charges
- Inverted block rates

Power Distribution (cont'd)

Current Situation

Government seeks "culture of conservation"

OPA& distributors will have growing DSM programs

Other federal and provincial initiatives also depress average use

Average use by residential customers declining

Multiyear rate plans don't compensate for declining average use

growth Rates = growth GDPIPI – (0.72% + Stretch)

Many distributors to regulate

Table 5

Trends in Volume Per Customer of Ontario Power Distibutors

(kWh/Customer)

	All Companies				Ten Largest Companies				Other Companies			
	Residential		General Service		Residential		General Service		Residential		General Service	
Year	Level	Growth Rate	Level	Growth Rate	Level	Growth Rate	Level	Growth Rate	Level	Growth Rate	Level	Growth Rate
2002	10,276		137,899		10,503		141,685		9,726		129,519	
2003	10,445	1.64%	140,350	1.76%	10,225	-2.68%	144,662	2.08%	10,975	12.08%	130,702	0.91%
2004	10,073	-3.63%	141,279	0.66%	10,275	0.49%	144,964	0.21%	9,589	-13.50%	133,129	1.84%
2005	10,403	3.22%	145,919	3.23%	10,586	2.99%	153,441	5.68%	9,966	3.86%	129,500	-2.76%
2006	9,780	-6.18%	144,035	-1.30%	9,959	-6.11%	149,865	-2.36%	9,356	-6.32%	131,180	1.29%
2007	9,882	1.04%	149,678	3.84%	10,045	0.86%	155,856	3.92%	9,495	1.48%	136,139	3.71%
2008	9,629	-2.59%	146,642	-2.05%	9,768	-2.79%	151,727	-2.69%	9,297	-2.10%	135,456	-0.50%
Average Annual Growth Rates												
2002-2008		**-1.08%**		**1.02%**		**-1.21%**		**1.14%**		**-0.75%**		**0.75%**
2005-2008		**-2.58%**		**0.16%**		**-2.68%**		**-0.37%**		**-2.31%**		**1.50%**

Source: Tabulated by PEG Research from OEB data

Ontario Context (cont'd)

Power Distribution (cont'd)

Current Regulatory Approach

Forward test years

LRAMs Available to all utilities but most haven't filed

CDM incentive mechanisms use CDM savings estimates

High fixed charges for residential Dx service

Recent Monthly Customer Charges of Residential and Commercial Electric Customers

Distributor	Service Class	Current Customer Charge	Share of Revenue Requirement	Customer Charge under SFV Pricing
Hydro One				
	Residential Rate UR	$13.78	44.8%	$30.76
	Residential Rate R1	$18.32	42.3%	$43.30
	Residential Rate R2	$48.01	55.6%	$86.28
	General Service Rate Gse	$29.79	31.6%	$94.17
	General Service Rate Uge	$11.86	17.5%	$67.59
Toronto Hydro				
	Residential	$16.85	61.9%	$27.21
	General Service < 50kW	$21.44	25.5%	$84.14

Source for Hydro One Rate Data: EB-2008-0187, Hydro One Exhibit B2, Tab 1, Schedule 1

Source for Toronto Hydro Rate Data: EB-2009-0139, Toronto Hydro Electric System Exhibit K1, Tabs 1 - 6 and Exhibit O1, Tab 1, Schedule 1

Power Distribution (cont'd)

Possible Improvements

Replace LRAMs w/ SFV pricing

- Lowest administrative cost
- Remove disincentives for wider range of utility CDM efforts
- Decouple revenue from all external sources of declining average use
- Price cap plans easily adapted
- But low volumetric charges discourage CDM

Power Distribution (cont'd)

Possible Improvements

Replace LRAMs w/ partial decoupling true up plans

- Lower administrative cost
- Remove disincentives for widest range of utility CDM efforts
- Decouple revenue from external sources of declining average use
- Price cap plans easily converted to decoupling true up plans

Full decoupling true up plans would, additionally, facilitate rate designs that better promote provincial policy goals.

- Higher volumetric charges
- Peak load pricing