

Empirical Research in Support of Incentive Rate Setting in Ontario: Ontario Energy Board Stakeholder Conference

Larry Kaufmann, Senior Advisor
Pacific Economics Group

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Introduction

- On May 3, Pacific Economics Group (PEG) released a report that provided empirical analysis in support of incentive rate-setting in Ontario
- The May 2013 PEG report also contained specific recommendations on three elements of the Board's incentive rate adjustment formula
 - The inflation factor
 - The productivity factor
 - Stretch factors that apply to different efficiency “cohorts” in the electricity distribution industry
- In light of questions and comments raised by stakeholders at the May 16, 2013 Q&A Session, PEG updated its empirical analysis
 - To correct for data processing error re: LV data

Outline

- Today's presentation will:
 - Provide an overview our empirical research, including data sources, and updates
 - Present our recommendations
 - More Ontario-specific inflation factor
 - TFP study for Ontario electricity distributors
 - Benchmarking electricity distributor total costs
 - Stretch factors

Overview

The Board's Renewed Regulatory Framework for Electricity, amongst other matters, establishes three rate-setting methods for distributors:

- 4th Generation Incentive Rate-setting (4th Gen IR) - suitable for most distributors;
- Custom Incentive Rate-setting - suitable for those distributors with large or highly variable capital requirements; and
- the Annual Incentive Rate-setting Index - suitable for distributors with limited incremental capital requirements.

“Each distributor may select the rate-setting method that best meets its needs and circumstances, and apply to the Board to have its rates set on that basis. This will provide greater flexibility to accommodate differences in the operations of distributors, some of which have capital programs that are expected to be significant and may include ‘lumpy’ investments, and others of which have capital needs that are expected to be comparatively stable over a prolonged period of time.”

(pp. 9-10, RRF Report)

Overview (Con't)

- PEG's recommendations for inflation, productivity, and stretch factors for 4th Gen IR are:
 - Informed by rigorous empirical research
 - Consistent with principles for effective incentive regulation
 - Compatible with Board policy direction set out in its RRF Report
 - Appropriate for most distributors in Ontario

Data Sources for Empirical Analysis

- Ontario-specific data posted on the Board's website by Board staff
 - Main data source: RRR filings 2002-2011
- To obtain longer time series and other necessary data, Board staff has also posted:
 - Ontario MUDBANK data on capital 1989-1998
 - Smart meter capital additions data
 - Data on distributor ownership of high voltage equipment
 - Data on low voltage charges paid by embedded distributors to host distributors
- Ontario Hydro Retail System data not available
- Electricity distributor data 1999-2001 incomplete and many stakeholders expressed concern over the accuracy of the data
- PEG inferred capital additions between 1997/98 and 2001

Data Sources for Empirical Analysis (con't)

- It was also appropriate to develop separate cost measures for TFP and benchmarking analyses
- Benchmarking cost began with TFP cost measure but:
 1. Subtracted HV transformation capital and OM&A costs
 2. Added contributions in aid of construction to capital stock
 3. Added LV charges paid by embedded distributors to host distributors

Table 7

Cost Measures for Empirical Analysis

Industry TFP Growth		Distribution Cost Benchmarking	
Candidate Capital Costs:	Included in Study?	Candidate Capital Costs:	Included in Study?
Capital Benchmark Year: 1989*		Capital Benchmark Year: 1989*	
Transmission Substations > 50 KV Assets**	Yes	Transmission Substations > 50 KV Assets**	No
Gross Capital Expenditures	Yes	Gross Capital Expenditures	Yes
CIAC	No	CIAC	Yes
Smart Meter Expenditures	Yes	Smart Meter Expenditures	Yes
Candidate OM&A Costs:		Candidate OM&A Costs:	
Distribution OM&A	Yes	Distribution OM&A	Yes
High Volatage OM&A***	Yes	High Volatage OM&A***	No
Low Voltage Charges Paid to Host Distributors****	No	LV Charges Paid to Host Distributors****	Yes
Notes:			
* Exceptions are Hydro One, Algoma Power, Canadian Niagara Power, Greater Sudbury Power, Innisfill Hydro and PUC Distribution, where data before 2002 were not available			
** Account Number 1815			
*** Proxy High Voltage OM&A costs were calculated as the sum of OM&A in accounts 5014, 5015, and 5112			
**** Excludes Regulatory Asset Recovery Charges			

Inflation Factor Recommendation

PEG recommends a “three-factor” inflation factor

- Capital
 - capital service price constructed by PEG including the Electric Utility Construction Price Index (EUCPI)
 - WACC calculated using Board-approved cost of capital parameters
 - PEG calculated value of the economic, “geometric” depreciation rate
- Labour
 - the average weekly earnings for workers in Ontario
- Non-Labour OM&A
 - Canada GDP-IPI

PEG also recommends that inflation be measured as a three-year moving average of recommended inflation measure

Inflation Factor Recommendation (con't)

- Rationale
 - Components are the best, feasible price indices for satisfying Board criteria
 - Leads to more accurate measure of industry input price inflation than alternatives
 - Easy to implement and update

Details of Recommended “Three Factor” IPI Inflation Factor

Year	Values of Current Inflation Factor		Values of Recommended Inflation Factor		
	May 1st	Jan 1st	Index	Annual Growth	3-Year Moving Avg
2002			100.00		
2003			101.10	1.09%	
2004			102.15	1.04%	
2005			103.94	1.74%	1.29%
2006	1.90%		104.07	0.12%	0.97%
2007	2.10%		106.90	2.68%	1.52%
2008	2.30%		109.45	2.36%	1.72%
2009	1.30%		110.82	1.24%	2.09%
2010	1.30%		113.55	2.44%	2.01%
2011	2.00%	1.70%	114.35	0.70%	1.46%
2012	1.60%	2.20%	112.51	-1.62%	0.51%

Productivity Factor Recommendation

- PEG estimated TFP growth in Ontario's electricity distribution using two methods:
 - Index-based measure of productivity growth >>> most important approach, as per Board guidance
 - Econometrics as supplement to index-based estimate of TFP trend

Productivity Factor Recommendation (con't)

- Toronto Hydro and Hydro One excluded because statistical tests show they are significantly and materially impacting the industry TFP trend
 - Impact on cost elasticities
 - Impact on industry cost trend
- In incentive regulation, industry TFP trend should not be materially impacted by one or two utilities in the industry

Productivity Factor Recommendation (con't)

- Updated estimate of TFP growth is 0.1%
 - May 2013 Report PEG recommended productivity factor of zero
 - PEG now recommends updated estimate
- Rationale
 - Slow growth in industry TFP is primarily due to slow output growth, which is expected to continue

Table 14

Output Quantity Trends for Ontario Power Distributors, 2002-2011

Year	Total Customers		Peak Demand (KW)		Delivery Volume (KWh)		Output Quantity Index	
	Level	Growth	Level	Growth	Level	Growth	Index	Growth
2002	2,525,210		14,953,754		65,523,878,635		100.00	
2003	2,590,817	2.6%	15,124,270	1.1%	67,480,321,397	2.9%	102.18	2.2%
2004	2,647,118	2.1%	15,282,376	1.0%	68,588,997,365	1.6%	104.01	1.8%
2005	2,703,821	2.1%	15,710,004	2.8%	72,989,180,570	6.2%	106.76	2.6%
2006	2,748,114	1.6%	16,004,095	1.9%	71,323,881,577	-2.3%	108.28	1.4%
2007	2,781,589	1.2%	16,030,411	0.2%	75,581,326,413	5.8%	109.61	1.2%
2008	2,823,654	1.5%	16,040,362	0.1%	74,626,460,193	-1.3%	110.56	0.9%
2009	2,864,567	1.4%	16,095,983	0.3%	71,454,871,565	-4.3%	111.34	0.7%
2010	2,885,251	0.7%	16,172,034	0.5%	71,603,206,532	0.2%	112.02	0.6%
2011	2,919,186	1.2%	16,287,524	0.7%	71,223,956,582	-0.5%	113.04	0.9%
Average Annual Growth Rate 2002-2011		1.61%		0.95%		0.93%		1.36%

Table 15

Capital Quantity and Cost Trends for Ontario Power Distributors, 2002-2011

Year	Capital Cost		Capital Price Index		Capital Quantity	
	Index	Growth	Index	Growth	Index	Growth
2002	100.00		100.00		100.00	
2003	101.44	1.4%	100.47	0.5%	100.97	1.0%
2004	103.28	1.8%	100.66	0.2%	102.60	1.6%
2005	105.91	2.5%	101.59	0.9%	104.25	1.6%
2006	105.93	0.0%	100.84	-0.7%	105.05	0.8%
2007	111.44	5.1%	103.31	2.4%	107.87	2.6%
2008	115.69	3.7%	105.82	2.4%	109.33	1.3%
2009	117.22	1.3%	107.10	1.2%	109.45	0.1%
2010	121.02	3.2%	109.31	2.0%	110.71	1.2%
2011	123.06	1.7%	109.45	0.1%	112.41	1.5%
Average Annual Growth Rate 2002-2011		2.31%		1.00%		1.30%

Table 16

OM&A Quantity Trends for Ontario Electric Distributors, 2002-2011

Year	OM&A Cost		OM&A Price Index		OM&A Quantity	
	Index	Growth	Index	Growth	Index	Growth
2002	100.000		100.000		100.000	
2003	104.040	4.0%	102.142	2.12%	101.858	1.84%
2004	105.063	1.0%	104.672	2.45%	100.373	-1.47%
2005	107.207	2.0%	107.961	3.09%	99.302	-1.07%
2006	110.827	3.3%	109.664	1.57%	101.061	1.76%
2007	119.077	7.2%	113.133	3.11%	105.254	4.07%
2008	123.993	4.0%	115.771	2.31%	107.102	1.74%
2009	126.377	1.9%	117.277	1.29%	107.759	0.61%
2010	127.286	0.7%	120.975	3.10%	105.217	-2.39%
2011	136.679	7.1%	122.969	1.63%	111.150	5.49%
Average Annual Growth Rate 2002-2011		3.47%		2.30%		1.17%

Table 17

Input Quantity Trends for Ontario Electric Distributors, 2002-2011

Year	Capital Quantity		O&M Quantity		Input Quantity Index	
	Index	Growth	Index	Growth	Index	Growth
2002	100.00		100.00		100.00	
2003	100.97	1.0%	101.86	1.8%	101.29	1.3%
2004	102.60	1.6%	100.37	-1.5%	101.77	0.5%
2005	104.25	1.6%	99.30	-1.1%	102.39	0.6%
2006	105.05	0.8%	101.06	1.8%	103.56	1.1%
2007	107.87	2.6%	105.25	4.1%	106.91	3.2%
2008	109.33	1.3%	107.10	1.7%	108.52	1.5%
2009	109.45	0.1%	107.76	0.6%	108.85	0.3%
2010	110.71	1.2%	105.22	-2.4%	108.64	-0.2%
2011	112.41	1.5%	111.15	5.5%	111.99	3.0%
Average Annual Growth Rate						
2002-2011		1.30%		1.17%		1.26%

Table 18

TFP Index Calculation for Ontario Power Distributors, 2002-2011

Year	Output Quantity Index		Input Quantity Index		TFP Index	
	Index	Growth	Index	Growth	Index	Growth
2002	100.00		100.00		100.00	
2003	102.18	2.2%	101.29	1.3%	100.88	0.87%
2004	104.01	1.8%	101.77	0.5%	102.20	1.31%
2005	106.76	2.6%	102.39	0.6%	104.26	1.99%
2006	108.28	1.4%	103.56	1.1%	104.56	0.28%
2007	109.61	1.2%	106.91	3.2%	102.52	-1.96%
2008	110.56	0.9%	108.52	1.5%	101.88	-0.63%
2009	111.34	0.7%	108.85	0.3%	102.29	0.40%
2010	112.02	0.6%	108.64	-0.2%	103.11	0.80%
2011	113.04	0.9%	111.99	3.0%	100.94	-2.13%
Average Annual Growth Rate						
2002-2011		1.36%		1.26%		0.10%

Total Cost Benchmarking Recommendations

- PEG developed two models to benchmark distributors' total cost performance and to inform stretch factor assignments
 - econometric
 - unit cost/peer group

Total Cost Benchmarking Recommendations (con't)

- Econometric Model
 - Estimates main “drivers” of electricity distribution costs in Ontario
 - Model used to predict cost of each distributor
 - Difference between actual and predicted cost (plus or minus “confidence intervals”) identifies statistically superior, statistically inferior, and average cost performers
- Unit Cost/Peer Group Model
 - Peer group benchmarking compares each distributors’ unit cost (i.e. total cost divided by output) to the average for the peer group
 - Peer groups determined based on similarities in cost drivers identified in econometric model

Econometric Benchmarking (con't)

Updated Econometric benchmarking (Table 13) shows

- 14 distributors significantly superior cost performers at 90% confidence (and nine of these significantly superior at 95% confidence)
- 18 distributors significantly inferior cost performers at 90% confidence (and nine of these significantly inferior at 95% confidence)

Table 13

Econometric Evaluation

Distributor Number	Actual minus Predicted Cost	P-Value
Distributor Number 13	-56.1%	-
Distributor Number 2	-45.6%	0.001
Distributor Number 3	-38.1%	-
Distributor Number 15	-30.0%	0.005
Distributor Number 4	-24.4%	0.011
Distributor Number 39	-22.6%	0.030
Distributor Number 18	-22.0%	0.021
Distributor Number 40	-21.1%	0.026
Distributor Number 27	-20.1%	0.030
Distributor Number 5	-16.7%	0.057
Distributor Number 6	-16.6%	0.060
Distributor Number 56	-16.3%	0.064
Distributor Number 42	-15.0%	0.082
Distributor Number 12	-14.2%	0.091
Distributor Number 1	-12.5%	0.225
Distributor Number 52	-11.0%	0.154
Distributor Number 8	-9.7%	0.182
Distributor Number 25	-8.3%	0.217
Distributor Number 20	-7.9%	0.233
Distributor Number 7	-7.1%	0.254
Distributor Number 70	-6.9%	0.258
Distributor Number 48	-6.7%	0.269
Distributor Number 43	-6.1%	0.294
Distributor Number 11	-6.1%	0.284
Distributor Number 58	-5.3%	0.310
Distributor Number 22	-5.1%	0.317
Distributor Number 54	-4.8%	0.325
Distributor Number 41	-4.5%	0.338
Distributor Number 24	-3.9%	0.357
Distributor Number 61	-1.8%	0.433
Distributor Number 60	-1.4%	0.446
Distributor Number 47	-1.0%	0.465
Distributor Number 35	-1.0%	0.464
Distributor Number 30	-0.8%	0.471

	Actual minus Predicted Cost	P-Value
Distributor Number 23	0.2%	0.494
Distributor Number 28	2.0%	0.427
Distributor Number 17	2.1%	0.422
Distributor Number 62	2.6%	0.404
Distributor Number 37	2.6%	0.403
Distributor Number 73	2.9%	0.393
Distributor Number 29	3.2%	0.381
Distributor Number 32	3.7%	0.363
Distributor Number 19	6.3%	0.278
Distributor Number 36	7.0%	0.254
Distributor Number 49	7.0%	0.269
Distributor Number 31	7.3%	0.247
Distributor Number 71	7.6%	0.237
Distributor Number 50	9.5%	0.186
Distributor Number 57	9.9%	0.206
Distributor Number 9	10.7%	0.162
Distributor Number 51	11.3%	0.145
Distributor Number 55	11.4%	0.151
Distributor Number 69	13.4%	0.107
Distributor Number 16	14.0%	0.098
Distributor Number 67	14.2%	0.088
Distributor Number 59	14.5%	0.085
Distributor Number 64	14.5%	0.093
Distributor Number 44	16.0%	0.096
Distributor Number 14	16.6%	0.081
Distributor Number 46	17.2%	0.054
Distributor Number 72	17.2%	0.054
Distributor Number 68	17.3%	0.060
Distributor Number 63	18.1%	0.046
Distributor Number 45	18.9%	0.038
Distributor Number 10	19.8%	0.038
Distributor Number 38	20.7%	0.028
Distributor Number 53	20.7%	0.030
Distributor Number 26	24.9%	0.014
Distributor Number 74	25.4%	0.009
Distributor Number 65	35.9%	0.000
Distributor Number 75	66.6%	0.000

Peer Group/Unit Cost Benchmarking

- Objective was to select peer groups
 - Using similarity in cost drivers
 - Through a transparent process
 - Where peer groups are above a critical size (i.e. not as small as four distributors)

Table 23

Peer Groups for Ontario Distributors

Group A- Large Output, Extensive Area	Group B- Small Output, Extensive Area, Above Average Customer Growth	Group C- Small Output, Extensive Area, Below Average Undergrounding and Growth
ENERSOURCE HYDRO MISSISSAUGA INC.	BRANT COUNTY POWER INC.	ALGOMA POWER INC.
ENWIN UTILITIES LTD.	BURLINGTON HYDRO INC.	ATIKOKAN HYDRO INC.
HORIZON UTILITIES CORPORATION	CAMBRIDGE AND NORTH DUMFRIES HYDRO INC.	BLUEWATER POWER DISTRIBUTION CORPORATION
HYDRO ONE BRAMPTON NETWORKS INC.	CANADIAN NIAGARA POWER INC.	ERIE THAMES POWERLINES CORPORATION
HYDRO ONE NETWORKS INC.	HALTON HILLS HYDRO INC.	GREATER SUDBURY HYDRO INC.
HYDRO OTTAWA LIMITED	INNISFIL HYDRO DISTRIBUTION SYSTEMS LIMITED	HALDIMAND COUNTY HYDRO INC.
KITCHENER-WILMOT HYDRO INC.	MILTON HYDRO DISTRIBUTION INC.	LAKELAND POWER DISTRIBUTION LTD.
LONDON HYDRO INC.	NIAGARA-ON-THE-LAKE HYDRO INC.	NIAGARA PENINSULA ENERGY INC.
POWERSTREAM INC.	OAKVILLE HYDRO ELECTRICITY DISTRIBUTION INC.	NORFOLK POWER DISTRIBUTION INC.
TORONTO HYDRO-ELECTRIC SYSTEM	WATERLOO NORTH HYDRO INC.	NORTH BAY HYDRO DISTRIBUTION LIMITED
VERIDIAN CONNECTIONS INC.	WHITBY HYDRO ELECTRIC CORPORATION	PUC DISTRIBUTION INC.
		SIoux LOOKOUT HYDRO INC.
		THUNDER BAY HYDRO ELECTRICITY DISTRIBUTION INC.
Group D- Small Output, Small Area, Above Average Customer Growth	Group E- Small Output, Small Area, Below Average Customer Growth	Group F- Small Output, Above Average Undergrounding, Below Average Customer Growth
CENTRE WELLINGTON HYDRO LTD.	CHAPLEAU PUBLIC UTILITIES CORPORATION	BRANTFORD POWER INC.
COLLUS POWER CORPORATION	ENTEGRUS POWERLINES	E.L.K. ENERGY INC.
COOPERATIVE HYDRO EMBRUN INC.	ESPANOLA REGIONAL HYDRO DISTRIBUTION CORPORATION	ESSEX POWERLINES CORPORATION
GRIMSBY POWER INCORPORATED	FORT FRANCES POWER CORPORATION	FESTIVAL HYDRO INC.
GUELPH HYDRO ELECTRIC SYSTEMS INC.	HEARST POWER DISTRIBUTION COMPANY LIMITED	KINGSTON HYDRO CORPORATION
LAKEFRONT UTILITIES INC.	HYDRO 2000 INC.	ORANGEVILLE HYDRO LIMITED
MIDLAND POWER UTILITY CORPORATION	HYDRO HAWKESBURY INC.	OSHAWA PUC NETWORKS INC.
NEWMARKET-TAY POWER DISTRIBUTION	KENORA HYDRO ELECTRIC CORPORATION LTD.	PETERBOROUGH DISTRIBUTION INCORPORATED
ST. THOMAS ENERGY INC.	NORTHERN ONTARIO WIRES INC.	TILLSONBURG HYDRO INC.
WASAGA DISTRIBUTION INC.	ORILLIA POWER DISTRIBUTION CORPORATION	WOODSTOCK HYDRO SERVICES INC.
	OTTAWA RIVER POWER CORPORATION	
	PARRY SOUND POWER CORPORATION	
	RENFREW HYDRO INC.	
	RIDEAU ST. LAWRENCE DISTRIBUTION INC.	
	WELLAND HYDRO-ELECTRIC SYSTEM CORP.	
	WELLINGTON NORTH POWER INC.	
	WEST COAST HURON ENERGY INC.	
	WESTARIO POWER INC.	

Table 24

Unit Costs By Peer Group

Group A- Large Output, Extensive Area		
Company Name	2009-2011 Unit Cost Average	Benchmark Unit Cost Comparison
ENERSOURCE HYDRO MISSISSAUGA INC.	44,171,342.06	-3.5%
ENWIN UTILITIES LTD.	52,733,099.86	15.2%
HORIZON UTILITIES CORPORATION	37,404,874.85	-18.3%
HYDRO ONE BRAMPTON NETWORKS INC.	42,873,918.64	-6.3%
HYDRO ONE NETWORKS INC.	58,869,958.84	28.6%
HYDRO OTTAWA LIMITED	42,402,993.49	-7.3%
KITCHENER-WILMOT HYDRO INC.	34,862,300.65	-23.8%
LONDON HYDRO INC.	35,693,442.92	-22.0%
POWERSTREAM INC.	43,521,777.95	-4.9%
TORONTO HYDRO-ELECTRIC SYSTEM LIMITED	70,787,098.03	54.7%
VERIDIAN CONNECTIONS INC.	40,069,784.87	-12.4%
Group Average	45,762,781.10	
Group B- Small Output, Extensive Area, High Growth		
Company Name	2009-2011 Unit Cost Average	Benchmark Unit Cost Comparison
BRANT COUNTY POWER INC.	50,356,575.90	13.3%
BURLINGTON HYDRO INC.	39,463,700.77	-11.2%
CAMBRIDGE AND NORTH DUMFRIES HYDRO INC.	39,158,703.46	-11.9%
CANADIAN NIAGARA POWER INC.	50,197,876.81	12.9%
HALTON HILLS HYDRO INC.	36,020,522.44	-19.0%
INNISFIL HYDRO DISTRIBUTION SYSTEMS LIMITED	42,966,128.84	-3.3%
MILTON HYDRO DISTRIBUTION INC.	47,353,397.43	6.5%
NIAGARA-ON-THE-LAKE HYDRO INC.	45,087,493.43	1.4%
OAKVILLE HYDRO ELECTRICITY DISTRIBUTION INC.	48,452,933.21	9.0%
WATERLOO NORTH HYDRO INC.	43,463,668.88	-2.2%
WHITBY HYDRO ELECTRIC CORPORATION	46,426,167.71	4.4%
Group Average	44,449,742.63	
Group C- Small Output, Extensive Area, Below Average Undergrounding and Growth		
Company Name	2009-2011 Unit Cost Average	Benchmark Unit Cost Comparison
ALGOMA POWER INC.	86,301,012.53	85.4%
ATIKOKAN HYDRO INC.	52,273,319.23	12.3%
BLUEWATER POWER DISTRIBUTION CORPORATION	41,588,544.77	-10.6%
ERIE THAMES POWERLINES CORPORATION	48,903,704.04	5.1%
GREATER SUDBURY HYDRO INC.	45,892,569.66	-1.4%
HALDIMAND COUNTY HYDRO INC.	35,008,338.00	-24.8%
LAKELAND POWER DISTRIBUTION LTD.	44,442,370.17	-4.5%
NIAGARA PENINSULA ENERGY INC.	44,553,279.32	-4.3%
NORFOLK POWER DISTRIBUTION INC.	44,304,189.59	-4.8%
NORTH BAY HYDRO DISTRIBUTION LIMITED	43,240,820.23	-7.1%
PUC DISTRIBUTION INC.	36,987,434.72	-20.5%
SIOUX LOOKOUT HYDRO INC.	37,960,463.65	-18.4%
THUNDER BAY HYDRO ELECTRICITY DISTRIBUTION	43,588,404.83	-6.3%
Group Average	46,541,880.83	

Group D- Small Output, Small Area, High Growth		
Company Name	2009-2011 Unit Cost Average	Benchmark Unit Cost Comparison
CENTRE WELLINGTON HYDRO LTD.	38,809,015.11	-7.0%
COLLUS POWER CORPORATION	41,008,125.56	-1.8%
COOPERATIVE HYDRO EMBRUN INC.	51,051,765.03	22.3%
GRIMSBY POWER INCORPORATED	37,102,188.55	-11.1%
GUELPH HYDRO ELECTRIC SYSTEMS INC.	48,983,647.69	17.3%
LAKEFRONT UTILITIES INC.	36,944,557.62	-11.5%
MIDLAND POWER UTILITY CORPORATION	44,602,078.09	6.8%
NEWMARKE-TAY POWER DISTRIBUTION LTD.	41,074,924.28	-1.6%
ST. THOMAS ENERGY INC.	40,913,971.74	-2.0%
WASAGA DISTRIBUTION INC.	36,982,324.00	-11.4%
Group Average	41,747,259.77	
Group E- Small Output, Small Area, Slow Growth		
Company Name	2009-2011 Unit Cost Average	Benchmark Unit Cost Comparison
CHAPLEAU PUBLIC UTILITIES CORPORATION	42,055,472.80	4.0%
ENTEGRUS POWERLINES	41,094,587.59	1.6%
ESPANOLA REGIONAL HYDRO DISTRIBUTION CORPORATION	38,852,915.81	-3.9%
FORT FRANCES POWER CORPORATION	48,152,849.74	19.1%
HEARST POWER DISTRIBUTION COMPANY LIMITED	28,679,825.65	-29.1%
HYDRO 2000 INC.	34,730,444.52	-14.1%
HYDRO HAWKESBURY INC.	20,289,273.44	-49.8%
KENORA HYDRO ELECTRIC CORPORATION LTD.	44,189,418.71	9.3%
NORTHERN ONTARIO WIRES INC.	33,646,419.79	-16.8%
ORILLIA POWER DISTRIBUTION CORPORATION	41,706,341.96	3.1%
OTTAWA RIVER POWER CORPORATION	42,939,091.97	6.2%
PARRY SOUND POWER CORPORATION	45,240,103.16	11.9%
RENFREW HYDRO INC.	50,178,128.48	24.1%
RIDEAU ST. LAWRENCE DISTRIBUTION INC.	37,285,466.09	-7.8%
WELLAND HYDRO-ELECTRIC SYSTEM CORP.	36,266,449.98	-10.3%
WELLINGTON NORTH POWER INC.	54,780,232.87	35.4%
WEST COAST HURON ENERGY INC.	44,809,620.80	10.8%
WESTARIO POWER INC.	43,123,590.05	6.6%
Group Average	40,445,568.52	
Group F- Small Output, Above Average Undergrounding, Below Average Growth		
Company Name	2009-2011 Unit Cost Average	Benchmark Unit Cost Comparison
BRANTFORD POWER INC.	42,708,771.79	-4.1%
E.L.K. ENERGY INC.	37,326,747.36	-16.2%
ESSEX POWERLINES CORPORATION	40,981,405.89	-8.0%
FESTIVAL HYDRO INC.	49,276,104.35	10.6%
KINGSTON HYDRO CORPORATION	40,315,352.43	-9.5%
ORANGEVILLE HYDRO LIMITED	45,189,614.78	1.4%
OSHAWA PUC NETWORKS INC.	39,709,013.51	-10.9%
PETERBOROUGH DISTRIBUTION INCORPORATED	44,808,269.63	0.6%
TILLSONBURG HYDRO INC.	44,484,426.14	-0.2%
WOODSTOCK HYDRO SERVICES INC.	60,745,230.93	36.3%
Group Average	44,554,493.68	

Table 25

Unit Cost Evaluations

Company Name	2009-2011 Average / 2009-2011 Group Average	Efficiency Ranking
YDRO HAWKESBURY INC.	-49.8%	1
EARST POWER DISTRIBUTION COMPANY LIMITED	-29.1%	2
ALDIMAND COUNTY HYDRO INC.	-24.8%	3
ITCHENER-WILMOT HYDRO INC.	-23.8%	4
ONDON HYDRO INC.	-22.0%	5
UC DISTRIBUTION INC.	-20.5%	6
ALTON HILLS HYDRO INC.	-19.0%	7
OUX LOOKOUT HYDRO INC.	-18.4%	8
ORIZON UTILITIES CORPORATION	-18.3%	9
ORTHERN ONTARIO WIRES INC.	-16.8%	10
L.K. ENERGY INC.	-16.2%	11
YDRO 2000 INC.	-14.1%	12
ERIDIAN CONNECTIONS INC.	-12.4%	13
AMBRIDGE AND NORTH DUMFRIES HYDRO INC.	-11.9%	14
AKEFRONT UTILITIES INC.	-11.5%	15
ASAGA DISTRIBUTION INC.	-11.4%	16
URLINGTON HYDRO INC.	-11.2%	17
RIMSBY POWER INCORPORATED	-11.1%	18
SHAWA PUC NETWORKS INC.	-10.9%	19
LUEWATER POWER DISTRIBUTION CORPORATION	-10.6%	20
HELLAND HYDRO-ELECTRIC SYSTEM CORP.	-10.3%	21
INGSTON HYDRO CORPORATION	-9.5%	22
SSEX POWERLINES CORPORATION	-8.0%	23
IDEAU ST. LAWRENCE DISTRIBUTION INC.	-7.8%	24
YDRO OTTAWA LIMITED	-7.3%	25
ORTH BAY HYDRO DISTRIBUTION LIMITED	-7.1%	26
ENTRE WELLINGTON HYDRO LTD.	-7.0%	27
HUNDER BAY HYDRO ELECTRICITY DISTRIBUTION INC.	-6.3%	28
YDRO ONE BRAMPTON NETWORKS INC.	-6.3%	29
OWERSTREAM INC.	-4.9%	30
ORFOLK POWER DISTRIBUTION INC.	-4.8%	31
AKELAND POWER DISTRIBUTION LTD.	-4.5%	32
IAGARA PENINSULA ENERGY INC.	-4.3%	33
RANTFORD POWER INC.	-4.1%	34
SPANOLA REGIONAL HYDRO DISTRIBUTION CORPORATION	-3.9%	35
VERSOURCE HYDRO MISSISSAUGA INC.	-3.5%	36
INISFIL HYDRO DISTRIBUTION SYSTEMS LIMITED	-3.3%	37
ATERLOO NORTH HYDRO INC.	-2.2%	38
F. THOMAS ENERGY INC.	-2.0%	39
OLLUS POWER CORPORATION	-1.8%	40
EWMARKET-TAY POWER DISTRIBUTION LTD.	-1.6%	41
REATER SUDBURY HYDRO INC.	-1.4%	42
LLSONBURG HYDRO INC.	-0.2%	43

Company Name	2009-2011 Average / 2009-2011 Group Average	Efficiency Ranking
PETERBOROUGH DISTRIBUTION INCORPORATED	0.6%	44
ORANGEVILLE HYDRO LIMITED	1.4%	45
NIAGARA-ON-THE-LAKE HYDRO INC.	1.4%	46
ENTEGRUS POWERLINES	1.6%	47
ORILLIA POWER DISTRIBUTION CORPORATION	3.1%	48
CHAPLEAU PUBLIC UTILITIES CORPORATION	4.0%	49
WHITBY HYDRO ELECTRIC CORPORATION	4.4%	50
ERIE THAMES POWERLINES CORPORATION	5.1%	51
OTTAWA RIVER POWER CORPORATION	6.2%	52
MILTON HYDRO DISTRIBUTION INC.	6.5%	53
WESTARIO POWER INC.	6.6%	54
MIDLAND POWER UTILITY CORPORATION	6.8%	55
OAKVILLE HYDRO ELECTRICITY DISTRIBUTION INC.	9.0%	56
KENORA HYDRO ELECTRIC CORPORATION LTD.	9.3%	57
FESTIVAL HYDRO INC.	10.6%	58
WEST COAST HURON ENERGY INC.	10.8%	59
PARRY SOUND POWER CORPORATION	11.9%	60
ATIKOKAN HYDRO INC.	12.3%	61
CANADIAN NIAGARA POWER INC.	12.9%	62
BRANT COUNTY POWER INC.	13.3%	63
ENWIN UTILITIES LTD.	15.2%	64
GUELPH HYDRO ELECTRIC SYSTEMS INC.	17.3%	65
FORT FRANCES POWER CORPORATION	19.1%	66
COOPERATIVE HYDRO EMBRUN INC.	22.3%	67
RENFREW HYDRO INC.	24.1%	68
HYDRO ONE NETWORKS INC.	28.6%	69
WELLINGTON NORTH POWER INC.	35.4%	70
WOODSTOCK HYDRO SERVICES INC.	36.3%	71
TORONTO HYDRO-ELECTRIC SYSTEM LIMITED	54.7%	72
ALGOMA POWER INC.	85.4%	73

Stretch Factor Recommendations

PEG recommends

- five efficiency cohorts
 - >> increasing the number of cohorts makes it easier for distributors to migrate to higher cohorts and therefore benefit from actions to cut costs
- the econometric benchmarking model and unit cost benchmarking model continue to be used to establish distributors into efficiency cohorts
- Stretch factor values based on judgment:
 - Max 0.6% as per 3rd Gen IR
 - Min 0.0% to encourage and reward efforts to reduce unit cost

Stretch Factor Recommendations (con't)

- Cohort I:** Significantly superior econometric benchmarking
Top quintile unit cost benchmarking
Stretch factor = 0
- Cohort II:** Significantly superior econometric benchmarking
Second quintile unit cost benchmarking
Stretch factor = 0.15%
- Cohort IV:** Significantly inferior econometric benchmarking
Fourth quintile unit cost benchmarking
Stretch factor = 0.45%
- Cohort V:** Significantly inferior econometric benchmarking
Fifth quintile unit cost benchmarking
Stretch factor 0.6%
- Cohort III:** All others
Stretch factor 0.3%

Table 26

Efficiency Cohorts for Ontario Electricity Distributors

Cohort I	Cohort II	Cohort III	Cohort IV	Cohort V
Distributor 13	Distributor 2	All Others	Distributor 44	Distributor 16
Distributor 3	Distributor 4		Distributor 72	Distributor 64
Distributor 15	Distributor 5		Distributor 45	Distributor 14
Distributor 18	Distributor 12		Distributor 26	Distributor 46
Distributor 40				Distributor 63
Distributor 27				Distributor 10
Distributor 6				Distributor 38
Distributor 42				Distributor 53
				Distributor 74
				Distributor 65
				Distributor 75
				Distributor 26
				Distributor 68

Conclusion

- PEG believes its recommendations are consistent with the Board's Policy direction in its RRF Report
- More Ontario-specific inflation factor possible; volatility can be mitigated in a straightforward way
- Low value of productivity factor mostly reflects slow growth in output quantity
- Benchmarking suggests some distributors can still achieve significant efficiency gains through cost-cutting
- 4th Gen IR should strengthen incentive to pursue incremental efficiency gains

Background Slides

BOARD POLICY DIRECTION IN THE RRF REPORT

May 27, 2013



Board Policy Direction in the RRF Report

Inflation Factor

- It is now appropriate to adopt a more industry-specific inflation factor
- Volatility will be mitigated by methodology adopted by Board
- Also:
 - Inflation factor must be constructed and updated using data that is readily available from public and objective sources (e.g. StatsCanada)
 - To the extent practicable, the component of inflation factor designed to adjust for non-labor price inflation should be indexed by Ontario distribution industry-specific indices
 - The component of the inflation factor that adjusts for labor prices will be indexed by an appropriate generic and off-the-shelf labor price index

Board Policy Direction in the RRF Report (con't)

Productivity Factor

- Intended to be the external benchmark which all distributors are expected to achieve
- Board will continue to build on its approach to benchmarking with further empirical work, including an Ontario TFP study
 - Productivity factor to be based on an index-based estimate of total factor productivity (TFP) growth in Ontario's electricity distribution industry
- >> PEG notes that external X factor critical to design of IR plans and creating appropriate incentives (Chapter 2 PEG report)

Board Policy Direction in the RRF Report (con't)

Benchmarking

- Board will continue to build on its approach to benchmarking with further empirical work, including Total Cost Benchmarking

Board Policy Direction in the RRF Report (con't)

Stretch Factor

- Intended to reflect the incremental efficiency gains distributors are expected to achieve under IR
- Can vary by distributor and depend on the efficiency of a given distributor at the outset of the IR plan
- The Board's approach in relation to the use and assignment of stretch factors will continue
 - Distributors will continue to be assigned annually to efficiency cohorts
 - Assignments will be made on the basis of total cost benchmarking evaluations
- The Board will further consider whether the current stretch factor values continue to be appropriate or whether there should be greater differentiation between the values