# Toronto Hydro Benchmarking study

Presentation to OEB RRFE Performance Measurement and benchmarking Working group

Benny LaPianta, VP Grid Management
Alex Bakulev, Manager Power System Planning and Logistics
January, 2013

# Agenda

- Current OEB Benchmarking Model
- Ontario and North America utility dataset
- THESL North America benchmarking results
- Next steps

# OEB Benchmarking (2013 Econometric Model)

**Actual OM&A** $212.3M

(3-year average)
Operation and Maintenance,
Administration, Bad Debt Expense

THESL
2009-2011

| | Model Variable (Logarithmic 'Quadratic' function) | THESL Actual (2011) |
|---|---|---|
| Output Category | # of Customers | 709,323 |
| | Total Volumes(KWh delivered) | 24,708GWh |
| | Total KM of lines | 10,061 |
| Price | Input Price Index (Labour and Non-Labour) | 1,441 |
| Business Conditions | % of UG lines | 58.6% |
| | 10-Year Customer Growth index (proxy for plant age) | 1120 |
| | Canadian Shield | No |

**Predicted OM&A** $153.7M

by Econometric Benchmarking Model
(3-year average)

THESL

$$\frac{\text{OM\&A Actual}}{\text{OM\&A Prediction}} = \text{Ratio}$$

THESL Ratio
2008-2010

$$\frac{\$212.3M}{\$153.7M} = 1.381$$

# OEB Benchmarking

## (2013 Unit Cost Indexing Model)

$$\text{OM\&A Unit Cost} = \frac{\text{OM\&A}}{\text{Output Index}}$$

Logarithmic function of:

| Parameters | Index Weights |
|---|---|
| # of Customers | 0.53 |
| Total Volumes | 0.34 |
| Total KM of lines | 0.13 |

To calculate the ratio OEB uses 3-year average numbers

$$\text{Ratio} = \frac{\text{OM\&A Unit Cost Actual}}{\text{OM\&A Unit Cost Peer Average}} = \frac{1.234}{1.005} = 1.228$$

THESL Peer Group Ratios (2008-2010)

| Utility | 3-Year Average Unit Cost | Ratio |
|---|---|---|
| Hydro Ottawa | 0.837 | 0.811 |
| Veridian | 0.815 | 0.833 |
| EnWin | 1.134 | 1.129 |
| THESL | 1.234 | 1.228 |
| Average | 1.005 | |

Peer Definition Large City, Southern, Med – High UG

# OEB Benchmarking (2013 Cohort Identification)

| Distributor must fall into the "superior" group in both benchmarking methods | Other Distributors | Distributor must fall into the "inferior" group in both benchmarking methods |
|---|---|---|
| **Cohort 1** | **Cohort 2** | **Cohort 3** |
| Entegrus Powerlines Inc. (Chatham-Kent Hydro Inc.) | 50 Other Distributors | Algoma Power Inc. |
| Festival Hydro Inc. | | Brant County Power Inc. |
| Grimsby Power Incorporated | Hydro One Networks Inc. | Centre Wellington Hydro Ltd. |
| Hydro Hawkesbury Inc. | PowerStream Inc. | COLLUS Power Corp. |
| Hydro One Brampton Networks Inc. | Hydro Ottawa Limited | Erie Thames Powerlines Corporation |
| Kitchener-Wilmot Hydro Inc. | Horizon Utilities Corporation | Orillia Power Distribution Corporation |
| Entegrus Powerlines Inc. (Middlesex Power Distribution Corporation) | Enersource Hydro Mississauga Inc. | Port Colborne (CNP) |
| North Bay Hydro Distribution Limited | London Hydro Inc. | Tillsonburg Hydro Inc. |
| Northern Ontario Wires Inc. | Veridian Connections Inc. | Toronto Hydro-Electric System Limited |
| Renfrew Hydro Inc. | Etc… | Wellington North Power Inc. |
| **-0.2%** | **-0.4%** | **-0.6%** |

**Stretch Factor**

Source: Third Generation Incentive Regulation Stretch Factor Updates for 2013 using 2009 – 2011 data from "RRR"

# Is there Opportunity For THESL to Improve The Ranking?*

## Sensitivity Analysis

- To move from Cohort 3 to Cohort 2
  - ✓ Change any of these parameters in all three years 2008-2010
    - + 20% in Customer Counts 2008-2010 (Econometric model)
    - + 25% in Volumes of Electricity sales 2008-2010 (Both models)
    - – $19M in OM&A 2008-2010 (Unit cost peer)
    - – $26M in OM&A 2008-2010 (Econometric model)
  - ✓ Change either of these parameters only 2010
    - – $50M in OM&A 2010 (Unit cost peer)
    - – $70M in OM&A 2010 (Econometric model)

## Total Cost Model (includes OM&A & CAPEX)

- Total Cost Model
  - ✓ No change in relative position compare to OM&A OEB Model
  - ✓ Econometric: costs are 40% worse than benchmark (+32% in OM&A model)
  - ✓ Peer Index : costs are 40% worse than benchmark (+17% in OM&A model)

* Using data from 'Third Generation Incentive Regulation Stretch Factor Updates for 2012 (EB-2011-0387) ' Report

# Ontario Benchmarking - Conclusions

The current OEB Models are *insensitive to move within Cohorts* :

- ✓ Reduce OM&A by $70M to gain ~ $1M in rates – unrealistic for THESL
- ✓ Increase customer count by 20% - unrealistic for THESL
- ✓ Increase electricity sales by 25% - unrealistic for THESL
- ✓ Including Total Cost (OM&A + CAPEX) will not impact Cohort ranking

- THESL does not have an Ontario peer, nor does it have a Canadian Peer - is an "outlier" in Ontario dataset [1]
  - ✓ Our closest "peer" has ~43% of our customer count, ~31% of our consumption, ~33% of the population, ~23% of the asset base (Hydro Ottawa)
  - ✓ The next largest to THESL utility has ~47% of our customer count, ~34% of our consumption, ~41% of the population, ~30% of the asset base (Powerstream)
- The current OEB benchmarking approach (dataset) is not sensitive to the *business conditions* that impact the cost performance of a highly diversified and complex, dense, urban utility.

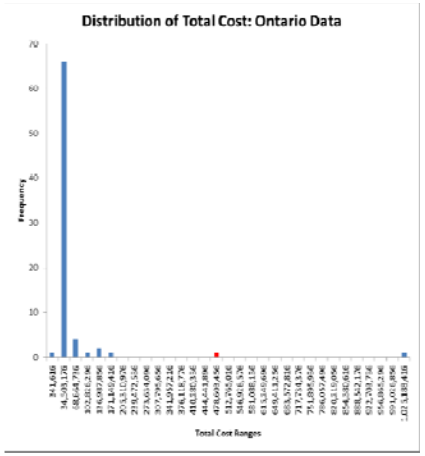
[1] Excluding HONI. HONI doesn't have a peer in Peer Unit Index model. Source: 2011 Yearbook of Electricity Distributors. OEB

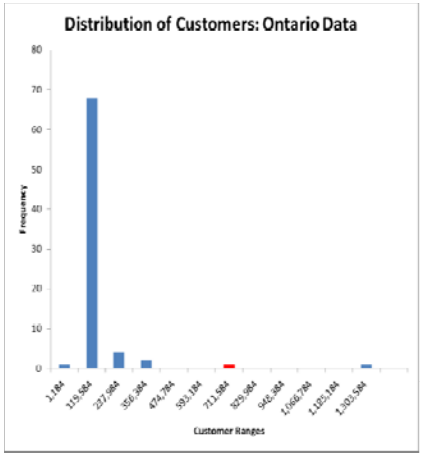
# U.S.A. Benchmark: Dataset Is Better Fit For THESL Size And Conditions

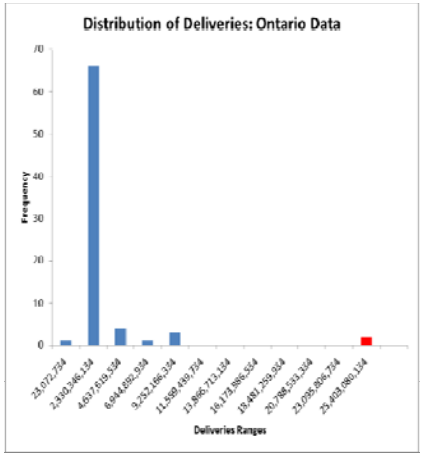
## Ontario

THESL compare to average:

- Cost **15x** bigger
- Customers **13x** bigger
- Deliveries **20x** bigger



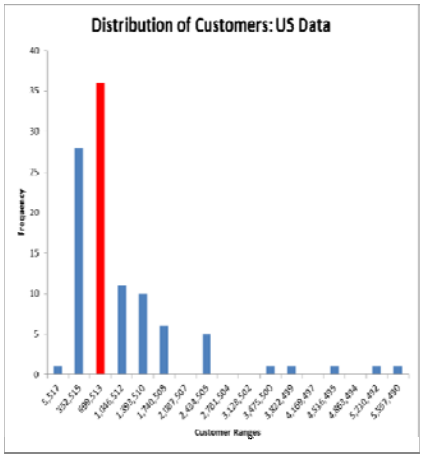



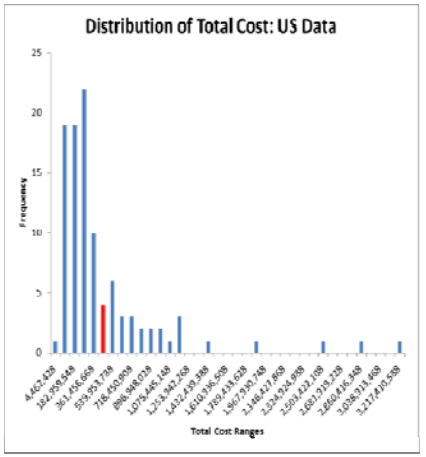



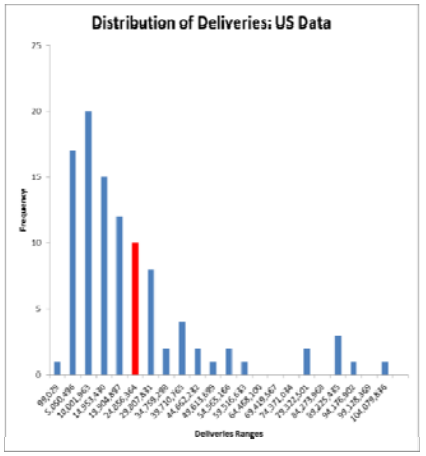

**Costs** **Customers** **Deliveries**

## USA

- Accounts for Urban Core Centre
- Relative Peer Group



# U.S.A. Benchmarking Research

- 102 U.S. utilities included in data set
- *9 years of data*[1]
- THESL is a *mid-size* utility within the dataset.
- *Establish Legitimate peer group*
- *New variables* recognize business conditions that impact utility cost drivers, such as:
  - ✓ Urban Core
  - ✓ Customer Density
  - ✓ Load mix
  - ✓ Vertical Integration
  - ✓ Horizontal Integration
  - ✓ Weather
  - ✓ Urban Canopy

**Criteria Peer group**:

- > 250K Customers
- % of Electric Customers >50%
- Customer Density per Line Mile > 25
- % of Distribution Electric Plant >50%
- Serves an urban center with population greater than 500K

- Commonwealth Edison
- Baltimore Gas & Electric
- Potomac Electric Power Company
- Pacific Gas & Electric
- Consolidated Edison of NY
- San Diego Electric & Gas

1- *2002 – 2010)*data, (FERC 1, EIA-861, EIA-176 forms, U.S. Census, Platts UDI Directory, U.S. Forest Service, Weather data, RS Mean's Heavy Construction Cost Data.)

# U.S.A. Benchmarking (Econometric Model)

Actual Total Cost $396.3M

OM&A + Allowed rate of return + Depreciation [1] THESL 2008-2010

| | Model Variable[2] (Logarithmic Translog function) | THESL Averages (2008-10) |
|---|---|---|
| Output Category | # of Customers | 691,591 |
| | Total Volumes (KWh delivered) | 24,824GWh |
| Price | Capital Service Price Index | 6.784 |
| Business Conditions | + Urban Core Dummy (>1M) | 1 |
| | + Density: Customers/Line Mile | 52.28 |
| | + Percent Electric Customers in Gas & Electric Customers | 1.00 |
| | + Percent Residential Deliveries in Total Deliveries | 0.208 |
| | + Percent Distribution Plant in Total Electric Plant | 1.00 |
| | + Wind*Percent Territory Forested | 1476 * 0.250 |

Predicted Total Cost $544.1M

by Econometric Benchmarking Model THESL

Total Cost Actual / Total Cost Prediction = Ratio

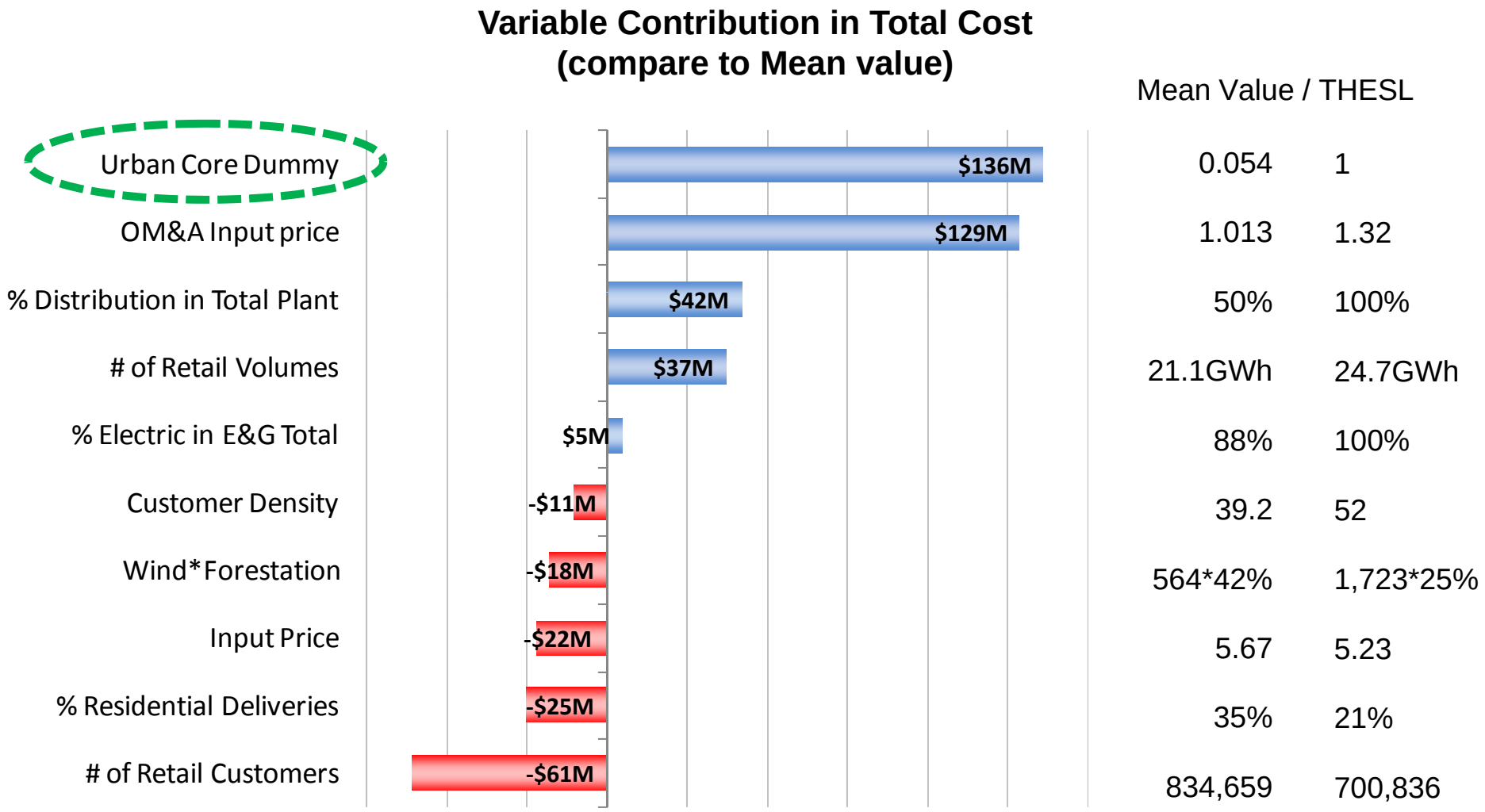
THESL Ratio 2008-2010

$\frac{\$396.3M}{\$544.1M} = 0.728$

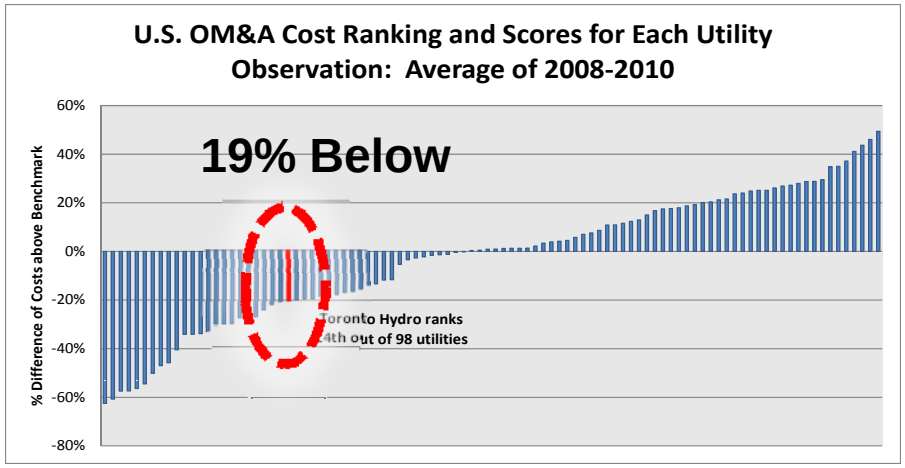
[1] Actual formula for Capital cost is based on the Capital Service Price Index calculated using regional Index Of The Price Of Capital Assets

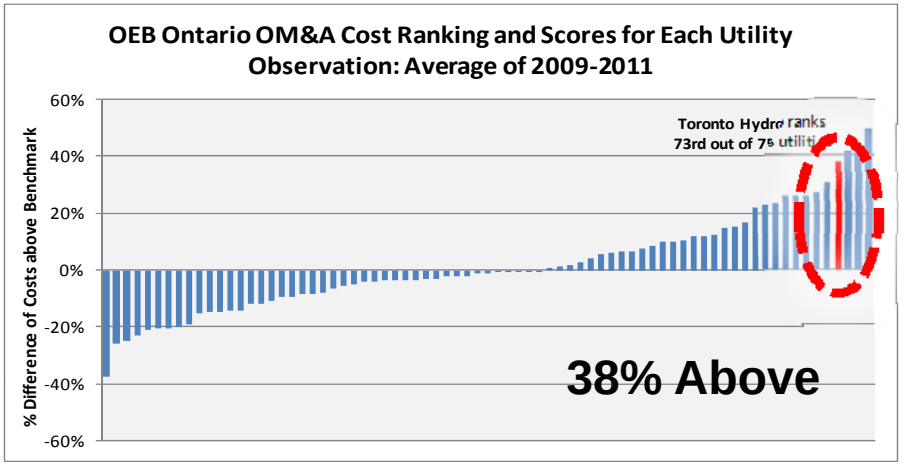
[2] The following variables didn't fit the model compared to OEB model: Total KM of lines, % of UG lines, 10-Year Customer Growth index, Canadian Shield

# In USA Benchmark The Most Influential Variable Is Urban Core Missed In The OEB Model (Econometric Model)



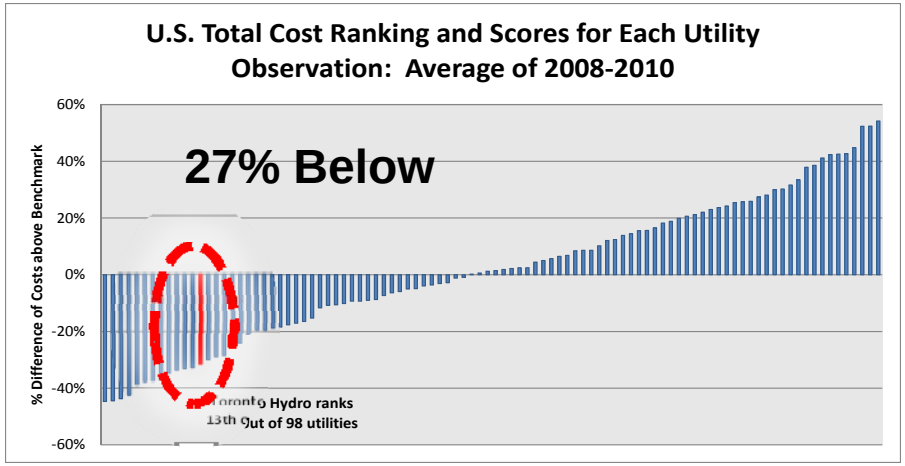
# THESL Is Below Average in Total And OM&A In U.S. Benchmark Compare To Above In Ontario (Econometric Model)*

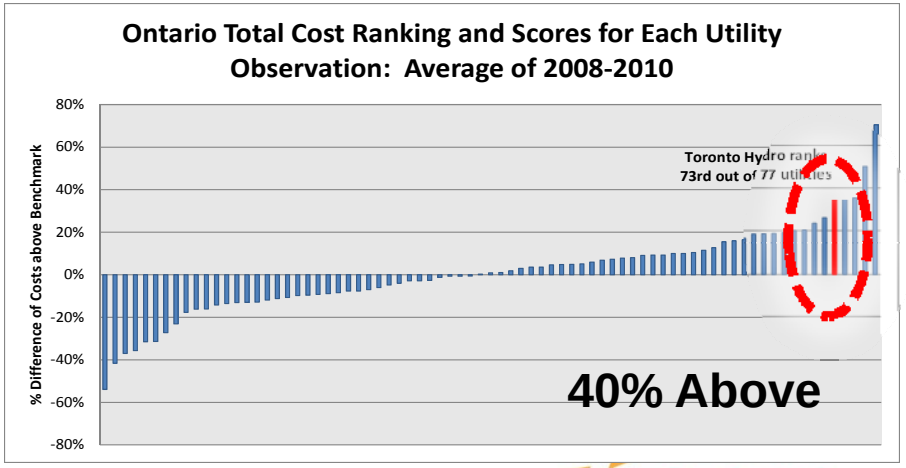



**U.S. Benchmark**

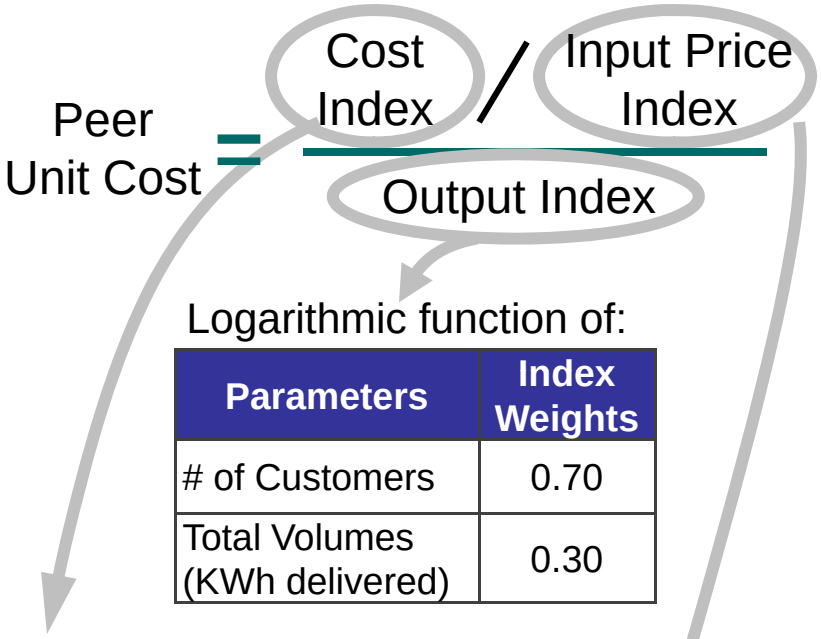
**Ontario Benchmark**




* Total Cost and OMA U.S. Benchmark and Ontario Total Cost percentages are determined logarithmically by taking the natural log of the actual value divided by the benchmark value.

# U.S.A. Benchmarking (Peer Indexing Model)




Logarithmic function of:

| Parameters | Index Weights |
|---|---|
| # of Customers | 0.70 |
| Total Volumes (KWh delivered) | 0.30 |

Logarithmic function of:

| Parameters | Index Weights |
|---|---|
| Total Cost | 1.00 |

Logarithmic function of:

| Parameters | Index Weights |
|---|---|
| OM&A Price Index | 0.50 |
| Capital Service Index | 0.50 |

To calculate the ratio, PSE uses 3-year average numbers

$$\frac{\text{Unit Cost Actual}}{\text{Unit Cost Peer Average}} = \text{Ratio}$$

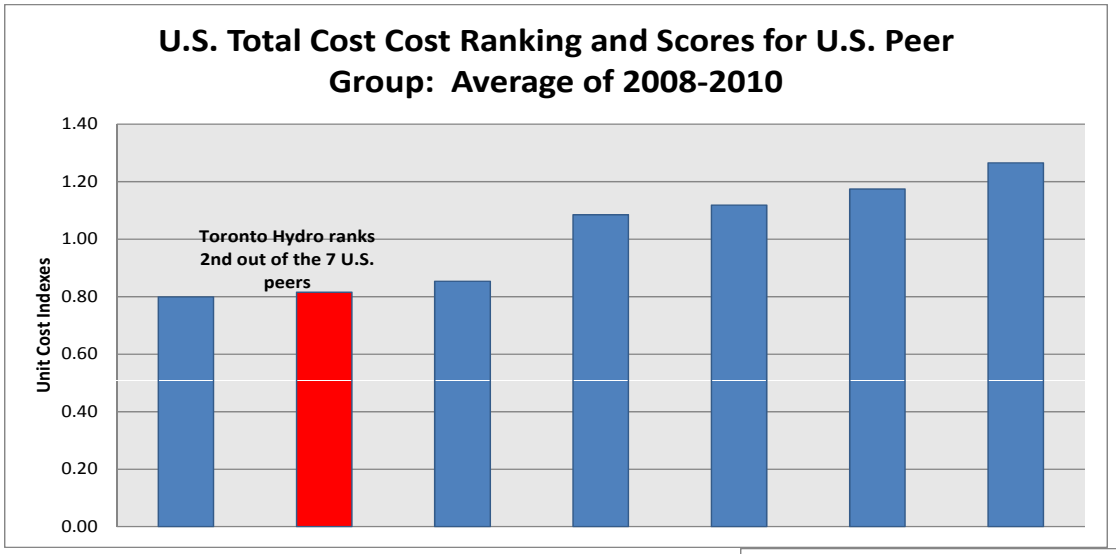
THESL Ratio 2008-2010

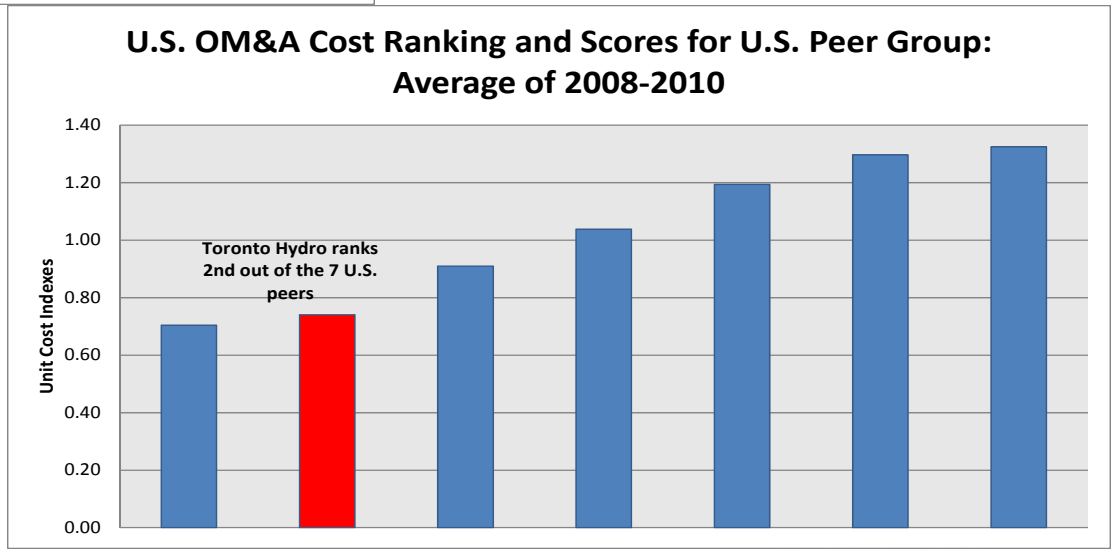
$$\frac{.81}{1.02} = .802$$

THESL Peer Group Ratios (2008-2010)

| Utility | 3-Year Average Unit Cost | Ratio |
|---|---|---|
| Utility 1 | 0.80 | 0.786 |
| **THESL - 2** | **0.81** | **0.802** |
| Utility 3 | 0.85 | 0.840 |
| Utility 4 | 1.08 | 1.068 |
| Utility 5 | 1.12 | 1.101 |
| Utility 6 | 1.18 | 1.157 |
| Utility 7 | 1.27 | 1.246 |
| Average | 1.02 | |

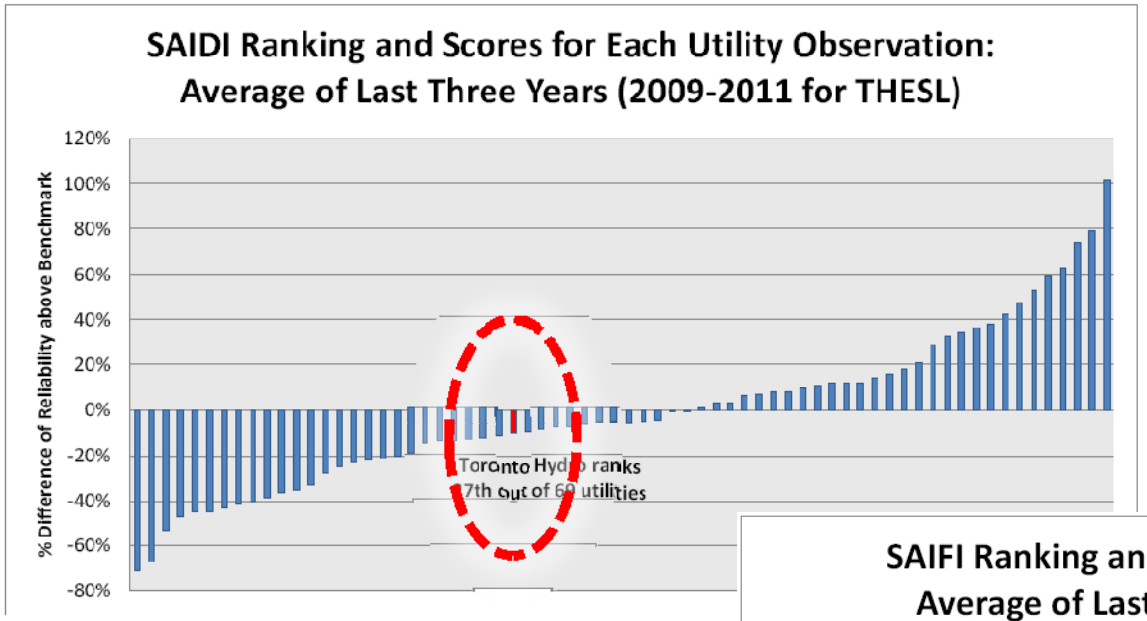
# THESL Ranks 2nd In The Peer Group: 20% Below In Total Cost And 28% Below In OM&A To Peer Average (2010) (Peer Indexing Model)*

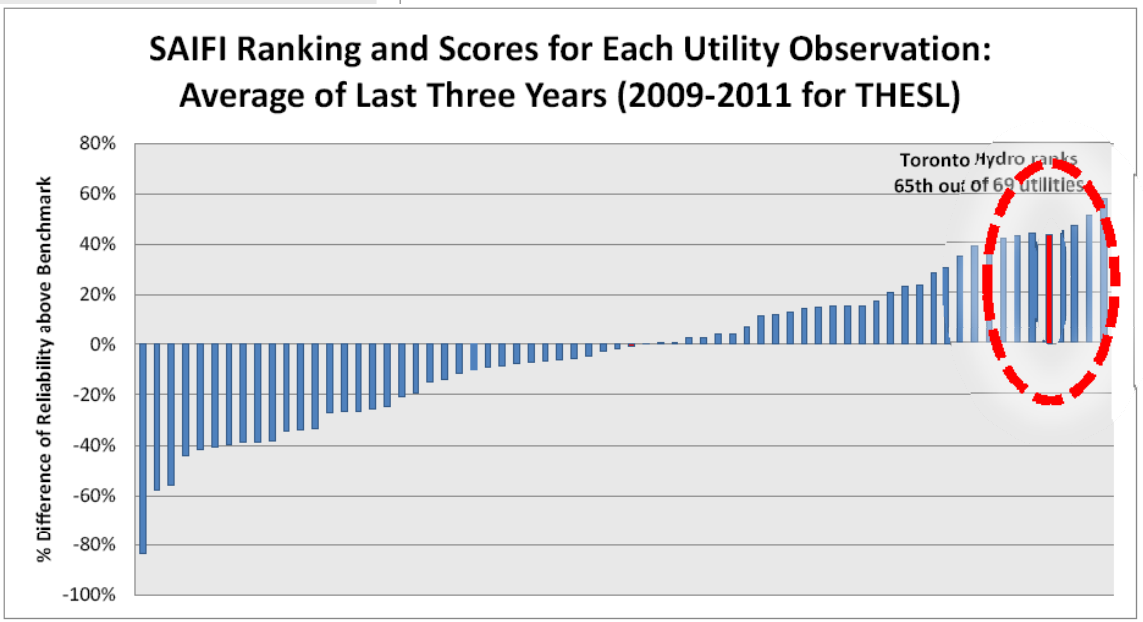



* Ratio of Actual to Benchmark costs

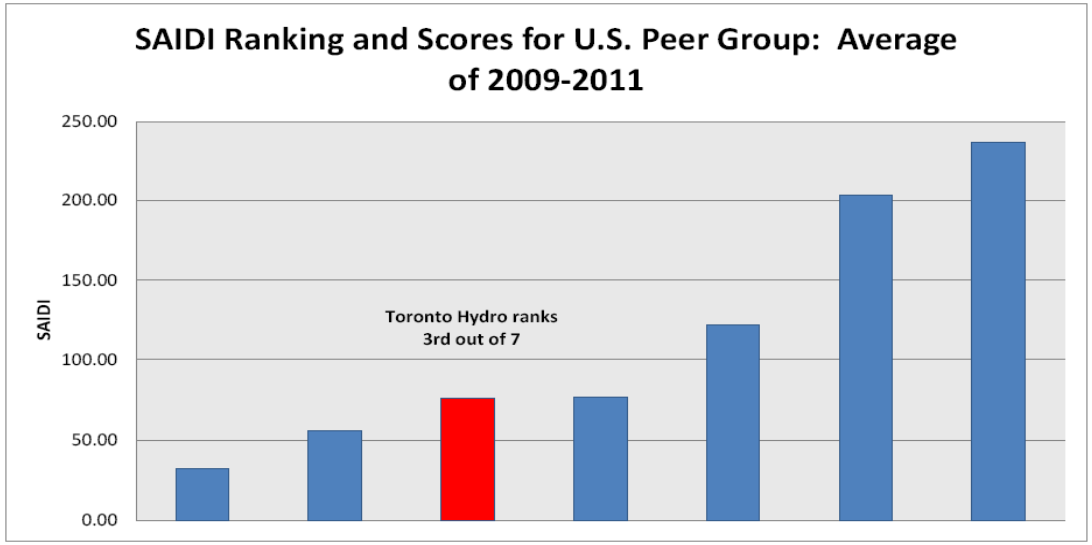
# USA Benchmark (2009-2011): THESL Is 11% Better In SAIDI And 53% Worse In SAIFI*




* Percentages in the graphs are determined logarithmically by taking the natural log of the actual value divided by the benchmark value. The heading shows ratios between the actual value to the benchmark value

# USA Benchmark: THESL Ranks 3rd In SAIDI And 6th In SAIFI In The Peer Group




**SAIDI**
**41% Below Average**

**SAIFI**
**30% Above Average**