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Memorandum

To: Working Group Standby Rates Policy for LDG EB-2013-0004

From: Mike Roger and Andrew Frank

Date: June 19, 2013

Re: Scenario Analysis Customers with LDG

Background

As a follow up to the meeting of the sub-working group, Elenchus ran a number of scenarios on customers with Load Displacement Generation (LDG) based on Horizon's 2011 Cost Allocation Model (CAM) used by the utility in their submission to the OEB to set 2011 Distribution rates. We have done a similar analysis based on Hydro Ottawa's 2011 Cost Allocation Model.

The purpose of the scenarios was to quantify the impact of different LDG operations and treatment of customers with LDG in the CAM.

Scenarios

Base Case:

Standby (reserve capacity) is deemed to be available, but never called upon, and resides in its own class (back-up power / standby power rate class). The Non-Displaced Load is deemed to be included in the GS > 50 kW rate class. For the purposes of Cost Allocation, the utility is expected to have built plant sufficient to be called upon by all LDG customers on the system peak.

Scenario 1:

Non-Displaced Load is moved to a dedicated customer class for customers with Load Displacement Generation.

Scenario 2:

Non-Displaced Load and displaced load are combined into one "Self Generating" class.

Scenario 3:

CP allocator is modified to 0 to reflect 100% of outages being scheduled for off-peak times.

Scenario 4:

The CP allocator is set to the demand of the largest standby load (approximately 35% of the total for Horizon and 25% for Hydro Ottawa), reflecting that the LDC is prepared to accommodate the total loss of any one displacement generator at any time, but not more than that.

Scenario 5

1 day per month of energy in the standby class

Scenario 6

No separate standby customer class

Scenario 7

Coincidence Factor for LDG customers same as Large User Class (Horizon 84%, Hydro Ottawa 98%)

Scenario 8

Coincidence factor for LDG customers 50%

Scenario 9

Services and Billing weighting factors equal to zero

For Horizon there are deemed to be 5 LDG customers with the following loads:

Customer	Displaced Load (Standby) (kW)	Non-Displaced Load (kW)
A	7,000	2,000
B	4,500	2,000
C	4,500	1,500
D	2,000	1,000
E	1,500	1,000
Total	19,500	7,500

For Hydro Ottawa there are deemed to be 2 LDG customers with the following loads:

Customer	Displaced Load (Standby) (kW)	Non-Displaced Load (kW)
A	500	1,500
B	5,000	1,000
Total	5,500	2,500

For all scenarios, Non-Displaced load is deemed to have occurred between 7am and 10pm in the GS > 50 kW class on weekdays – the generation is deemed to be sufficient at all other times. This is deemed to be on-peak at all times. All customers are deemed to be connected at primary voltage and own their own transformation. All scenarios are relative to the base case.

Results

The results of the various scenarios for Horizon compared to the base case are included in the table below.

Revenue Requirement	Residential	GS <50 kW	GS>50 kW-Regular	Large Use >5MW	Street Light	Sentinel	Unmetered Scattered Load	Back-up/Standby Power	Non-Displaced Standby
Base Case	$61,797,082	$12,645,288	$20,985,938	$8,762,969	$3,104,351	$59,884	$565,283	$787,143	
Scenario 1	$61,797,794	$12,645,070	$20,686,291	$8,748,867	$3,104,351	$59,884	$565,249	$787,148	$313,286
Scenario 2	$61,797,794	$12,645,070	$20,686,291	$8,748,867	$3,104,351	$59,884	$565,249	$1,100,434	
Scenario 3	$61,807,441	$12,648,422	$20,995,362	$8,770,170	$3,104,556	$59,886	$565,337	$756,764	
Scenario 4	$61,803,665	$12,647,280	$20,991,927	$8,767,545	$3,104,482	$59,885	$565,318	$767,837	
Scenario 5	$61,797,065	$12,645,282	$20,985,919	$8,762,954	$3,104,351	$59,884	$565,283	$787,201	
Scenario 6	$61,795,343	$12,644,840	$21,775,322	$8,762,985	$3,104,314	$59,883	$565,252		
Scenario 7	$61,834,226	$12,660,661	$21,026,223	$8,792,771	$3,104,348	$59,884	$565,378	$664,412	
Scenario 8	$61,912,324	$12,692,983	$21,110,923	$8,855,428	$3,104,453	$59,885	$565,577	$406,367	
Scenario 9	$61,797,325	$12,645,360	$20,985,971	$8,762,960	$3,104,351	$59,884	$565,287	$786,791	

The results of the various scenarios for Hydro Ottawa compared to the base case are included in the table below.

Revenue Requirement	Residential	GS <50 kW	GS 50 to 1,499 kW	GS 1,500 to 4,999 kW	Large Use	Street Light	Sentinel	Unmetered Scattered Load	Standby Power GS 1,500 to 4,999 kW (Back-up/ Standby Power)	Non-Displaced Standby
Base Case	$94,362,532	$19,069,216	$39,265,526	$7,782,600	$5,736,744	$1,181,823	$10,894	$470,439	$293,836	
Scenario 1	$94,362,532	$19,069,216	$39,265,526	$7,642,717	$5,736,744	$1,181,823	$10,894	$470,439	$293,836	$139,883
Scenario 2	$94,362,532	$19,069,216	$39,265,526	$7,642,717	$5,736,744	$1,181,823	$10,894	$470,439	$433,719	
Scenario 3	$94,390,428	$19,077,357	$39,297,529	$7,789,964	$5,742,287	$1,182,128	$10,894	$470,556	$212,465	
Scenario 4	$94,383,430	$19,075,315	$39,289,501	$7,788,117	$5,740,897	$1,182,052	$10,894	$470,527	$232,876	
Scenario 5	$94,362,478	$19,069,199	$39,265,455	$7,782,580	$5,736,728	$1,181,822	$10,894	$470,438	$294,015	
Scenario 6	$94,362,532	$19,069,216	$39,265,526	$8,076,436	$5,736,744	$1,181,823	$10,894	$470,439		
Scenario 7	$94,364,642	$19,069,932	$39,268,244	$7,783,264	$5,737,251	$1,181,872	$10,894	$470,444	$287,065	
Scenario 8	$94,406,751	$19,084,200	$39,322,469	$7,796,519	$5,747,360	$1,182,861	$10,894	$470,561	$151,994	
Scenario 9	$94,363,531	$19,069,384	$39,265,690	$7,782,603	$5,736,745	$1,181,823	$10,894	$470,439	$292,501	

Results Analysis Horizon

The changes in the revenue requirement for the GS>50 kW class reflect the revenue requirement changes allocated to the Back-up/Standby Power class and the Non-Displaced Standby class so these 3 customer classes' revenue requirement should be looked at as a group.

It is assumed that 5 extra meters are required to measure the self-generation when treated as a separate customer class. In scenarios 1 and 2 there is energy (kWh) associated with the displaced load in the input data.

Scenarios 1 and 2 can be considered to be the "Worst Case" scenarios where the LDC is called upon to replace all the load that can be generated by the customer.

Scenario 8 can be considered to be the "Best Case" scenario, where there is diversity amongst the customers with LDG.

The impact on the other customer classes' revenue requirement of all scenarios is minimal.

Results Analysis Hydro Ottawa

The same result analysis applies to Hydro Ottawa as described above for Horizon. For Hydro Ottawa, it is assumed that 2 extra meters are required to measure the self-generation.

Rate Design

For comparison purposes, we calculated possible rates for the GS>50 kW, Standby and Non-displaced Standby for each scenario.

Horizon 100% fixed charge	GS>50 kW-Regular	Back-up/Standby Power	Non-Displaced Standby
Base Case	$767.37	$13,119.05	
Scenario 1	$758.07	$13,119.13	$5,221.43
Scenario 2	$758.07	$18,340.57	
Scenario 3	$767.71	$12,612.73	
Scenario 4	$767.59	$12,797.28	
Scenario 5	$767.37	$13,120.02	
Scenario 6	$796.23		
Scenario 7	$768.84	$11,073.53	
Scenario 8	$771.94	$6,772.78	
Scenario 9	$767.37	$13,113.18	

Horizon 100% variable	GS>50 kW-Regular	Back-up/Standby Power	Non-Displaced Standby
Base Case	$4.32	$3.36	
Scenario 1	$4.34	$3.36	$3.48
Scenario 2	$4.34	$3.40	
Scenario 3	$4.32	$3.23	
Scenario 4	$4.32	$3.28	
Scenario 5	$4.32	$3.36	
Scenario 6	$4.28		
Scenario 7	$4.33	$2.84	
Scenario 8	$4.35	$1.74	
Scenario 9	$4.32	$3.36	

Horizon Current % fixed/variable	GS>50 kW-Regular Fixed	GS>50 kW-Regular Variable	Back-up/Standby Power Fixed	Back-up/Standby Power Variable	Non-Displaced Standby Fixed	Non-Displaced Standby Variable
Base Case	$307	$2.59	$5,251	$2.02		
Scenario 1	$303	$2.60	$5,251	$2.02	$2,090	$2.09
Scenario 2	$303	$2.60	$7,340	$2.04		
Scenario 3	$307	$2.59	$5,048	$1.94		
Scenario 4	$307	$2.59	$5,122	$1.97		
Scenario 5	$307	$2.59	$5,251	$2.02		
Scenario 6	$319	$2.57				
Scenario 7	$308	$2.60	$4,432	$1.70		
Scenario 8	$309	$2.61	$2,711	$1.04		
Scenario 9	$307	$2.59	$5,248	$2.02		

Hydro Ottawa 100% fixed charge	GS 1,500 to 4,999 kW	Standby Power GS 1,500 to 4,999 kW (Back-up/ Standby Power)	Non-Displaced Standby
Base Case	$9,978	$12,243	
Scenario 1	$10,109	$12,243	$5,828
Scenario 2	$10,109	$18,072	
Scenario 3	$9,987	$8,853	
Scenario 4	$9,985	$9,703	
Scenario 5	$9,978	$12,251	
Scenario 6	$10,354		
Scenario 7	$9,979	$11,961	
Scenario 8	$9,996	$6,333	
Scenario 9	$9,978	$12,188	

Hydro Ottawa 100% variable	GS 1,500 to 4,999 kW	Standby Power GS 1,500 to 4,999 kW (Back-up/ Standby Power)	Non-Displaced Standby
Base Case	$4.53	$4.45	
Scenario 1	$4.52	$4.45	$4.66
Scenario 2	$4.52	$4.52	
Scenario 3	$4.53	$3.22	
Scenario 4	$4.53	$3.53	
Scenario 5	$4.53	$4.45	
Scenario 6	$4.52		
Scenario 7	$4.53	$4.35	
Scenario 8	$4.53	$2.30	
Scenario 9	$4.53	$4.43	

Hydro Ottawa Current % fixed/variable	GS 1,500 to 4,999 kW Fixed	GS 1,500 to 4,999 kW Variable	Standby Power GS 1,500 to 4,999 kW (Back-up/ Standby Power) Fixed	Standby Power GS 1,500 to 4,999 kW (Back-up/ Standby Power) Variable	Non-Displaced Standby Fixed	Non-Displaced Standby Variable
Base Case	$5,957	$1.82	$7,309	$1.79		
Scenario 1	$6,035	$1.82	$7,309	$1.79	$3,480	$1.88
Scenario 2	$6,035	$1.82	$10,789	$1.82		
Scenario 3	$5,962	$1.83	$5,285	$1.30		
Scenario 4	$5,961	$1.83	$5,793	$1.42		
Scenario 5	$5,957	$1.82	$7,314	$1.80		
Scenario 6	$6,182	$1.82				
Scenario 7	$5,957	$1.82	$7,141	$1.75		
Scenario 8	$5,967	$1.83	$3,781	$0.93		
Scenario 9	$5,957	$1.82	$7,276	$1.79		

Conclusions

The following conclusions can be drawn:

- There are costs to the LDC of having to be ready to supply the load generated by the customer, using the CAM principles to determine the costs
- The reserve (contract) capacity that has not been displaced can be charged separately or in addition to the charges of the load being displaced. Scenarios 1 and 2 have revenue requirement results that are very similar when combining the Back-up Power Standby class and the Non Displaced Standby class revenue requirement

- There is not much difference in the rates between the scenarios. Few LDG customers are absorbed by many GS customers, when there is no separate customer class for Standby power