

UNION GAS LIMITED

Undertaking of Union Gas
To School Energy Coalition ("SEC")

To confirm whether the math in Exhibit K3.5 is correct.

There does not appear to be any arithmetic errors in Exhibit K3.5. However, it does not appear as if any meaningful conclusions can be drawn from the arithmetic in the exhibit. Please see undertaking response provided in Exhibit J3.3 for an explanation of how the analysis should be completed.

Question: March 31, 2008
Answer: April 7, 2008
Docket: EB-2007-0606 / EB-2007-0615

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Union to prepare a chart with assumed effect of tax change on GDP and translate that into the reduced revenue requirement under the IRM formula for Union Gas on a Year-by-Year basis.

We have prepared estimates of the impact of tax changes on the GDP IPI FDD final demand deflator for the 2008-2012 period. Our analysis incorporates all federal and provincial tax changes that affect corporations, including corporate and capital tax rates and CCA changes. Estimates of future tax changes are based on scheduled tax changes as of December 31, 2007.

As we indicated in our testimony, the effects of corporate tax changes on investment and prices are subject to lags. However, it is important to note that lagged adjustments to past tax changes must be taken into account as well as the delayed adjustment to current and future tax changes.

When tax reductions affect prices with a distributed lag, the effects of a tax cut in a particular year gradually affect prices, beginning in that year, but extending over a number of years in the future. This means that prices in a year reflect the effects of not only the (partial) impact of tax changes in that year, but also the delayed effects of tax changes in previous years.

For example, the GDP IPI FDD for 2010 is not just affected by tax reductions occurring in 2010, but by all previous tax changes going back as far as 2001 (with a diminishing impact from the earlier years).

Our analysis, as another example, shows that the 2006 tax changes have little impact on the GDP deflator in 2006. These effects are distributed forward. The tax changes in 2006 put downward pressure on the GDP deflator in 2008 and exert even more downward pressure in 2009. The lagged effect trails off thereafter. Put another way, the 2.04% inflation factor for 2008 is lower than it would otherwise have been without the prior tax changes.

This is important because Union has already reflected historical tax changes in its cost of service as of 2007. Customers have already received the benefit of these tax reductions through reduced costs. To ignore the effect of the historical tax changes on the current GDP deflator and focus only on lag effects from 2008 forwards ignores an important input to the 2008 and subsequent years' inflation factor. It would be illogical and unfair to take into account lags in the realization of inflation factor impacts starting in 2008 but ignore the same impacts spilling over from the prior period. The question, at the end of the day, is whether the deflator is compensating customers through the price cap index in an amount approximately equal to the tax reductions during the IR term. The evidence in Table 1 clearly shows that it is.

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Our estimates of the time pattern of adjustments to tax changes are based on simulations with the FOCUS models of the Ontario and Canadian economies. These simulations were prepared for a study of the economic effects of replacing Ontario's Retail Sales Tax (RST) with a Value Added Tax (VAT) similar to the Federal Goods and Services Tax (GST). This tax reform would involve reductions in the sales tax burden on investment, thereby reducing METRs on capital. We have used the time pattern of the response of capital formation in Ontario in these simulations to derive the weights used in the distributed lag response of prices to changes in the METR on capital. The top section of Table 1 is based on our estimates of the impact of changes on business taxes on the final demand deflator that take account of lagged adjustments to all corporate tax changes over the 2000-2011 period, together with the current effects of the GST reductions. To be consistent with the way the price cap formula works, these results are lagged one year.

The impact that each year's tax rate changes are having on GDP IPI FDD in each year is shown separately. For example, the impact that the 2001 tax rate changes is having on GDP IPI FDD in 2008 is (0.02%), 2009 is (0.02%), 2010 is (0.02%) and 2011 is (0.01%). The tax rate changes for 2000 through 2006 are shown separately on lines 1 - 7 from the tax rate changes for 2007 through 2011 which are shown on lines 8 - 14. The combined total appears on line 15.

In order to explore the effects of anticipatory responses to scheduled future tax reductions, we have also prepared tables based on a more rapid response to the corporate tax changes. In these calculations the full adjustment of the capital stock to the tax reduction is accelerated by three years, with complete adjustment achieved by the seventh year. Since the 5 year tax reduction plan implemented in 2000 also involved scheduled future tax reductions, we assume that the reduction of the adjustment period applies over the complete period 2000-2011. The top section of Table 2 presents these results.

Finally, in order to explore the sensitivity of our results to longer lags, we prepared estimates where the length of the adjustment period is increased by three years. The results are presented in the top section of Table 3.

The lower half (lines 16 to 26) of Table 1 compares the impact tax rate changes will have on Union's rates as a result of how they influence the GDP IPI FDD inflation factor used in the price cap index to the impact the tax rate changes will have on Union's revenue requirement. Line 26 shows that the impact on Union's rates is slightly larger (\$0.21 million) than the impact on Union's revenue requirement over the 5 year incentive regulation period.

The base revenue requirement for 2008 that the price cap index is applied against is shown on line 16. It has been held constant as a simplifying assumption. The annual change is dependent on the actual year over year change in the annualized average of 4 quarters (using Q2 to Q2) of GDP IPI FDD.

Line 17 shows the impact tax rate changes are having each year on Union's revenue requirement. The cumulative total appears on line 18. This is the same information as provided in Exhibit E3.1.1.

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Lines 19 - 22 show the impact that the change in GDP IPI FDD is having on Union's rates through the incentive regulation period if only the affects of the 2006 -2011 tax changes are reflected. Lines 23 – 26 show the impact if all tax changes over the 2000 – 2011 period are reflected. Excluding anticipatory affects, the 2006 – 2007 tax changes will start to show up in the GDP IPI FDD inflation factor in 2008, the first year of incentive regulation.

Lines 19 & 23 show the impact GDP IPI FDD changes are having on the price cap index in each year. Lines 20 & 24 show the impact GDP IPI FDD changes are having on rates in each year. The impact in any year of the incentive regulation period is the impact the GDP IPI FDD change is having in that year and prior years. Lines 21 & 25 show the cumulative impact on rates. Line 22 & 26 compare the impact tax rate changes will have on Union's rates as a result of how they influence the GDP IPI FDD inflation factor used in the price cap index to the impact the tax rate changes will have on Union's revenue requirement.

Table 2 provides the same comparison reflecting anticipatory effects. Line 26 of Table 2 shows that the impact on Union's rates is much larger (\$9.70 million) than the impact on Union's revenue requirement over the same 5 year incentive regulation period when anticipatory effects are reflected.

Table 3 provides the same comparison without the anticipatory effects and with longer lags. Line 26 of Table 3 shows that the impact on Union's rates is less (\$5.48 million) than the impact on Union's revenue requirement over the same 5 year incentive regulation period if anticipatory effects are ignored and longer lags are assumed.

Conclusion

The results presented in Table 1 indicate that, when account is taken of the lags in investment, the effects of tax reductions on the final demand deflator approximately offsets the \$80.5 million direct effects of the tax reduction on Union's cash flow position over the 5 year period of incentive regulation.

As indicated in our testimony, it is our view that it is appropriate to make allowance for anticipatory effects, both before and after the incentive regulation period. The results presented in Table 2 indicate that the effects of the tax changes in the final demand deflator would reduce Union's revenue by \$90 million.

Finally, the analysis of the sensitivity of the results to an increase in the lag period presented in Table 3 indicates that a 30% increase in the period of adjustment would only reduce the negative impact of the final demand deflator on Union's revenues to about \$75 million. Taken as a whole these results indicate that the price cap mechanism adopted by the Board for Union's incentive regulation plan would do its job properly with the corporate tax reduction regime now in place.

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Table 1
Impact of Tax Changes on Union Gas without Anticipatory Effects

Line No.			<u>2008</u> (a)	<u>2009</u> (b)	<u>2010</u> (c)	<u>2011</u> (d)	<u>2012</u> (e)
	<u>Tax Change Impact on GDP IPI FDD</u>						
1	2000-2001		-0.02%	-0.02%	-0.02%	-0.01%	0.00%
2	2001-2002		-0.05%	-0.04%	-0.03%	-0.03%	-0.02%
3	2002-2003		-0.01%	0.00%	0.00%	0.00%	0.00%
4	2003-2004		-0.07%	-0.05%	-0.04%	-0.03%	-0.03%
5	2004-2005		-0.02%	-0.02%	-0.01%	-0.01%	-0.01%
6	2005-2006		-0.08%	-0.11%	-0.09%	-0.07%	-0.06%
7	2000-2006 Tax Changes		-0.24%	-0.24%	-0.20%	-0.16%	-0.12%
8	2006-2007		-0.24%	-0.21%	-0.28%	-0.24%	-0.19%
9	2007-2008			-0.42%	-0.10%	-0.13%	-0.11%
10	2008-2009				0.00%	-0.02%	-0.03%
11	2009-2010					-0.01%	-0.03%
12	2010-2011						-0.01%
14	2006-2011 Tax Changes		-0.24%	-0.63%	-0.39%	-0.40%	-0.37%
15	Total Tax Change Impact on GDP IPI FDD	L7 + L14	-0.48%	-0.87%	-0.58%	-0.56%	-0.49%
16	Base Revenue Requirement (\$ millions)	Rate Order Working Papers	873.20	873.20	873.20	873.20	873.20
	<u>Revenue Requirement Impact Associated with Tax Rate Change</u>						
17	Tax Change Impact (\$ millions)	Exhibit E3.1.1	-8.29	-10.05	-16.75	-21.56	-23.86
18	Cumulative Tax Change Impact (\$ millions)	From L17	-8.29	-18.34	-35.09	-56.65	-80.51
	<u>Rate Impact Associated with GDP IPI FDD Change</u>						
	2006-2011 Tax Changes:						
19	Price Change Impact (\$ millions)	L14 * L16	-2.13	-5.54	-3.37	-3.47	-3.20
20	Annual Rate Impact (\$ millions)	From L19	-2.13	-7.67	-11.04	-14.51	-17.71
21	Cumulative Rate Impact (\$ millions)	From L20	-2.13	-9.80	-20.84	-35.35	-53.05
22	Cumulative Difference (\$ millions)	L18 - L21	-6.16	-8.54	-14.25	-21.30	-27.46
	2000-2011 Tax Changes:						
23	Price Change Impact (\$ millions)	L15 * L16	-4.20	-7.60	-5.10	-4.88	-4.27
24	Annual Rate Impact (\$ millions)	From L23	-4.20	-11.80	-16.90	-21.78	-26.05
25	Cumulative Rate Impact (\$ millions)	From L24	-4.20	-16.00	-32.90	-54.67	-80.72
26	Cumulative Difference (\$ millions)	L18 - L25	-4.09	-2.34	-2.19	-1.98	0.21

Notes: Distributed lags apply to business taxes. GST impacts appear fully at the time of implementation.

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Table 2
Impact of Tax Changes on Union Gas with Anticipatory Effects

Line No.			<u>2008</u> (a)	<u>2009</u> (b)	<u>2010</u> (c)	<u>2011</u> (d)	<u>2012</u> (e)
	<u>Tax Change Impact on GDP IPI FDD</u>						
1	2000-2001		-0.02%	0.00%	0.00%	0.00%	0.00%
2	2001-2002		-0.06%	-0.05%	0.00%	0.00%	0.00%
3	2002-2003		-0.01%	-0.01%	0.00%	0.00%	0.00%
4	2003-2004		-0.08%	-0.06%	-0.05%	-0.04%	0.00%
5	2004-2005		-0.02%	-0.02%	-0.01%	-0.01%	-0.01%
6	2005-2006		-0.10%	-0.13%	-0.11%	-0.09%	-0.07%
7	2000-2006 Tax Changes		-0.29%	-0.27%	-0.18%	-0.14%	-0.08%
8	2006-2007		-0.25%	-0.26%	-0.35%	-0.30%	-0.23%
9	2007-2008			-0.42%	-0.12%	-0.16%	-0.14%
10	2008-2009				0.00%	-0.02%	-0.03%
11	2009-2010					-0.01%	-0.04%
12	2010-2011						-0.01%
14	2006-2011 Tax Changes		-0.25%	-0.69%	-0.47%	-0.49%	-0.45%
15	Total Tax Change Impact on GDP IPI FDD	L7 + L14	-0.55%	-0.96%	-0.66%	-0.63%	-0.53%
16	Base Revenue Requirement (\$ millions)	Rate Order Working Papers	873.20	873.20	873.20	873.20	873.20
	<u>Revenue Requirement Impact Associated with Tax Rate Change</u>						
17	Tax Change Impact (\$ millions)	Exhibit E3.1.1	-8.29	-10.05	-16.75	-21.56	-23.86
18	Cumulative Tax Change Impact (\$ millions)	From L17	-8.29	-18.34	-35.09	-56.65	-80.51
	<u>Rate Impact Associated with GDP IPI FDD Change</u>						
	2006-2011 Tax Changes:						
19	Price Change Impact (\$ millions)	L14 * L16	-2.22	-6.01	-4.15	-4.27	-3.94
20	Annual Rate Impact (\$ millions)	From L19	-2.22	-8.23	-12.38	-16.65	-20.59
21	Cumulative Rate Impact (\$ millions)	From L20	-2.22	-10.45	-22.83	-39.49	-60.08
22	Cumulative Difference (\$ millions)	L18 - L21	-6.07	-7.89	-12.26	-17.16	-20.43
	2000-2011 Tax Changes:						
23	Price Change Impact (\$ millions)	L15 * L16	-4.77	-8.36	-5.75	-5.52	-4.64
24	Annual Rate Impact (\$ millions)	From L23	-4.77	-13.13	-18.88	-24.40	-29.04
25	Cumulative Rate Impact (\$ millions)	From L24	-4.77	-17.89	-36.77	-61.17	-90.21
26	Cumulative Difference (\$ millions)	L18 - L25	-3.52	-0.45	1.68	4.52	9.70

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Table 3
Impact of Tax Changes on Union Gas without Anticipatory Effects and with Longer Lags

Line No.			<u>2008</u> (a)	<u>2009</u> (b)	<u>2010</u> (c)	<u>2011</u> (d)	<u>2012</u> (e)
	<u>Tax Change Impact on GDP IPI FDD</u>						
1	2000-2001		-0.02%	-0.02%	-0.01%	-0.01%	-0.01%
2	2001-2002		-0.04%	-0.03%	-0.03%	-0.03%	-0.02%
3	2002-2003		-0.01%	0.00%	0.00%	0.00%	0.00%
4	2003-2004		-0.06%	-0.05%	-0.04%	-0.03%	-0.03%
5	2004-2005		-0.02%	-0.01%	-0.01%	-0.01%	-0.01%
6	2005-2006		-0.07%	-0.10%	-0.08%	-0.06%	-0.05%
7	2000-2006 Tax Changes		-0.21%	-0.21%	-0.18%	-0.15%	-0.12%
8	2006-2007		-0.24%	-0.19%	-0.26%	-0.22%	-0.17%
9	2007-2008			-0.42%	-0.09%	-0.12%	-0.10%
10	2008-2009				0.00%	-0.02%	-0.02%
11	2009-2010					-0.01%	-0.03%
12	2010-2011						-0.01%
14	2006-2011 Tax Changes		-0.24%	-0.61%	-0.35%	-0.36%	-0.33%
15	Total Tax Change Impact on GDP IPI FDD	L7 + L14	-0.45%	-0.82%	-0.53%	-0.50%	-0.45%
16	Base Revenue Requirement (\$ millions)	Rate Order Working Papers	873.20	873.20	873.20	873.20	873.20
	<u>Revenue Requirement Impact Associated with Tax Rate Change</u>						
17	Tax Change Impact (\$ millions)	Exhibit E3.1.1	-8.29	-10.05	-16.75	-21.56	-23.86
18	Cumulative Tax Change Impact (\$ millions)	From L17	-8.29	-18.34	-35.09	-56.65	-80.51
	<u>Rate Impact Associated with GDP IPI FDD Change</u>						
	2006-2011 Tax Changes:						
19	Price Change Impact (\$ millions)	L14 * L16	-2.09	-5.34	-3.03	-3.13	-2.88
20	Annual Rate Impact (\$ millions)	From L19	-2.09	-7.43	-10.46	-13.59	-16.46
21	Cumulative Rate Impact (\$ millions)	From L20	-2.09	-9.52	-19.98	-33.56	-50.03
22	Cumulative Difference (\$ millions)	L18 - L21	-6.20	-8.82	-15.11	-23.09	-30.48
	2000-2011 Tax Changes:						
23	Price Change Impact (\$ millions)	L15 * L16	-3.96	-7.19	-4.59	-4.39	-3.94
24	Annual Rate Impact (\$ millions)	From L23	-3.96	-11.14	-15.73	-20.13	-24.06
25	Cumulative Rate Impact (\$ millions)	From L24	-3.96	-15.10	-30.83	-50.96	-75.03
26	Cumulative Difference (\$ millions)	L18 - L25	-4.33	-3.24	-4.26	-5.69	-5.48

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