From: Loren Gudbjartsson [mailto:kraftur@mts.net]
Sent: March 9, 2004 2:24 AM
To: 'Alex Fleming'
Subject: industrial reference case

First the Canadian projections of energy use are based on 1990 to 2000, 10 years. During which time industrial energy use increased 16.3%. Relative to GDP the energy use would have been 36% but "Structural" changes in industry reduced this growth by 11.5% and "Efficiency Improvement" reduced it a further 8.7%. Therefore the net industrial energy use increased 16.3% over 10 years. Based on this NRCAN projected the impact of "Efficiency Improvement" to be 8.7% (.87%) per year – that is what is used in the reference case.

The GDP projections, 34% over 10, years based on the economic studies referred to fall into line with the 1990 to 2000 history and the national projection,

The anticipated national "structural" changes in the industrial market are accounted for in that the GDP (and energy growth) were determined on a sub-sector bases – in each case a reflection of structural change – one growing faster or slower than the other. Therefore the 1.15% per year structural factor cannot be applied in this case.

Therefore only the "Efficiency Improvement" correction of .87% was applied.

So the GDP projection is ok as we discussed.

The Energy Use increases less the "Efficiency Improvements" are ok based on the above argument.

Therefore the energy use by Sub-sectors and Total Sector in the milestone years is ok.

What is not correct in the report (and irrelevant to the resulting energy use in future years) is the energy intensity which is calculated by dividing the GWH growth (less the "Efficiency Improvements") by the GDP.

The GWH growth is not calculated from the intensity numbers (I think that is where you were having trouble, and rightfully so).

Rather the intensities are determined from the GWH energy use which is de-rated by the "Efficiency Improvements".

The correct energy intensities for Exhibit 3-2 (page 20) are below.

Regards,
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Sub-sector	% Mb GDP	M$	GWh / M$GDP	2007/08	2012/13	2017/18
Primary Metals	3.00%	$1,039	2.01	1.90	1.82	1.74
Chemical	1.00%	$346	4.34	4.12	3.94	3.77
Petroleum	0.30%	$104	7.51	7.12	6.82	6.53
Pulp & Paper	1.00%	$346	2.27	2.15	2.06	1.97
Misc. Industrial/Mfg.	2.20%	$762	0.57	0.54	0.52	0.50
Transportation	2.90%	$1,004	0.06	0.06	0.05	0.05
Metal	1.00%	$346	0.60	0.57	0.55	0.52
Food & Beverage	2.50%	$866	0.56	0.54	0.51	0.49
Mining	1.70%	$589	0.38	0.36	0.34	0.33
Hog	1.50%	$519	0.76	0.72	0.69	0.66
Other Ag.	3.40%	$1,178	0.20	0.19	0.19	0.18
Industrial Ag Total	**20.50%**	**$ 34,633**	1.01	0.95	0.91	0.87