Société de gestion des huiles usagées (SOGHU)

Estimated Rates of Recoverable Antifreeze in Canada

Final Report – Volume 2

DESSAU

ni ENVIRONNEMENT

LIST OF APPENDICES

Appendices

Appendix 1   Parameters Used for Calculations, Values, Precision and Sources
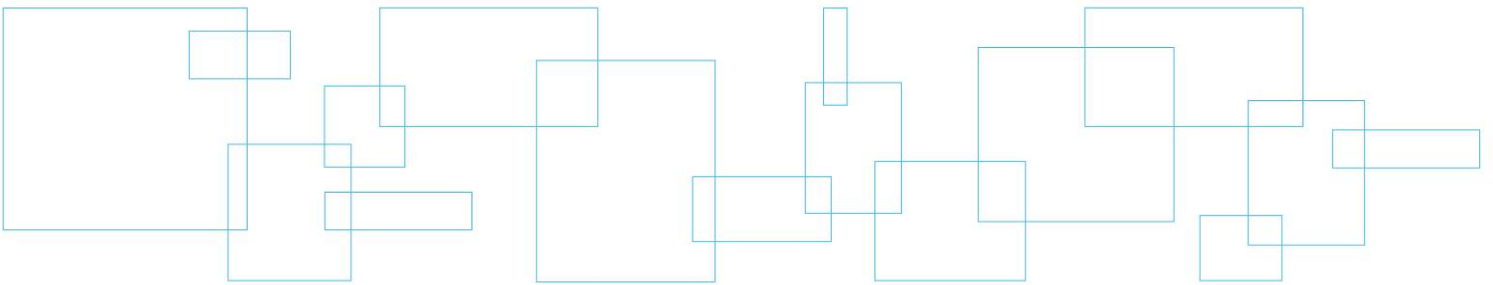
IDENTICAL FOR ALL PROVINCES

PARAMETERS	Source	VALUE	Precision
CONSTANTS			
Proportion of radiators emptied in truck accidents	Hypothesis	50%	NA
New antifreeze concentration	Convention	50%	NA
AUTOMOTIVE SECTOR			+/-
General Statistics			
Used antifreeze concentration	Sample measurements	45.0%	1.3%
Breakage Parameters			
Volume consumed antifreeze per radiator	Bodyshop survey	2.36	0.49
Volume recoverable antifreeze per radiator	Bodyshop survey	0.95	0.32
Loss by Usage Parameters			
DIFM Frequency of top-ups for PC and LT	Garages survey	34.1%	5.8%
Top-up volume for cars	Garages survey	0.92	0.13
Top-up volume for light trucks	Garages survey	1.21	0.20
End-of-life Parameters			
Volume antifreeze in end-of-life light vehicles	Recyclers survey	2.9	1.0
ROAD TRANSPORTATION SECTOR			+/-
General Statistics			
Antifreeze volume consumed per truck	Road Transporters Survey	30.3	8.4
Antifreeze volume in class 3-4-5 trucks	Road Transporters Survey and Truck Dealerships	22.8	2.5
Antifreeze volume in class 6 trucks	Road Transporters Survey and Truck Dealerships	27.9	3.8
Antifreeze volume in class 7 trucks	Road Transporters Survey and Truck Dealerships	56.7	9.0
Antifreeze volume in class 8 trucks	Road Transporters Survey and Truck Dealerships	41.1	3.3
Antifreeze concentration	Sample measurements	45.0%	1.3%
Breakage Parameters			
Antifreeze volume consumed/truck/year, breakage, classes 7-8	Road Transporters survey	5.3	3.1
Loss by Usage Parameters			
Volume antifreeze consumed/truck/year, top-up	Road Transporters survey	12.8	3.8
Draining Parameters			
% drained/consumed	Road Transporters survey	38.9%	5.5%
End-of-life Parameters			
End-of-life truck antifreeze volume	Road Transporters survey	12.2	8.5

PARAMETERS	Source	VALUE	Precision
OTHER SECTORS			+/-
General Statistics			
Volume of antifreeze consumed per machine per year - agricultural	Other Sectors Survey	10.6	5.1
Volume of antifreeze consumed per machine per year - construction	Other Sectors Survey	29.4	11.4
Volume of antifreeze consumed per machine per year - mining	Other Sectors Survey	111.7	111.7
Antifreeze volume in farming tractor	Other Sectors Survey and Equipment dealerships	23.3	1.5
Antifreeze volume in construction machinery	Other Sectors Survey and Equipment dealerships	38.8	3.2
Antifreeze volume in mining machines	Other Sectosr Survey and Equipment dealerships	201.0	201.0
Antifreeze concentration	Sample measurements	45.0%	1.3%
Breakage Parameters			
Antifreeze volume consumed/machine/year, breakage - agricultural	Other Sectors Survey	3.8	1.6
Antifreeze volume consumed/machine/year, breakage - construction	Other Sectors Survey	10.0	4.9
Antifreeze volume consumed/machine/year, breakage - mining	Other Sectors Survey	61.2	61.2
Loss by Usage Parameters			
Volume antifreeze consumed/machine/year, top-up – agricultural	Other Sectors Survey	4.2	1.7
Volume antifreeze consumed/machine/year, top-up – construction	Other Sectors Survey	8.3	2.9
Volume antigel consommé /machine/an pour appoints - mining	Other Sectors Survey	19.0	19.0
Draining Parameters			
% drained/consumed	Other Sectors Survey	38.9%	8.7%

SPECIFIC FOR BRITISH COLUMBIA

PARAMETERS	Source	VALUE	Precision
CONSTANTS			**+/-**
Antifreeze sales (eq 50/50)	Extrapolation from the last 6 months of 2011	10,128,440	NA
Total accidents for cars and light trucks	ICBC, average 2007-2011	254,027	NA
Total loss vehicles	-	ND	NA
Number of trucks & buses in accidents	ICBC, average 2007-2011	15,973	NA
Number of machines in accidents	-	ND	NA
Number of cars	Desrosiers 2010	1,524,183	NA
Number of class 1 light trucks	Desrosiers 2010	908,558	NA
Number of class 2 light trucks	Desrosiers 2010	572,168	NA
Number of class 3-4-5 trucks	Polk 2010	93,367	NA
Number of class 6 trucks	Polk 2010	8,358	NA
Number of class 7 trucks	Polk 2010	14,746	NA
Number of class 8 trucks	Polk 2010	48,338	NA
Total number of trucks and buses	Polk 2010, total	164,809	NA
Number of farming tractors	From QC in proportion of GDP	35,833	7,167
Number of machines construction/forestry	From QC in proportion of GDP	73,627	14,725
Number of machines in the mining sector	From QC in proportion of GDP	5,713	1,143
Total Number of machines	Calculation	115,173	-
Car sales	Desrosiers average 2006-2010	85,054	NA
Light truck sales class 1 & 2	Desrosiers average 2006-2010	88,062	NA
Truck sales class 3-4-5	Polk average 2006-2010	6,889	NA
Truck sales class 6	Polk average 2006-2010	226	NA
Truck sales class 7	Polk average 2006-2010	620	NA
Truck sales class 8	Polk average 2006-2010	2,762	NA
Bus & truck sales	Polk average 2006-2010, total	10,496	NA
Farming tractor sales	From QC in proportion of GDP	1,292	258
Construction/forestry machine sales	From QC in proportion of GDP	2,655	531
Mining sector machine sales	From QC in proportion of GDP	206	41
Machine sales	Calculation	4,153	-
End-of-life cars	Sales minus fleet increase (av. 2006-2009)	41,049	NA
End-of-life light trucks class 1 & 2	Sales minus fleet increase (av. 2006-2009)	43,670	NA
End-of-life trucks	Sales minus fleet increase (av. 2006-2009)	1,152	NA
End-of-life machines	Sales minus fleet increase (av. 2006-2009)	414	83
AUTOMOTIVE SECTOR			**+/-**
General Statistics			
Antifreeze volume in car	Desrosiers 2010	7.66	NA

PARAMETERS	Source	VALUE	Precision
Antifreeze volume in light trucks class 1	Desrosiers 2010	10.09	NA
Antifreeze volume in light trucks class 2	Desrosiers 2010	17.33	NA
Average antifreeze volume in light vehicles	Prorating the fleet	10.24	NA
Average antifreeze volume in light trucks	Prorating the fleet	12.89	NA
Antifreeze volume in sold cars	Desrosiers average 2006-2010	7.12	NA
Antifreeze volume in sold class 1 trucks	Desrosiers average 2006-2010	9.29	NA
Antifreeze volume in sold class 2 trucks	Desrosiers average 2006-2010	15.98	NA
Average antifreeze volume sold LV	Proration of sales	9.54	NA
Average antifreeze volume sold LT	Proration of sales	11.88	NA
Breakage parameters			
Radiator change frequency	Desrosiers average 2006-2010	2.98%	0.17%
Number of radiators repared/changed	Calculation	89,546	-
Loss by Usage Parameters			
DIY top-up frequency for cars and light trucks	Desrosiers average 2006-2010	30.4%	1.1%
Average top-up volume light vehicles	Prorating the fleet	1.06	-
Draining Parameters			
Average volume of drainage in light vehicles	Calcuation from average volume light vehicles minus top-up volume LV	9.17	-
Frequency of fluid changes for light vehicles	Desrosiers average 2006-2010	20.20%	0.7%
% of DIFM	Desrosiers average 2006-2010	79.60%	2.9%
ROAD TRANSPORT SECTOR			+/-
Average antifreeze volume in trucks	Prorating of each class	31.5	-
Volume of antifreeze consumed per class 3-4-5 trucks	Prorating capacity	15.4	-
Volume of antifreeze consumed per class 6 truck	Prorating capacity	18.9	-
Average volume of antifreeze consumed per truck	Prorating of each class	21.3	-
Volume of antifreeze consumed/truck/year for breakage classes 3-4-5	Prorating capacity	2.7	-
Volume of antifreeze consumed/truck/year for breakage class 6	Prorating capacity	3.3	-
Average volume of antifreeze consumed/truck/year for breakage	Prorating of each class	3.7	-

PARAMETERS	Source	VALUE	Precision
Volume of antifreeze consumed/truck/year for top-ups for classes 3-4-5	Prorating capacity	6.5	-
Volume of antifreeze consumed/truck/year for top-ups for class 6	Prorating capacity	8.0	-
Average volume of antifreeze consumed/truck/year for top-ups	Prorating of each class	9.0	-
OTHER SECTORS			+/-
Average volume of antifreeze in machines	Prorating of each category	42.0	-
Average volume of antifreeze consumed per machine	Prorating of each category	27.6	-
Average volume of antifreeze consumed per machine for breakage	Prorating of each category	10.6	-
Average volume of antifreeze consumed per machine for top-ups	Prorating of each category	7.6	-
Volume of antifreeze in end-of-life machines	Calculation from the value for trucks in proportion to the capacity	16.3	-

SPECIFIC TO ALBERTA

PARAMETERS	Source	VALUE	Precision
CONSTANTS			+/-
Antifreeze sales (eq 50/50)	AUOMA Surveys in 2008 and 2010	18,850,576	NA
Total accidents for cars and light trucks	Alberta Infrastructure and Transportation average 2006-2010	142,647	NA
Total loss vehicles	-	ND	NA
Number of trucks & buses in accidents	Estimation from the total number in proportion of the number of trucks and buses	9,966	NA
Number of machines in accidents	-	ND	NA
Number of cars	Desrosiers 2010	1,305,623	NA
Number of class 1 light trucks	Desrosiers 2010	870,591	NA
Number of class 2 light trucks	Desrosiers 2010	854,649	NA
Number of class 3-4-5 trucks	Polk 2010	143,568	NA
Number of class 6 trucks	Polk 2010	21,913	NA
Number of class 7 trucks	Polk 2010	25,468	NA
Number of class 8 trucks	Polk 2010	105,943	NA
Total number of trucks and buses	Polk 2010, total	296,892	NA
Number of farming tractors	From QC in proportion of GDP	156,617	31,323
Number of machines construction/forestry	From QC in proportion of GDP	92,904	18,581
Number of machines in mining sector	From QC in proportion of GDP	43,297	8,659
Total Number of machines	Calculation	292,818	-
Car sales	Desrosiers average 2006-2010	76,836	NA
Light truck sales class 1 & 2	Desrosiers average 2006-2010	143,889	NA
Truck sales class 3-4-5	Polk average 2006-2010	13,610	NA
Truck sales class 6	Polk average 2006-2010	442	NA
Truck sales class 7	Polk average 2006-2010	1,094	NA
Truck sales class 8	Polk average 2006-2010	6,184	NA
Bus & truck sales	Polk average 2006-2010, total	21,330	NA
Farming tractor sales	From QC in proportion of GDP	5,647	1,129
Construction/forestry machine sales	From QC in proportion of GDP	3,350	670
Mining sector machine sales	From QC in proportion of GDP	1,561	312
Machine sales	Calculation	10,558	-
End-of-life cars	Sales minus fleet increase (av. 2006-2009)	22,479	NA
End-of-life light trucks class 1 & 2	Sales minus fleet increase (av. 2006-2009)	87,042	NA
End-of-life trucks	Sales minus fleet increase (av. 2006-2009)	5,719	NA
End-of-life machines	Sales minus fleet increase (av. 2006-2009)	1,053	211
AUTOMOTIVE SECTOR			+/-
General Statistics			
Antifreeze volume in car	Desrosiers 2010	8.25	NA

PARAMETERS	Source	VALUE	Precision
Antifreeze volume in light trucks class 1	Desrosiers 2010	10.47	NA
Antifreeze volume in light trucks class 2	Desrosiers 2010	17.39	NA
Average antifreeze volume light vehicles	Prorating the fleet	11.46	NA
Average antifreeze volume light trucks	Prorating the fleet	13.90	NA
Antifreeze volume in sold cars	Desrosiers average 2006-2010	7.67	NA
Antifreeze volume in sold class 1 LT	Desrosiers average 2006-2010	9.54	NA
Antifreeze volume in sold class 2 LT	Desrosiers average 2006-2010	16.68	NA
Average antifreeze volume in sold LV	Proration of sales	11.19	NA
Average antifreeze volume in sold LT	Proration of sales	13.08	NA
Breakage parameters			
Radiator change frequency	Desrosiers average 2006-2010	2.50%	0.11%
Number of radiators repared/changed	Calculation	75,772	-
Loss by Usage Parameters			
DIY top-up frequency for cars and light trucks	Desrosiers average 2006-2010	37.0%	1.1%
Average top-up volume light vehicles	Prorating the fleet	1.09	-
Paramètres vidange			
Average volume of drainage in light vehicles	Calcuation from average volume light vehicles minus top-up volume LV	10.38	-
Frequency of fluid changes for light vehicles	Desrosiers average 2006-2010	19.20%	0.6%
% of DIFM	Desrosiers average 2006-2010	74.30%	2.2%
ROAD TRANSPORT SECTOR			+/-
Average antifreeze volume in trucks	Prorating of each class	32.6	-
Volume of antifreeze consumed per class 3-4-5 trucks	Prorating capacity	15.7	-
Volume of antifreeze consumed per class 6 truck	Prorating capacity	19.2	-
Average volume of antifreeze consumed per truck	Prorating of each class	22.4	-
Volume of antifreeze consumed/truck/year for breakage classes 3-4-5	Prorating capacity	2.7	-
Volume of antifreeze consumed/truck/year for breakage class 6	Prorating capacity	3.4	-
Average volume of antifreeze consumed/truck/year for breakage	Prorating of each class	3.9	-

PARAMETERS	Source	VALUE	Precision
Volume of antifreeze consumed/truck/year for top-ups for classes 3-4-5	Prorating capacity	6.6	-
Volume of antifreeze consumed/truck/year for top-ups for class 6	Prorating capacity	8.1	-
Average volume of antifreeze consumed/truck/year for top-ups	Prorating of each class	9.5	-
OTHER SECTORS			+/-
Average volume of antifreeze in machines	Prorating of each category	54.5	-
Average volume of antifreeze consumed per machine	Prorating of each category	31.5	-
Average volume of antifreeze consumed per machine for breakage	Prorating of each category	14.3	-
Average volume of antifreeze consumed per machine for top-ups	Prorating of each category	7.7	-
Volume of antifreeze in end-of-life machines	Calculation from the value for trucks in proportion to the capacity	20.4	-

SPECIFIC TO SASKATCHEWAN

PARAMETERS	Source	VALUE	Precision
CONSTANTS			+/-
Antifreeze sales (eq 50/50)	Members survey	3,424,040	NA
Total accidents for cars and light trucks	SGI 2010	45,346	NA
Total loss vehicles	-	ND	NA
Number of trucks & buses in accidents	SGI average 2006-2010	1,639	NA
Number of machines in accidents	-	ND	NA
Number of cars	Desrosiers 2010	423,669	NA
Number of class 1 light trucks	Desrosiers 2010	255,680	NA
Number of class 2 light trucks	Desrosiers 2010	281,463	NA
Number of class 3-4-5 trucks	Polk 2010	28,277	NA
Number of class 6 trucks	Polk 2010	19,972	NA
Number of class 7 trucks	Polk 2010	9,259	NA
Number of class 8 trucks	Polk 2010	37,496	NA
Total number of trucks and buses	Polk 2010, total	95,004	NA
Number of farming tractors	From QC in proportion of GDP	149,638	29,928
Number of machines construction/forestry	From QC in proportion of GDP	16,147	3,229
Number of machines in mining sector	From QC in proportion of GDP	6,461	1,292
Total Number of machines	Calculation	172,246	-
Car sales	Desrosiers average 2006-2010	14,782	NA
Light truck sales class 1 & 2	Desrosiers average 2006-2010	29,270	NA
Truck sales class 3-4-5	Polk average 2006-2010	1,730	NA
Truck sales class 6	Polk average 2006-2010	120	NA
Truck sales class 7	Polk average 2006-2010	243	NA
Truck sales class 8	Polk average 2006-2010	1,153	NA
Bus & truck sales	Polk average 2006-2010, total	3,247	NA
Farming tractor sales	From QC in proportion of GDP	5,395	1,079
Construction/forestry machine sales	From QC in proportion of GDP	582	116
Mining sector machine sales	From QC in proportion of GDP	233	47
Machine sales	Calculation	6,210	-
End-of-life cars	Sales minus fleet increase (av. 2006-2009)	13,325	NA
End-of-life light trucks classes 1 and 2	Sales minus fleet increase (av. 2006-2009)	18,466	NA
End-of-life trucks	Sales minus fleet increase (av. 2006-2009)	193	NA
End-of-life machines	Sales minus fleet increase (av. 2006-2009)	619	24
AUTOMOTIVE SECTOR			+/-
General Statistics			

PARAMETERS	Source	VALUE	Precision
Antifreeze volume in car	Desrosiers 2010	8.68	NA
Antifreeze volume in light trucks class 1	Desrosiers 2010	10.89	NA
Antifreeze volume in light trucks class 2	Desrosiers 2010	17.60	NA
Average antifreeze volume in light vehicles	Prorating the fleet	11.88	NA
Average antifreeze volume in light trucks	Prorating the fleet	14.41	NA
Antifreeze volume in sold cars	Desrosiers average 2006-2010	7.73	NA
Antifreeze volume in sold class 1 trucks	Desrosiers average 2006-2010	9.67	NA
Antifreeze volume in sold class 2 trucks	Desrosiers average 2006-2010	16.84	NA
Average antifreeze volume in sold LV	Proration of sales	11.52	NA
Average antifreeze volume in sold LT	Proration of sales	13.43	NA
Breakage parameters			
Radiator change frequency	Desrosiers average 2006-2010	2.5%	0.11%
Number of radiators repared/changed	Calculation	24,020	-
Loss by Usage Parameters			
DIY top-up frequency for cars and light trucks	Desrosiers average 2006-2010	37.0%	1.1%
Average top-up volume light vehicles	Prorating the fleet	1.08	-
Draining Parameters			
Average volume of drainage in light vehicles	Calcuation from average volume light vehicles minus top-up volume LV	10.8	-
Frequency of fluid changes for light vehicles	Desrosiers average 2006-2010	19.20%	0.6%
% of DIFM	Desrosiers average 2006-2010	74.30%	2.2%
ROAD TRANSPORT SECTOR			+/-
Average antifreeze volume in trucks	Prorating of each class	34.4	-
Volume of antifreeze consumed per class 3-4-5 trucks	Prorating capacity	15.6	-
Volume of antifreeze consumed per class 6 truck	Prorating capacity	19.1	-
Average volume of antifreeze consumed per truck	Prorating of each class	23.6	-
Volume of antifreeze consumed/truck/year for breakage classes 3-4-5	Prorating capacity	2.7	-
Volume of antifreeze consumed/truck/year for breakage class 6	Prorating capacity	3.3	-

PARAMETERS	Source	VALUE	Precision
Average volume of antifreeze consumed/truck/year for breakage	Prorating of each class	4.1	-
Volume of antifreeze consumed/truck/year for top-ups for classes 3-4-5	Prorating capacity	6.6	-
Volume of antifreeze consumed/truck/year for top-ups for class 6	Prorating capacity	8.1	-
Average volume of antifreeze consumed/truck/year for top-ups	Prorating of each class	10.0	-
OTHER SECTORS			+/-
Average volume of antifreeze in machines	Prorating of each category	31.4	-
Average volume of antifreeze consumed per machine	Prorating of each category	16.2	-
Average volume of antifreeze consumed per machine for breakage	Prorating of each category	6.5	-
Average volume of antifreeze consumed per machine for top-ups	Prorating of each category	5.1	-
Volume of antifreeze in end-of-life machines	Calculation from the value for trucks in proportion to the capacity	11.1	-

SPECIFIC TO MANITOBA

PARAMETERS	Source	VALUE	Precision
CONSTANTS			
Antifreeze sales (eq 50/50)	Extrapolation from the 4 first months 2011	4,521,000	NA
Total accidents for cars and light trucks	-	ND	NA
Total loss vehicles	-	ND	NA
Number of trucks & buses in accidents	Estimation from SK in proportion to the number of trucks	1,031	NA
Number of machines in accidents	-	ND	NA
Number of cars	Desrosiers 2010	423,305	NA
Number of class 1 light trucks	Desrosiers 2010	249,819	NA
Number of class 2 light trucks	Desrosiers 2010	186,062	NA
Number of class 3-4-5 trucks	Polk 2010	13,726	NA
Number of class 6 trucks	Polk 2010	8,313	NA
Number of class 7 trucks	Polk 2010	6,616	NA
Number of class 8 trucks	Polk 2010	31,134	NA
Total number of trucks and buses	Polk 2010, total	59,789	NA
Number of farming tractors	From QC in proportion of GDP	57,868	11,574
Number of machines construction/forestry	From QC in proportion of GDP	11,942	2,388
Number of machines in mining sector	From QC in proportion of GDP	826	165
Total Number of machines	Calculation	70,636	-
Car sales	Desrosiers average 2006-2010	18,922	NA
Light truck sales class 1 & 2	Desrosiers average 2006-2010	25,418	NA
Truck sales class 3-4-5	Polk average 2006-2010	569	NA
Truck sales class 6	Polk average 2006-2010	65	NA
Truck sales class 7	Polk average 2006-2010	267	NA
Truck sales class 8	Polk average 2006-2010	1,289	NA
Bus & truck sales	Polk average 2006-2010, total	2,190	NA
Farming tractor sales	From QC in proportion of GDP	2,086	417
Construction/forestry machine sales	From QC in proportion of GDP	431	86
Mining sector machine sales	From QC in proportion of GDP	30	6
Machine sales	Calculation	2,547	-
End-of-life cars	Sales minus fleet increase (av. 2006-2009)	19,771	NA
End-of-life light trucks class 1 & 2	Sales minus fleet increase (av. 2006-2009)	18,711	NA
End-of-life trucks	Sales minus fleet increase (av. 2006-2009)	121	NA
End-of-life machines	Sales minus fleet increase (av. 2006-2009)	254	-
AUTOMOTIVE SECTOR			+/-
General Statistics			
Antifreeze volume in car	Desrosiers 2010	8.36	NA

PARAMETERS	Source	VALUE	Precision
Antifreeze volume in light trucks class 1	Desrosiers 2010	10.70	NA
Antifreeze volume in light trucks class 2	Desrosiers 2010	17.01	NA
Average antifreeze volume in light vehicles	Prorating the fleet	10.91	NA
Average antifreeze volume in light trucks	Prorating the fleet	13.39	NA
Antifreeze volume in sold cars	Desrosiers average 2006-2010	7.41	NA
Antifreeze volume in sold class 1 trucks	Desrosiers average 2006-2010	9.46	NA
Antifreeze volume in sold class 2 trucks	Desrosiers average 2006-2010	16.18	NA
Average antifreeze volume sold LV	Proration of sales	10.23	NA
Average antifreeze volume sold LT	Proration of sales	12.33	NA
Breakage parameters			
Radiator change frequency	Desrosiers average 2006-2010	2.5%	0.11%
Number of radiators repared/changed	Calculation	21,480	-
Loss by Usage Parameters			
DIY top-up frequency for cars and light trucks	Desrosiers average 2006-2010	37.0%	1.1%
Average top-up volume light vehicles	Prorating the fleet	1.07	-
Draining Parameters			
Average volume of drainage in light vehicles	Calcuation from average volume light vehicles minus top-up volume LV	9.85	-
Frequency of fluid changes for light vehicles	Desrosiers average 2006-2010	19.20%	0.6%
% of DIFM	Desrosiers average 2006-2010	74.30%	2.2%
ROAD TRANSPORT SECTOR			+/-
Average antifreeze volume in trucks	Prorating of each class	36.8	-
Volume of antifreeze consumed per class 3-4-5 trucks	Prorating capacity	15.8	-
Volume of antifreeze consumed per class 6 truck	Prorating capacity	19.3	-
Average volume of antifreeze consumed per truck	Prorating of each class	25.4	-
Volume of antifreeze consumed/truck/year for breakage classes 3-4-5	Prorating capacity	2.8	-
Volume of antifreeze consumed/truck/year for breakage class 6	Prorating capacity	3.4	-
Average volume of antifreeze consumed/truck/year for breakage	Prorating of each class	4.4	-

PARAMETERS	Source	VALUE	Precision
Volume of antifreeze consumed/truck/year for top-ups for classes 3-4-5	Prorating capacity	6.7	-
Volume of antifreeze consumed/truck/year for top-ups for class 6	Prorating capacity	8.1	-
Average volume of antifreeze consumed/truck/year for top-ups	Prorating of each class	10.7	-
OTHER SECTORS			+/-
Average volume of antifreeze in machines	Prorating of each category	28.0	-
Average volume of antifreeze consumed per machine	Prorating of each category	15.0	-
Average volume of antifreeze consumed per machine for breakage	Prorating of each category	5.5	-
Average volume of antifreeze consumed per machine for top-ups	Prorating of each category	5.1	-
Volume of antifreeze in end-of-life machines	Calculation from the value for trucks in proportion to the capacity	9.3	-

SPECIFIC TO ONTARIO

PARAMETERS	Source	VALUE	Precision
CONSTANTS			+/-
Antifreeze sales (eq 50/50)	Stewardship Ontario 2011 Estimation	26,611,061	NA
Total accidents for cars and light trucks	Ontario Government, average 2006-2008	330,633	NA
Total loss vehicles	-	ND	NA
Number of trucks & buses in accidents	Ontario Government, average 2006-2008	38,481	NA
Number of machines in accidents	Ontario Government, average 2006-2008	487	NA
Number of cars	Desrosiers 2010	4,196,007	NA
Number of class 1 light trucks	Desrosiers 2010	2,245,742	NA
Number of class 2 light trucks	Desrosiers 2010	1,087,043	NA
Number of class 3-4-5 trucks	Polk 2010	107,298	NA
Number of class 6 trucks	Polk 2010	17,153	NA
Number of class 7 trucks	Polk 2010	38,239	NA
Number of class 8 trucks	Polk 2010	150,172	NA
Total number of trucks and busses	Polk 2010, total	312,862	NA
Number of farming tractors	From QC in proportion of GDP	147,721	29,544
Number of machines construction/forestry	From QC in proportion of GDP	155,298	31,060
Number of machines in mining sector	From QC in proportion of GDP	2,828	566
Total Number of machines	Calculation	305,847	-
Car sales	Desrosiers average 2006-2010	297,069	NA
Light truck sales class 1 & 2	Desrosiers average 2006-2010	279,797	NA
Truck sales class 3-4-5	Polk average 2006-2010	6,200	NA
Truck sales class 6	Polk average 2006-2010	792	NA
Truck sales class 7	Polk average 2006-2010	2,008	NA
Truck sales class 8	Polk average 2006-2010	8,350	NA
Bus & truck sales	Polk average 2006-2010, total	17,350	NA
Farming tractor sales	From QC in proportion of GDP	5,326	1,065
Construction/forestry machine sales	From QC in proportion of GDP	5,599	1,120
Mining sector machine sales	From QC in proportion of GDP	102	20
Machine sales	Calculation	11,027	-
End-of-life cars	Sales minus fleet increase (av. 2006-2009)	306,948	NA
End-of-life light trucks class 1 & 2	Sales minus fleet increase (av. 2006-2009)	217,707	NA
End-of-life trucks	Sales minus fleet increase (av. 2006-2009)	14,872	NA
End-of-life machines	Sales minus fleet increase (av. 2006-2009)	1,099	-
AUTOMOTIVE SECTOR			+/-
General Statistics			
Antifreeze volume in car	Desrosiers 2010	7.91	NA

PARAMETERS	Source	VALUE	Precision
Antifreeze volume in light trucks class 1	Desrosiers 2010	10.36	NA
Antifreeze volume in light trucks class 2	Desrosiers 2010	16.42	NA
Average antifreeze volume in light vehicles	Prorating the fleet	9.87	NA
Average antifreeze volume in light trucks	Prorating the fleet	12.34	NA
Antifreeze volume in sold cars	Desrosiers average 2006-2010	7.41	NA
Antifreeze volume in sold class 1 trucks	Desrosiers average 2006-2010	9.39	NA
Antifreeze volume in sold class 2 trucks	Desrosiers average 2006-2010	15.47	NA
Average antifreeze volume sold LV	Proration of sales	9.33	NA
Average antifreeze volume sold LT	Proration of sales	11.37	NA
Breakage parameters			
Radiator change frequency	Desrosiers average 2006-2010	2.4%	0.08%
Number of radiators srepared/changed	Calculation	180,691	-
Loss by Usage Parameters			
DIY top-up frequency for cars and light trucks	Desrosiers average 2006-2010	35.1%	0.9%
Average top-up volume light vehicles	Prorating the fleet	1.05	-
Draining Parameters			
Average volume of drainage in light vehicles	Calcuation from average volume light vehicles minus top-up volume LV	8.82	-
Frequency of fluid changes for light vehicles	Desrosiers average 2006-2010	17.40%	0.4%
% of DIFM	Desrosiers average 2006-2010	81.40%	2.0%
ROAD TRANSPORT SECTOR			+/-
Average antifreeze volume in trucks	Prorating of each class	36.0	-
Volume of antifreeze consumed per class 3-4-5 trucks	Prorating capacity	15.6	-
Volume of antifreeze consumed per class 6 truck	Prorating capacity	19.1	-
Average volume of antifreeze consumed per truck	Prorating of each class	24.6	-
Volume of antifreeze consumed/truck/year for breakage classes 3-4-5	Prorating capacity	2.7	-
Volume of antifreeze consumed/truck/year for breakage class 6	Prorating capacity	3.3	-
Average volume of antifreeze consumed/truck/year for breakage	Prorating of each class	4.3	-

PARAMETERS	Source	VALUE	Precision
Volume of antifreeze consumed/truck/year for top-ups for classes 3-4-5	Prorating capacity	6.6	-
Volume of antifreeze consumed/truck/year for top-ups for class 6	Prorating capacity	8.1	-
Average volume of antifreeze consumed/truck/year for top-ups	Prorating of each class	10.4	-
OTHER SECTORS			+/-
Average volume of antifreeze in machines	Prorating of each category	32.8	-
Average volume of antifreeze consumed per machine	Prorating of each category	21.1	-
Average volume of antifreeze consumed per machine for breakage	Prorating of each category	7.5	-
Average volume of antifreeze consumed per machine for top-ups	Prorating of each category	6.4	-
Volume of antifreeze in end-of-life machines	Calculation from the value for trucks in proportion to the capacity	11.1	-

SPECIFIC TO QUEBEC

PARAMETERS	Source	VALUE	Precision
CONSTANTS			
Antifreeze sales (eq 50/50)	SOGHU 2008	18,598,120	NA
Total accidents for cars and light trucks	SAAQ, average 2006-2010 (Table 60)	204,833	NA
Total loss vehicles	SAAQ, average 2008-2010	45,490	NA
Number of trucks & buses in accidents	SAAQ, average 2006-2010 (Table 60)	14,299	NA
Number of machines in accidents	SAAQ, average 2006-2010 (Table 60)	1,852	NA
Number of cars	Desrosiers 2010	3,227,305	NA
Number of class 1 light trucks	Desrosiers 2010	1,192,492	NA
Number of class 2 light trucks	Desrosiers 2010	498,577	NA
Number of class 3-4-5 trucks	Polk 2010	74,846	NA
Number of class 6 trucks	Polk 2010	14,615	NA
Number of class 7 trucks	Polk 2010	30,135	NA
Number of class 8 trucks	Polk 2010	116,529	NA
Total number of trucks and buses	Polk 2010, total	236,125	NA
Number of farming tractors	SAAQ 2010	96,798	19,360
Number of machines construction/forestry	SAAQ 2010	94,937	18,987
Number of machines in mining sector	SAAQ 2010	1,278	256
Total Number of machines	SAAQ 2010	193,013	-
Car sales	Desrosiers av. 2006-2010	257,293	NA
Light truck sales class 1 & 2	Desrosiers av. 2006-2010	145,580	NA
Truck sales class 3-4-5	Polk average 2006-2010	3,995	NA
Truck sales class 6	Polk average 2006-2010	326	NA
Truck sales class 7	Polk average 2006-2010	1,234	NA
Truck sales class 8	Polk average 2006-2010	5,321	NA
Bus & truck sales	Polk average 2006-2010, total	10,876	NA
Farming tractor sales	Fleet proportion	3,490	698
Construction/forestry machine sales	Fleet proportion	3,423	685
Mining sector machine sales	Fleet proportion	46	9
Machine sales	SAAQ, class 1 year, average 2006-2010	6,959	-
End-of-life cars	Sales minus fleet increase (av. 2006-2009)	225,159	NA
End-of-life light trucks class 1 & 2	Sales minus fleet increase (av. 2006-2009)	117,496	NA
End-of-life trucks	Sales minus fleet increase (av. 2006-2009)	8,332	NA
End-of-life machines	Sales minus fleet increase (av. 2006-2009)	692	-
AUTOMOTIVE SECTOR			+/-
General Statistics			
Antifreeze volume in car	Desrosiers 2010	7.05	NA

PARAMETERS	Source	VALUE	Precision
Antifreeze volume in light trucks class 1	Desrosiers 2010	10.08	NA
Antifreeze volume in light trucks class 2	Desrosiers 2010	16.80	NA
Average antifreeze volume in light vehicles	Prorating the fleet	8.77	NA
Average antifreeze volume in light trucks	Prorating the fleet	12.06	NA
Antifreeze volume in sold cars	Desrosiers average 2006-2010	6.81	NA
Antifreeze volume in sold class 1 trucks	Desrosiers average 2006-2010	9.21	NA
Antifreeze volume in sold class 2 trucks	Desrosiers average 2006-2010	15.98	NA
Average antifreeze volume sold LV	Proration of sales	8.40	NA
Average antifreeze volume sold LT	Proration of sales	11.21	NA
Breakage parameters			
Radiator change frequency	Desrosiers average 2006-2010	1.96%	0.09%
Number of radiators repared/changed	Calculation	96,400	-
Loss by Usage Parameters			
DIY top-up frequency for cars and light trucks	Desrosiers average 2006-2010	12.5%	0.4%
Average top-up volume light vehicles	Prorating the fleet	1.02	-
Draining Parameters			
Average volume of drainage in light vehicles	Calcuation from average volume light vehicles minus top-up volume LV	7.75	-
Frequency of fluid changes for light vehicles	Desrosiers average 2006-2010	14.0%	0.4%
% of DIFM	Desrosiers average 2006-2010	75.8%	2.3%
ROAD TRANSPORT SECTOR			+/-
Average antifreeze volume in trucks	Prorating of each class	36.5	-
Volume of antifreeze consumed per class 3-4-5 trucks	Prorating capacity	15.6	-
Volume of antifreeze consumed per class 6 truck	Prorating capacity	19.1	-
Average volume of antifreeze consumed per truck	Prorating of each class	24.9	-
Volume of antifreeze consumed/truck/year for breakage classes 3-4-5	Prorating capacity	2.7	-
Volume of antifreeze consumed/truck/year for breakage class 6	Prorating capacity	3.3	-
Average volume of antifreeze consumed/truck/year for breakage	Prorating of each class	4.4	-

PARAMETERS	Source	VALUE	Precision
Volume of antifreeze consumed/truck/year for top-ups for classes 3-4-5	Prorating capacity	6.6	-
Volume of antifreeze consumed/truck/year for top-ups for class 6	Prorating capacity	8.1	-
Average volume of antifreeze consumed/truck/year for top-ups	Prorating of each class	10.5	-
OTHER SECTORS			+/-
Average volume of antifreeze in machines	Prorating of each category	32.1	-
Average volume of antifreeze consumed per machine	Prorating of each category	20.5	-
Average volume of antifreeze consumed per machine for breakage	Prorating of each category	7.2	-
Average volume of antifreeze consumed per machine for top-ups	Prorating of each category	6.3	-
Volume of antifreeze in end-of-life machines	Calculation from the value for trucks in proportion to the capacity	10.7	-

SPECIFIC TO NEW-BRUNSWICK

PARAMETERS	Source	VALUE	Precision
CONSTANTS			
Antifreeze sales (eq 50/50)	Survey of SOGHU Members in NB, 2012	On-going	NA
Total accidents for cars and light trucks	GRC, average 2007-2009	10,427	NA
Total loss vehicles	-	ND	NA
Number of trucks & buses in accidents	Estimation from GRC, average 2007-2009	728	NA
Number of machines in accidents	-	ND	NA
Number of cars	Desrosiers 2010	318,216	NA
Number of class 1 light trucks	Desrosiers 2010	160,983	NA
Number of class 2 light trucks	Desrosiers 2010	97,415	NA
Number of class 3-4-5 trucks	Polk 2010	8,017	NA
Number of class 6 trucks	Polk 2010	1,725	NA
Number of class 7 trucks	Polk 2010	3,525	NA
Number of class 8 trucks	Polk 2010	16,149	NA
Total number of trucks and buses in accidents	Polk 2010, total	29,416	NA
Number of farming tractors	From QC in proportion of GDP	8,854	1,771
Number of machines construction/forestry	From QC in proportion of GDP	10,498	2,100
Number of machines in mining sector	From QC in proportion of GDP	354	71
Total Number of machines	Calculation	19,706	-
Car sales	Desrosiers average 2006-2010	19,004	NA
Light truck sales class 1 & 2	Desrosiers average 2006-2010	17,085	NA
Truck sales class 3-4-5	Polk average 2006-2010	364	NA
Truck sales class 6	Polk average 2006-2010	43	NA
Truck sales class 7	Polk average 2006-2010	147	NA
Truck sales class 8	Polk average 2006-2010	873	NA
Bus & truck sales	Polk average 2006-2010, total	1,427	NA
Farming tractor sales	From QC in proportion of GDP	319	64
Construction/forestry machine sales	From QC in proportion of GDP	379	76
Mining sector machine sales	From QC in proportion of GDP	13	3
Machine sales	Calculation	711	-
End-of-life cars	Sales minus fleet increase (av. 2006-2009)	13,242	NA
End-of-life light trucks class 1 & 2	Sales minus fleet increase (av. 2006-2009)	10,184	NA
End-of-life trucks	Sales minus fleet increase (av. 2006-2009)	817	NA
End-of-life machines	Sales minus fleet increase (av. 2006-2009)	71	14
AUTOMOTIVE SECTOR			+/-
General Statistics			

PARAMETERS	Source	VALUE	Precision
Antifreeze volume in car	Desrosiers 2010	7.79	NA
Antifreeze volume in light trucks class 1	Desrosiers 2010	10.56	NA
Antifreeze volume in light trucks class 2	Desrosiers 2010	16.51	NA
Average antifreeze volume in light vehicles	Prorating the fleet	10.04	NA
Average antifreeze volume in light trucks	Prorating the fleet	12.80	NA
Antifreeze volume in sold cars	Desrosiers average 2006-2010	7.16	NA
Antifreeze volume in sold class 1 trucks	Desrosiers average 2006-2010	9.61	NA
Antifreeze volume in sold class 2 trucks	Desrosiers average 2006-2010	16.07	NA
Average antifreeze volume sold LV	Proration of sales	9.47	NA
Average antifreeze volume sold LT	Proration of sales	12.05	NA
Breakage parameters			
Radiator change frequency	Desrosiers average 2006-2010	2.06%	0.17%
Number of radiators repared/changed	Calculation	11,878	-
Loss by Usage Parameters			
DIY top-up frequency for cars and light trucks	Desrosiers average 2006-2010	27.5%	1.5%
Average top-up volume light vehicles	Prorating the fleet	1.05	-
Draining Parameters			
Average volume of drainage in light vehicles	Calcuation from average volume light vehicles minus top-up volume LV	8.99	-
Frequency of fluid changes for light vehicles	Desrosiers average 2006-2010	15.40%	0.8%
% of DIFM	Desrosiers average 2006-2010	80.60%	4.4%
ROAD TRANSPORT SECTOR			+/-
Average antifreeze volume in trucks	Prorating of each class	37.2	-
Volume of antifreeze consumed per class 3-4-5 trucks	Prorating capacity	15.7	-
Volume of antifreeze consumed per class 6 truck	Prorating capacity	19.3	-
Average volume of antifreeze consumed per truck	Prorating of each class	25.7	-
Volume of antifreeze consumed/truck/year for breakage classes 3-4-5	Prorating capacity	2.8	-
Volume of antifreeze consumed/truck/year for breakage class 6	Prorating capacity	3.4	-

PARAMETERS	Source	VALUE	Precision
Average volume of antifreeze consumed/truck/year for breakage	Prorating of each class	4.5	-
Volume of antifreeze consumed/truck/year for top-ups for classes 3-4-5	Prorating capacity	6.6	-
Volume of antifreeze consumed/truck/year for top-ups for class 6	Prorating capacity	8.1	-
Average volume of antifreeze consumed/truck/year for top-ups	Prorating of each class	10.8	-
OTHER SECTORS			+/-
Average volume of antifreeze in machines	Prorating of each category	34.7	-
Average volume of antifreeze consumed per machine	Prorating of each category	22.4	-
Average volume of antifreeze consumed per machine for breakage	Prorating of each category	8.1	-
Average volume of antifreeze consumed per machine for top-ups	Prorating of each category	6.7	-
Volume of antifreeze in end-of-life machines	Calculation from the value for trucks in proportion to the capacity	11.4	-

Appendix 2   Detailed Calculation for the Estimation of the Number of Heavy Equipment per Province
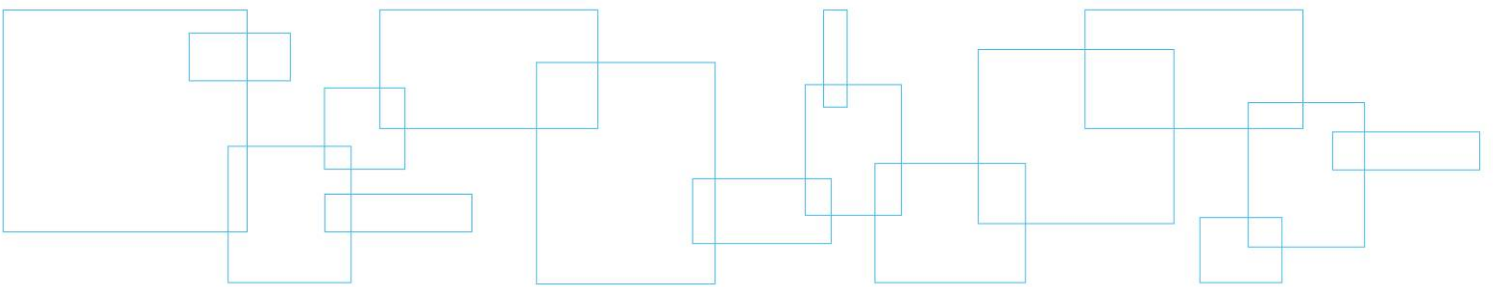
CALCULATIONS LEADING TO ESTIMATIONS OF THE NUMBER OF HEAVY EQUIPMENT FOR PROVINCES OTHER THAN QUEBEC

Quebec is the only province to register all heavy equipment in circulation. In other provinces, the number of registered heavy equipment in circulation is very low. This is explained by the fact that only heavy equipment that can circulate on roads need to be registered. Therefore, the number of heavy equipment per sector was estimated using the methodology developed below.

Firstly, an average of the GDPs from 2007 to 2011 of the other provinces was calculated for sectors indentified as primary users of heavy equipment. The averaging was to smooth out the fluctuation in annual GDPs that depend on ever changing economic conditions.

(Source : Statistics Canada, dollars x 1 000 000)

NAICS	QC	BC	AB	SK	MB	ON	NB
Crop production [111] and animal production [112]	3,091	1,144	5,001	4,778	1,848	4,717	283
Foresty and logging [113] and Construction [23]	15,475	12,001	15,144	2,632	1,947	25,314	1,711
Mining, quarrying, and oil and gas extraction [21]	1,019	4,556	34,534	5,153	659	2,256	283

The SAAQ provided a spreadsheet of the make and model of all registered off-road vehicles which had more than 60,000 entries. Over 50% of the spreadsheet was analysed in order to class the heavy equipment by sector. Carts, ATVs and lawn mowers were excluded.

This analysis was used to evaluate the number of heavy equipment in Quebec by category: agriculture, construction / forestry / manufacturing and mining / oil and gas, as indicated in the first column of the table below. Then, the number of heavy equipment per million dollars of GDP was calculated for each sector.

TYPE OF HEAVY EQUIPMENT	UNITS IN QC IN 2011	UNITS PER $ MILLION OF GDP
Agricultural	96,798	31.32
Construction, forestry, manufacturing	94,937	6.13
Mines, oil and gas	1,278	1.25

This ratio was then applied to the GDPs of these sectors for the other provinces to calculate the number of heavy equipment per sector.
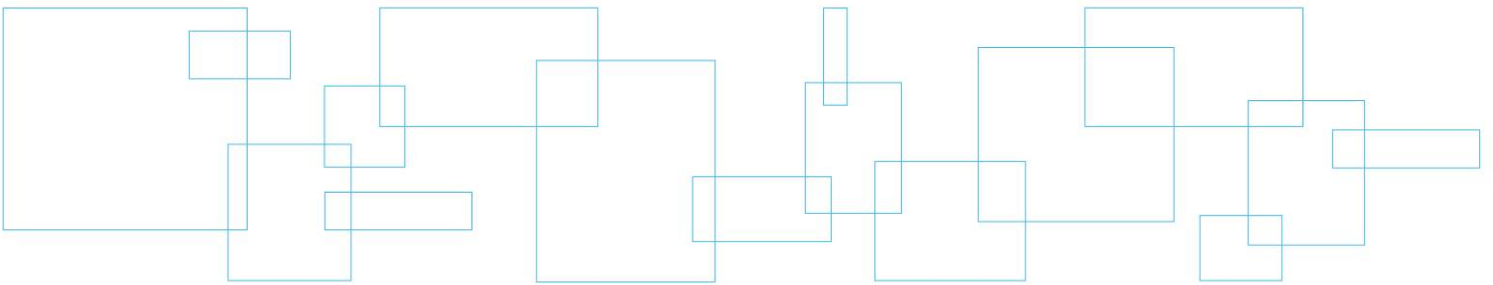
TYPE OF HEABY EQUIPMENT	QC	BC	AB	SK	MB	ON	NB
Agricultural	96,798	35,833	156,617	149,638	57,868	147,721	8,854
Construction, forestry, manufacturing	94,937	73,627	92,904	16,147	11,942	155,298	10,498
Mines, gaz and oil	1,278	5,713	43,297	6,461	826	2,828	354
TOTAL	**193,013**	**115,173**	**292,818**	**172,246**	**70,636**	**305,847**	**19,706**

It is interesting to compare the results for Manitoba with another method. Statistics Canada publishes the total number of off-road vehicles and agricultural and construction heavy equipment in different provinces and the Manitoba Public Insurance (MPI) publishes the number of off-road vehicles in Manitoba.

SOURCE	2005	2006	2007	2008	2009
STATCAN : all off-road vehicles and agricultural and construction heavy equipment	105,971	108,404	113,602	120,805	121,895
MPI : all off-road vehicles	36,731	39,459	43,118	48,728	52,801
Subtraction = agricultural and construction heavy equipment	**69,240**	**68,945**	**70,484**	**72,077**	**69,094**

The resulting numbers are very close to the ones obtained when comparing GDPs (70,363 heavy equipment), which validates this method.

Appendix 3   Comparison of the Results for the 7 Provinces

AUTOMOTIVE SECTOR RESULTS

		BC	AB	SK	MB	ON	QC	NB
Volume contained in sold vehicles (OEM)		1,651,328	2,470,968	507,316	453,576	5,383,438	3,383,536	341,864
Volume used in the different sectors	+	7,278,191	7,817,736	2,508,102	2,119,829	15,635,358	7,488,909	1,077,981
Total volume sold per sector	=	**8,929,519**	**10,288,704**	**3,015,418**	**2,573,405**	**21,018,797**	**10,872,446**	**1,419,845**
DIRECT METHOD - "DRAINS"								
Volume of drains		5,653,065	6,112,324	2,000,999	1,644,716	11,727,441	5,430,284	800,335
Volume in the end-of-life vehicles	+	245,682	317,609	63,192	111,600	1,521,500	993,700	76,683
Recoverable antifreeze		5,898,747	6,429,934	2,064,191	1,756,316	13,248,940	6,423,984	877,018
Recoverable antifreeze eq 50/50	=	**5,308,872**	**5,786,940**	**1,844,021**	**1,580,684**	**11,924,046**	**5,781,585**	**773,183**
Rate of recoverable antifreeze eq. 50/50	=	**59.5%**	**56.2%**	**61.2%**	**61.4%**	**56.7%**	**53.2%**	**54.5%**
INDIRECT METHOD - "LOSS"								
Loss following breakage		126,260	106,838	38,410	30,286	254,774	135,924	17,350
Consume in use	+	1,710,195	1,777,395	535,777	495,518	4,079,574	2,150,206	285,096
Total loss of antifreeze	=	**1,836,455**	**1,884,233**	**574,187**	**525,804**	**4,334,348**	**2,286,130**	**302,445**
Volume in the end-of-life vehicles	=	**245,682**	**317,609**	**63,192**	**111,600**	**1,521,500**	**993,700**	**76,683**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**5,687,418**	**6,251,113**	**1,997,107**	**1,705,624**	**12,822,509**	**6,196,479**	**852,219**
Recoverable antifreeze eq 50/50	=	**5,118,676**	**5,626,001**	**1,784,092**	**1,535,062**	**11,540,258**	**5,576,831**	**751,320**
Rate of recoverable antifreeze eq. 50/50	=	**57.3%**	**54.7%**	**59.2%**	**59.7%**	**54.9%**	**51.3%**	**52.9%**

ROAD TRANSPORTATION RESULTS

		BC	AB	SK	MB	ON	QC	NB
Volume contained in sold vehicles (OEM)		311,997	638,824	107,317	82,889	620,484	388,825	53,799
Volume used in the different sectors	+	3,510,838	6,649,437	2,472,466	1,520,474	7,710,981	5,889,833	675,043
Total volume sold per sector	=	**3,822,834**	**7,288,260**	**2,579,783**	**1,603,362**	**8,331,465**	**6,278,658**	**728,842**
DIRECT METHOD - "DRAINS"								
Volume of drains		1,365,716	2,586,631	908,455	591,464	2,999,572	2,291,145	272,494
Volume in the end-of-life vehicles	+	14,054	69,772	2,760	1,476	181,438	101,650	8,539
Recoverable antifreeze		1,379,770	2,656,403	911,215	592,940	3,181,010	2,392,796	281,033
Recoverable antifreeze eq 50/50	=	**1,241,793**	**2,390,762**	**839,844**	**533,646**	**2,862,909**	**2,153,516**	**249,942**
Rate of recoverable antifreeze eq. 50/50	=	**32.5%**	**32.8%**	**32.6%**	**33.3%**	**34.4%**	**34.3%**	**34.3%**
INDIRECT METHOD - "LOSS"								
Loss following breakage		767,920	1,264,829	280,351	278,639	1,806,842	1,203,781	140,541
Consume in use	+	1,483,126	2,809,003	709,158	642,312	3,257,444	2,488,114	275,916
Total loss of antifreeze	=	**2,251,046**	**4,073,832**	**989,509**	**920,952**	**5,064,286**	**3,691,896**	**416,457**
Volume in the end-of-life vehicles	=	**14,054**	**69,772**	**2,760**	**1,476**	**181,438**	**101,650**	**8,539**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**1,273,846**	**2,645,377**	**1,485,717**	**600,998**	**2,828,134**	**2,299,588**	**267,125**
Recoverable antifreeze eq 50/50	=	**1,146,461**	**2,380,839**	**1,369,348**	**540,898**	**2,545,320**	**2,069,629**	**237,572**
Rate of recoverable antifreeze eq. 50/50	=	**30.0%**	**32.7%**	**53.1%**	**33.7%**	**30.6%**	**33.0%**	**32.6%**

OTHER SECTORS RESULTS

		BC	AB	SK	MB	ON	QC	NB
Volume contained in sold vehicles (OEM)		174,524	575,316	195,081	71,357	361,839	223,375	24,968
Volume used in the different sectors	+	3,182,606	9,227,793	2,145,711	1,056,760	6,447,491	3,959,959	414,940
Total volume sold per sector	=	**3,357,129**	**9,803,109**	**2,340,792**	**1,128,116**	**6,809,330**	**4,183,335**	**439,908**
DIRECT METHOD - "DRAINS"								
Volume of drains		1,238,034	3,589,611	677,707	411,080	2,508,074	1,540,424	144,208
Volume in the end-of-life vehicles	+	6,747	21,464	9,360	2,358	12,219	7,430	567
Recoverable antifreeze		1,244,781	3,611,076	687,067	413,438	2,520,293	1,547,854	144,775
Recoverable antifreeze eq 50/50	=	**1,120,302**	**3,249,968**	**622,083**	**372,094**	**2,268,264**	**1,393,069**	**127,529**
Rate of recoverable antifreeze eq. 50/50	=	**33.4%**	**33.2%**	**26.6%**	**33.0%**	**33.3%**	**33.3%**	**29.0%**
INDIRECT METHOD - "LOSS"								
Loss following breakage		1,222,071	4,173,961	1,054,945	389,870	2,287,393	1,396,566	125,317
Consume in use	+	870,150	2,251,538	596,564	357,858	1,963,134	1,218,811	160,942
Total loss of antifreeze	=	**2,092,221**	**6,425,499**	**1,651,509**	**747,728**	**4,250,527**	**2,615,377**	**286,259**
Volume in the end-of-life vehicles	=	**6,747**	**21,464**	**9,360**	**2,358**	**12,219**	**7,430**	**567**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**1,097,132**	**2,823,758**	**503,562**	**311,390**	**2,209,183**	**1,352,013**	**129,248**
Recoverable antifreeze eq 50/50	=	**987,419**	**2,541,383**	**455,934**	**280,251**	**1,988,265**	**1,216,811**	**113,852**
Rate of recoverable antifreeze eq. 50/50	=	**29.4%**	**25.9%**	**19.5%**	**24.8%**	**29.2%**	**29.1%**	**25.9%**

GLOBAL RESULTS

		BC	AB	SK	MB	ON	QC	NB
Volume contained in sold vehicles (OEM)		2,137,848	3,685,107	809,714	607,821	6,365,761	3,995,737	420,632
Volume used in the different sectors	+	13,971,634	23,694,966	7,126,279	4,697,062	29,793,830	17,338,702	2,167,964
Total volume sold per sector	**=**	**16,109,482**	**27,380,073**	**7,935,993**	**5,304,883**	**36,159,592**	**21,334,439**	**2,588,596**
DIRECT METHOD - "DRAINS"								
Volume of drains		8,256,814	12,288,566	3,587,161	2,647,260	17,235,086	9,261,853	1,217,037
Volume in the end-of-life vehicles	+	266,483	408,846	75,312	115,434	1,715,157	1,102,780	85,789
Recoverable antifreeze		8,523,298	12,697,412	3,662,472	2,762,694	18,950,243	10,364,633	1,302,825
Recoverable antifreeze eq 50/50	**=**	**7,670,968**	**11,427,671**	**3,305,947**	**2,486,425**	**17,055,219**	**9,328,170**	**1,150,654**
Rate of recoverable antifreeze eq. 50/50	**=**	**47.6%**	**41.7%**	**41.7%**	**46.9%**	**47.2%**	**43.7%**	**44.5%**
Margin of error	**±**	**3.1%**	**3.7%**	**3.7%**	**3.2%**	**3.4%**	**3.3%**	**3.1%**
INDIRECT METHOD - "LOSS"								
Loss following breakage		2,116,251	5,545,628	1,373,707	698,795	4,349,009	2,736,272	283,207
Consume in use	+	4,063,470	6,837,936	1,841,499	1,495,688	9,300,152	5,857,131	721,954
Total loss of antifreeze	**=**	**6,179,721**	**12,383,563**	**3,215,206**	**2,194,484**	**13,649,161**	**8,593,402**	**1,005,161**
Volume in the end-of-life vehicles	**=**	**266,483**	**408,846**	**75,312**	**115,434**	**1,715,157**	**1,102,780**	**85,789**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**8,058,396**	**11,720,248**	**3,986,385**	**2,618,013**	**17,859,826**	**9,848,080**	**1,248,592**
Recoverable antifreeze eq 50/50	**=**	**7,252,556**	**10,548,223**	**3,609,374**	**2,356,211**	**16,073,843**	**8,863,272**	**1,102,745**
Rate of recoverable antifreeze eq. 50/50	**=**	**45.0%**	**38.5%**	**45.5%**	**44.4%**	**44.5%**	**41.5%**	**42.6%**
Margin of error	**±**	**8.3%**	**17.5%**	**12.1%**	**8.4%**	**7.5%**	**9.0%**	**8.5%**

Appendix 4   Details on the Calculation of the Rate for BRITISH COLUMBIA

AUTOMOTIVE SECTOR		BRITISH-COLUMBIA	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of PC sold per year		85,054	Desrosiers average 2006-2010
Volume of antifreeze in PC	x	7.12	Desrosiers 2010
Volume of antifreeze in PC sold every year	=	*605,584*	*Calculation*
Number of LT sold per year		88,062	Desrosiers average 2006-2010
Volume of antifreeze in LT	x	11.88	Desrosiers 2010
Volume of antifreeze in LT sold every year	=	*1,045,744*	*Calculation*
Total volume of antifreeze in sold vehicles (OEM)	=	**1,651,328**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Frequency of antifreeze replacement		20.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,004,909	Desrosiers 2010
Average volume of antifreeze in PC and LT	x	10.24	Desrosiers 2010
Volume used for antifreeze replacement	=	*6,213,169*	*Calculation*
Frequency of DIY top-ups		30.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,004,909	Desrosiers 2010
% of DIY	x	20.4%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.06	Garage survey
Volume used fot DIY top-ups	=	*198,075*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	3,004,909	Desrosiers 2010
% DIFM	x	79.6%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.06	Garage survey
Volume used for DIFM top-ups	=	*866,947*	*Calculation*
Volume sold in automotive sector	=	**7,278,191**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**8,929,519**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
Frequency of drains (% of total vehicles)		20.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,004,909	Desrosiers 2010
Average volume of a drain for PC and LT	x	9.17	Volume in vehicles - Top-up volume
Volume of drains	=	*5,567,996*	*Calculation*
Frequency of radiators changed or repaired		2.98%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,004,909	Desrosiers 2010
Average recovered volume per radiator changed or repaired	x	0.95	Body shop survey
Volume recovered for radiator schanged or repaired	=	*85,069*	*Calculation*
Total volume of drains	=	**5,653,065**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**245,682**	**Calculation**
Total volume of recoverable antifreeze	**=**	**5,898,747**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**5,308,872**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**59.5%**	**Calculation**
Indirect method - "Loss"			
Calcul des pertes dues aux bris (accident ou mécanique)			

AUTOMOTIVE SECTOR		BRITISH-COLUMBIA	
Frequency of radiators changed or repaired		2.98%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,004,909	Desrosiers 2010
Average lost volume per radiator changed or repaired	x	1.41	Body shop survey
Total loss following breakage	=	**126,260**	**Calculation**
Calculation of the consume in use volume			
Frequency of DIY top-ups		30.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,004,909	Desrosiers 2010
% of DIY	x	20.4%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.06	Garage survey
Volume used fot DIY top-ups	=	*198,075*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	3,004,909	Desrosiers 2010
% DIFM	x	79.6%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.06	Garage survey
Volume used for DIFM top-ups	=	*866,947*	*Calculation*
Frequency of antifreeze replacement		20.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,004,909	Desrosiers 2010
Average volume of antifreeze added	x	1.06	Garage survey
Lossed volume in drains	=	*645,173*	*Calculation*
Total consume in use volume	=	**1,710,195**	**Calculation**
Total antifreeze loss	**=**	**1,836,455**	**Calculation**
Calculation of antifreeze in end-of-life vehicles (recoverable)			
Number of end-of-life PC and LT		84,718	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life PC and LT	x	2.90	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**245,682**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**5,687,418**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**5,118,676**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**57.3%**	**Calculation**

ROAD TRANSPORTATION SECTOR		BRITISH-COLUMBIA	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of trucks and buses sold per year		10,496	Polk average 2006-2010
Average volume of antifreeze in trucks and buses	x	29.7	Surveys
Total volume of antifreeze in sold vehicles (OEM)	=	**311,997**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per vehicle in one year		21.3	Road transportation survey
Number of trucks and buses on road	x	164,809	Polk 2010
Volume sold in road transportation sector	=	**3,510,838**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**3,822,834**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Road transportation survey
Volume sold in road transportation sector	x	3,510,838	Calculation
Total volume of drains	=	**1,365,716**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**14,054**	**Calculation**
Total volume of recoverable antifreeze	**=**	**1,379,770**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,241,793**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**32.5%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (accident or mechanical)			
Number of damaged trucks and buses (hyp. 50% radiator damaged)		7,987	Estimation from ICBC, average 2007-2011
Average volume of antifreeze in trucks and buses	x	31.5	Surveys
(Hyp. = end-of-life)	-	12.20	Vehicle recyclers survey
Antifreeze lost following trucks and buses accidents	=	*153,813*	*Calculation*
Average volume lost following breakage per vehicle in one year		3.7	Road transportation survey
Number of trucks and buses on road	x	164,809	Polk 2010
Antifreeze lost following mechanical breakages	=	*614,107*	*Calculation*
Total loss following breakages	=	**767,920**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per vehicle in one year		9.0	Road transportation survey
Number of trucks and buses on road	x	164,809	Polk 2010
Total consume in use volume	=	**1,483,126**	**Calculation**
Total antifreeze loss	**=**	**2,251,046**	**Calculation**
Calcul du volume provenant des véhicules en fin de vie (récupérable)			
Number of end-of-life trucks and buses		1,152	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life trucks and buses	x	12.20	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**14,054**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**1,273,846**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,146,461**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**30.0%**	**Calculation**

OTHER SECTORS		BRITISH-COLUMBIA	
Calculation of the volume of antifreeze in sold heavy equipment (OEM)			
Number of heavy equipment sold per year		4,153	From QC in proportion of GDP
Volume of antifreeze in heavy equipment	x	42.0	Surveys
Total volume of antifreeze in sold heavy equipment (OEM)	=	**174,524**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per heavy equipment in one year		27.6	Sondage autres secteurs
Number of heavy equipment in use	x	115,173	From QC in proportion of GDP
Volume sold in other sectors	=	**3,182,606**	**Calculation**
Total volume of antifreeze sold	**=**	**3,357,129**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Other sectors survey
Volume sold in other sectors	x	3,182,606	Calculation
Total volume of drains	=	**1,238,034**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**6,747**	**Calculation**
Total volume of recoverable antifreeze	**=**	**1,244,781**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,120,302**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**33.4%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (mechanical)			
Average volume lost following breakage per heavy equipment in one year		10.6	Other sectors survey
Number of heavy equipment in use	x	115,173	From QC in proportion of GDP
Total loss following breakages	=	**1,222,071**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per heavy equipment in one year		7.6	Other sectors survey
Number of heavy equipment in use	x	115,173	From QC in proportion of GDP
Total consume in use volume	=	**870,150**	**Calculation**
Total antifreeze loss	**=**	**2,092,221**	**Calculation**
Calculation of antifreeze in end-of-life heavy equipment (recoverable)			
Number of end-of-life heavy equipment		414	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life heavy equipment	x	16.30	Proportion of truck rate
Volume in end-of-life heavy equipments	=	**6,747**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**1,097,132**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**987,419**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**29.4%**	**Calculation**

GLOBAL RESULTS		BRITISH-COLUMBIA		
		AUTOMOTIVE	ROAD TRANSPORTATION	OTHER SECTORS
Volume contained in sold vehicles (OEM)		1,651,328	311,997	174,524
Volume used in the different sectors	+	7,278,191	3,510,838	3,182,606
Total volume sold per sector	=	**8,929,519**	**3,822,834**	**3,357,129**
Total volume of antifreeze sold	=	**16,109,482**		
DIRECT METHOD - "DRAINS"				
Volume of drains		5,653,065	1,365,716	1,238,034
Volume in the end-of-life vehicles	+	245,682	14,054	6,747
Recoverable antifreeze per sector	=	5,898,747	1,379,770	1,244,781
Recoverable antifreeze per sector eq 50/50	=	**5,308,872**	**1,241,793**	**1,120,302**
Total volume of recov. antifreeze eq.50/50	=	**7,670,968**		
Rate of recoverable antifreeze per sector eq. 50/50	=	**59.5%**	**32.5%**	**33.4%**
Global rate of recov. antifreeze eq. 50/50	=	**47.6%**		
INDIRECT METHOD - "LOSS"				
Loss following breakage		126,260	767,920	1,222,071
Consume in use	+	1,710,195	1,483,126	870,150
Total loss of antifreeze	=	**1,836,455**	**2,251,046**	**2,092,221**
Volume in the end-of-life vehicles	=	**245,682**	**14,054**	**6,747**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**5,687,418**	**1,273,846**	**1,097,132**
Recoverable antifreeze per sector eq 50/50	=	**5,118,676**	**1,146,461**	**987,419**
Total volume of recov. antifreeze eq.50/50		**7,252,556**		
Rate of recoverable antifreeze per sector eq. 50/50	=	**57.3%**	**30.0%**	**29.4%**
Global rate of recov. antifreeze eq. 50/50	=	**45.0%**		

Appendix 5   Details on the Calculation of the Rate for ALBERTA
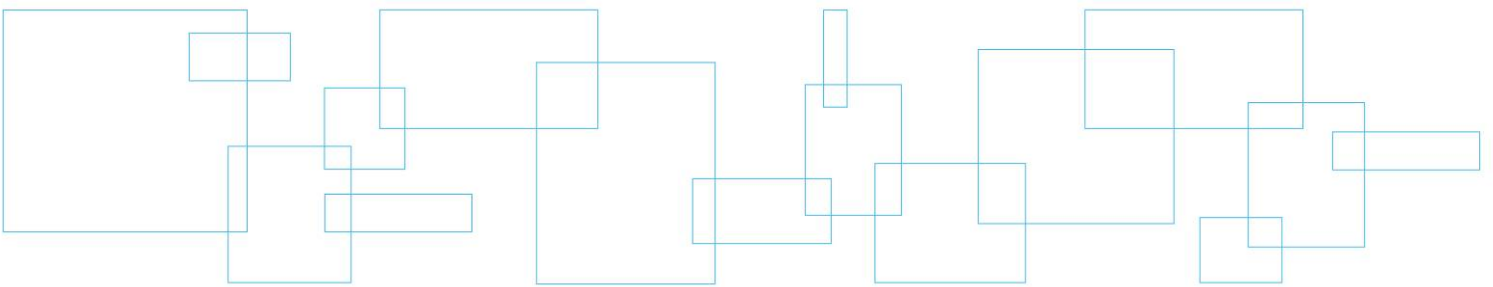
AUTOMOTIVE SECTOR		ALBERTA	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of PC sold per year		76,836	Desrosiers average 2006-2010
Volume of antifreeze in PC	x	7.67	Desrosiers 2010
Volume of antifreeze in PC sold every year	=	*589,332*	*Calculation*
Number of LT sold per year		143,889	Desrosiers average 2006-2010
Volume of antifreeze in LT	x	13.08	Desrosiers 2010
Volume of antifreeze in LT sold every year	=	*1,881,636*	*Calculation*
Total volume of antifreeze in sold vehicles (OEM)	**=**	**2,470,968**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Frequency of antifreeze replacement		19.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,030,863	Desrosiers 2010
Average volume of antifreeze in PC and LT	x	11.46	Desrosiers 2010
Volume used for antifreeze replacement	=	*6,671,774*	*Calculation*
Frequency of DIY top-ups		37.00%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,030,863	Desrosiers 2010
% of DIY	x	25.7%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.09	Garage survey
Volume used fot DIY top-ups	=	*312,724*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	3,030,863	Desrosiers 2010
% DIFM	x	74.3%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.09	Garage survey
Volume used for DIFM top-ups	=	*833,238*	*Calculation*
Volume sold in automotive sector	**=**	**7,817,736**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**10,288,704**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
Frequency of drains (% of total vehicles)		19.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,030,863	Desrosiers 2010
Average volume of a drain for PC and LT	x	10.38	Volume in vehicles - Top-up volume
Volume of drains	=	*6,040,341*	*Calculation*
Frequency of radiators changed or repaired		2.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,030,863	Desrosiers 2010
Average recovered volume per radiator changed or repaired	x	0.95	Body shop survey
Volume recovered for radiator schanged or repaired	=	*71,983*	*Calculation*
Total volume of drains	**=**	**6,112,324**	**Calculation**
Antifreeze volume in end-of-life vehicles	**=**	**317,609**	**Calculation**
Total volume of recoverable antifreeze	**=**	**6,429,934**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**5,786,940**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**56.2%**	**Calculation**
Indirect method - "Loss"			
Calcul des pertes dues aux bris (accident ou mécanique)			

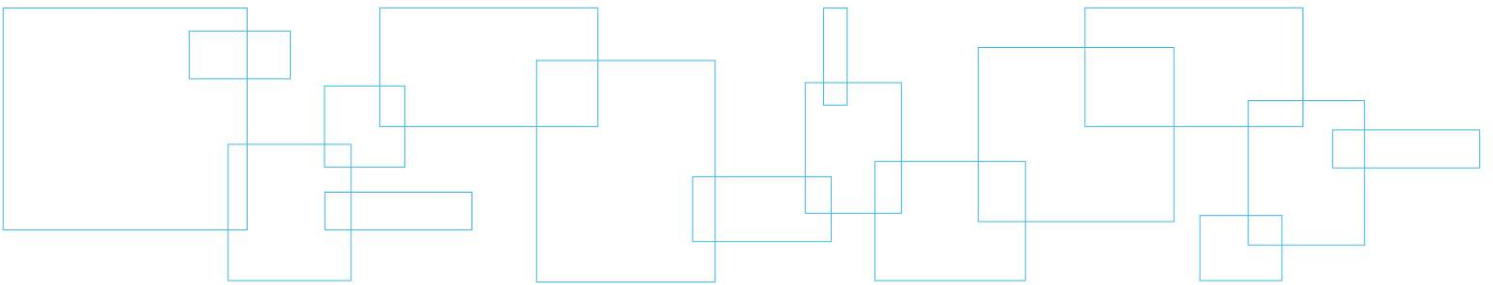| AUTOMOTIVE SECTOR		ALBERTA	
Frequency of radiators changed or repaired		2.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,030,863	Desrosiers 2010
Average lost volume per radiator changed or repaired	x	1.41	Body shop survey
Total loss following breakage	=	**106,838**	**Calculation**
Calculation of the consume in use volume			
Frequency of DIY top-ups		37.00%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,030,863	Desrosiers 2010
% of DIY	x	25.7%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.09	Garage survey
Volume used fot DIY top-ups	=	*312,724*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	3,030,863	Desrosiers 2010
% DIFM	x	74.3%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.09	Garage survey
Volume used for DIFM top-ups	=	*833,238*	*Calculation*
Frequency of antifreeze replacement		19.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	3,030,863	Desrosiers 2010
Average volume of antifreeze added	x	1.09	Garage survey
Lossed volume in drains	=	*631,433*	*Calculation*
Total consume in use volume	=	**1,777,395**	**Calculation**
Total antifreeze loss	=	**1,884,233**	**Calculation**
Calculation of antifreeze in end-of-life vehicles (recoverable)			
Number of end-of-life PC and LT		109,521	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life PC and LT	x	2.90	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**317,609**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**6,251,113**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	=	**5,626,001**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	=	**54.7%**	**Calculation**

ROAD TRANSPORTATION SECTOR		ALBERTA	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of trucks and buses sold per year		21,330	Polk average 2006-2010
Average volume of antifreeze in trucks and buses	x	29.9	Surveys
Total volume of antifreeze in sold vehicles (OEM)	=	**638,824**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per vehicle in one year		22.4	Road transportation survey
Number of trucks and buses on road	x	296,892	Polk 2010
Volume sold in road transportation sector	=	**6,649,437**	Calculation
Total volume of antifreeze sold eq. 50/50	**=**	**7,288,260**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Road transportation survey
Volume sold in road transportation sector	x	6,649,437	Calculation
Total volume of drains	=	**2,586,631**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**69,772**	**Calculation**
Total volume of recoverable antifreeze	**=**	**2,656,403**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**2,390,762**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**32.8%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (accident or mechanical)			
Number of damaged trucks and buses (hyp. 50% radiator damaged)		4,983	Estimation from Alberta Inf&Tra (average 2006-2010)
Average volume of antifreeze in trucks and buses	x	32.6	Surveys
(Hyp. = end-of-life)	-	12.20	Vehicle recyclers survey
Antifreeze lost following trucks and buses accidents	=	*101,726*	*Calculation*
Average volume lost following breakage per vehicle in one year		3.9	Road transportation survey
Number of trucks and buses on road	x	296,892	Polk 2010
Antifreeze lost following mechanical breakages	=	*1,163,103*	*Calculation*
Total loss following breakages	=	**1,264,829**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per vehicle in one year		9.5	Road transportation survey
Number of trucks and buses on road	x	296,892	Polk 2010
Total consume in use volume	=	**2,809,003**	**Calculation**
Total antifreeze loss	**=**	**4,073,832**	**Calculation**
Calcul du volume provenant des véhicules en fin de vie (récupérable)			
Number of end-of-life trucks and buses		5,719	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life trucks and buses	x	12.20	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**69,772**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**2,645,377**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**2,380,839**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**32.7%**	**Calculation**

OTHER SECTORS		ALBERTA	
Calculation of the volume of antifreeze in sold heavy equipment (OEM)			
Number of heavy equipment sold per year		10,558	From QC in proportion of GDP
Volume of antifreeze in heavy equipment	x	54.5	Surveys
Total volume of antifreeze in sold heavy equipment (OEM)	=	**575,316**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per heavy equipment in one year		31.5	Sondage autres secteurs
Number of heavy equipment in use	x	292,818	From QC in proportion of GDP
Volume sold in other sectors	=	**9,227,793**	**Calculation**
Total volume of antifreeze sold	**=**	**9,803,109**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Other sectors survey
Volume sold in other sectors	x	9,227,793	Calculation
Total volume of drains	=	**3,589,611**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**21,464**	**Calculation**
Total volume of recoverable antifreeze	=	**3,611,076**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	=	**3,249,968**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	=	**33.2%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (mechanical)			
Average volume lost following breakage per heavy equipment in one year		14.3	Other sectors survey
Number of heavy equipment in use	x	292,818	From QC in proportion of GDP
Total loss following breakages	=	**4,173,961**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per heavy equipment in one year		7.7	Other sectors survey
Number of heavy equipment in use	x	292,818	From QC in proportion of GDP
Total consume in use volume	=	**2,251,538**	**Calculation**
Total antifreeze loss	**=**	**6,425,499**	**Calculation**
Calculation of antifreeze in end-of-life heavy equipment (recoverable)			
Number of end-of-life heavy equipment		1,053	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life heavy equipment	x	20.38	Proportion of truck rate
Volume in end-of-life heavy equipments	=	**21,464**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**2,823,758**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	=	**2,541,383**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	=	**25.9%**	**Calculation**

GLOBAL RESULTS	ALBERTA		
	AUTOMOTIVE	ROAD TRANSPORTATION	OTHER SECTORS
Volume contained in sold vehicles (OEM)	2,470,968	638,824	575,316
Volume used in the different sectors +	7,817,736	6,649,437	9,227,793
Total volume sold per sector =	**10,288,704**	**7,288,260**	**9,803,109**
Total volume of antifreeze sold =	**27,380,073**		
DIRECT METHOD - "DRAINS"			
Volume of drains	6,112,324	2,586,631	3,589,611
Volume in the end-of-life vehicles +	317,609	69,772	21,464
Recoverable antifreeze per sector =	6,429,934	2,656,403	3,611,076
Recoverable antifreeze per sector eq 50/50 =	**5,786,940**	**2,390,762**	**3,249,968**
Total volume of recov. antifreeze eq.50/50 =	**11,427,671**		
Rate of recoverable antifreeze per sector eq. 50/50 =	**56.2%**	**32.8%**	**33.2%**
Global rate of recov. antifreeze eq. 50/50 =	**41.7%**		
INDIRECT METHOD - "LOSS"			
Loss following breakage	106,838	1,264,829	4,173,961
Consume in use +	1,777,395	2,809,003	2,251,538
Total loss of antifreeze =	**1,884,233**	**4,073,832**	**6,425,499**
Volume in the end-of-life vehicles =	**317,609**	**69,772**	**21,464**
Recoverable antifreeze (End-of-life + Sold - Loss) =	**6,251,113**	**2,645,377**	**2,823,758**
Recoverable antifreeze per sector eq 50/50 =	**5,626,001**	**2,380,839**	**2,541,383**
Total volume of recov. antifreeze eq.50/50	**10,548,223**		
Rate of recoverable antifreeze per sector eq. 50/50 =	**54.7%**	**32.7%**	**25.9%**
Global rate of recov. antifreeze eq. 50/50 =	**38.5%**		

Appendix 6   Details on the Calculation of the Rate for SASKATCHEWAN

AUTOMOTIVE SECTOR		SASKATCHEWAN	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of PC sold per year		14,782	Desrosiers average 2006-2010
Volume of antifreeze in PC	x	7.73	Desrosiers 2010
Volume of antifreeze in PC sold every year	=	*114,266*	*Calculation*
Number of LT sold per year		29,270	Desrosiers average 2006-2010
Volume of antifreeze in LT	x	13.43	Desrosiers 2010
Volume of antifreeze in LT sold every year	=	*393,050*	*Calculation*
Total volume of antifreeze in sold vehicles (OEM)	**=**	**507,316**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Frequency of antifreeze replacement		19.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	960,812	Desrosiers 2010
Average volume of antifreeze in PC and LT	x	11.88	Desrosiers 2010
Volume used for antifreeze replacement	=	*2,191,786*	*Calculation*
Frequency of DIY top-ups		37.00%	Desrosiers average 2006-2010
Number of PC and LT on road	x	960,812	Desrosiers 2010
% of DIY	x	25.7%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.08	Garage survey
Volume used fot DIY top-ups	=	*98,867*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	960,812	Desrosiers 2010
% DIFM	x	74.3%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.08	Garage survey
Volume used for DIFM top-ups	=	*263,426*	*Calculation*
Volume sold in automotive sector	**=**	**2,554,079**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**3,061,395**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
Frequency of drains (% of total vehicles)		19.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	960,812	Desrosiers 2010
Average volume of a drain for PC and LT	x	10.80	Volume in vehicles - Top-up volume
Volume of drains	=	*1,992,160*	*Calculation*
Frequency of radiators changed or repaired		2.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	960,812	Desrosiers 2010
Average recovered volume per radiator changed or repaired	x	0.95	Body shop survey
Volume recovered for radiator schanged or repaired	=	*22,819*	*Calculation*
Total volume of drains	**=**	**2,014,979**	**Calculation**
Antifreeze volume in end-of-life vehicles	**=**	**92,193**	**Calculation**
Total volume of recoverable antifreeze	**=**	**2,107,172**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,896,455**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**61.9%**	**Calculation**
Indirect method - "Loss"			
Calcul des pertes dues aux bris (accident ou mécanique)			

AUTOMOTIVE SECTOR		SASKATCHEWAN	
Frequency of radiators changed or repaired		2.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	960,812	Desrosiers 2010
Average lost volume per radiator changed or repaired	x	1.41	Body shop survey
Total loss following breakage	=	**33,869**	**Calculation**
Calculation of the consume in use volume			
Frequency of DIY top-ups		37.00%	Desrosiers average 2006-2010
Number of PC and LT on road	x	960,812	Desrosiers 2010
% of DIY	x	25.7%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.08	Garage survey
Volume used fot DIY top-ups	=	*98,867*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	960,812	Desrosiers 2010
% DIFM	x	74.3%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.08	Garage survey
Volume used for DIFM top-ups	=	*263,426*	*Calculation*
Frequency of antifreeze replacement		19.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	960,812	Desrosiers 2010
Average volume of antifreeze added	x	1.08	Garage survey
Lossed volume in drains	=	*199,626*	*Calculation*
Total consume in use volume	=	**561,919**	**Calculation**
Total antifreeze loss	**=**	**595,788**	**Calculation**
Calculation of antifreeze in end-of-life vehicles (recoverable)			
Number of end-of-life PC and LT		31,791	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life PC and LT	x	2.90	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**92,193**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**2,050,484**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,845,436**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**60.3%**	**Calculation**

ROAD TRANSPORTATION SECTOR		SASKATCHEWAN	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of trucks and buses sold per year		3,247	Polk average 2006-2010
Average volume of antifreeze in trucks and buses	x	32.0	Surveys
Total volume of antifreeze in sold vehicles (OEM)	=	**103,986**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per vehicle in one year		23.6	Road transportation survey
Number of trucks and buses on road	x	95,004	Polk 2010
Volume sold in road transportation sector	=	**2,240,826**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**2,344,812**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Road transportation survey
Volume sold in road transportation sector	x	2,240,826	Calculation
Total volume of drains	=	**871,681**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**2,355**	**Calculation**
Total volume of recoverable antifreeze	**=**	**874,036**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**786,632**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**33.5%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (accident or mechanical)			
Number of damaged trucks and buses (hyp. 50% radiator damaged)		820	Estimation from SGI (average 2006-2010)
Average volume of antifreeze in trucks and buses	x	34.4	Surveys
(Hyp. = end-of-life)	-	12.20	Vehicle recyclers survey
Antifreeze lost following trucks and buses accidents	=	*18,192*	*Calculation*
Average volume lost following breakage per vehicle in one year		4.1	Road transportation survey
Number of trucks and buses on road	x	95,004	Polk 2010
Antifreeze lost following mechanical breakages	=	*391,960*	*Calculation*
Total loss following breakages	=	**410,152**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per vehicle in one year		10.0	Road transportation survey
Number of trucks and buses on road	x	95,004	Polk 2010
Total consume in use volume	=	**946,620**	**Calculation**
Total antifreeze loss	**=**	**1,356,771**	**Calculation**
Calcul du volume provenant des véhicules en fin de vie (récupérable)			
Number of end-of-life trucks and buses		193	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life trucks and buses	x	12.20	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**2,355**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**886,410**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**797,769**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**34.0%**	**Calculation**

OTHER SECTORS		SASKATCHEWAN	
Calculation of the volume of antifreeze in sold heavy equipment (OEM)			
Number of heavy equipment sold per year		6,210	From QC in proportion of GDP
Volume of antifreeze in heavy equipment	x	31.4	Surveys
Total volume of antifreeze in sold heavy equipment (OEM)	=	**195,118**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per heavy equipment in one year		16.2	Sondage autres secteurs
Number of heavy equipment in use	x	172,246	From QC in proportion of GDP
Volume sold in other sectors	=	**2,782,578**	**Calculation**
Total volume of antifreeze sold	**=**	**2,977,696**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Other sectors survey
Volume sold in other sectors	x	2,782,578	Calculation
Total volume of drains	=	**1,082,423**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**6,898**	**Calculation**
Total volume of recoverable antifreeze	**=**	**1,089,321**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**980,388**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**32.9%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (mechanical)			
Average volume lost following breakage per heavy equipment in one year		6.5	Other sectors survey
Number of heavy equipment in use	x	172,246	From QC in proportion of GDP
Total loss following breakages	=	**1,125,508**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per heavy equipment in one year		5.1	Other sectors survey
Number of heavy equipment in use	x	172,246	From QC in proportion of GDP
Total consume in use volume	=	**885,259**	**Calculation**
Total antifreeze loss	**=**	**2,010,766**	**Calculation**
Calculation of antifreeze in end-of-life heavy equipment (recoverable)			
Number of end-of-life heavy equipment		619	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life heavy equipment	x	11.14	Proportion of truck rate
Volume in end-of-life heavy equipments	=	**6,898**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**778,710**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**700,839**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**23.5%**	**Calculation**

GLOBAL RESULTS		SASKATCHEWAN		
		AUTOMOTIVE	ROAD TRANSPORTATION	OTHER SECTORS
Volume contained in sold vehicles (OEM)		507,316	103,986	195,118
Volume used in the different sectors	+	2,554,079	2,240,826	2,782,578
Total volume sold per sector	=	**3,061,395**	**2,344,812**	**2,977,696**
Total volume of antifreeze sold	=	**8,383,904**		
DIRECT METHOD - "DRAINS"				
Volume of drains		2,014,979	871,681	1,082,423
Volume in the end-of-life vehicles	+	92,193	2,355	6,898
Recoverable antifreeze per sector	=	2,107,172	874,036	1,089,321
Recoverable antifreeze per sector eq 50/50	=	**1,896,455**	**786,632**	**980,388**
Total volume of recov. antifreeze eq.50/50	=	**3,663,476**		
Rate of recoverable antifreeze per sector eq. 50/50	=	**61.9%**	**33.5%**	**32.9%**
Global rate of recov. antifreeze eq. 50/50	=	**43.7%**		
INDIRECT METHOD - "LOSS"				
Loss following breakage		33,869	410,152	1,125,508
Consume in use	+	561,919	946,620	885,259
Total loss of antifreeze	=	**595,788**	**1,356,771**	**2,010,766**
Volume in the end-of-life vehicles	=	**92,193**	**2,355**	**6,898**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**2,050,484**	**886,410**	**778,710**
Recoverable antifreeze per sector eq 50/50	=	**1,845,436**	**797,769**	**700,839**
Total volume of recov. antifreeze eq.50/50		**3,344,043**		
Rate of recoverable antifreeze per sector eq. 50/50	=	**60.3%**	**34.0%**	**23.5%**
Global rate of recov. antifreeze eq. 50/50	=	**39.9%**		

Appendix 7   Details on the Calculation of the Rate for MANITOBA

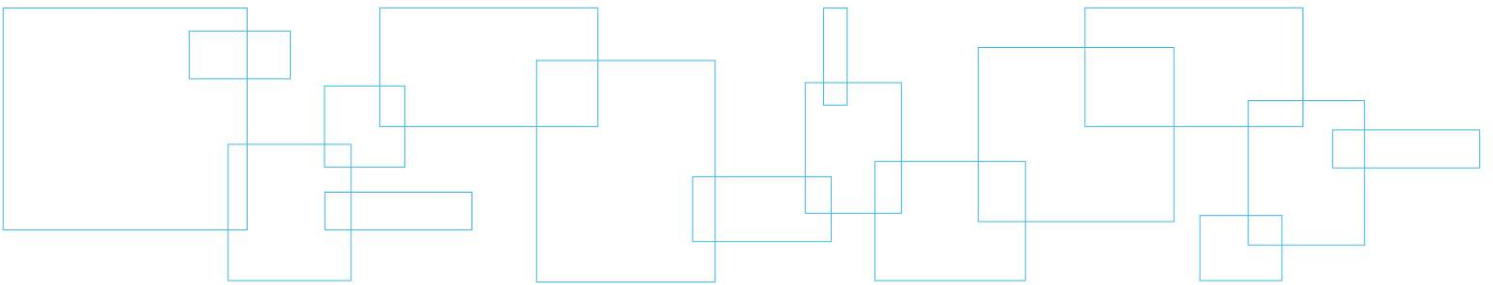| AUTOMOTIVE SECTOR		MANITOBA	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of PC sold per year		18,922	Desrosiers average 2006-2010
Volume of antifreeze in PC	x	7.41	Desrosiers 2010
Volume of antifreeze in PC sold every year	=	*140,212*	*Calculation*
Number of LT sold per year		25,418	Desrosiers average 2006-2010
Volume of antifreeze in LT	x	12.33	Desrosiers 2010
Volume of antifreeze in LT sold every year	=	*313,364*	*Calculation*
Total volume of antifreeze in sold vehicles (OEM)	=	**453,576**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Frequency of antifreeze replacement		19.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	859,186	Desrosiers 2010
Average volume of antifreeze in PC and LT	x	10.91	Desrosiers 2010
Volume used for antifreeze replacement	=	*1,800,347*	*Calculation*
Frequency of DIY top-ups		37.00%	Desrosiers average 2006-2010
Number of PC and LT on road	x	859,186	Desrosiers 2010
% of DIY	x	25.7%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.07	Garage survey
Volume used fot DIY top-ups	=	*87,184*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	859,186	Desrosiers 2010
% DIFM	x	74.3%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.07	Garage survey
Volume used for DIFM top-ups	=	*232,298*	*Calculation*
Volume sold in automotive sector	=	**2,119,829**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**2,573,405**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
Frequency of drains (% of total vehicles)		19.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	859,186	Desrosiers 2010
Average volume of a drain for PC and LT	x	9.85	Volume in vehicles - Top-up volume
Volume of drains	=	*1,624,311*	*Calculation*
Frequency of radiators changed or repaired		2.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	859,186	Desrosiers 2010
Average recovered volume per radiator changed or repaired	x	0.95	Body shop survey
Volume recovered for radiator schanged or repaired	=	*20,406*	*Calculation*
Total volume of drains	=	**1,644,716**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**111,600**	**Calculation**
Total volume of recoverable antifreeze	**=**	**1,756,316**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,580,684**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**61.4%**	**Calculation**
Indirect method - "Loss"			
Calcul des pertes dues aux bris (accident ou mécanique)			

AUTOMOTIVE SECTOR		MANITOBA	
Frequency of radiators changed or repaired		2.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	859,186	Desrosiers 2010
Average lost volume per radiator changed or repaired	x	1.41	Body shop survey
Total loss following breakage	=	**30,286**	**Calculation**
Calculation of the consume in use volume			
Frequency of DIY top-ups		37.00%	Desrosiers average 2006-2010
Number of PC and LT on road	x	859,186	Desrosiers 2010
% of DIY	x	25.7%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.07	Garage survey
Volume used fot DIY top-ups	=	*87,184*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	859,186	Desrosiers 2010
% DIFM	x	74.3%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.07	Garage survey
Volume used for DIFM top-ups	=	*232,298*	*Calculation*
Frequency of antifreeze replacement		19.20%	Desrosiers average 2006-2010
Number of PC and LT on road	x	859,186	Desrosiers 2010
Average volume of antifreeze added	x	1.07	Garage survey
Lossed volume in drains	=	*176,036*	*Calculation*
Total consume in use volume	=	**495,518**	**Calculation**
Total antifreeze loss	**=**	**525,804**	**Calculation**
Calculation of antifreeze in end-of-life vehicles (recoverable)			
Number of end-of-life PC and LT		38,483	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life PC and LT	x	2.90	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**111,600**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**1,705,624**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,535,062**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**59.7%**	**Calculation**

ROAD TRANSPORTATION SECTOR		MANITOBA	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of trucks and buses sold per year		2,190	Polk average 2006-2010
Average volume of antifreeze in trucks and buses	x	37.9	Surveys
Total volume of antifreeze in sold vehicles (OEM)	=	**82,889**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per vehicle in one year		25.4	Road transportation survey
Number of trucks and buses on road	x	59,789	Polk 2010
Volume sold in road transportation sector	=	**1,520,474**	**Calculation**
Total volume of antifreeze sold eq. 50/50	=	**1,603,362**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Road transportation survey
Volume sold in road transportation sector	x	1,520,474	Calculation
Total volume of drains	=	**591,464**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**1,476**	**Calculation**
Total volume of recoverable antifreeze	=	**592,940**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	=	**533,646**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	=	**33.3%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (accident or mechanical)			
Number of damaged trucks and buses (hyp. 50% radiator damaged)		516	Estimation from SK
Average volume of antifreeze in trucks and buses	x	36.8	Surveys
(Hyp. = end-of-life)	-	12.20	Vehicle recyclers survey
Antifreeze lost following trucks and buses accidents	=	*12,682*	*Calculation*
Average volume lost following breakage per vehicle in one year		4.4	Road transportation survey
Number of trucks and buses on road	x	59,789	Polk 2010
Antifreeze lost following mechanical breakages	=	*265,957*	*Calculation*
Total loss following breakages	=	**278,639**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per vehicle in one year		10.7	Road transportation survey
Number of trucks and buses on road	x	59,789	Polk 2010
Total consume in use volume	=	**642,312**	**Calculation**
Total antifreeze loss	=	**920,952**	**Calculation**
Calcul du volume provenant des véhicules en fin de vie (récupérable)			
Number of end-of-life trucks and buses		121	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life trucks and buses	x	12.20	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**1,476**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**600,998**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	=	**540,898**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	=	**33.7%**	**Calculation**

OTHER SECTORS		MANITOBA	
Calculation of the volume of antifreeze in sold heavy equipment (OEM)			
Number of heavy equipment sold per year		2,547	From QC in proportion of GDP
Volume of antifreeze in heavy equipment	x	28.0	Surveys
Total volume of antifreeze in sold heavy equipment (OEM)	=	**71,357**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per heavy equipment in one year		15.0	Sondage autres secteurs
Number of heavy equipment in use	x	70,636	From QC in proportion of GDP
Volume sold in other sectors	=	**1,056,760**	**Calculation**
Total volume of antifreeze sold	**=**	**1,128,116**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Other sectors survey
Volume sold in other sectors	x	1,056,760	Calculation
Total volume of drains	=	**411,080**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**2,358**	**Calculation**
Total volume of recoverable antifreeze	**=**	**413,438**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**372,094**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**33.0%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (mechanical)			
Average volume lost following breakage per heavy equipment in one year		5.5	Other sectors survey
Number of heavy equipment in use	x	70,636	From QC in proportion of GDP
Total loss following breakages	=	**389,870**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per heavy equipment in one year		5.1	Other sectors survey
Number of heavy equipment in use	x	70,636	From QC in proportion of GDP
Total consume in use volume	=	**357,858**	**Calculation**
Total antifreeze loss	**=**	**747,728**	**Calculation**
Calculation of antifreeze in end-of-life heavy equipment (recoverable)			
Number of end-of-life heavy equipment		254	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life heavy equipment	x	9.28	Proportion of truck rate
Volume in end-of-life heavy equipments	=	**2,358**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**311,390**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**280,251**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**24.8%**	**Calculation**

GLOBAL RESULTS	MANITOBA		
	AUTOMOTIVE	**ROAD TRANSPORTATION**	**OTHER SECTORS**
Volume contained in sold vehicles (OEM)	453,576	82,889	71,357
Volume used in the different sectors +	2,119,829	1,520,474	1,056,760
Total volume sold per sector =	**2,573,405**	**1,603,362**	**1,128,116**
Total volume of antifreeze sold =	**5,304,883**		
DIRECT METHOD - "DRAINS"			
Volume of drains	1,644,716	591,464	411,080
Volume in the end-of-life vehicles +	111,600	1,476	2,358
Recoverable antifreeze per sector =	1,756,316	592,940	413,438
Recoverable antifreeze per sector eq 50/50 =	**1,580,684**	**533,646**	**372,094**
Total volume of recov. antifreeze eq.50/50 =	**2,486,425**		
Rate of recoverable antifreeze per sector eq. 50/50 =	**61.4%**	**33.3%**	**33.0%**
Global rate of recov. antifreeze eq. 50/50 =	**46.9%**		
INDIRECT METHOD - "LOSS"			
Loss following breakage	30,286	278,639	389,870
Consume in use +	495,518	642,312	357,858
Total loss of antifreeze =	**525,804**	**920,952**	**747,728**
Volume in the end-of-life vehicles =	**111,600**	**1,476**	**2,358**
Recoverable antifreeze (End-of-life + Sold - Loss) =	**1,705,624**	**600,998**	**311,390**
Recoverable antifreeze per sector eq 50/50 =	**1,535,062**	**540,898**	**280,251**
Total volume of recov. antifreeze eq.50/50	**2,356,211**		
Rate of recoverable antifreeze per sector eq. 50/50 =	**59.7%**	**33.7%**	**24.8%**
Global rate of recov. antifreeze eq. 50/50 =	**44.4%**		

Appendix 8   Details on the Calculation of the Rate for ONTARIO

AUTOMOTIVE SECTOR		ONTARIO	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of PC sold per year		297,069	Desrosiers average 2006-2010
Volume of antifreeze in PC	x	7.41	Desrosiers 2010
Volume of antifreeze in PC sold every year	=	*2,201,281*	*Calculation*
Number of LT sold per year		279,797	Desrosiers average 2006-2010
Volume of antifreeze in LT	x	11.37	Desrosiers 2010
Volume of antifreeze in LT sold every year	=	*3,182,157*	*Calculation*
Total volume of antifreeze in sold vehicles (OEM)	=	**5,383,438**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Frequency of antifreeze replacement		17.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	7,528,792	Desrosiers 2010
Average volume of antifreeze in PC and LT	x	9.87	Desrosiers 2010
Volume used for antifreeze replacement	=	*12,929,165*	*Calculation*
Frequency of DIY top-ups		35.10%	Desrosiers average 2006-2010
Number of PC and LT on road	x	7,528,792	Desrosiers 2010
% of DIY	x	18.6%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.05	Garage survey
Volume used fot DIY top-ups	=	*515,302*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	7,528,792	Desrosiers 2010
% DIFM	x	81.4%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.05	Garage survey
Volume used for DIFM top-ups	=	*2,190,891*	*Calculation*
Volume sold in automotive sector	=	**15,635,358**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**21,018,797**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
Frequency of drains (% of total vehicles)		17.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	7,528,792	Desrosiers 2010
Average volume of a drain for PC and LT	x	8.82	Volume in vehicles - Top-up volume
Volume of drains	=	*11,555,784*	*Calculation*
Frequency of radiators changed or repaired		2.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	7,528,792	Desrosiers 2010
Average recovered volume per radiator changed or repaired	x	0.95	Body shop survey
Volume recovered for radiator schanged or repaired	=	*171,656*	*Calculation*
Total volume of drains	=	**11,727,441**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**1,521,500**	**Calculation**
Total volume of recoverable antifreeze	**=**	**13,248,940**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**11,924,046**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**56.7%**	**Calculation**
Indirect method - "Loss"			
Calcul des pertes dues aux bris (accident ou mécanique)			

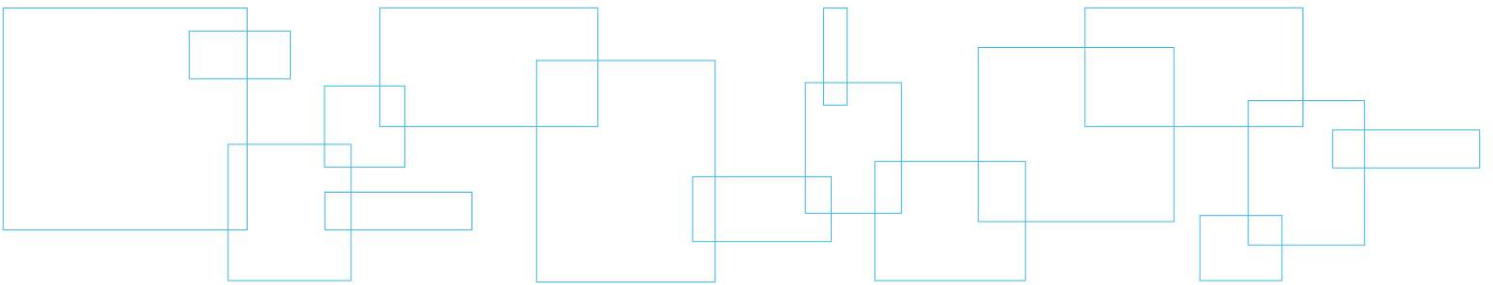| AUTOMOTIVE SECTOR		ONTARIO	
Frequency of radiators changed or repaired		2.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	7,528,792	Desrosiers 2010
Average lost volume per radiator changed or repaired	x	1.41	Body shop survey
Total loss following breakage	=	**254,774**	**Calculation**
Calculation of the consume in use volume			
Frequency of DIY top-ups		35.10%	Desrosiers average 2006-2010
Number of PC and LT on road	x	7,528,792	Desrosiers 2010
% of DIY	x	18.6%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.05	Garage survey
Volume used fot DIY top-ups	=	*515,302*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	7,528,792	Desrosiers 2010
% DIFM	x	81.4%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.05	Garage survey
Volume used for DIFM top-ups	=	*2,190,891*	*Calculation*
Frequency of antifreeze replacement		17.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	7,528,792	Desrosiers 2010
Average volume of antifreeze added	x	1.05	Garage survey
Lossed volume in drains	=	*1,373,381*	*Calculation*
Total consume in use volume	=	**4,079,574**	**Calculation**
Total antifreeze loss	=	**4,334,348**	**Calculation**
Calculation of antifreeze in end-of-life vehicles (recoverable)			
Number of end-of-life PC and LT		524,655	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life PC and LT	x	2.90	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**1,521,500**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**12,822,509**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	=	**11,540,258**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	=	**54.9%**	**Calculation**

ROAD TRANSPORTATION SECTOR		ONTARIO	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of trucks and buses sold per year		17,350	Polk average 2006-2010
Average volume of antifreeze in trucks and buses	x	35.8	Surveys
Total volume of antifreeze in sold vehicles (OEM)	=	**620,484**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per vehicle in one year		24.6	Road transportation survey
Number of trucks and buses on road	x	312,862	Polk 2010
Volume sold in road transportation sector	=	**7,710,981**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**8,331,465**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Road transportation survey
Volume sold in road transportation sector	x	7,710,981	Calculation
Total volume of drains	=	**2,999,572**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**181,438**	**Calculation**
Total volume of recoverable antifreeze	**=**	**3,181,010**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**2,862,909**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**34.4%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (accident or mechanical)			
Number of damaged trucks and buses (hyp. 50% radiator damaged)		19,241	Ont. Gov. average 2006-2008
Average volume of antifreeze in trucks and buses	x	36.0	Surveys
(Hyp. = end-of-life)	-	12.20	Vehicle recyclers survey
Antifreeze lost following trucks and buses accidents	=	*458,056*	*Calculation*
Average volume lost following breakage per vehicle in one year		4.3	Road transportation survey
Number of trucks and buses on road	x	312,862	Polk 2010
Antifreeze lost following mechanical breakages	=	*1,348,785*	*Calculation*
Total loss following breakages	=	**1,806,842**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per vehicle in one year		10.4	Road transportation survey
Number of trucks and buses on road	x	312,862	Polk 2010
Total consume in use volume	=	**3,257,444**	**Calculation**
Total antifreeze loss	**=**	**5,064,286**	**Calculation**
Calcul du volume provenant des véhicules en fin de vie (récupérable)			
Number of end-of-life trucks and buses		14,872	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life trucks and buses	x	12.20	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**181,438**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**2,828,134**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**2,545,320**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**30.6%**	**Calculation**

OTHER SECTORS		ONTARIO	
Calculation of the volume of antifreeze in sold heavy equipment (OEM)			
Number of heavy equipment sold per year		11,027	From QC in proportion of GDP
Volume of antifreeze in heavy equipment	x	32.8	Surveys
Total volume of antifreeze in sold heavy equipment (OEM)	=	**361,839**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per heavy equipment in one year		21.1	Sondage autres secteurs
Number of heavy equipment in use	x	305,847	From QC in proportion of GDP
Volume sold in other sectors	=	**6,447,491**	**Calculation**
Total volume of antifreeze sold	**=**	**6,809,330**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Other sectors survey
Volume sold in other sectors	x	6,447,491	Calculation
Total volume of drains	=	**2,508,074**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**12,219**	**Calculation**
Total volume of recoverable antifreeze	**=**	**2,520,293**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**2,268,264**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**33.3%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (mechanical)			
Average volume lost following breakage per heavy equipment in one year		7.5	Other sectors survey
Number of heavy equipment in use	x	305,847	From QC in proportion of GDP
Total loss following breakages	=	**2,287,393**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per heavy equipment in one year		6.4	Other sectors survey
Number of heavy equipment in use	x	305,847	From QC in proportion of GDP
Total consume in use volume	=	**1,963,134**	**Calculation**
Total antifreeze loss	**=**	**4,250,527**	**Calculation**
Calculation of antifreeze in end-of-life heavy equipment (recoverable)			
Number of end-of-life heavy equipment		1,099	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life heavy equipment	x	11.12	Proportion of truck rate
Volume in end-of-life heavy equipments	=	**12,219**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**2,209,183**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,988,265**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**29.2%**	**Calculation**

GLOBAL RESULTS		ONTARIO		
		AUTOMOTIVE	ROAD TRANSPORTATION	OTHER SECTORS
Volume contained in sold vehicles (OEM)		5,383,438	620,484	361,839
Volume used in the different sectors	+	15,635,358	7,710,981	6,447,491
Total volume sold per sector	=	21,018,797	8,331,465	6,809,330
Total volume of antifreeze sold	=	36,159,592		
DIRECT METHOD - "DRAINS"				
Volume of drains		11,727,441	2,999,572	2,508,074
Volume in the end-of-life vehicles	+	1,521,500	181,438	12,219
Recoverable antifreeze per sector	=	13,248,940	3,181,010	2,520,293
Recoverable antifreeze per sector eq 50/50	=	11,924,046	2,862,909	2,268,264
Total volume of recov. antifreeze eq.50/50	=	17,055,219		
Rate of recoverable antifreeze per sector eq. 50/50	=	56.7%	34.4%	33.3%
Global rate of recov. antifreeze eq. 50/50	=	47.2%		
INDIRECT METHOD - "LOSS"				
Loss following breakage		254,774	1,806,842	2,287,393
Consume in use	+	4,079,574	3,257,444	1,963,134
Total loss of antifreeze	=	4,334,348	5,064,286	4,250,527
Volume in the end-of-life vehicles	=	1,521,500	181,438	12,219
Recoverable antifreeze (End-of-life + Sold - Loss)	=	12,822,509	2,828,134	2,209,183
Recoverable antifreeze per sector eq 50/50	=	11,540,258	2,545,320	1,988,265
Total volume of recov. antifreeze eq.50/50		16,073,843		
Rate of recoverable antifreeze per sector eq. 50/50	=	54.9%	30.6%	29.2%
Global rate of recov. antifreeze eq. 50/50	=	44.5%		

Appendix 9   Details on the Calculation of the Rate for QUEBEC

AUTOMOTIVE SECTOR		QUEBEC	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of PC sold per year		257,293	Desrosiers average 2006-2010
Volume of antifreeze in PC	x	6.81	Desrosiers 2010
Volume of antifreeze in PC sold every year	=	*1,752,165*	*Calculation*
Number of LT sold per year		145,580	Desrosiers average 2006-2010
Volume of antifreeze in LT	x	11.21	Desrosiers 2010
Volume of antifreeze in LT sold every year	=	*1,631,371*	*Calculation*
Total volume of antifreeze in sold vehicles (OEM)	=	**3,383,536**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Frequency of antifreeze replacement		14.00%	Desrosiers average 2006-2010
Number of PC and LT on road	x	4,918,374	Desrosiers 2010
Average volume of antifreeze in PC and LT	x	8.77	Desrosiers 2010
Volume used for antifreeze replacement	=	*6,040,848*	*Calculation*
Frequency of DIY top-ups		12.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	4,918,374	Desrosiers 2010
% of DIY	x	24.2%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.02	Garage survey
Volume used fot DIY top-ups	=	*151,713*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	4,918,374	Desrosiers 2010
% DIFM	x	75.8%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.02	Garage survey
Volume used for DIFM top-ups	=	*1,296,348*	*Calculation*
Volume sold in automotive sector	=	**7,488,909**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**10,872,446**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
Frequency of drains (% of total vehicles)		14.00%	Desrosiers average 2006-2010
Number of PC and LT on road	x	4,918,374	Desrosiers 2010
Average volume of a drain for PC and LT	x	7.75	Volume in vehicles - Top-up volume
Volume of drains	=	*5,338,704*	*Calculation*
Frequency of radiators changed or repaired		1.96%	Desrosiers average 2006-2010
Number of PC and LT on road	x	4,918,374	Desrosiers 2010
Average recovered volume per radiator changed or repaired	x	0.95	Body shop survey
Volume recovered for radiator schanged or repaired	=	*91,580*	*Calculation*
Total volume of drains	=	**5,430,284**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**993,700**	**Calculation**
Total volume of recoverable antifreeze	**=**	**6,423,984**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**5,781,585**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**53.2%**	**Calculation**
Indirect method - "Loss"			
Calcul des pertes dues aux bris (accident ou mécanique)			

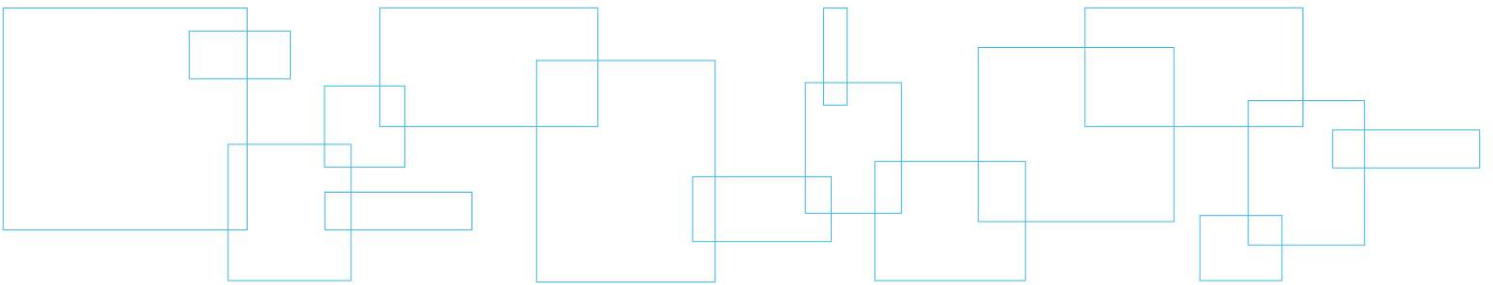| AUTOMOTIVE SECTOR		QUEBEC	
Frequency of radiators changed or repaired		1.96%	Desrosiers average 2006-2010
Number of PC and LT on road	x	4,918,374	Desrosiers 2010
Average lost volume per radiator changed or repaired	x	1.41	Body shop survey
Total loss following breakage	=	**135,924**	**Calculation**
Calculation of the consume in use volume			
Frequency of DIY top-ups		12.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	4,918,374	Desrosiers 2010
% of DIY	x	24.2%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.02	Garage survey
Volume used fot DIY top-ups	=	*151,713*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	4,918,374	Desrosiers 2010
% DIFM	x	75.8%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.02	Garage survey
Volume used for DIFM top-ups	=	*1,296,348*	*Calculation*
Frequency of antifreeze replacement		14.00%	Desrosiers average 2006-2010
Number of PC and LT on road	x	4,918,374	Desrosiers 2010
Average volume of antifreeze added	x	1.02	Garage survey
Lossed volume in drains	=	*702,144*	*Calculation*
Total consume in use volume	=	**2,150,206**	**Calculation**
Total antifreeze loss	=	**2,286,130**	**Calculation**
Calculation of antifreeze in end-of-life vehicles (recoverable)			
Number of end-of-life PC and LT		342,655	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life PC and LT	x	2.90	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**993,700**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**6,196,479**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	=	**5,576,831**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	=	**51.3%**	**Calculation**

ROAD TRANSPORTATION SECTOR		QUEBEC	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of trucks and buses sold per year		10,876	Polk average 2006-2010
Average volume of antifreeze in trucks and buses	x	35.8	Surveys
Total volume of antifreeze in sold vehicles (OEM)	=	**388,825**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per vehicle in one year		24.9	Road transportation survey
Number of trucks and buses on road	x	236,125	Polk 2010
Volume sold in road transportation sector	=	**5,889,833**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**6,278,658**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Road transportation survey
Volume sold in road transportation sector	x	5,889,833	Calculation
Total volume of drains	=	**2,291,145**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**101,650**	**Calculation**
Total volume of recoverable antifreeze	**=**	**2,392,796**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**2,153,516**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**34.3%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (accident or mechanical)			
Number of damaged trucks and buses (hyp. 50% radiator damaged)		7,150	SAAQ average 2006-2010
Average volume of antifreeze in trucks and buses	x	36.5	Surveys
(Hyp. = end-of-life)	-	12.20	Vehicle recyclers survey
Antifreeze lost following trucks and buses accidents	=	*173,546*	*Calculation*
Average volume lost following breakage per vehicle in one year		4.4	Road transportation survey
Number of trucks and buses on road	x	236,125	Polk 2010
Antifreeze lost following mechanical breakages	=	*1,030,235*	*Calculation*
Total loss following breakages	=	**1,203,781**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per vehicle in one year		10.5	Road transportation survey
Number of trucks and buses on road	x	236,125	Polk 2010
Total consume in use volume	=	**2,488,114**	**Calculation**
Total antifreeze loss	**=**	**3,691,896**	**Calculation**
Calcul du volume provenant des véhicules en fin de vie (récupérable)			
Number of end-of-life trucks and buses		8,332	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life trucks and buses	x	12.20	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**101,650**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**2,299,588**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**2,069,629**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**33.0%**	**Calculation**

OTHER SECTORS		QUEBEC	
Calculation of the volume of antifreeze in sold heavy equipment (OEM)			
Number of heavy equipment sold per year		6,959	SAAQ average 2006-2010
Volume of antifreeze in heavy equipment	x	32.1	Surveys
Total volume of antifreeze in sold heavy equipment (OEM)	=	**223,375**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per heavy equipment in one year		20.5	Sondage autres secteurs
Number of heavy equipment in use	x	193,013	SAAQ 2010
Volume sold in other sectors	=	**3,959,959**	**Calculation**
Total volume of antifreeze sold	**=**	**4,183,335**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Other sectors survey
Volume sold in other sectors	x	3,959,959	Calculation
Total volume of drains	=	**1,540,424**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**7,430**	**Calculation**
Total volume of recoverable antifreeze	**=**	**1,547,854**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,393,069**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**33.3%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (mechanical)			
Average volume lost following breakage per heavy equipment in one year		7.2	Other sectors survey
Number of heavy equipment in use	x	193,013	SAAQ 2010
Total loss following breakages	=	**1,396,566**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per heavy equipment in one year		6.3	Other sectors survey
Number of heavy equipment in use	x	193,013	SAAQ 2010
Total consume in use volume	=	**1,218,811**	**Calculation**
Total antifreeze loss	**=**	**2,615,377**	**Calculation**
Calculation of antifreeze in end-of-life heavy equipment (recoverable)			
Number of end-of-life heavy equipment		692	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life heavy equipment	x	10.74	Proportion of truck rate
Volume in end-of-life heavy equipments	=	**7,430**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**1,352,013**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**1,216,811**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**29.1%**	**Calculation**

GLOBAL RESULTS	QUEBEC		AUTOMOTIVE	ROAD TRANSPORTATION	OTHER SECTORS
Volume contained in sold vehicles (OEM)			3,383,536	388,825	223,375
Volume used in the different sectors	+		7,488,909	5,889,833	3,959,959
Total volume sold per sector	=		**10,872,446**	**6,278,658**	**4,183,335**
Total volume of antifreeze sold	=		**21,334,439**		
DIRECT METHOD - "DRAINS"					
Volume of drains			5,430,284	2,291,145	1,540,424
Volume in the end-of-life vehicles	+		993,700	101,650	7,430
Recoverable antifreeze per sector	=		6,423,984	2,392,796	1,547,854
Recoverable antifreeze per sector eq 50/50	=		**5,781,585**	**2,153,516**	**1,393,069**
Total volume of recov. antifreeze eq.50/50	=		**9,328,170**		
Rate of recoverable antifreeze per sector eq. 50/50	=		**53.2%**	**34.3%**	**33.3%**
Global rate of recov. antifreeze eq. 50/50	=		**43.7%**		
INDIRECT METHOD - "LOSS"					
Loss following breakage			135,924	1,203,781	1,396,566
Consume in use	+		2,150,206	2,488,114	1,218,811
Total loss of antifreeze	=		**2,286,130**	**3,691,896**	**2,615,377**
Volume in the end-of-life vehicles	=		**993,700**	**101,650**	**7,430**
Recoverable antifreeze (End-of-life + Sold - Loss)	=		**6,196,479**	**2,299,588**	**1,352,013**
Recoverable antifreeze per sector eq 50/50	=		**5,576,831**	**2,069,629**	**1,216,811**
Total volume of recov. antifreeze eq.50/50			**8,863,272**		
Rate of recoverable antifreeze per sector eq. 50/50	=		**51.3%**	**33.0%**	**29.1%**
Global rate of recov. antifreeze eq. 50/50	=		**41.5%**		

Appendix 10   Details on the Calculation of the Rate for NEW BRUNSWICK

AUTOMOTIVE SECTOR		NEW-BRUNSWICK	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of PC sold per year		19,004	Desrosiers average 2006-2010
Volume of antifreeze in PC	x	7.16	Desrosiers 2010
Volume of antifreeze in PC sold every year	=	*136,069*	*Calculation*
Number of LT sold per year		17,085	Desrosiers average 2006-2010
Volume of antifreeze in LT	x	12.05	Desrosiers 2010
Volume of antifreeze in LT sold every year	=	*205,796*	*Calculation*
Total volume of antifreeze in sold vehicles (OEM)	=	**341,864**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Frequency of antifreeze replacement		15.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	576,614	Desrosiers 2010
Average volume of antifreeze in PC and LT	x	10.04	Desrosiers 2010
Volume used for antifreeze replacement	=	*891,230*	*Calculation*
Frequency of DIY top-ups		27.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	576,614	Desrosiers 2010
% of DIY	x	19.4%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.05	Garage survey
Volume used fot DIY top-ups	=	*32,299*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	576,614	Desrosiers 2010
% DIFM	x	80.6%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.05	Garage survey
Volume used for DIFM top-ups	=	*166,397*	*Calculation*
Volume sold in automotive sector	=	**1,089,926**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**1,431,790**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
Frequency of drains (% of total vehicles)		15.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	576,614	Desrosiers 2010
Average volume of a drain for PC and LT	x	8.99	Volume in vehicles - Top-up volume
Volume of drains	=	*797,995*	*Calculation*
Frequency of radiators changed or repaired		2.06%	Desrosiers average 2006-2010
Number of PC and LT on road	x	576,614	Desrosiers 2010
Average recovered volume per radiator changed or repaired	x	0.95	Body shop survey
Volume recovered for radiator schanged or repaired	=	*11,284*	*Calculation*
Total volume of drains	=	**809,279**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**67,935**	**Calculation**
Total volume of recoverable antifreeze	**=**	**877,215**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**789,493**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**55.1%**	**Calculation**
Indirect method - "Loss"			
Calcul des pertes dues aux bris (accident ou mécanique)			

AUTOMOTIVE SECTOR		NEW-BRUNSWICK	
Frequency of radiators changed or repaired		2.06%	Desrosiers average 2006-2010
Number of PC and LT on road	x	576,614	Desrosiers 2010
Average lost volume per radiator changed or repaired	x	1.41	Body shop survey
Total loss following breakage	=	**16,748**	**Calculation**
Calculation of the consume in use volume			
Frequency of DIY top-ups		27.50%	Desrosiers average 2006-2010
Number of PC and LT on road	x	576,614	Desrosiers 2010
% of DIY	x	19.4%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.05	Garage survey
Volume used fot DIY top-ups	=	*32,299*	*Calculation*
Frequency of DIFM top-ups		34.10%	Garage survey
Number of PC and LT on road	x	576,614	Desrosiers 2010
% DIFM	x	80.6%	Desrosiers average 2006-2010
Average volume of antifreeze added	x	1.05	Garage survey
Volume used for DIFM top-ups	=	*166,397*	*Calculation*
Frequency of antifreeze replacement		15.40%	Desrosiers average 2006-2010
Number of PC and LT on road	x	576,614	Desrosiers 2010
Average volume of antifreeze added	x	1.05	Garage survey
Lossed volume in drains	=	*93,235*	*Calculation*
Total consume in use volume	=	**291,931**	**Calculation**
Total antifreeze loss	**=**	**308,680**	**Calculation**
Calculation of antifreeze in end-of-life vehicles (recoverable)			
Number of end-of-life PC and LT		23,426	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life PC and LT	x	2.90	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**67,935**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**849,182**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**764,264**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**53.4%**	**Calculation**

ROAD TRANSPORTATION SECTOR		NEW-BRUNSWICK	
Calculation of the volume of antifreeze in sold vehicles (OEM)			
Number of trucks and buses sold per year		1,427	Polk average 2006-2010
Average volume of antifreeze in trucks and buses	x	37.6	Surveys
Total volume of antifreeze in sold vehicles (OEM)	=	**53,714**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per vehicle in one year		25.7	Road transportation survey
Number of trucks and buses on road	x	29,416	Polk 2010
Volume sold in road transportation sector	=	**755,519**	**Calculation**
Total volume of antifreeze sold eq. 50/50	**=**	**809,233**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Road transportation survey
Volume sold in road transportation sector	x	755,519	Calculation
Total volume of drains	=	**293,897**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**9,967**	**Calculation**
Total volume of recoverable antifreeze	**=**	**303,864**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**273,478**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**33.8%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (accident or mechanical)			
Number of damaged trucks and buses (hyp. 50% radiator damaged)		364	Estimation from GRC, average 2007-2009
Average volume of antifreeze in trucks and buses	x	37.2	Surveys
(Hyp. = end-of-life)	-	12.20	Vehicle recyclers survey
Antifreeze lost following trucks and buses accidents	=	*9,103*	*Calculation*
Average volume lost following breakage per vehicle in one year		4.5	Road transportation survey
Number of trucks and buses on road	x	29,416	Polk 2010
Antifreeze lost following mechanical breakages	=	*132,153*	*Calculation*
Total loss following breakages	=	**141,256**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per vehicle in one year		10.8	Road transportation survey
Number of trucks and buses on road	x	29,416	Polk 2010
Total consume in use volume	=	**319,163**	**Calculation**
Total antifreeze loss	**=**	**460,419**	**Calculation**
Calcul du volume provenant des véhicules en fin de vie (récupérable)			
Number of end-of-life trucks and buses		817	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life trucks and buses	x	12.20	Vehicle recyclers survey
Antifreeze volume in end-of-life vehicles	=	**9,967**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**305,067**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**274,560**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**33.9%**	**Calculation**

OTHER SECTORS		NEW-BRUNSWICK	
Calculation of the volume of antifreeze in sold heavy equipment (OEM)			
Number of heavy equipment sold per year		711	From QC in proportion of GDP
Volume of antifreeze in heavy equipment	x	34.8	Surveys
Total volume of antifreeze in sold heavy equipment (OEM)	=	**24,751**	**Calculation**
Calculation of the volume of antifreeze sold for replacement or addition			
Average volume used per heavy equipment in one year		22.4	Sondage autres secteurs
Number of heavy equipment in use	x	19,706	From QC in proportion of GDP
Volume sold in other sectors	=	**442,035**	**Calculation**
Total volume of antifreeze sold	**=**	**466,786**	**Calculation**
Direct method - "drains"			
Calculation of the volume of drains			
% recoverable of the antifreeze used in one year		38.9%	Other sectors survey
Volume sold in other sectors	x	442,035	Calculation
Total volume of drains	=	**171,952**	**Calculation**
Antifreeze volume in end-of-life vehicles	=	**809**	**Calculation**
Total volume of recoverable antifreeze	**=**	**172,761**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**155,485**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**33.3%**	**Calculation**
Indirect method - "Loss"			
Calculation of the antifreeze lost following breakages (mechanical)			
Average volume lost following breakage per heavy equipment in one year		8.1	Other sectors survey
Number of heavy equipment in use	x	19,706	From QC in proportion of GDP
Total loss following breakages	=	**160,290**	**Calculation**
Calculation of the consume in use volume			
Average volume used for top-ups per heavy equipment in one year		6.7	Other sectors survey
Number of heavy equipment in use	x	19,706	From QC in proportion of GDP
Total consume in use volume	=	**131,046**	**Calculation**
Total antifreeze loss	**=**	**291,336**	**Calculation**
Calculation of antifreeze in end-of-life heavy equipment (recoverable)			
Number of end-of-life heavy equipment		71	Sales - increase of the number of vehicles (average 2006-2009)
Volume of antifreeze in end-of-life heavy equipment	x	11.39	Proportion of truck rate
Volume in end-of-life heavy equipments	=	**809**	**Calculation**
Recoverable antifreeze (End-of-life + Sold - Loss)	**=**	**151,508**	**Calculation**
Recoverable antifreeze concentration	x	45.0%	Collectors and sampling
Premix concentration	÷	50.0%	Convention
Volume of recoverable antifreeze eq. 50/50	**=**	**136,357**	**Calculation**
Rate of recoverable antifreeze eq. 50/50	**=**	**29.2%**	**Calculation**

GLOBAL RESULTS		NEW-BRUNSWICK		
		AUTOMOTIVE	ROAD TRANSPORTATION	OTHER SECTORS
Volume contained in sold vehicles (OEM)		341,864	53,714	24,751
Volume used in the different sectors	+	1,089,926	755,519	442,035
Total volume sold per sector	=	**1,431,790**	**809,233**	**466,786**
Total volume of antifreeze sold	=	**2,707,810**		
DIRECT METHOD - "DRAINS"				
Volume of drains		809,279	293,897	171,952
Volume in the end-of-life vehicles	+	67,935	9,967	809
Recoverable antifreeze per sector	=	877,215	303,864	172,761
Recoverable antifreeze per sector eq 50/50	=	**789,493**	**273,478**	**155,485**
Total volume of recov. antifreeze eq.50/50	=	**1,218,456**		
Rate of recoverable antifreeze per sector eq. 50/50	=	**55.1%**	**33.8%**	**33.3%**
Global rate of recov. antifreeze eq. 50/50	=	**45.0%**		
INDIRECT METHOD - "LOSS"				
Loss following breakage		16,748	141,256	160,290
Consume in use	+	291,931	319,163	131,046
Total loss of antifreeze	=	**308,680**	**460,419**	**291,336**
Volume in the end-of-life vehicles	=	**67,935**	**9,967**	**809**
Recoverable antifreeze (End-of-life + Sold - Loss)	=	**849,182**	**305,067**	**151,508**
Recoverable antifreeze per sector eq 50/50	=	**764,264**	**274,560**	**136,357**
Total volume of recov. antifreeze eq.50/50		**1,175,181**		
Rate of recoverable antifreeze per sector eq. 50/50	=	**53.4%**	**33.9%**	**29.2%**
Global rate of recov. antifreeze eq. 50/50	=	**43.4%**		

Appendix 11   Crystal Ball Report
BRITISH COLUMBIA

Crystal Ball Report
Simulation started on 12-8-3 at 10:04:26
Simulation stopped on 12-8-3 at 10:05:02

Sensitivity Chart

Target Forecast: BC_TauxDirect

Variable	Contribution
PVidM	23,2%
PVidC	16,2%
VoConsCo	14,9%
ConcA	12,3%
VoConsC	9,0%
VoAppCL	6,2%
VoConsM	3,3%
FVidVL	3,2%
VoFinVL	2,7%
VoAppA	2,2%
FAppDIFM	2,1%
NbConst	1,2%
ConcC	0,6%
VoConsAg	0,5%
NbMn	0,5%
VoRadRec	0,4%
VoC3	0,3%
VoFinC	0,3%
VoMn	0,1%
VoC7	0,1%

Measured by Contribution to Variance
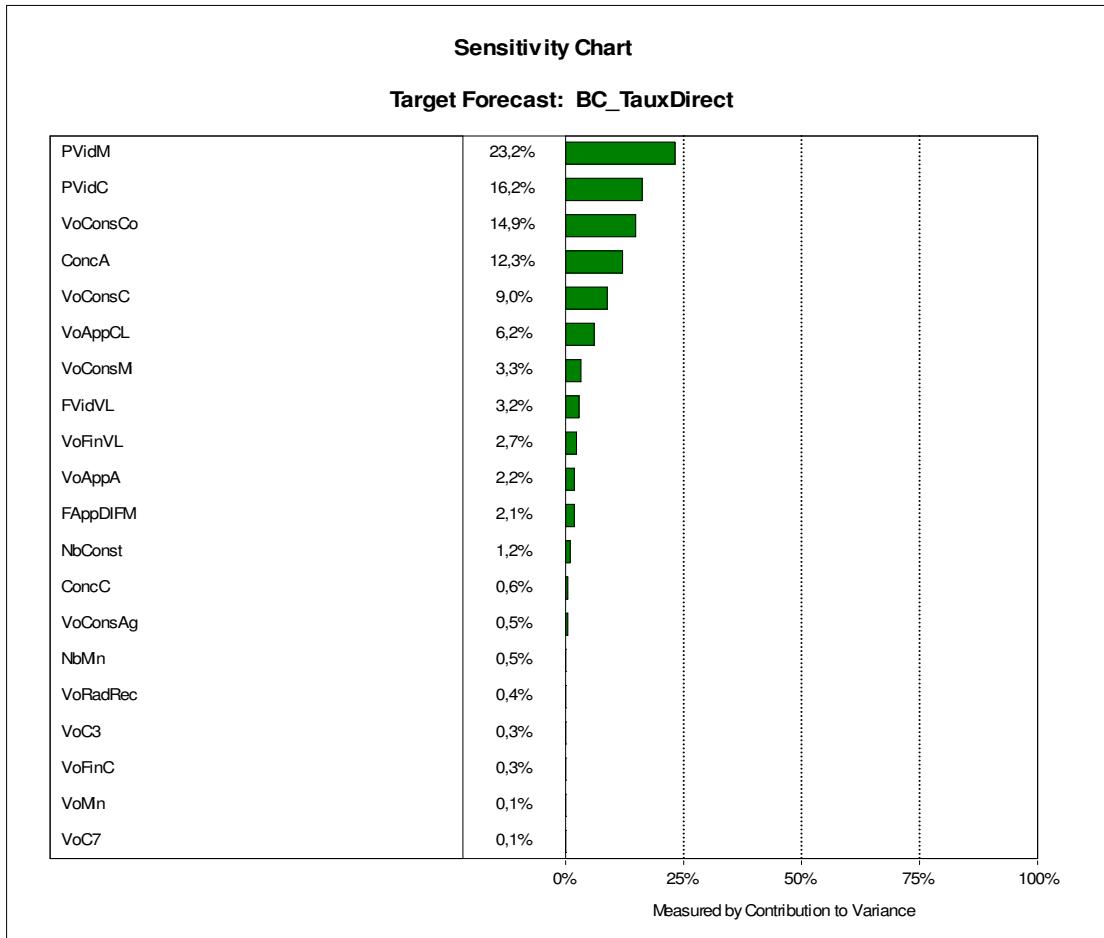
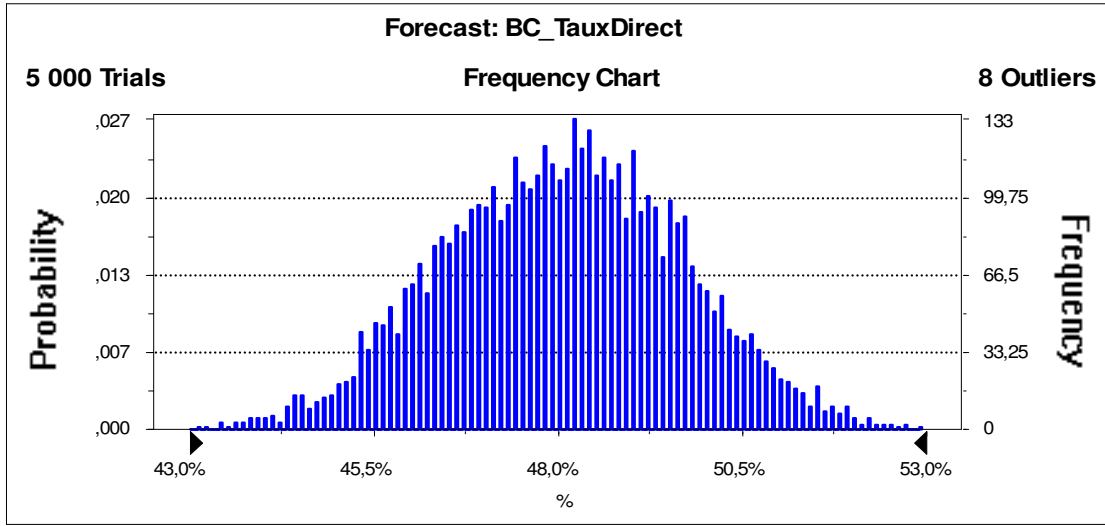**Forecast: BC_TauxDirect**   **Cell: C15**

Summary:
Display Range is from 43,0% to 53,0% %
Entire Range is from 41,5% to 53,3% %
After 5 000 Trials, the Std. Error of the Mean is 0,0%

Statistics:	Value
Trials	5000
Mean	48.1%
Median	48.1%

Mode	---
Standard Deviation	1.6%
Variance	0.0%
Skewness	- 0.03
Kurtosis	2.79
Coeff. of Variability	0.03
Range Minimum	41.5%
Range Maximum	53.3%
Range Width	11.9%
Mean Std. Error	0.02%

Forecast: BC_TauxDirect

5 000 Trials — **Frequency Chart** — **8 Outliers**

Forecast: BC_TauxDirect (cont'd)　　　　　　　　　　　　**Cell: C15**

Percentiles:

Percentile	%	
0.0%	41.5%	
2.5%	45.0%	± 3.1%
5.0%	45.4%	
50.0%	48.1%	
95.0%	50.7%	
97.5%	51.2%	
100.0%	53.3%	

End of Forecast

Crystal Ball Report
Simulation started on 12-8-3 at 10:06:54
Simulation stopped on 12-8-3 at 10:07:34

Sensitivity Chart

Target Forecast: BC_TauxIndirect

Variable	Contribution
VoConsCo	30,6%
VoConsC	16,5%
VoAppC	12,4%
VoBriCo	8,2%
VoBrisC	7,6%
VoBriM	6,9%
VoConsM	6,4%
VoAppCo	3,3%
ConcA	1,4%
VoAppM	0,8%
NbConst	0,8%
FVidVL	0,7%
VoAppCL	0,7%
VoFinC	0,5%
VoBriAg	0,5%
VoAppA	0,4%
FAppDIFM	0,4%
VoRadCons	0,4%
VoConsAg	0,4%
VoC3	0,3%

Measured by Contribution to Variance
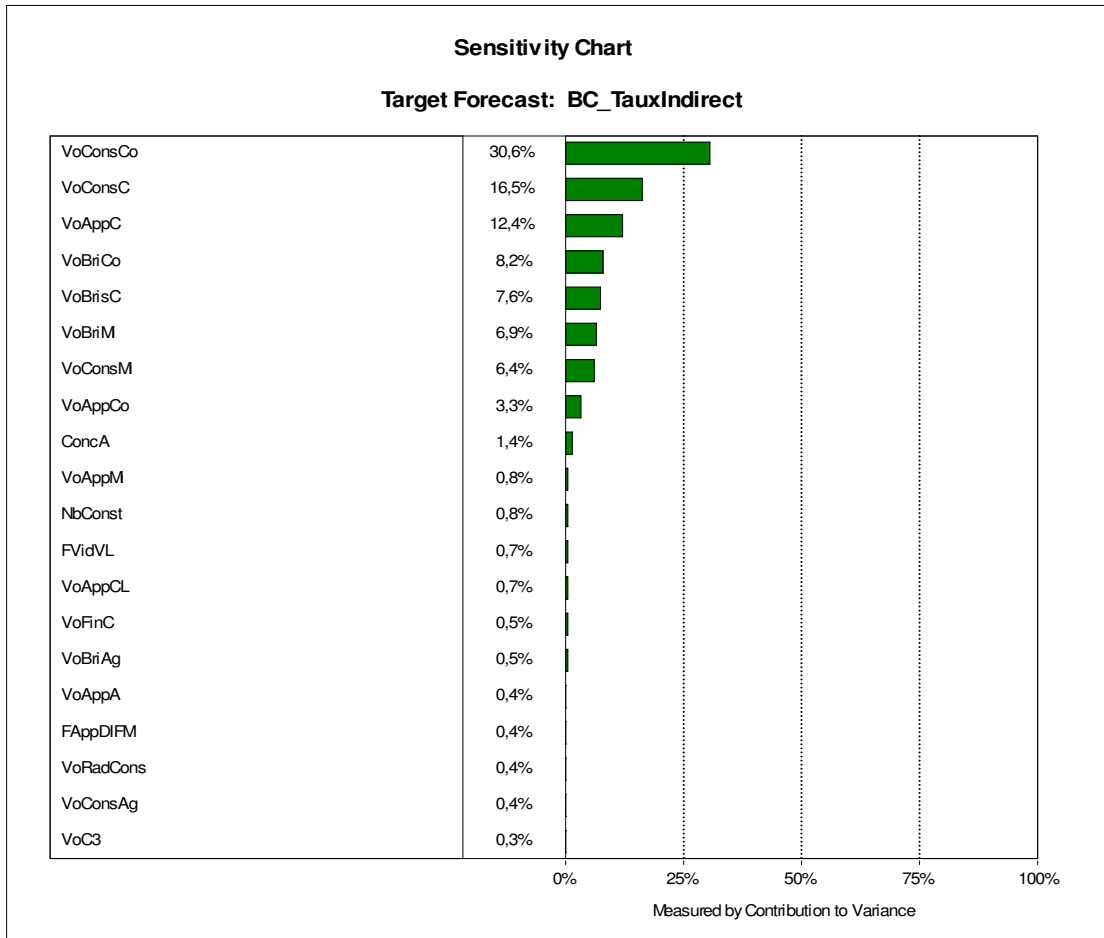
Forecast: BC_TauxIndirect   **Cell: C28**

Summary:
Display Range is from 30,0% to 55,0% %
Entire Range is from 25,8% to 57,4% %
After 5 000 Trials, the Std. Error of the Mean is 0,1%

Statistics:	Value
Trials	5000
Mean	43.3%
Median	43.5%

Mode	---
Standard Deviation	4.3%
Variance	0.2%
Skewness	- 0.30
Kurtosis	3.02
Coeff. of Variability	0.10
Range Minimum	25.8%
Range Maximum	57.4%
Range Width	31.5%
Mean Std. Error	0.06%

Forecast: BC_TauxIndirect

5 000 Trials **Frequency Chart** **15 Outliers**
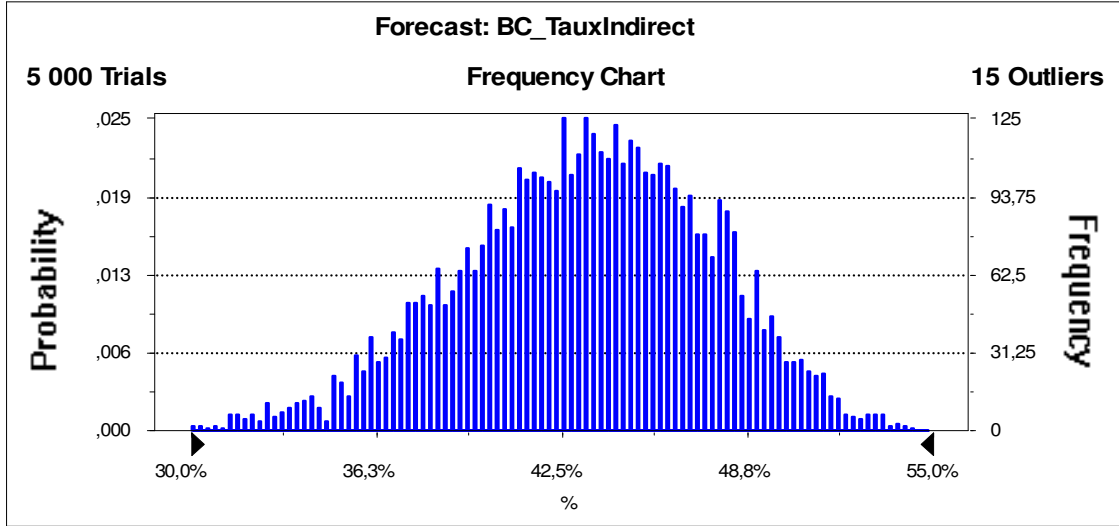
Forecast: BC_TauxIndirect (cont'd) **Cell: C28**
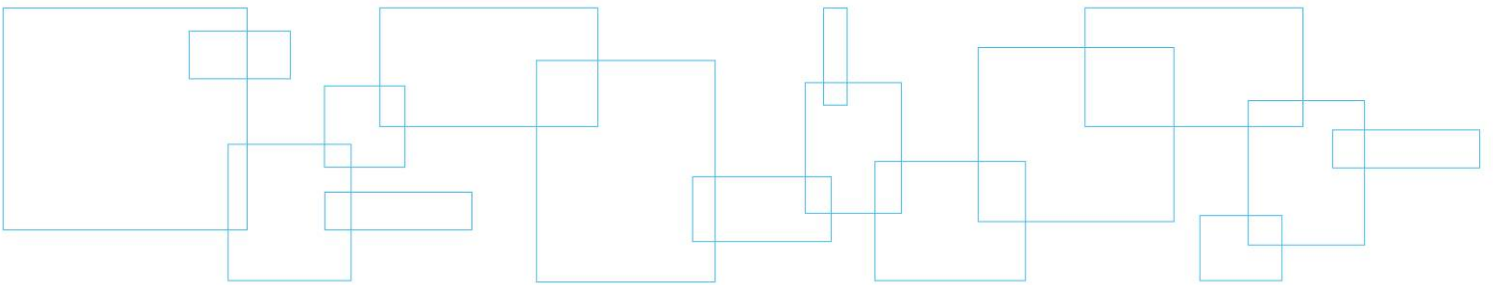
Percentiles:

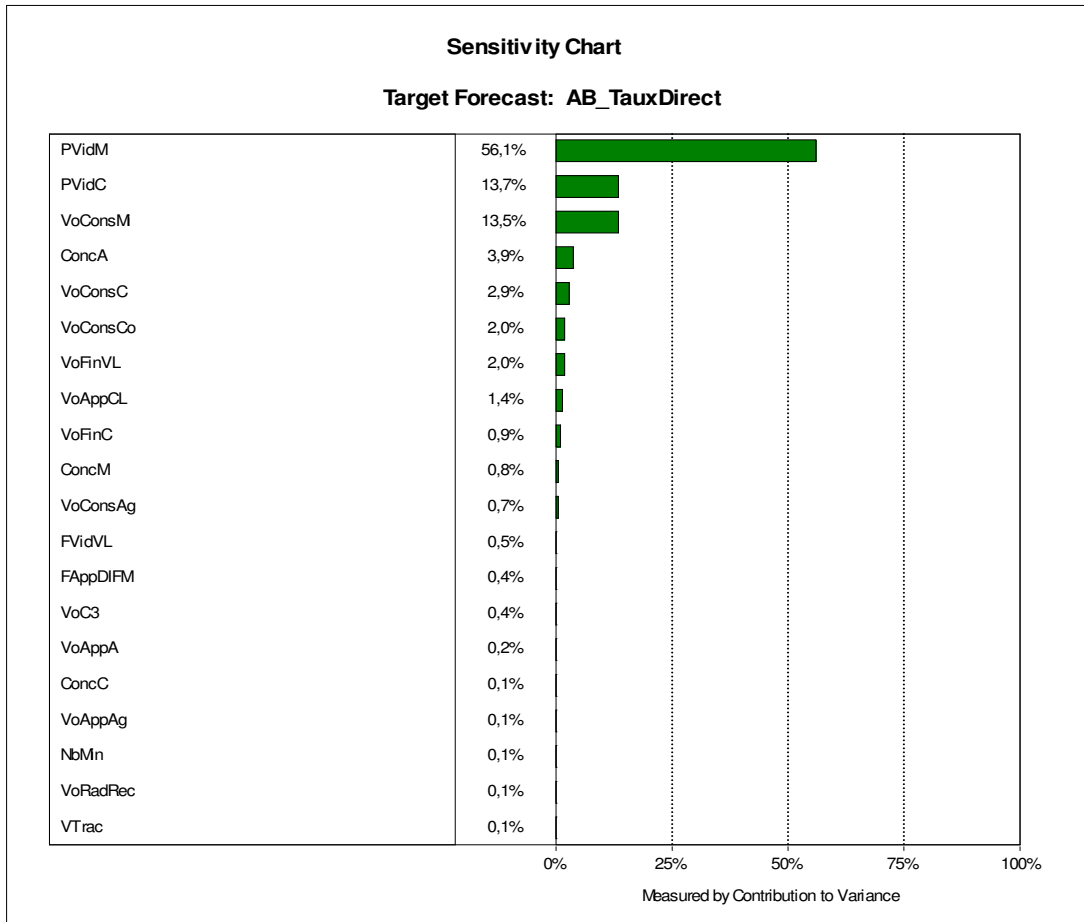| Percentile	%	
0.0%	25.8%	
2.5%	34.3%	± 8.3%
5.0%	36.0%	
50.0%	43.5%	
95.0%	49.9%	
97.5%	50.9%	
100.0%	57.4%	

End of Forecast

Appendix 12   Crystal Ball Report
ALBERTA

Crystal Ball Report
Simulation started on 12-8-2 at 17:36:58
Simulation stopped on 12-8-2 at 17:38:06

Sensitivity Chart

Target Forecast: AB_TauxDirect

Variable	Contribution
PVidM	56,1%
PVidC	13,7%
VoConsM	13,5%
ConcA	3,9%
VoConsC	2,9%
VoConsCo	2,0%
VoFinVL	2,0%
VoAppCL	1,4%
VoFinC	0,9%
ConcM	0,8%
VoConsAg	0,7%
FVidVL	0,5%
FAppDIFM	0,4%
VoC3	0,4%
VoAppA	0,2%
ConcC	0,1%
VoAppAg	0,1%
NbMn	0,1%
VoRadRec	0,1%
VTrac	0,1%

Measured by Contribution to Variance

Forecast: AB_TauxDirect   **Cell: C15**

Summary:
    Display Range is from 36,0% to 48,0% %
    Entire Range is from 35,6% to 47,9% %
    After 5 000 Trials, the Std. Error of the Mean is 0,0%

Statistics:	Value
Trials	5000
Mean	42.0%
Median	42.1%

Mode	---
Standard Deviation	1.9%
Variance	0.0%
Skewness	- 0.21
Kurtosis	2.61
Coeff. of Variability	0.05
Range Minimum	35.6%
Range Maximum	47.9%
Range Width	12.2%
Mean Std. Error	0.03%

Forecast: AB_TauxDirect

5 000 Trials **Frequency Chart** **3 Outliers**
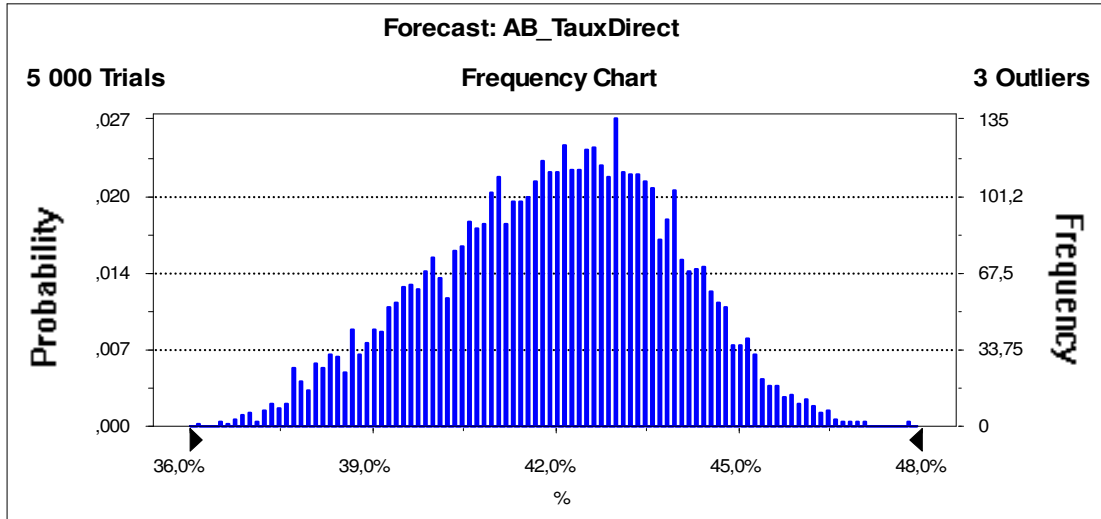
Forecast: AB_TauxDirect (cont'd)   **Cell: C15**

Percentiles:

Percentile	%	
0.0%	35.6%	
2.5%	38.1%	± 3.7%
5.0%	38.6%	
50.0%	42.1%	
95.0%	45.0%	
97.5%	45.4%	
100.0%	47.9%	

End of Forecast

Crystal Ball Report
Simulation started on 12-8-2 at 17:40:17
Simulation stopped on 12-8-2 at 17:40:56

Sensitivity Chart

Target Forecast: AB_TauxIndirect

Variable	Contribution
VoConsM	41,2%
VoBriM	35,5%
VoConsC	5,1%
VoConsCo	4,9%
VoAppC	4,2%
VoAppM	2,8%
VoBrisC	1,8%
VoBriCo	1,4%
VoConsAg	0,9%
VoAppAg	0,5%
ConcA	0,4%
VoBriAg	0,3%
VoAppCo	0,2%
VoConst	0,2%
VoAppCL	0,1%
VMn	0,1%
NbConst	0,1%
NbMn	0,0%
VoFinC	0,0%
PDIFM	0,0%

Measured by Contribution to Variance
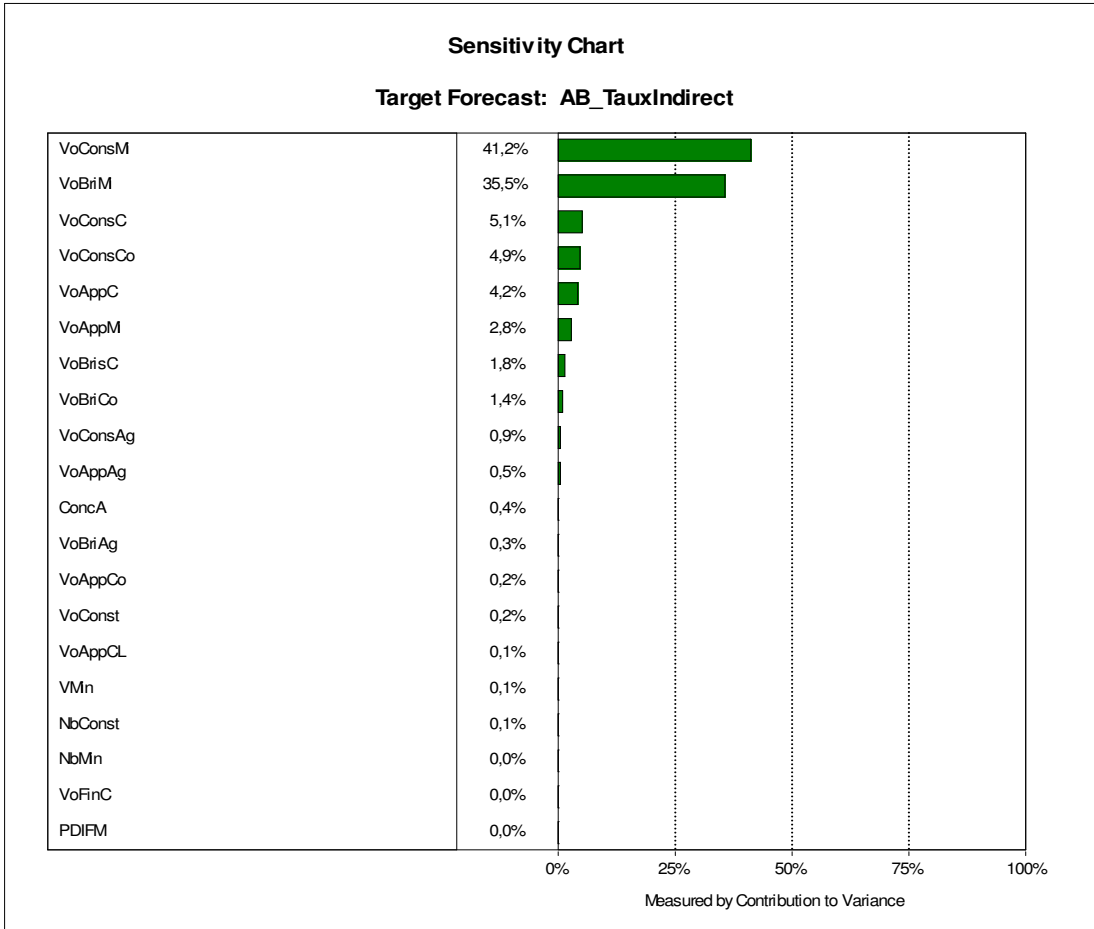
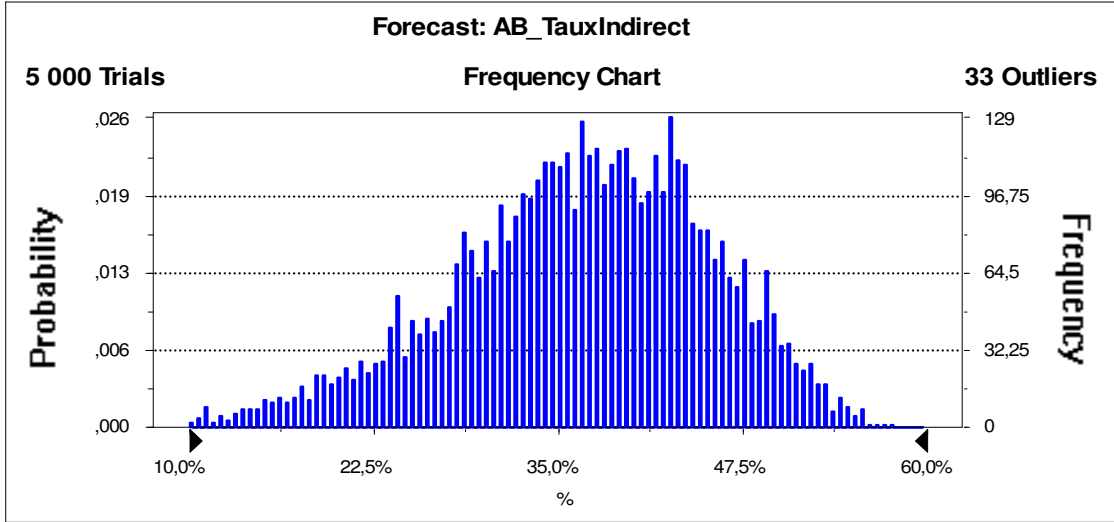**Forecast: AB_TauxIndirect**   **Cell: C28**

Summary:
Display Range is from 10,0% to 60,0% %
Entire Range is from -3,3% to 57,8% %
After 5 000 Trials, the Std. Error of the Mean is 0,1%

Statistics:	Value
Trials	5000
Mean	36.5%
Median	37.2%

Mode	---
Standard Deviation	9.0%
Variance	0.8%
Skewness	- 0.54
Kurtosis	3.31
Coeff. of Variability	0.25
Range Minimum	-3.3%
Range Maximum	57.8%
Range Width	61.1%
Mean Std. Error	0.13%

Forecast: AB_TauxIndirect

5 000 Trials · **Frequency Chart** · **33 Outliers**

Forecast: AB_TauxIndirect (cont'd)   Cell: C28

Percentiles:

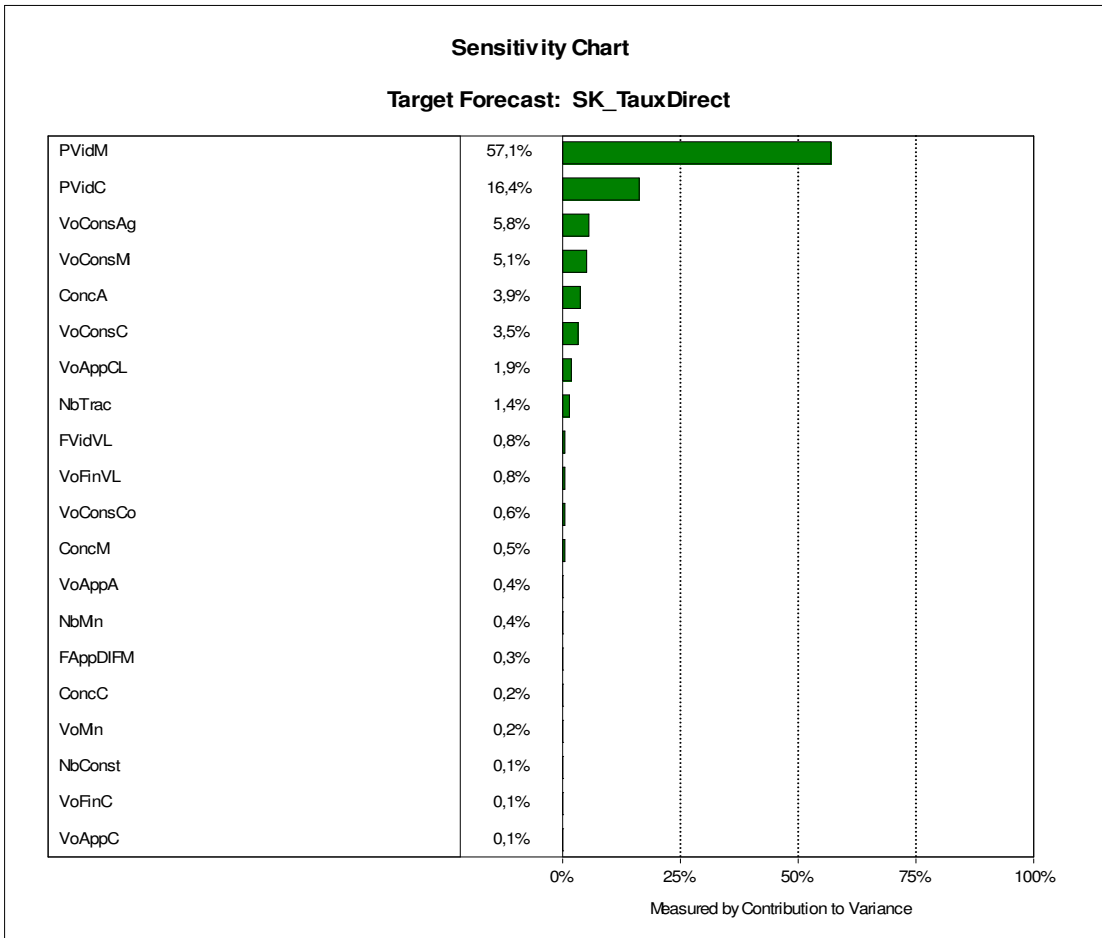| Percentile	%	
0.0%	-3.3%	
2.5%	16.6%	± 17.5%
5.0%	20.3%	
50.0%	37.2%	
95.0%	49.8%	
97.5%	51.6%	
100.0%	57.8%	

End of Forecast

**Appendix 13   Crystal Ball Report
SASKATCHEWAN**
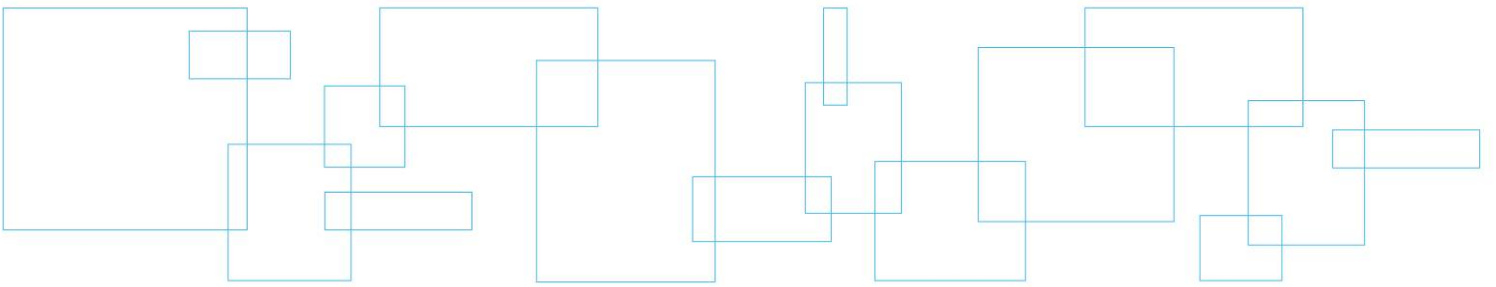
Crystal Ball Report
Simulation started on 12-8-2 at 17:30:20
Simulation stopped on 12-8-2 at 17:30:58

Sensitivity Chart

Target Forecast: SK_TauxDirect

Variable	Value
PVidM	57,1%
PVidC	16,4%
VoConsAg	5,8%
VoConsM	5,1%
ConcA	3,9%
VoConsC	3,5%
VoAppCL	1,9%
NbTrac	1,4%
FVidVL	0,8%
VoFinVL	0,8%
VoConsCo	0,6%
ConcM	0,5%
VoAppA	0,4%
NbMn	0,4%
FAppDIFM	0,3%
ConcC	0,2%
VoMn	0,2%
NbConst	0,1%
VoFinC	0,1%
VoAppC	0,1%

Measured by Contribution to Variance

Forecast: SK_TauxDirect   **Cell: C15**

Summary:
    Display Range is from 38,0% to 49,0% %
    Entire Range is from 37,8% to 50,1% %
    After 5 000 Trials, the Std. Error of the Mean is 0,0%

Statistics:	Value
Trials	5000
Mean	43.9%
Median	43.9%

|	
Mode	---
Standard Deviation	2.0%
Variance	0.0%
Skewness	- 0.08
Kurtosis	2.63
Coeff. of Variability	0.04
Range Minimum	37.8%
Range Maximum	50.1%
Range Width	12.3%
Mean Std. Error	0.03%

Forecast: SK_TauxDirect

5 000 Trials   **Frequency Chart**   **12 Outliers**
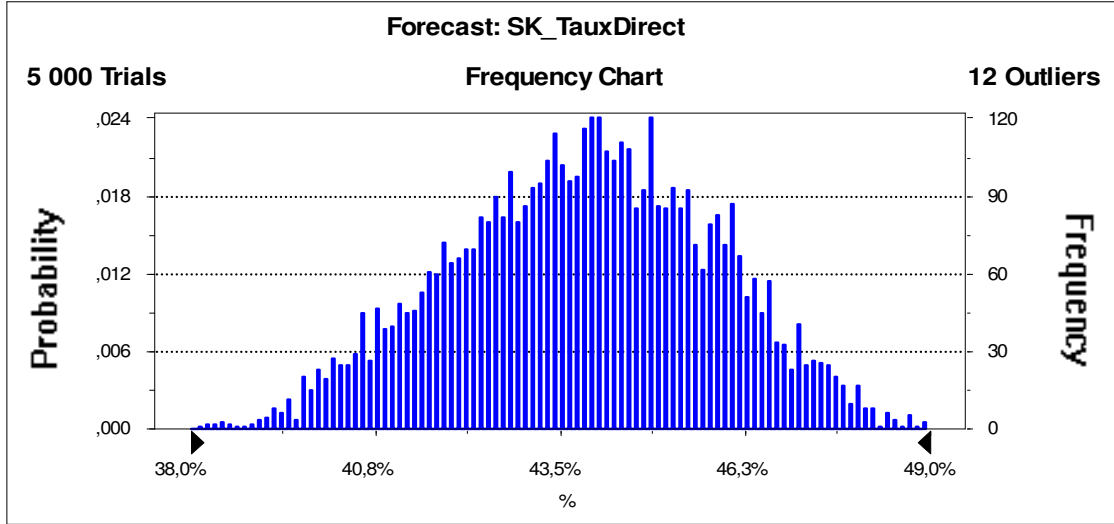
Forecast: SK_TauxDirect (cont'd)   **Cell: C15**

Percentiles:

Percentile	%	
0.0%	37.8%	
2.5%	40.0%	± 3.7%
5.0%	40.5%	
50.0%	43.9%	
95.0%	47.0%	
97.5%	47.5%	
100.0%	50.1%	

End of Forecast

Crystal Ball Report
Simulation started on 12-8-2 at 17:32:33
Simulation stopped on 12-8-2 at 17:33:35

Sensitivity Chart

Target Forecast: SK_TauxIndirect

Variable	Value
VoConsAg	20,9%
VoBriM	16,9%
VoConsM	16,7%
VoConsC	13,0%
VoAppC	8,0%
VoAppAg	7,6%
VoBrisC	5,2%
VoBriAg	5,1%
VoConsCo	1,7%
VoAppM	1,3%
ConcA	0,5%
NbTrac	0,5%
VoBriCo	0,4%
VoFinVL	0,4%
VoFinC	0,2%
VoAppA	0,2%
ConcC	0,2%
VoAppCL	0,2%
VoAppCo	0,2%
FVidVL	0,2%

Measured by Contribution to Variance
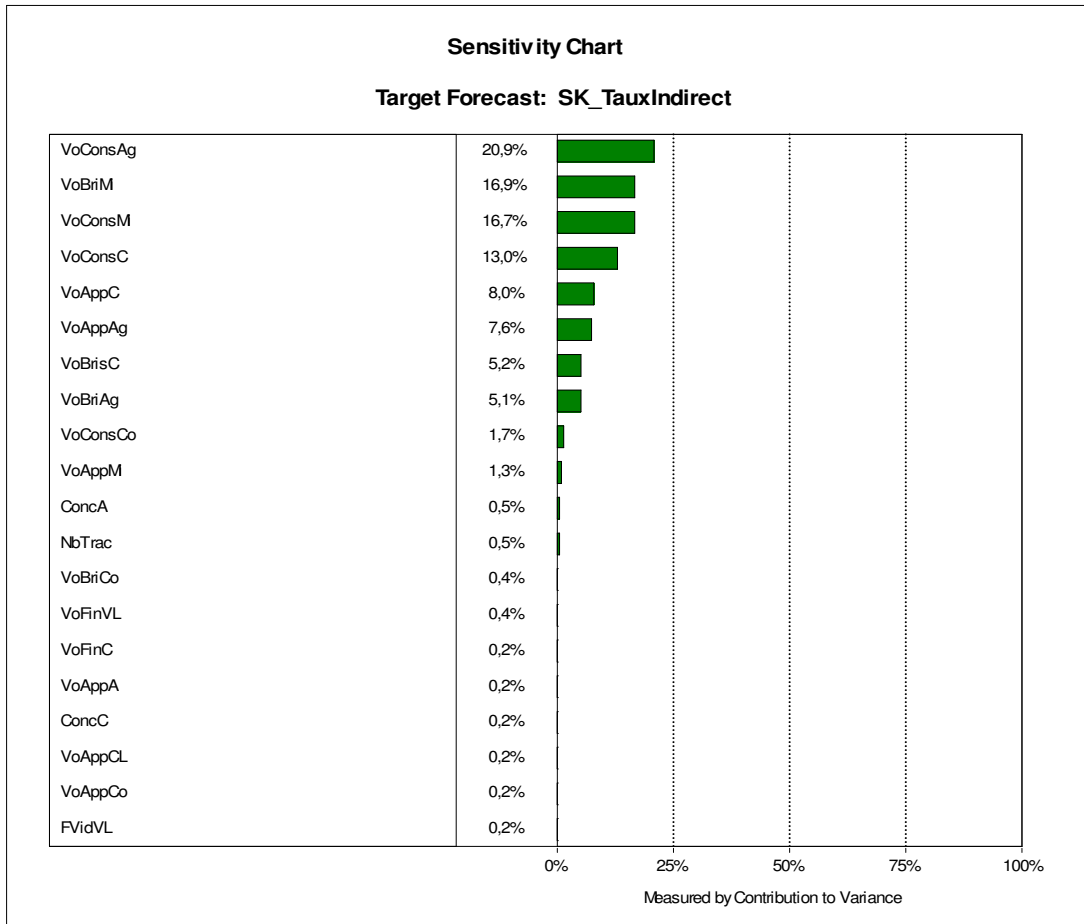
Forecast: SK_TauxIndirect   **Cell: C28**

Summary:
    Display Range is from 20,0% to 60,0% %
    Entire Range is from 12,6% to 56,4% %
    After 5 000 Trials, the Std. Error of the Mean is 0,1%

Statistics:	Value
Trials	5000
Mean	38.9%
Median	39.4%

Mode	---
Standard Deviation	6.3%
Variance	0.4%
Skewness	- 0.38
Kurtosis	3.08
Coeff. of Variability	0.16
Range Minimum	12.6%
Range Maximum	56.4%
Range Width	43.8%
Mean Std. Error	0.09%

Forecast: SK_TauxIndirect

5 000 Trials | **Frequency Chart** | **20 Outliers**
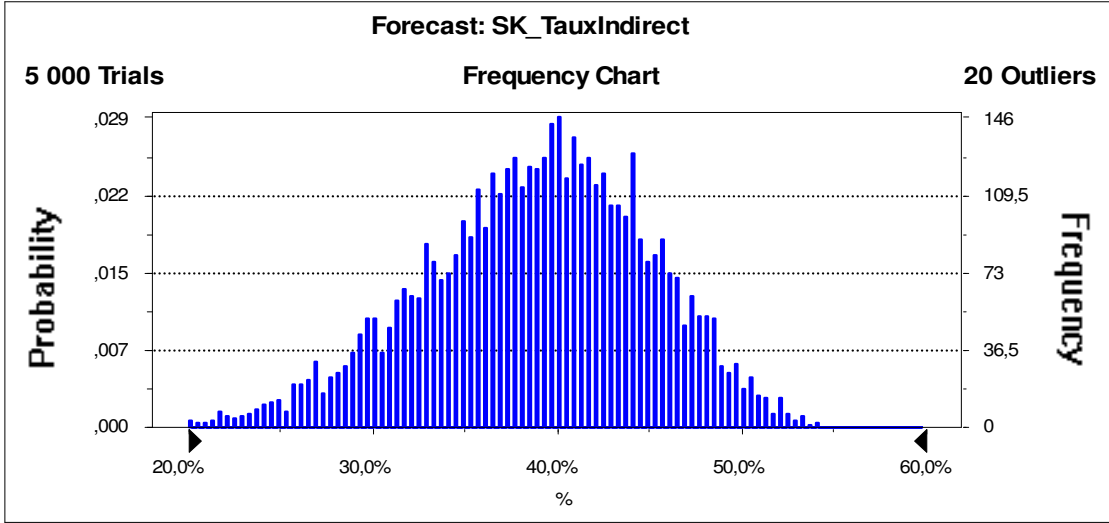
Forecast: SK_TauxIndirect (cont'd)   **Cell: C28**

Percentiles:

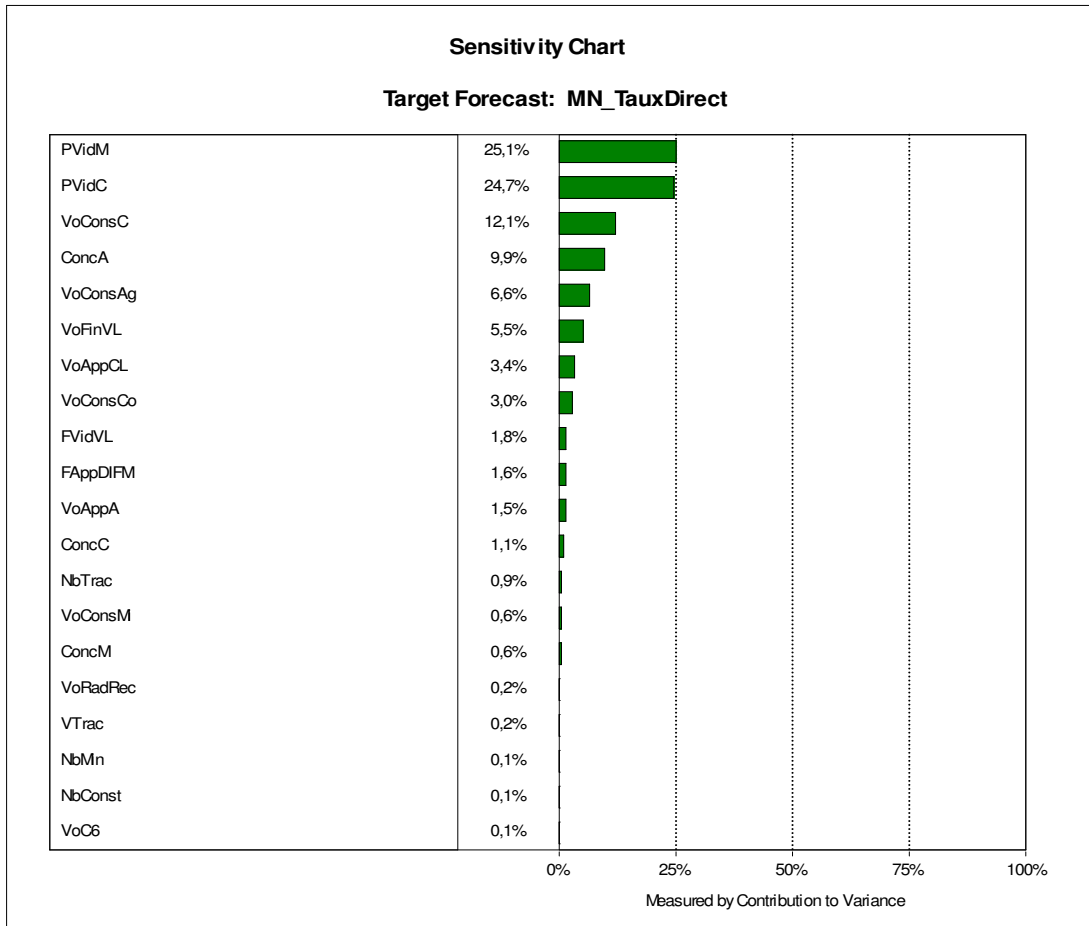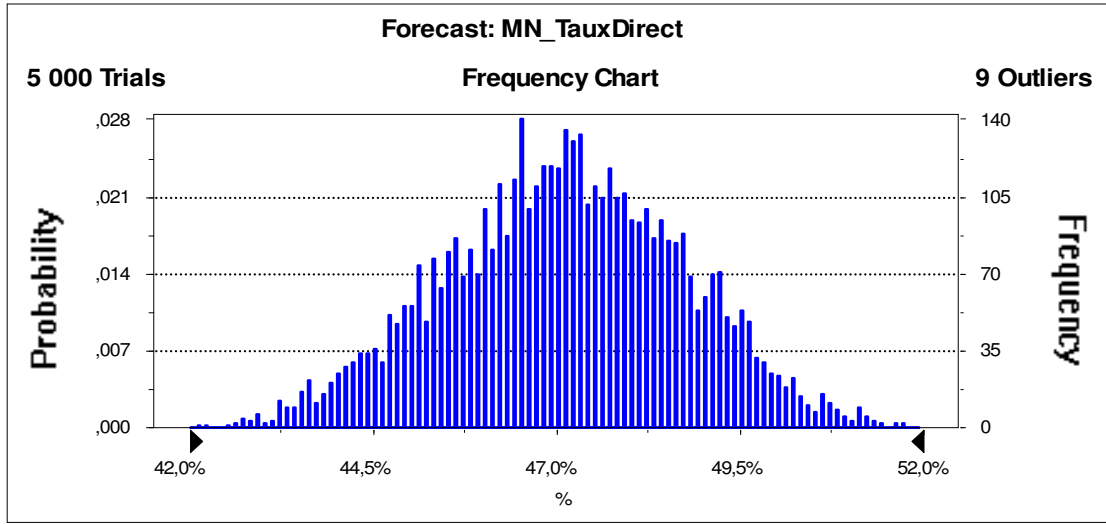| Percentile	%	
0.0%	12.6%	
2.5%	25.7%	± 12.1%
5.0%	27.8%	
50.0%	39.4%	
95.0%	48.4%	
97.5%	49.9%	
100.0%	56.4%	

End of Forecast

**Appendix 14   Crystal Ball Report
MANITOBA**

Crystal Ball Report
Simulation started on 12-8-2 at 16:53:05
Simulation stopped on 12-8-2 at 16:53:50

Sensitivity Chart

Target Forecast: MN_TauxDirect

PVidM	25,1%	
PVidC	24,7%	
VoConsC	12,1%	
ConcA	9,9%	
VoConsAg	6,6%	
VoFinVL	5,5%	
VoAppCL	3,4%	
VoConsCo	3,0%	
FVidVL	1,8%	
FAppDIFM	1,6%	
VoAppA	1,5%	
ConcC	1,1%	
NbTrac	0,9%	
VoConsM	0,6%	
ConcM	0,6%	
VoRadRec	0,2%	
VTrac	0,2%	
NbMn	0,1%	
NbConst	0,1%	
VoC6	0,1%	

0%   25%   50%   75%   100%

Measured by Contribution to Variance

Forecast: MB_TauxDirect   **Cell: C15**

Summary:
Display Range is from 42,0% to 52,0% %
Entire Range is from 41,4% to 52,6% %
After 5 000 Trials, the Std. Error of the Mean is 0,0%

Statistics:	Value
Trials	5000
Mean	47.1%
Median	47.2%

Mode	---
Standard Deviation	1.7%
Variance	0.0%
Skewness	- 0.07
Kurtosis	2.82
Coeff. of Variability	0.04
Range Minimum	41.4%
Range Maximum	52.6%
Range Width	11.2%
Mean Std. Error	0.02%

Forecast: MB_TauxDirect (cont'd)   **Cell: C15**
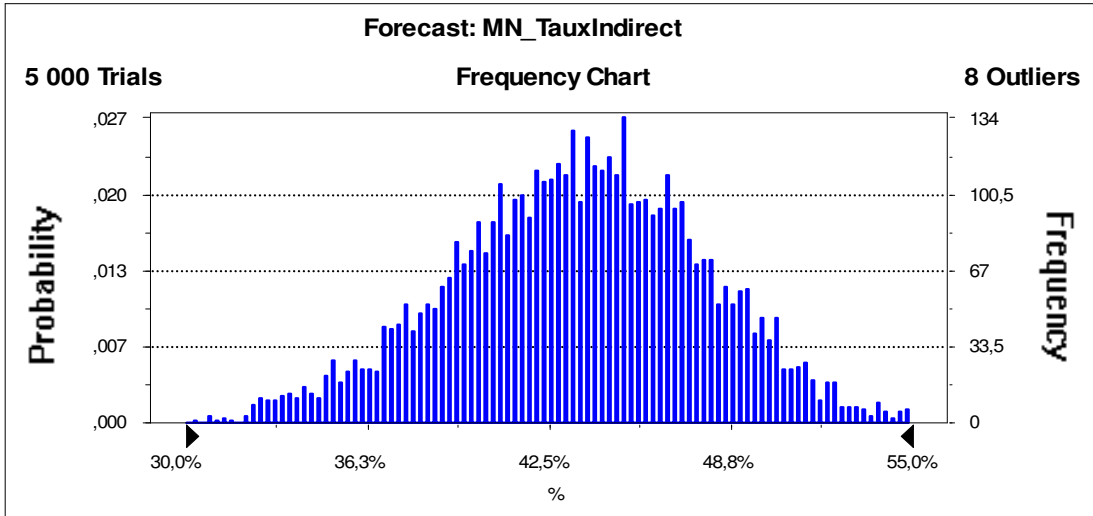
Percentiles:

Percentile	%	
0.0%	41.4%	
2.5%	43.8%	± 3.2%
5.0%	44.3%	
50.0%	47.2%	
95.0%	49.8%	
97.5%	50.3%	
100.0%	52.6%	

End of Forecast

Crystal Ball Report
Simulation started on 12-8-2 at 16:55:26
Simulation stopped on 12-8-2 at 16:56:02

Sensitivity Chart

Target Forecast: MN_TauxIndirect

Variable	%	
VoConsC	28,1%	
VoAppC	18,2%	
VoConsAg	15,2%	
VoBrisC	13,8%	
VoAppAg	5,6%	
VoConsCo	5,6%	
VoBrisAg	4,2%	
VoBriCo	1,8%	
VoBriM	1,4%	
ConcA	1,2%	
VoConsM	0,8%	
VoAppCo	0,7%	
VoFinVL	0,5%	
VoAppCL	0,4%	
FVidVL	0,4%	
ConcC	0,3%	
NbConst	0,3%	
NbTrac	0,3%	
VoAppM	0,2%	
VoAppA	0,2%	

0%   25%   50%   75%   100%

Measured by Contribution to Variance
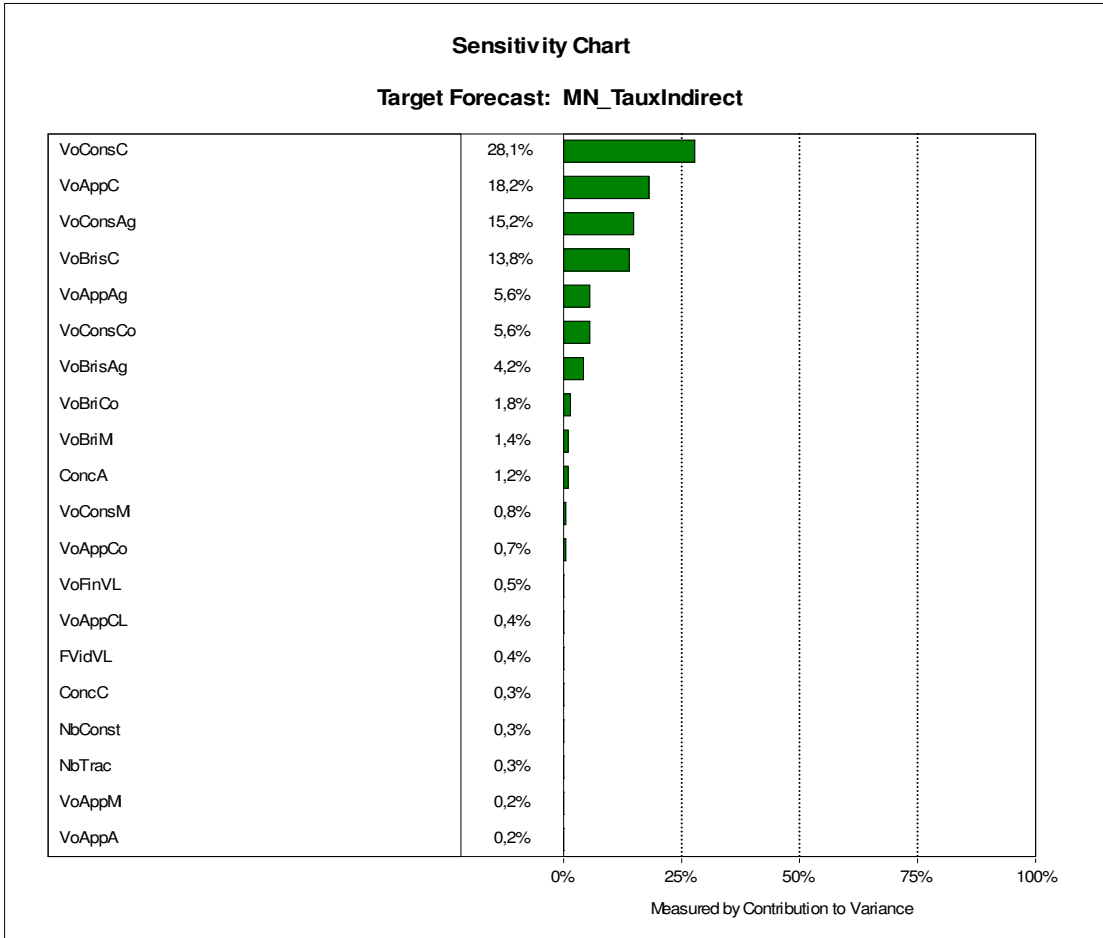
Forecast: MB_TauxIndirect   **Cell: C28**

Summary:
    Display Range is from 30,0% to 55,0% %
    Entire Range is from 25,3% to 57,3% %
    After 5 000 Trials, the Std. Error of the Mean is 0,1%

Statistics:	Value
Trials	5000
Mean	43.5%
Median	43.6%

|	
Mode	---
Standard Deviation	4.3%
Variance	0.2%
Skewness	- 0.16
Kurtosis	2.87
Coeff. of Variability	0.10
Range Minimum	25.3%
Range Maximum	57.3%
Range Width	32.0%
Mean Std. Error	0.06%

Forecast: MN_TauxIndirect

5 000 Trials   **Frequency Chart**   **8 Outliers**

Forecast: MB_TauxIndirect (cont'd)   **Cell: C28**

Percentiles:

Percentile	%	
0.0%	25.3%	
2.5%	34.6%	± 8.4%
5.0%	36.0%	
50.0%	43.6%	
95.0%	50.4%	
97.5%	51.5%	
100.0%	57.3%	

End of Forecast

Appendix 15   Crystal Ball Report
ONTARIO
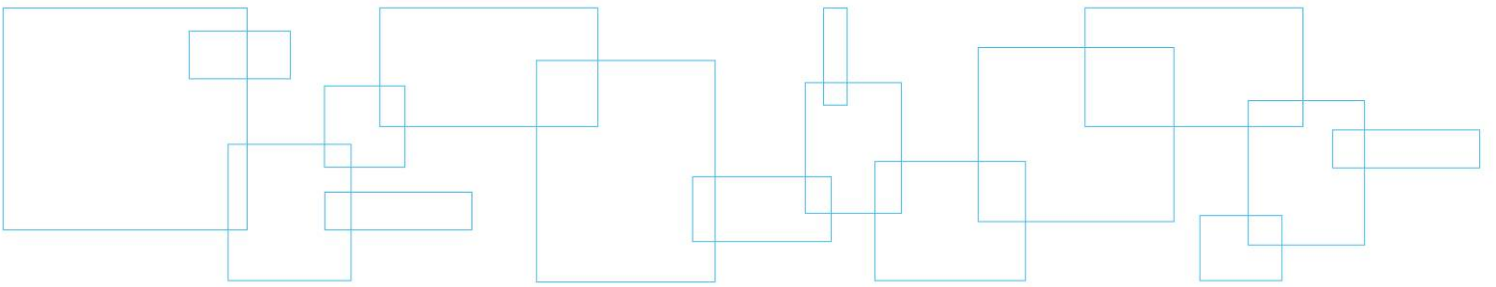
Crystal Ball Report
Simulation started on 12-8-2 at 17:11:31
Simulation stopped on 12-8-2 at 17:12:08

Sensitivity Chart

Target Forecast: ON_TauxDirect

VoFinVL	21,7%	
PVidM	16,3%	
PVidC	13,6%	
VoConsCo	12,7%	
ConcA	10,6%	
VoConsC	7,1%	
VoAppCL	5,1%	
VoAppA	2,9%	
VoFinC	2,8%	
FAppDIFM	2,6%	
VoConsAg	1,3%	
FVidVL	0,9%	
NbConst	0,8%	
ConcC	0,5%	
ConcM	0,4%	
VoRadRec	0,3%	
NbTrac	0,1%	
VoTrac	0,1%	
VoBriAg	0,0%	
VConst	0,0%	

0%   25%   50%   75%   100%

Measured by Contribution to Variance
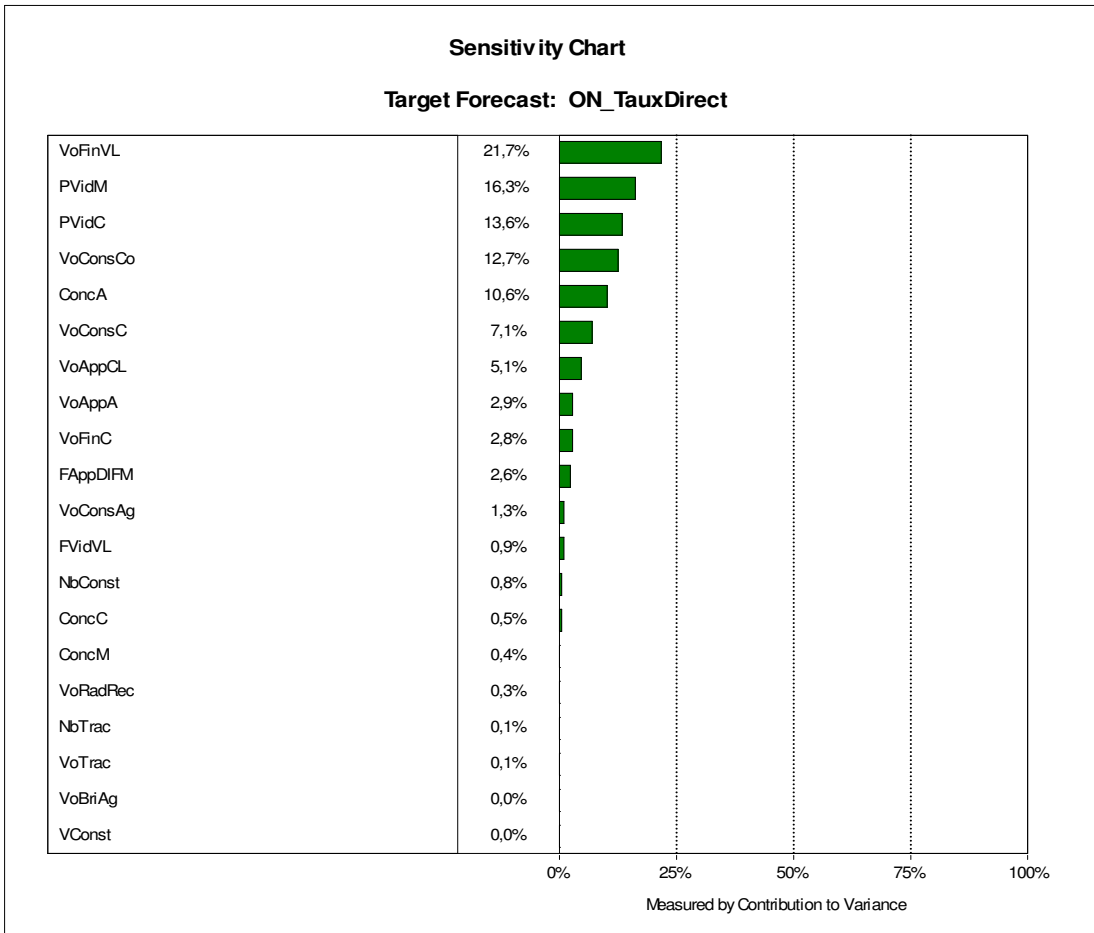
Forecast: ON_TauxDirect   **Cell: C15**

Summary:
Display Range is from 43,0% to 53,0% %
Entire Range is from 42,1% to 53,6% %
After 5 000 Trials, the Std. Error of the Mean is 0,0%

Statistics:	Value
Trials	5000
Mean	47.6%
Median	47.6%

| Mode	---
Standard Deviation	1.7%
Variance	0.0%
Skewness	0.04
Kurtosis	2.80
Coeff. of Variability	0.04
Range Minimum	42.1%
Range Maximum	53.6%
Range Width	11.5%
Mean Std. Error	0.02%

Forecast: ON_TauxDirect

5 000 Trials   **Frequency Chart**   **9 Outliers**
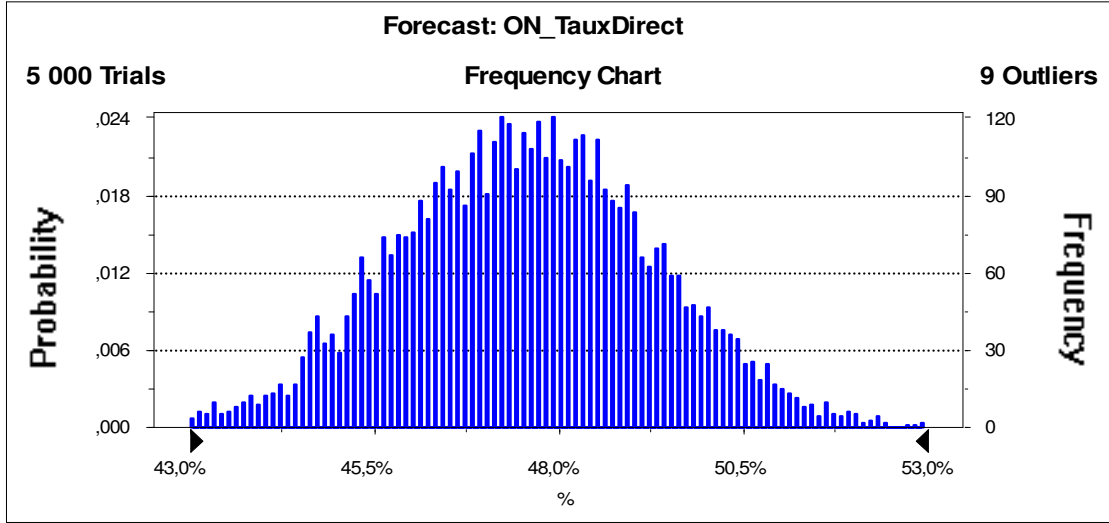
Forecast: ON_TauxDirect (cont'd)   **Cell: C15**

Percentiles:

Percentile	%	
0.0%	42.1%	
2.5%	44.2%	± 3.4%
5.0%	44.8%	
50.0%	47.6%	
95.0%	50.4%	
97.5%	51.0%	
100.0%	53.6%	

End of Forecast

Crystal Ball Report
Simulation started on 12-8-2 at 17:13:53
Simulation stopped on 12-8-2 at 17:14:34

Sensitivity Chart

Target Forecast: ON_TauxIndirect

VoConsCo	34,3%	
VoConsC	19,1%	
VoAppC	13,4%	
VoBriCo	7,6%	
VoBrisC	6,9%	
VoFinVL	3,3%	
VoAppCo	2,9%	
ConcA	2,3%	
VoFinC	1,8%	
VoConsAg	1,7%	
FAppDIFM	1,2%	
VoAppCL	1,1%	
VoBriAg	0,8%	
VoAppAg	0,8%	
VoAppA	0,5%	
NbConst	0,5%	
VoConsM	0,3%	
NbMn	0,3%	
FVidVL	0,2%	
VoBriM	0,1%	

0%   25%   50%   75%   100%

Measured by Contribution to Variance
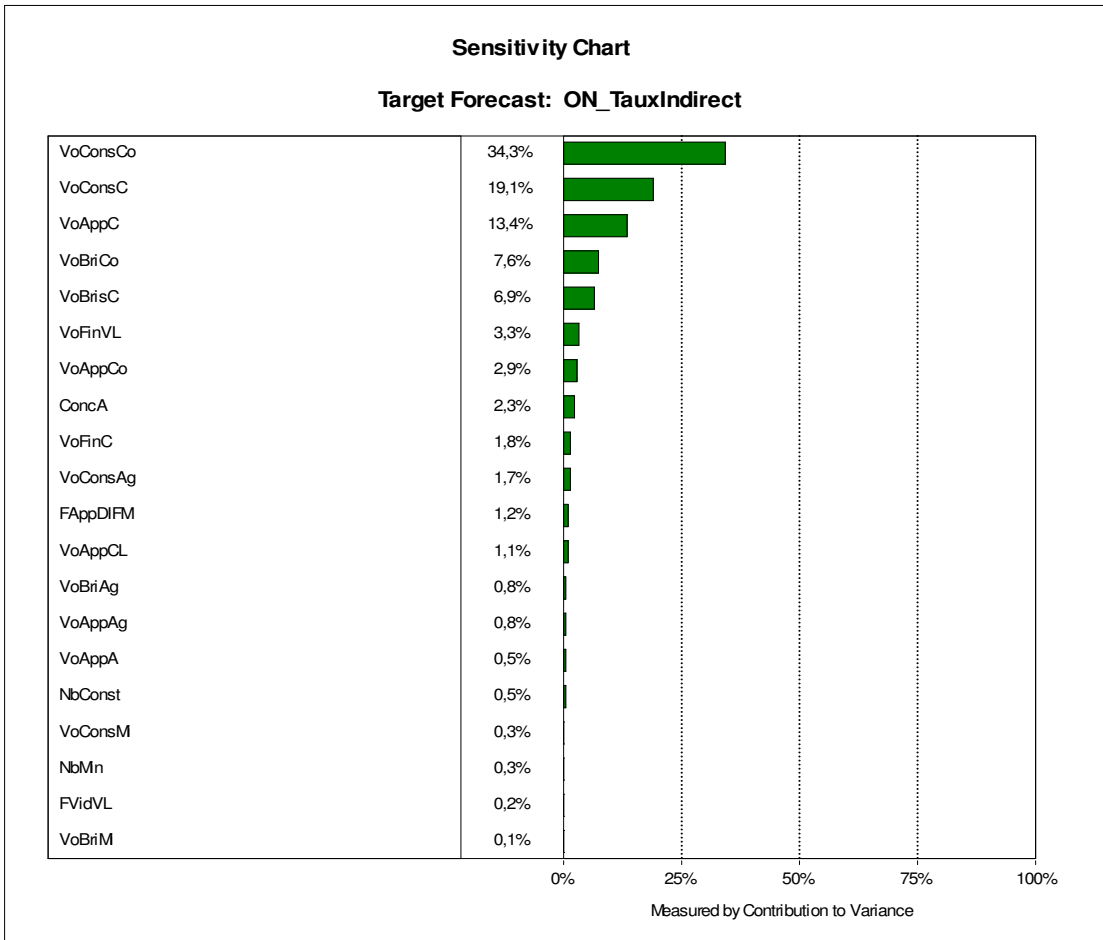
Forecast: ON_TauxIndirect   **Cell: C28**

Summary:
  Display Range is from 32,5% to 55,0% %
  Entire Range is from 29,1% to 54,7% %
  After 5 000 Trials, the Std. Error of the Mean is 0,1%

Statistics:	Value
Trials	5000
Mean	42.8%
Median	43.0%

| Mode	---
Standard Deviation	3.9%
Variance	0.2%
Skewness	- 0.22
Kurtosis	2.85
Coeff. of Variability	0.09
Range Minimum	29.1%
Range Maximum	54.7%
Range Width	25.6%
Mean Std. Error	0.06%

Forecast: ON_TauxIndirect

5 000 Trials **Frequency Chart** **27 Outliers**
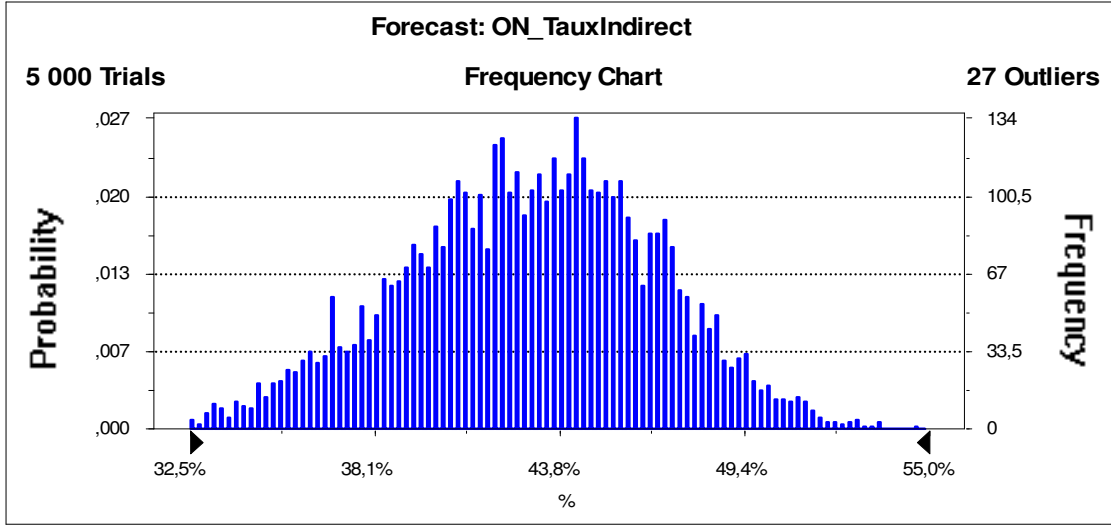
Forecast: ON_TauxIndirect (cont'd)   **Cell: C28**

Percentiles:

Percentile	%	
0.0%	29.1%	
2.5%	34.9%	± 7.5%
5.0%	36.1%	
50.0%	43.0%	
95.0%	48.9%	
97.5%	49.9%	
100.0%	54.7%	

End of Forecast

Appendix 16   Crystal Ball Report
QUEBEC

Crystal Ball Report
Simulation started on 12-8-6 at 16:07:08
Simulation stopped on 12-8-6 at 16:07:52

Sensitivity Chart

Target Forecast: QC_TauxDirect

Variable	Contribution
VoFinVL	25,5%
PVidC	22,6%
PVidM	17,2%
ConcA	8,1%
VoConsCo	7,1%
VoConsC	6,5%
FAppDIFM	2,3%
VoAppA	2,0%
VoFinC	1,9%
ConcC	1,7%
VoAppCL	1,5%
VoConsAg	1,1%
FVidVL	0,7%
NbConst	0,2%
ConcM	0,2%
VoRadRec	0,2%
VoConsM	0,2%
VoC3	0,1%
VoConst	0,1%
NbTrac	0,1%

Measured by Contribution to Variance
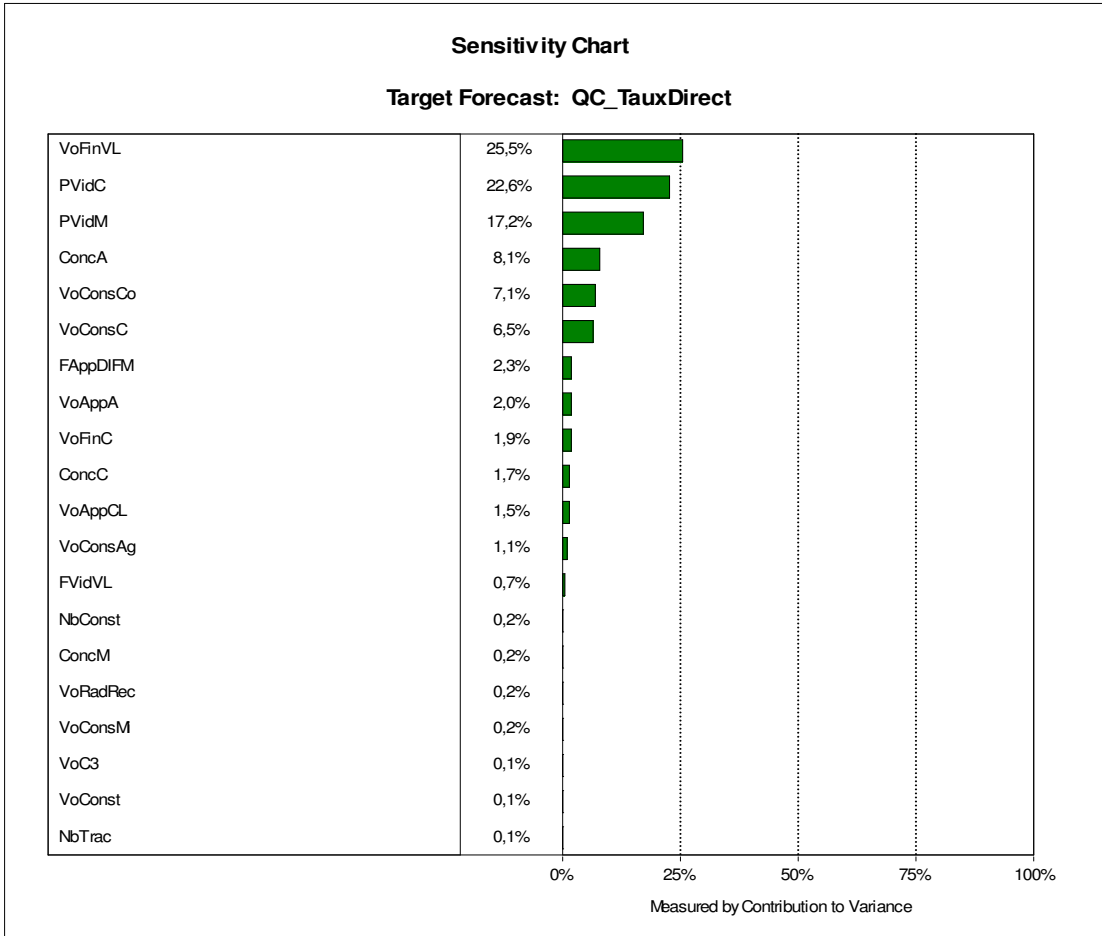
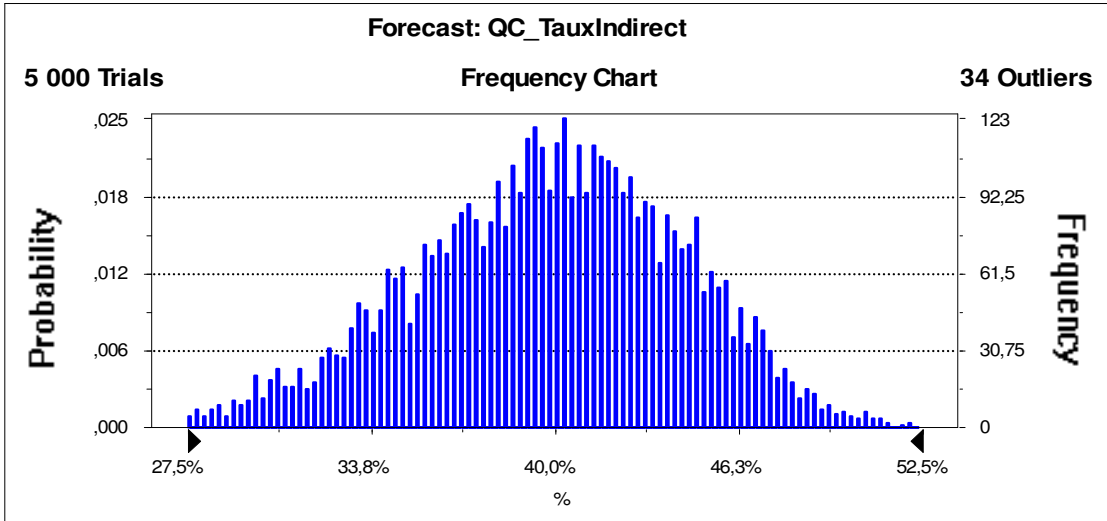**Forecast: QC_TauxDirect**   **Cell: C15**

Summary:
    Display Range is from 39,0% to 49,0% %
    Entire Range is from 38,3% to 49,6% %
    After 5 000 Trials, the Std. Error of the Mean is 0,0%

Statistics:	Value
Trials	5000
Mean	44.1%
Median	44.1%

Mode	---
Standard Deviation	1.7%
Variance	0.0%
Skewness	0.04
Kurtosis	2.80
Coeff. of Variability	0.04
Range Minimum	38.3%
Range Maximum	49.6%
Range Width	11.3%
Mean Std. Error	0.02%

Forecast: QC_TauxDirect

5 000 Trials **Frequency Chart** **10 Outliers**
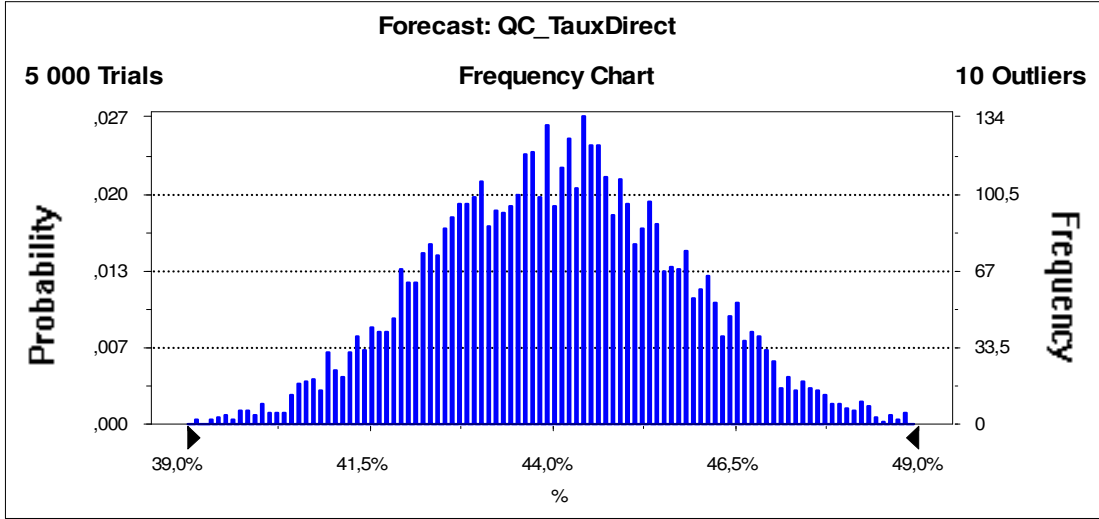
Forecast: QC_TauxDirect (cont'd)   **Cell: C15**

Percentiles:

Percentile	%	
0.0%	38.3%	
2.5%	40.8%	± 3.3%
5.0%	41.3%	
50.0%	44.1%	
95.0%	46.9%	
97.5%	47.5%	
100.0%	49.6%	

End of Forecast

Crystal Ball Report
Simulation started on 12-8-6 at 16:09:06
Simulation stopped on 12-8-6 at 16:09:53

Sensitivity Chart

Target Forecast: QC_TauxIndirect

Variable	Contribution
VoConsCo	27,0%
VoConsC	26,6%
VoAppC	15,0%
VoBrisC	9,9%
VoBriCo	5,8%
VoFinVL	3,8%
VoConsAg	2,5%
VoAppCo	2,2%
VoBriAg	0,9%
ConcA	0,9%
NbConst	0,7%
VoAppAg	0,7%
VoFinC	0,5%
VoAppA	0,5%
VoAppCL	0,4%
FVidVL	0,4%
VoConsM	0,4%
FAppDIFM	0,3%
VoRadCons	0,3%
NbTrac	0,2%

Measured by Contribution to Variance
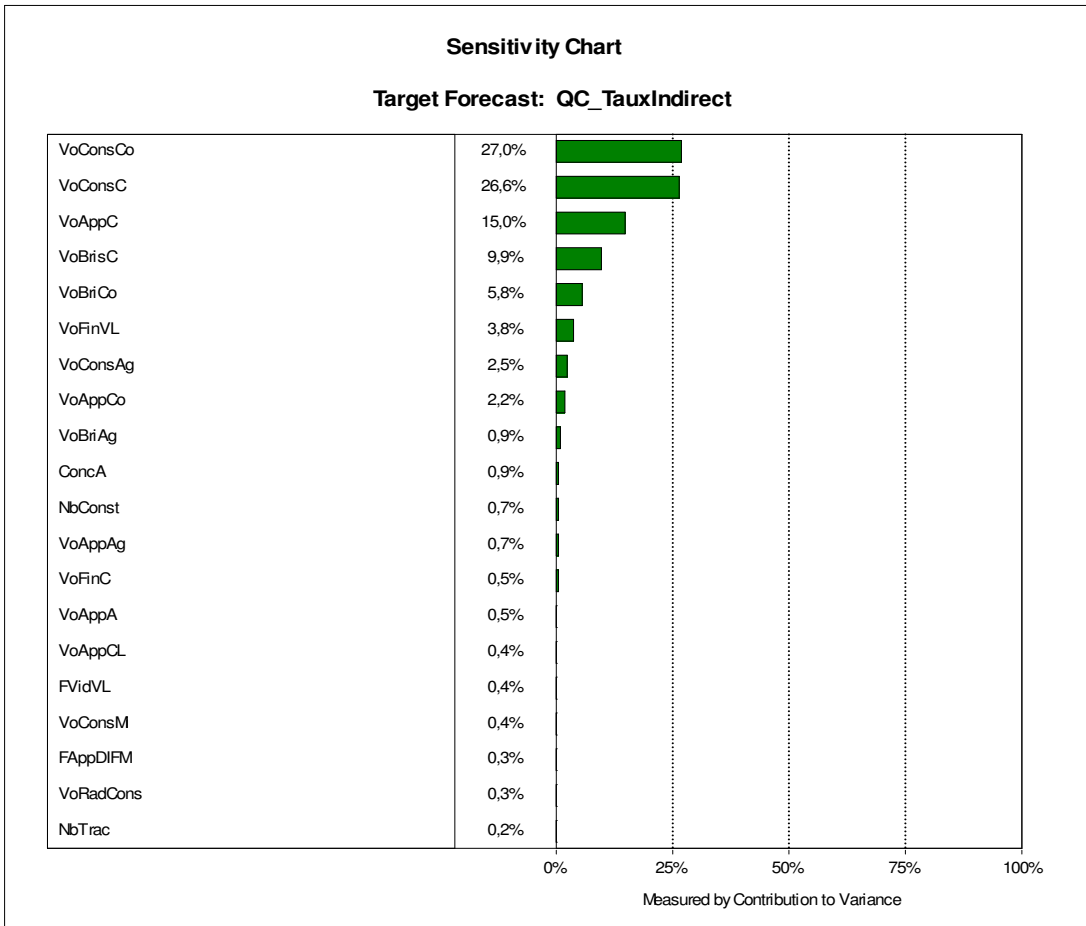
**Forecast: QC_TauxIndirect**   **Cell: C28**

Summary:
 Display Range is from 27,5% to 52,5% %
 Entire Range is from 20,4% to 52,1% %
 After 5 000 Trials, the Std. Error of the Mean is 0,1%

Statistics:	Value
Trials	5000
Mean	39.8%
Median	40.0%

Mode	---
Standard Deviation	4.6%
Variance	0.2%
Skewness	- 0.29
Kurtosis	2.92
Coeff. of Variability	0.12
Range Minimum	20.4%
Range Maximum	52.1%
Range Width	31.7%
Mean Std. Error	0.07%

Forecast: QC_TauxIndirect

5 000 Trials   **Frequency Chart**   **34 Outliers**

Forecast: QC_TauxIndirect (cont'd)   **Cell: C28**

Percentiles:

Percentile	%	
0.0%	20.4%	
2.5%	30.0%	± 9.0%
5.0%	31.7%	
50.0%	40.0%	
95.0%	46.9%	
97.5%	47.9%	
100.0%	52.1%	

End of Forecast

**Appendix 17   Crystal Ball Report
NEW BRUNSWICK**
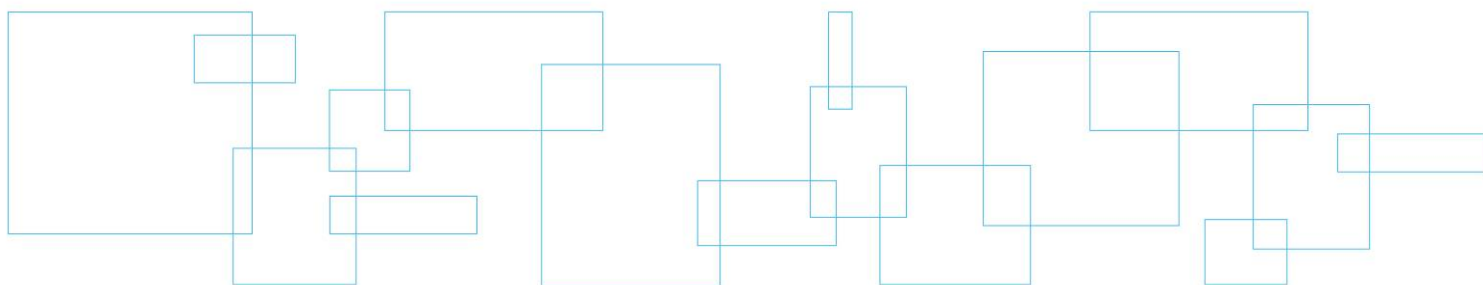
Crystal Ball Report
Simulation started on 12-8-6 at 16:02:17
Simulation stopped on 12-8-6 at 16:02:60

Sensitivity Chart

Target Forecast: NB_TauxDirect

PVidC	29,4%	
PVidM	14,3%	
ConcA	11,3%	
VoConsC	11,0%	
VoFinVL	7,9%	
VoConsCo	6,5%	
FVidVL	5,5%	
VoAppCL	3,9%	
FAppDIFM	3,0%	
VoAppA	2,3%	
VoFinC	1,0%	
ConcC	1,0%	
NbConst	0,6%	
VoRadRec	0,4%	
VoConsAg	0,4%	
NbTrac	0,3%	
VoConsM	0,3%	
ConcM	0,2%	
PDIFM	0,1%	
VoAppAg	0,1%	

0%   25%   50%   75%   100%

Measured by Contribution to Variance
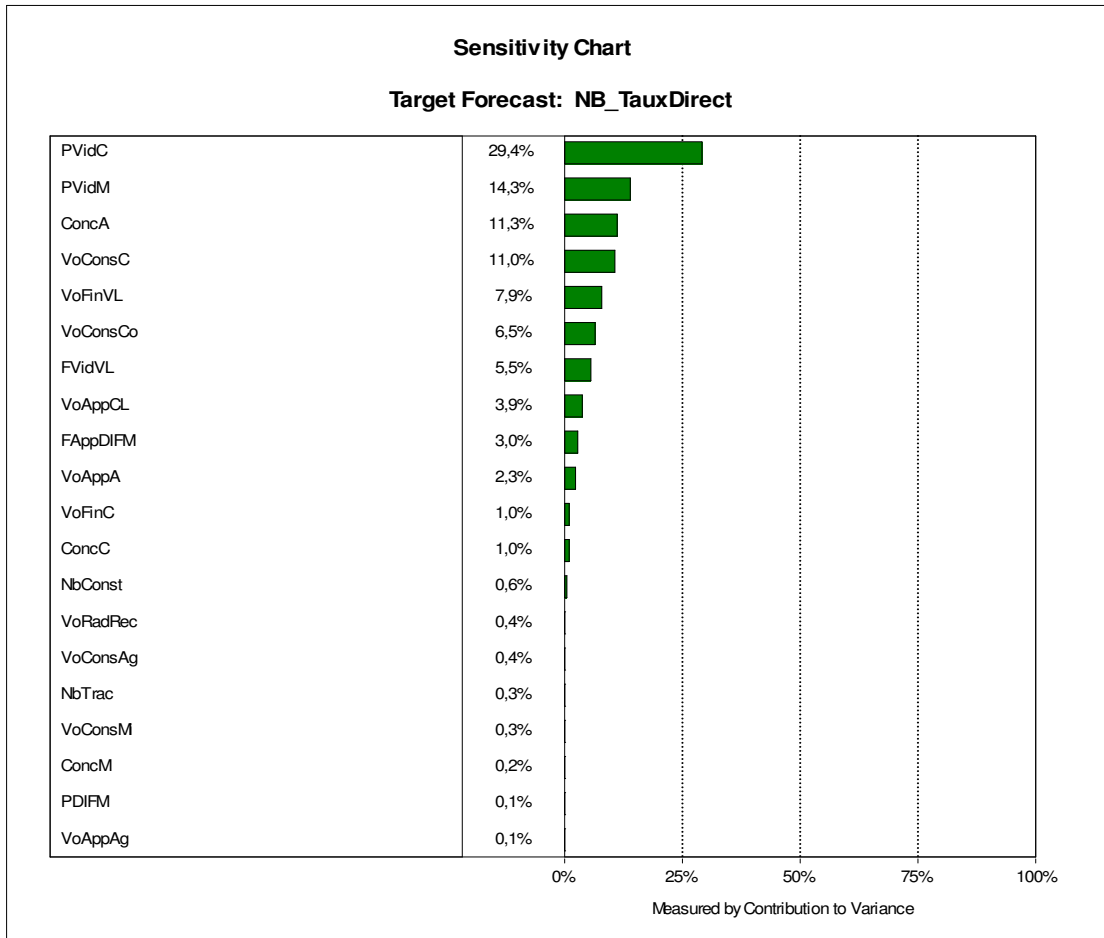
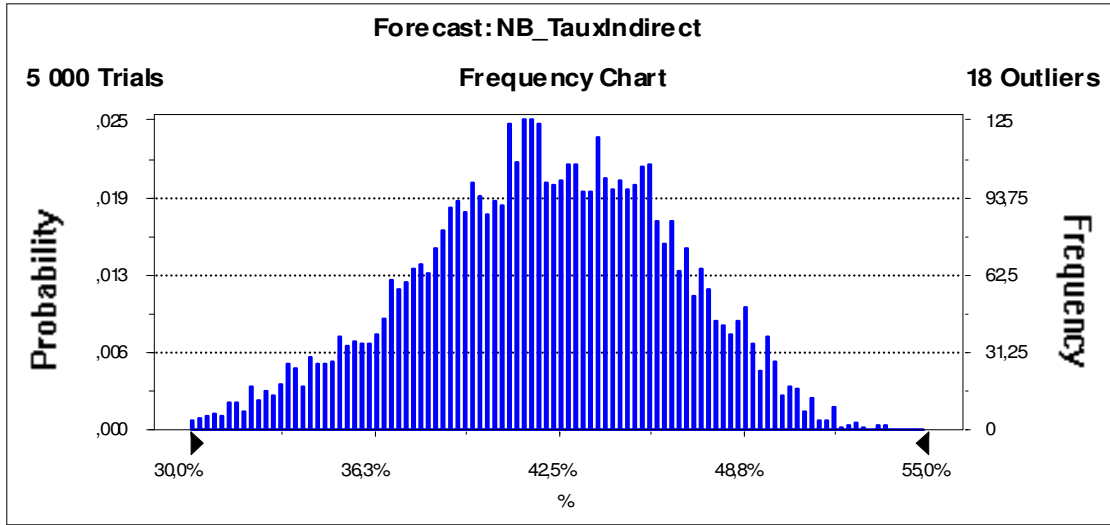**Forecast: NB_TauxDirect**   **Cell: C15**

Summary:
   Display Range is from 41,0% to 50,0% %
   Entire Range is from 40,4% to 51,8% %
   After 5 000 Trials, the Std. Error of the Mean is 0,0%

Statistics:	Value
Trials	5000
Mean	45.3%
Median	45.3%

Mode	---
Standard Deviation	1.6%
Variance	0.0%
Skewness	- 0.03
Kurtosis	2.81
Coeff. of Variability	0.03
Range Minimum	40.4%
Range Maximum	51.8%
Range Width	11.4%
Mean Std. Error	0.02%

Forecast: NB_TauxDirect

5 000 Trials   **Frequency Chart**   **14 Outliers**
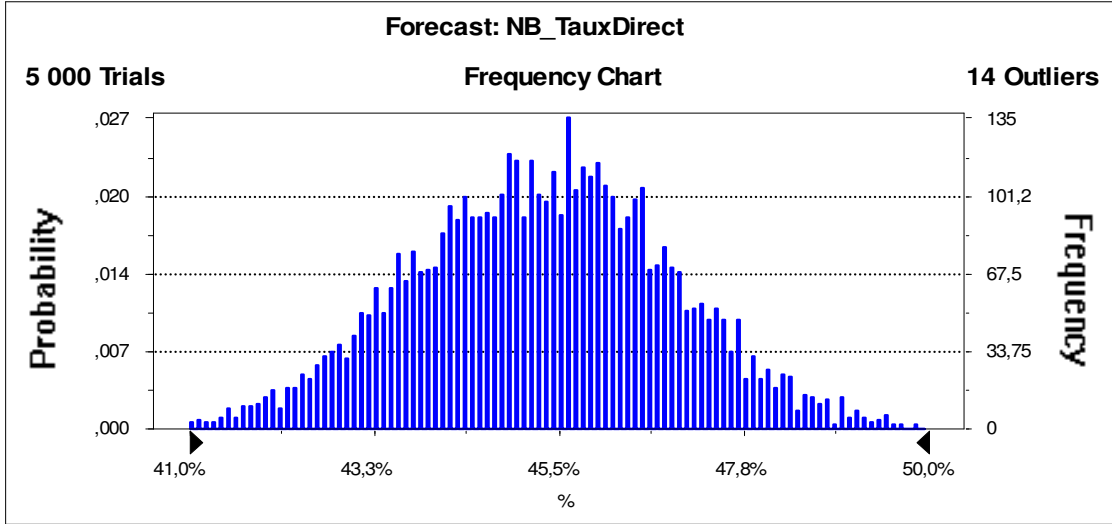
Forecast: NB_TauxDirect (cont'd)   **Cell: C15**

Percentiles:

Percentile	%	
0.0%	40.4%	
2.5%	42.2%	± 3.1%
5.0%	42.7%	
50.0%	45.3%	
95.0%	47.9%	
97.5%	48.3%	
100.0%	51.8%	

End of Forecast

Crystal Ball Report
Simulation started on 12-8-6 at 16:04:10
Simulation stopped on 12-8-6 at 16:04:55

Sensitivity Chart

Target Forecast: NB_TauxIndirect

VoConsC	26,9%	
VoConsCo	23,3%	
VoAppC	20,0%	
VoBrisC	13,4%	
VoBriCo	5,7%	
VoAppCo	2,4%	
VoConsAg	1,3%	
VoBriM	1,2%	
ConcA	0,9%	
VoFinVL	0,7%	
VoConsM	0,6%	
ConcC	0,4%	
VoAppAg	0,4%	
VoAppCL	0,4%	
FVidVL	0,4%	
FAppDIFM	0,4%	
NbConst	0,3%	
VoBriAg	0,2%	
VoAppM	0,2%	
VoFinC	0,2%	

0%   25%   50%   75%   100%

Measured by Contribution to Variance
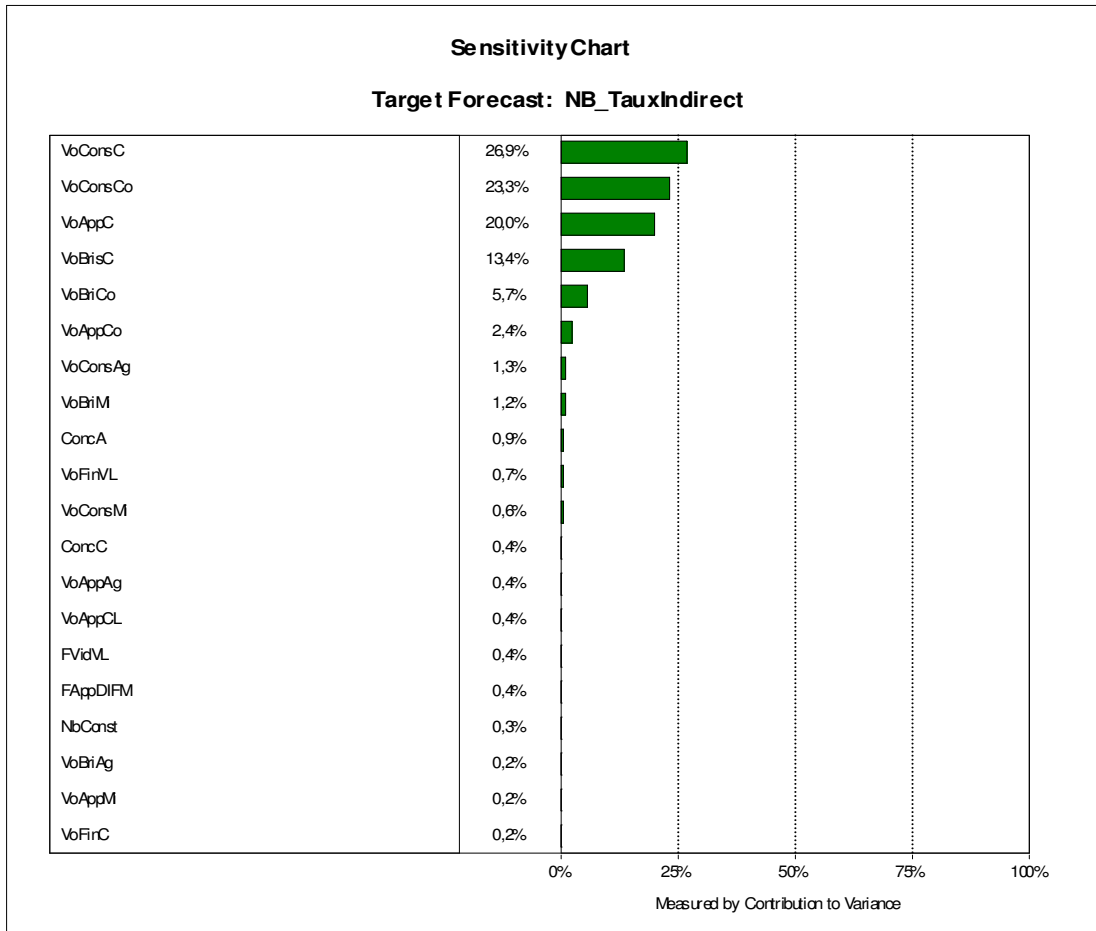
Forecast: NB_TauxIndirect   **Cell: C28**

Summary:
    Display Range is from 30,0% to 55,0% %
    Entire Range is from 26,4% to 53,7% %
    After 5 000 Trials, the Std. Error of the Mean is 0,1%

Statistics:	Value
Trials	5000
Mean	42.0%
Median	42.1%

Mode	---
Standard Deviation	4.4%
Variance	0.2%
Skewness	- 0.26
Kurtosis	2.80
Coeff. of Variability	0.10
Range Minimum	26.4%
Range Maximum	53.7%
Range Width	27.3%
Mean Std. Error	0.06%

Forecast: NB_TauxIndirect

5 000 Trials **Frequency Chart** **18 Outliers**

Forecast: NB_TauxIndirect (cont'd) **Cell: C28**

Percentiles:

Percentile	%	
0.0%	26.4%	
2.5%	32.8%	± 8.5%
5.0%	34.2%	
50.0%	42.1%	
95.0%	48.9%	
97.5%	49.8%	
100.0%	53.7%	

End of Forecast

Appendix 18   Sensitivity Analysis
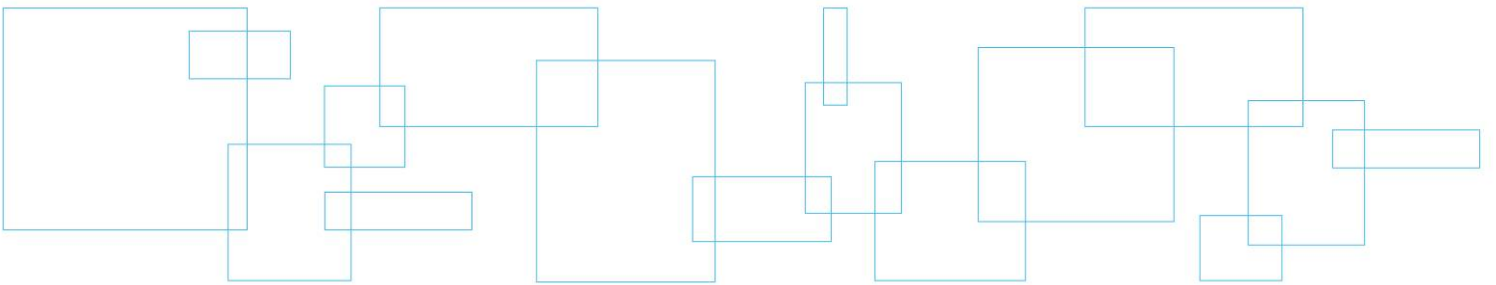
SENSIBILITY ANALYSIS - DIRECT METHOD

Parameters that contribute more than 0.5%	BC	AB	SK	MB	ON	QC	NB	Moyenne
Heavy equipment parameters								
% drained/consumed	**23.2%**	**56.1%**	**57.1%**	**25.1%**	**16.3%**	**17.2%**	**14.3%**	**29.9%**
Volume of antifreeze consumed - agricultural	0.5%	0.7%	5.8%	6.6%	1.3%	1.1%	-	2.3%
Volume of antifreeze consumed - construction	14.9%	2.0%	0.6%	3.0%	12.7%	7.1%	6.5%	6.7%
Volume of antifreeze consumed - mining	3.3%	**13.5%**	**5.1%**	0.6%	-	-	-	3.2%
Used antifreeze concentration	-	0.8%	0.5%	0.6%	-	-	-	0.3%
Number of heavy equipment - agricultural	-	-	1.4%	0.9%	-	-	-	0.3%
Number of heavy equipment - construction	1.2%	-	-	-	0.8%	-	0.6%	0.4%
Number of heavy equipment - mining	0.5%	-	-	-	-	-	-	0.1%
TOTAL	**43.6%**	**73.1%**	**70.5%**	**36.8%**	**31.1%**	**25.4%**	**21.4%**	**43.1%**
Truck parameters								
% drained/consumed	**16.2%**	**13.7%**	**16.4%**	**24.7%**	**13.6%**	**22.6%**	**29.4%**	**19.5%**
Volume of antifreeze consumed per truck	9.0%	2.9%	3.5%	**12.1%**	7.1%	6.5%	11.0%	7.4%
End-of-life truck antifreeze volume	-	0.9%	-	-	2.8%	1.9%	1.0%	0.9%
Used antifreeze concentration	0.6%	-	-	-	0.5%	1.7%	1.0%	0.5%
TOTAL	**25.8%**	**17.5%**	**19.9%**	**36.8%**	**24.0%**	**32.7%**	**42.4%**	**28.4%**
Automotive parameters								
Used antifreeze concentration	**12.3%**	3.9%	3.9%	9.9%	10.6%	8.1%	**11.3%**	8.6%
End-of-life PC and LT antifreeze volume	2.7%	2.0%	-	5.5%	**21.7%**	**25.5%**	7.9%	**9.3%**
Top-up volume for light trucks	6.2%	1.4%	1.9%	3.4%	5.1%	1.5%	3.9%	3.3%
Top-up volume for PC	2.2%	-	-	1.5%	2.9%	2.0%	2.3%	1.6%
Frenquency of drainage for PC and LT	3.2%	0.5%	0.8%	1.8%	0.9%	0.7%	5.5%	1.9%
DIFM Frequency of top-ups for PC and LT	2.1%	-	-	1.6%	2.6%	2.3%	3.0%	1.7%
TOTAL	**28.7%**	**7.8%**	**6.6%**	**23.7%**	**43.8%**	**40.1%**	**33.9%**	**26.4%**

SENSIBILITY ANALYSIS - INDIRECT METHOD

Parameters that contribute more than 0.5%	BC	AB	SK	MB	ON	QC	NB	Moyenne
Heavy equipment parameters								
Volume of antifreeze consumed - agricultural	-	0.9%	**20.9%**	**15.2%**	1.7%	2.5%	1.3%	6.1%
Volume of antifreeze consumed - construction	**30.6%**	4.9%	1.7%	-	**34.3%**	**27.0%**	**23.3%**	**17.4%**
Volume of antifreeze consumed - mining	6.4%	**41.2%**	**16.7%**	0.8%	-	-		10.9%
Number of heavy equipment - agricultural	-	-	0.5%	-	-	-	-	
Number of heavy equipment - construction	0.8%	-	-	-	0.5%	0.7%	-	0.3%
Number of heavy equipment - mining	-	-		-	-	-	0.6%	0.1%
Antifreeze volume consumed, breakage - agr.	0.5%	-	5.1%	4.2%	0.8%	0.9%	-	1.6%
Antifreeze volume consumed, breakage - const.	8.2%	1.4%	-	1.8%	7.6%	5.8%	5.7%	4.4%
Antifreeze volume consumed, breakage - min.	6.9%	**35.5%**	**16.9%**	1.4%	-	-	1.2%	8.8%
Antifreeze volume consumed, top-up - agr.	-	0.5%	7.6%	5.6%	-	0.7%	-	2.1%
Antifreeze volume consumed, top-up - const.	3.3%	-	-	0.7%	2.9%	2.2%	2.4%	1.6%
Antifreeze volume consumed, top-up - min.	0.8%	2.8%	1.3%	-	-	-	-	0.7%
TOTAL	**57.5%**	**87.2%**	**70.7%**	**29.7%**	**47.8%**	**39.8%**	**34.5%**	**47.2%**
Truck parameters								
Volume of antifreeze consumed per truck	**16.5%**	**5.1%**	13.0%	**28.1%**	**19.1%**	**26.6%**	**26.9%**	**19.3%**
End-of-life truck antifreeze volume	0.5%	-	-	-	1.8%	0.5%	-	0.4%
Antifreeze volume consumed, breakage	-	1.8%	5.2%	13.8%	6.9%	9.9%	13.4%	7.3%
Antifreeze volume consumed, top-up	**12.4%**	4.2%	8.0%	**18.2%**	**13.4%**	**15.0%**	**20.0%**	**13.0%**
TOTAL	**29.4%**	**11.1%**	**26.2%**	**60.1%**	**41.2%**	**52.0%**	**60.3%**	**40.0%**
Automotive parameters								
Used antifreeze concentration	1.4%	-	0.5%	1.2%	2.3%	0.9%	0.9%	1.0%
End-of-life PC and LT antifreeze volume	-	-	-	0.5%	3.3%	3.8%	0.7%	1.2%
Top-up volume for light trucks	0.7%	-	-	-	1.1%	-	-	0.3%
Top-up volume for PC	0.0%	-	-	-	0.5%	0.5%	-	0.1%
Frenquency of drainage for PC and LT	0.7%	-	-	-	-	-	-	0.1%
DIFM Frequency of top-ups for PC and LT	-	-	-	-	1.2%	-	-	0.2%
TOTAL	**2.8%**	**0.0%**	**0.5%**	**1.7%**	**8.4%**	**5.2%**	**1.6%**	**2.9%**

Appendix 19   Forms, Questionnaires and Documents Used for Data Collection

Farming Equipment Confidential Survey   **Code: EQUIPLOURD**

The Alberta Used Oil Management Association (AUOMA) has mandated NI Environnement and Dessau to carry out a study evaluating the antifreeze reuse potential in Alberta. This study aims to collect precise data of antifreeze usage and actual quantities used in different economic sectors in your province. Your contribution is important since the data collected will help improve the efficiency used antifreeze management and its reuse.

Questions	Answers		
Date:	Contact: Position: Telephone: E-mail:		
1. In which economic sector is your business?	Farming Forestry Construction	Industrial Mining Other (Specify):	
2. How many units of the following different equipment are used over the course of a year? Please indicate the total number of hours per year along with the horsepower for each unit.	**Number of Machines**	**Number of hours/year**	*Horsepower (HP)*
	Tractor(s)		
	Combine harvester(s)		
	Other farming equipment (please precise):		
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		
3. What is average age of your equipment by category?	**Equipment**	**Average Age**	
	Tractor(s)		
	Combine harvester(s)		
	Other farming equipment (precise):		
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		
4. Is the maintenance done in-house or is it outsourced? If outsourced, please			

indicate the service supplier name.	

5. What is the antifreeze volume contained in the different equipment categories for each unit? If it is difficult to answer, please indicate the machines' model and make.	Equipment	Antifreeze Volume
	Tractor(s)	
	Combine harvester(s)	
	Other farming equipment (precise):	
	Digger(s)	
	Loader(s)	
	Compactor(s)	
	Forestry equipment	

6. What are the antifreeze change and top-up frequencies (hours or km)?	Equipment	Top-up Frequency	Change Frequency
	Tractor(s)		
	Combine harvester(s)		
	Other farming equipment (precise):		
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		

7. Are there any antifreeze leaks? If so, is it possible to evaluate the number of leaks and the amount loss?	

8. What is the average top-up volume? Indicate with or without breakage if possible.	Equipment	Top-up volumes	
		With Breakage	Without Breakage
	Tractor(s)		
	Combine harvester(s)		
	Other farming equipment (precise):		
	Digger(s)		
	Loader(s)		
	Compactor(s)		

	Forestry equipment		
9. Once the antifreeze change is done, is there a radiator cleaning procedure? Please elaborate.	(If a cleaning product is used, precise type and volume)
10. In 2011, what is the total consumed antifreeze volume (in liter or gallon)?	Pure: (Specify concentration when diluted) _____ Premix: _____
11. Was there any antifreeze reused during 2011? *(Specify volume if possible)*	
12. What antifreeze volume was not recovered (or containers number and capacity) in 2011? If so, what amount (liter or gallon)?	
13. What is your antifreeze recovery procedure?	(Describe steps and storage containers size and characteristics) Antifreeze final use and/or destination: *sewer, trash, reuse, collecting company*
14. What is the equipment final destination once its useful life is over? (Name of recycler if available)	
15. We need to evaluate, whenever possible, the used antifreeze concentration. Would you be willing to provide a sample (if not contaminated by used oil)?	Yes/No

16. Comments	

CONFIDENTIAL

Heavy Duty Equipment Confidential Survey   **Code: EQUIPLOURD**

The Alberta Used Oil Management Association (AUOMA) has mandated NI Environnement and Dessau to carry out a study evaluating the antifreeze reuse potential in Alberta. This study aims to collect precise data of antifreeze usage and actual quantities used in different economic sectors in your province. Your contribution is important since the data collected will help improve the efficiency used antifreeze management and its reuse.

Questions	Answers		
Date :	Contact: Position: Telephone: E-mail:		
1. In which economic sector are you?	Farming Forestry Construction	Industrial Mining Other (Specify):	
2. How many units of different equipment categories are used? Please indicate the total number of hours per year along with the horsepower for each unit.	**Number of machines**	**Number of hours/year**	*Horsepower (HP)*
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		
	Farming equipment		
	Other (Specify – ex.: snow blower) :		
3. What is average age of your equipment by category?	**Equipment**	**Average Age**	
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		
	Farming equipment		
	Other (Specify – ex.: snow blower) :		
4. Is the maintenance done in-house or is it outsourced? If outsourced, please indicate the service supplier name.			

5. What is the antifreeze volume contained in the different equipment categories for each unit? If it is difficult to answer, please indicate the machines' model and make.	Equipment	Antifreeze Volume
	Digger(s)	
	Loader(s)	
	Compactor(s)	
	Forestry equipment	
	Farming equipment	
	Other (Specify – ex.: snow blower) :	

6. What is antifreeze change and top-up frequency (hours)?	Equipment	Top-up Frequency	Change Frequency
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		
	Farming equipment		
	Other (Specify – ex.: snow blower) :		

7. Are there any antifreeze leaks? If so, is it possible to evaluate the number of leaks and the amount loss?	

8. What are the top-ups frequencies? If possible, specify when the top-up is caused by radiator breakage or not.	Equipment	Top-up Volumes	
		With Breakage	Without Breakage
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		
	Farming equipment		
	Other (Specify – ex.: snow blower) :		

9. Once the antifreeze change is done, is there a radiator cleaning procedure? Please elaborate.	
	(If cleaning fluid is used, please specify type and volume)

10. In 2011, what is the total consumed antifreeze volume (in liter or gallon)?	Pure: (specify concentration when diluted) _____ Premix: _____

11. Was there any antifreeze reused during 2011? *(Specify volume if possible)*	
12. What antifreeze volume was not recovered (or containers number and capacity) in 2011? If so, what amount?	
13. What is your antifreeze recovery procedure?	(Describe steps and storage containers size and characteristics) Antifreeze final use and/or destination: *sewer, trash, reuse, collecting company*
14. What is the equipment final destination once its useful life is over? (Name of recycler if available)	
15. We need to evaluate, whenever possible, the used antifreeze concentration. Would you be willing to provide a sample (if not contaminated by used oil)?	
16. Comments, remarks	

Julien Dubuc or Pierre Benabidès (514-270-1102, ext. 205)

Automobile and Light Trucks Confidential Survey   **Code AUTGAR-**

The Alberta Used Oil Management Association (AUOMA) has mandated NI Environnement and Dessau to carry out a study evaluating the antifreeze reuse potential in Alberta. This study aims to collect precise data of antifreeze usage and actual quantities used in different economic sectors in your province. Your contribution is important since the data collected will help improve the efficiency used antifreeze management and its reuse.

Questions	Answers
Date	Contact: Position: Telephone: E-mail:
1. What is the number of vehicles repaired for antifreeze related repairs in 2011? (Please specify number of clients vs number of invoices if possible) If you have mentioned total invoice number (total of every repairs), how many or what percentage of these vehicles was processed only once during the year? What is the average number of visits for the vehicles that need to be repaired more than once per year?	Automobiles: _____ Light trucks (ex. Econoline): _____
2. On the total amount of processed vehicles, how many or what percentage of processed vehicles needed an antifreeze top-up?	
3. On the total amount of processed vehicles, how many or what percentage of processed vehicles needed an antifreeze change?	
4. What is the average volume poured for cars top-ups? (gallons or liters)	
5. What is the average volume poured for light trucks top-ups? (gallons or liters)	

6. What is the top-up frequency? (km, please specify average mileage per year or number of years)	
7. How many or what percentage of vehicles had a radiator or cooling pipe breakage?	
8. In the case of a radiator or cooling pipe breakage, what is the average antifreeze volume added? (percentage or volume) (gallons or liters)	
9. According to your observations, what is antifreeze change frequency (number of years or km)	Automobiles: Light trucks:
10. Once the antifreeze change is done, is there a radiator cleaning procedure? Please elaborate.	(If a cleaning fluid is used, specify type and volume)
11. In 2011, what is the total consumed antifreeze volume (gallons or liters)?	Pure: (specify concentration) _____ Premix: _____
12. What is the used antifreeze volume (or number of containers and capacity) for 2011?	
13. Was antifreeze reused in 2011? If so, please specify volume if possible (gallons or liters).	
14. What was the used antifreeze volume (or number of containers and capacity) that was not reused during 2011?	

15. What is your recovery procedure for repair or radiator replacement? Is stored antifreeze mixed with used oil?	(Please describe steps and storage containers characteristics) Used antifreeze destination and/or final use : *sewer, trash, reuse, collecting company*
16. We need to evaluate, whenever possible, the used antifreeze concentration. Would you be willing to provide a sample (if not contaminated by used oil)?	Yes/No
17. Comments	

Heavy Duty Equipment Confidential Questionnaire **Code EQUIPLOURD**

The Alberta Used Oil Management Association (AUOMA) has mandated NI Environnement and Dessau to carry out a study evaluating the antifreeze reuse potential in Alberta. This study aims to collect precise data of antifreeze usage and actual quantities used in different economic sectors in your province. Your contribution is important since the data collected will help improve the efficiency used antifreeze management and its reuse.

Questions	Answers		
Date:	Contact: Position: Telephone: E-mail:		
1. In which economic sector are you?	Farming Forestry Construction	Industrial Mining Other (Specify) :	
2. How many units of the following different equipment are used over the course of a year? Please indicate the total number of hours per year along with the horsepower for each unit.	**Number of machines**	**Number of hours/year**	*Horsepower (HP)*
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		
	Tractor(s)		
	Farming equipment		
	Other (specify):		
3. What is average age of your equipment by category?	**Equipment**	**Average Age**	
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		
	Tractor(s)		
	Farming equipment		
	Other (specify):		
4. Is the maintenance done in-house or is it outsourced? If outsourced, please indicate the service supplier name.			
5. What is the antifreeze volume	**Equipment**	**Antifreeze Volume**	

contained in the different equipment categories for each unit? If it is difficult to answer, please indicate the machines' model and make.	Digger(s)	
	Loader(s)	
	Compactor(s)	
	Forestry equipment	
	Tractor(s)	
	Farming equipment	
	Other (specify):	

6. What are the antifreeze change and top-up frequencies (hours or km)?	**Equipment**	**Top-up frequency**
	Digger(s)	
	Loader(s)	
	Compactor(s)	
	Forestry equipment	
	Tractor(s)	
	Farming equipment	
	Other (specify):	

7. Are there any antifreeze leaks? If so, is it possible to evaluate the number of leaks and the amount loss?	

8. What are the top-ups frequencies? If possible, specify when the top-up is caused by radiator breakage or not.	**Equipment**	**With breakage**	**Without breakage**
	Digger(s)		
	Loader(s)		
	Compactor(s)		
	Forestry equipment		
	Tractor(s)		
	Farming equipment		
	Other (specify):		

9. What are the antifreeze change frequencies for your equipment by category? (in km or hours)	**Equipment**	**Change frequency**
	Digger(s)	
	Loader(s)	
	Compactor(s)	
	Forestry equipment	
	Tractor(s)	
	Farming equipment	
	Other (specify):	

10. Once the antifreeze change is	

done, is there a radiator cleaning procedure? Please elaborate. .	(If a cleaning fluid is used, precise type and volume)
11. In 2011, what is the total consumed antifreeze volume (in liter or gallon)?	Pure: (Specify concentration) _____ Premix: _____
12. Was there any antifreeze reused during 2011? *(Specify volume if possible)*	
13. Was used antifreeze not reused in 2011? Please specify volume (or containers number and size).	
14. What is your antifreeze recovery procedure?	(Describe steps and storage containers size and characteristics) Antifreeze final use and/or destination: *sewer, trash, reuse, collecting company*
15. What is the equipment final destination once its useful life is over? (Name of recycler if available)	
16. We need to evaluate, whenever possible, the used antifreeze concentration. Would you be willing to provide a sample (if not contaminated by used oil)?	
17. Comments	

Confidential

Mining Equipment Confidential Survey   **Code: MINIER**

The Alberta Used Oil Management Association (AUOMA) has mandated NI Environnement and Dessau to carry out a study evaluating the antifreeze reuse potential in Alberta. This study aims to collect precise data of antifreeze usage and actual quantities used in different economic sectors in your province. Your contribution is important since the data collected will help improve the efficiency used antifreeze management and its reuse.

Questions	Answers		
Date :	Contact: Position: Telephone: E-mail:		
1. How many units of the following different equipment are used over the course of a year? Please indicate the total number of hours per year along with the horsepower for each unit.	**Number of machines**	**Number of hours/year**	*Horse Power (HP)*
	Digger(s)		
	Loader(s)		
	Grader(s)		
	Drill(s)		
	Tractor(s)		
	Dumper(s)		
	Other (Specify):		
2. What is average age of your equipment by category?	**Equipment**	**Average age**	
	Digger(s)		
	Loader(s)		
	Grader(s)		
	Drill(s)		
	Tractor(s)		
	Dumper(s)		
	Other (Specify):		
3. Is the maintenance done in-house or is it outsourced? If outsourced, please indicate the service supplier name.			
4. What is the antifreeze volume contained in the different equipment categories for each unit? If it is difficult to answer, please indicate the machines' model and make.	**Equipment**	**Antifreeze volume**	
	Digger(s)		
	Loader(s)		
	Grader(s)		
	Drill(s)		
	Tractor(s)		

| | Dumper(s) | | |
| | Other (Specify): | | |

5. What are the antifreeze change and top-up frequencies (hours or km)?	**Equipment**	**Top-up frequency**	**Change frequency**
	Digger(s)		
	Loader(s)		
	Grader(s)		
	Drill(s)		
	Tractor(s)		
	Dumper(s)		
	Other (Specify):		

6. Are there any antifreeze leaks? If so, is it possible to evaluate the number of leaks and the amount loss?	

7. What is the average top-up volume? Indicate with or without breakage if possible.	**Equipment**	**With breakage**	**Without breakage**
	Digger(s)		
	Loader(s)		
	Grader(s)		
	Drill(s)		
	Tractor(s)		
	Dumper(s)		
	Other (Specify):		

8. What is top-up frequency? If possible, specify when the top-up is caused by radiator breakage or not.	**Equipment**	**Top-up frequency**	
		With breakage	**Without breakage**
	Digger(s)		
	Loader(s)		
	Grader(s)		
	Drill(s)		
	Tractor(s)		
	Dumper(s)		
	Other (Specify):		

9. Once the antifreeze change is done, is there a radiator cleaning procedure? Please elaborate.	
	(If a cleaning fluid is used, precise type and volume)

10. In 2011, what is the total consumed antifreeze volume (in liter or gallon)?	Pure (Specify concentration): _____ Premix: _____
11. What was the antifreeze volume that was not reused in 2011? (or containers number and capacity).	
12. Was there any antifreeze reused during 2011? *(Specify volume if possible)*	
13. What is your antifreeze recovery procedure?	(Describe steps and storage containers size and characteristics) Antifreeze final use and/or destination : *sewer, trash, reuse, collecting company*
14. What is the equipment final destination once its useful life is over? (Name of recycler if available)	
15. We need to evaluate, whenever possible, the used antifreeze concentration. Would you be willing to provide a sample (if not contaminated by used oil)?	
16. Comments	

Confidential

*Name:*_____

*Company name:*_____

*Address:*_____

*Telephone:*_____

1. Volume of antifreeze used in 2011: _____

   a) Was the bought antifreeze pure or premixed? _____

   b) If pure, what is its concentration when mixed? _____

2. a) Volume of recovered antifreeze (2011): _____

   b) Volume of reused antifreeze (2011): _____

3. Number of possessed heavy equipment (excluding cars) ex. Tractors, combine harvesters, diggers, seed or snow blowers, etc. Please precise number of machines by category:

   _____

4. Proportion of equipment under 100 HP and over 100 HP:

   _____

5. We need to evaluate, whenever possible, the used antifreeze concentration. Would you agree to provide a sample (if not contaminated by used oil)?

   _____

Contact:

Julien Dubuc
NI Environnement

3505, Isabelle st., local P
Brossard (Québec) J4Y 2R2
Telephone: (514) 270-1102
Toll free: 1 800 694-1216 extension 206
Fax: (514) 270-1104

Name: *Company:*

Address: *Telephone:*

1.   a) In 2011, what was the number of vehicles serviced for repairs related to antifreeze? (Please specify number of client versus number of invoices produced during the year).

_____

        b) What percentage or number of these vehicles were light trucks (ex. Econoline)?

_____

2.   What was the volume of antifreeze you used in 2011? _____

a)   Was the antifreeze purchased pure or premixed? _____

b)   If pure, what is its concentration when diluted? _____

3.   What do you do with used antifreeze? _____

        Collector's name: _____

4.   What was the amount of used antifreeze recovered in 2011? _____

5.   We need to evaluate, whenever possible, the used antifreeze concentration. Would you agree to provide a sample (if not contaminated by used oil)?

        _____

Contact :

Julien Dubuc
NI Environnement

3505, Isabelle st., local P
Brossard (Québec) J4Y 2R2
Toll free : 1 800 694-1216
Fax : (514) 270-1104

Julien Dubuc or Pierre Benabidès (1-800-694-1216, extension 205)

Name: _____   Company: _____

Address: _____   Telephone: _____

1. Volume of used antifreeze in 2011: _____

   a) Was the bought antifreeze pure or premixed? _____

   b) If pure, what is its concentration when diluted? _____

2. a) Volume of recovered antifreeze (2011) : _____

   b) Volume of reused antifreeze (2011): _____

3. Number of possessed heavy equipment (excluding cars) ex : Diggers, loaders, dozers, tractors, etc. Please precise number of machines by category.:

   _____

4. Proportion of equipment under 100 HP and over 100 HP:

   _____

5. We need to evaluate, whenever possible, the used antifreeze concentration. Would you agree to provide a sample (if not contaminated by used oil)?

   _____

Contact:

Julien Dubuc
NI Environnement

3505, Isabelle st., local P
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ni ENVIRONNEMENT

DESSAU

Road Transport Services Survey   Code CAMTRA-

Since 2008, the province of Ontario has put into effect a bylaw to promote the recovery of engine coolant or antifreeze. We are now conducting a study for the SOGHU (Société de Gestion des Huiles Usées) and its partners in Ontario, Stewardship Ontario. The aim is to collect as much data as possible on the current state of coolant liquid recovery. These results will help us establish the most accurate rate on which to adjust the current legislation. Your contribution is very important and greatly appreciated.

Our study focuses primarily on the quantity of coolant purchased, recovered and the number of vehicles in your fleet.

Questions	Answers	
Date	Company : Name : Job Title : Telephone : Email :	
Engine Coolant Consumption and Recovery		
What was the volume of engine coolant used in 2011 **(please include measurement unit)**	• Concentrated : Dilution Factor : 50/50 ; 60/40 ; • Premix (always 50/50) :	
What volume of used antifreeze was recovered over the last year?	*(If you are unsure, an alternative answer would be the capacity of your recovery container and the frequency at which it is emptied)*	
When a fluid change occurs, is the coolant disposed of separately from the oil?		
Where is used engine coolant sent?	*Sewers, Garbage, Recovery Servicer…*	
In 2011, was used antifreeze put back into vehicles to be reused?		
Fleet Information		
How many trucks do you have in service and how are they divided by class?	Nb :	% classes 3 to 5 : % classes 6 to 8 :
What is the average age of your fleet?	Min :	Max :

Questions	Answers	
Other Questions		
At a certain phase in our project, we will need to sample coolant from different sources. Could we count on your participation?	*(Our technicians would do the sampling or we could send a container to you (postage paid))*	
Do you know where end-of-life trucks are sent? Recycler's name:	(*Resold, Sold for Pieces, Recycled, Exported*) *name of recycler or exporter:*	
In your professional opinion, what is the volume of engine coolant contained in a vehicle, by class? **(please include measurement unit)**	*Class 3 :* *Class 4 :* *Class 5 :*	*Class 6 :* *Class 7 :* *Class 8 :*
In your professional experience, how many fluid changes are needed per vehicle, per year?	Class 3 - 5 : Class 6 - 8 :	All Trucks :
What is the average mileage, per year, of your fleet?	Class 3 -5:	Class 6-8 :
Engine Coolant used for "Top-ups"		
In General, who is more likely to do the top-ups?	*Driver, mechanic,…*	
In your professional opinion, what volume of coolant is added to a vehicle in a year in top-ups?		
If you are unsure, please answer the following 2 questions to the best of your knowledge:		
- How often is there need for an engine coolant top-up:		
- What is the volume added at each top-up:	*(Please include measurement unit)*	

Questions	Answers	
Radiator leaks		
On average, how many important engine coolant leaks are there per year?		
In the case of one of these important leaks, how much coolant is added to the radiator?	Classes 3 to 5 :	Classes 6 to 8 :
Other Questions		
Comments		

Philippe Cantin (514-281-1033, ext. 2965) or Julien Rosset (514-281-1033, ext. 1952)

Truck Repair and Service Centre Survey   Code CAMGAR-

Since July, 2011 British-Columbia has put into effect a bylaw to promote the recovery of engine coolant or antifreeze. We are now conducting a study for the SOGHU (Société de Gestion des Huiles Usagée) and its partners in British Columbia, the BCUOMA. The aim is to collect as much data as possible on the current state of coolant liquid recovery. These results will help us establish the most accurate rate on which to adjust the current legislation. Your contribution is very important and greatly appreciated.

Our study focuses primarily on the quantity of coolant purchased, recovered and the number of vehicles repaired.

Questions	Answers
Date	Company : Contact : Position/Title : Phone : E-mail :
Engine Coolant Consumption and Recovery	
How much coolant did you consume/purchased in the year 2011? **(please include measurement unit)**	• Concentrated : Does this only involve the amount purchased or the volume after dilution? ; • Premix (always 50/50) :
In 2011, was used antifreeze put back into vehicles to be reused?	
What volume of used antifreeze was recovered over the last year?	*(If you are unsure, an alternative answer would be the capacity of your recovery container and the frequency at which it is emptied)*
Is the coolant disposed of separately from the oil?	
Where is used engine coolant sent?	*Sewers, Garbage, Recovery Servicer…*
Repaired/ treated Vehicles	
How many trucks did you work on in 2011?	*(if you're not sure about the exact number, an estimation per week or month is a good alternative answer)*
Among these vehicles, how many required repair following an accident?	
Questions	**Answers**
Engine Coolant used for "Top-ups"	

Out of the total trucks treated/repaired in 2011 how many needed a coolant top-up?		
In your professional opinion, what volume of coolant does your company add to a vehicle in a year in top-ups?	Class 3 -5:	Class 6-8 :
Following a leak/ breakage, in your experience how much coolant is added to a radiator?	Classes 3 to 5 :	Classes 6 to 8 :
In your professional opinion, what is the volume of engine coolant contained in a vehicle, by class? **(consider only classes brought by customers / - please include measurement unit)**	*Class 3 :* *Class 4 :* *Class 5 :*	*Class 6 :* *Class 7 :* *Class 8 :*

Other Questions	
At a certain phase in our project, we will need to sample coolant from different sources. Could we count on your participation?	*(Our technicians would do the sampling or we could send a container to you (postage paid))*
Do you know where end-of-life trucks are sent? Recycler's name:	*(Resold, Sold for Pieces, Recycled, Exported)* *name of recycler or exporter:*
Comments	

Philippe Cantin (514-281-1033, ext 2965) or Julien Rosset (514-281-1033, ext 1952)

Bodyshop Survey   Code CAR-

Since July, 2011, the province of Manitoba has put into effect a bylaw to promote the recovery of engine coolant or antifreeze. We are now conducting a study for the SOGHU (Société de Gestion des Huiles Usagée) and its partners in Manitoba, the MARRC (Manitoba Association for Resource Recovery Corp. The aim is to collect as much data as possible on the current state of coolant liquid recovery. These results will help us establish the most accurate rate on which to adjust the current legislation. Your contribution is very important and greatly appreciated.

Our study focuses primarily on the quantity of coolant purchased, recovered and the number of vehicles recycled.

Questions	Answers
Date	Company : Contact : Position/Title : Phone : E-mail :
Repaired Vehicles	
How many vehicles you worked on in 2011 ?	*(if you're not sure about the exact number, an estimation per week or month is a good alternative answer)*
Among these vehicles, how many required repairs to the radiator ?	
How many of your repairs in 2011 had damages over 2000$?	
Purchased/Consumed Engine Coolant	
How much coolant did you consume/purchased in the year 2011 ?	• Concentrated : Dilution Factor : 50/50 ; 60/40 ; • Premix (toujours 50/50) :
Which portion of the consumed/purchased coolant liquid was used in vehicles requiring body work?	
Engine Coolant Recovery	
What is the volume of coolant that you recovered in 2011?	*(or the capacity of your recovery tank and the frequency at which you empty it)*

Questions	Answers
During a fluid change, is the coolant liquid disposed of in the used oil tank, or in a seperate container?	
How is used coolant disposed of ?	*Sewers, Garbage, Recovery Service…*
Comments	