## Supplemental for:

High-resolution quantification of atmospheric  ${\rm CO_2}$  mixing ratios in Greater Toronto Area, Canada

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Table S1: Facility-specific  $CO_2$ : CO for the Point sector

Brighton Beach         233.3         0.28         842           Bruce Power         69.0         0.03         2091           Cardinal Power         562.1         0.06         9527           Cochrane Generating Station         1113.3         0.34         3323           East Windsor Cogeneration Center         124.3         0.05         2345           Essar Power Canada ltd.         1502.4         0.48         3137           Goreway Power Station         1209.8         0.72         1680           Greenfield Energy Center         937.9         2.18         431           Halton Hills Generating Station         397.0         0.07         5839           Iroquois Falls Generating Station         321.0         0.07         4864           Kapuskasing Power Plant         136.6         0.03         4268           Kingston Cogen         332.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         120.1         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756 <tr< th=""><th></th><th>CO<sub>2</sub></th><th>СО</th><th>CO<sub>2</sub>:CO</th></tr<>		CO <sub>2</sub>	СО	CO <sub>2</sub> :CO
Bruce Power         69.0         0.03         2091           Cardinal Power         562.1         0.06         9527           Cochrane Generating Station         1113.3         0.34         3323           East Windsor Cogeneration Center         124.3         0.05         2345           Essar Power Canada Itd.         1502.4         0.48         3137           Goreway Power Station         1209.8         0.72         1680           Greenfield Energy Center         937.9         2.18         431           Halton Hills Generating Station         397.0         0.07         5839           Iroquois Falls Generating Station         321.0         0.07         4864           Kapuskasing Power Plant         136.6         0.03         4268           Kingston Cogen         322.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         120.1         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756           Nanticoke Generating Station         8544.1         3.40         2513	Name	(kt)	(kt)	(kt CO <sub>2</sub> /kt CO)
Cardinal Power         562.1         0.06         9527           Cochrane Generating Station         1113.3         0.34         3323           East Windsor Cogeneration Center         124.3         0.05         2345           Essar Power Canada Itd.         1502.4         0.48         3137           Goreway Power Station         1209.8         0.72         1680           Greenfield Energy Center         937.9         2.18         431           Halton Hills Generating Station         397.0         0.07         5839           Iroquois Falls Generating Station         321.0         0.07         4864           Kapuskasing Power Plant         136.6         0.03         4268           Kingston Cogen         332.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         328.9         1.41         2337           Lennox Generating Station         328.9         1.41         2337           Lennox Generating Station         8544.1         3.40         2513           North Bay         133.5         0.03         4170				
Cochrane Generating Station         1113.3         0.34         3323           East Windsor Cogeneration Center         124.3         0.05         2345           Essar Power Canada Itd.         1502.4         0.48         3137           Goreway Power Station         1209.8         0.72         1680           Greenfield Energy Center         937.9         2.18         431           Halton Hills Generating Station         397.0         0.07         5839           Iroquois Falls Generating Station         321.0         0.07         4864           Kapuskasing Power Plant         136.6         0.03         4268           Kingston Cogen         332.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         3289.9         1.41         2337           Lennox Generating Station         321.0         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756           Nanticoke Generating Station         8544.1         3.40         2513           North Bay         133.5         0.03		69.0	0.03	2091
East Windsor Cogeneration Center         124.3         0.05         2345           Essar Power Canada ltd.         1502.4         0.48         3137           Goreway Power Station         1209.8         0.72         1680           Greenfield Energy Center         937.9         2.18         431           Halton Hills Generating Station         397.0         0.07         5839           Iroquois Falls Generating Station         321.0         0.07         4864           Kapuskasing Power Plant         136.6         0.03         4268           Kingston Cogen         332.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         120.1         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756           Naticoke Generating Station         8544.1         3.40         2513           North Bay         133.5         0.03         4170           Ottawa Health Sciences Center Cogeneration Facility         20.0         0.07         3013           Plasco Trail Road         3.2         0.02	Cardinal Power	562.1	0.06	9527
Essar Power Canada ltd.         1502.4         0.48         3137           Goreway Power Station         1209.8         0.72         1680           Greenfield Energy Center         937.9         2.18         431           Halton Hills Generating Station         397.0         0.07         5839           Iroquois Falls Generating Station         321.0         0.07         4864           Kapuskasing Power Plant         136.6         0.03         4268           Kingston Cogen         332.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         120.1         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756           Nanticoke Generating Station         8544.1         3.40         2513           North Bay         133.5         0.03         4170           Ottawa Health Sciences Center Cogeneration Facility         220.0         0.07         3013           Plasco Trail Road         3.2         0.02         154           Portlands Energy Centre         457.3         0.34 <t< td=""><td>Cochrane Generating Station</td><td>1113.3</td><td>0.34</td><td>3323</td></t<>	Cochrane Generating Station	1113.3	0.34	3323
Goreway Power Station         1209.8         0.72         1680           Greenfield Energy Center         937.9         2.18         431           Halton Hills Generating Station         397.0         0.07         5839           Iroquois Falls Generating Station         321.0         0.07         4864           Kapuskasing Power Plant         136.6         0.03         4268           Kingston Cogen         332.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         120.1         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756           Nanticoke Generating Station         8544.1         3.40         2513           North Bay         133.5         0.03         4170           Ottawa Health Sciences Center Cogeneration Facility         220.0         0.07         3013           Plasco Trail Road         3.2         0.02         154           Portlands Energy Centre         457.3         0.34         1333           Sarnia Cogen Plant         362.4         0.22         1618	East Windsor Cogeneration Center	124.3	0.05	2345
Greenfield Energy Center         937.9         2.18         431           Halton Hills Generating Station         397.0         0.07         5839           Iroquois Falls Generating Station         321.0         0.07         4864           Kapuskasing Power Plant         136.6         0.03         4268           Kingston Cogen         332.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         120.1         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756           Nanticoke Generating Station         8544.1         3.40         2513           North Bay         133.5         0.03         4170           Ottawa Health Sciences Center Cogeneration Facility         220.0         0.07         3013           Plasco Trail Road         3.2         0.02         154           Portlands Energy Centre         457.3         0.34         1333           Sarnia Cogen Plant         362.4         0.22         1618           Sarnia Regional Cogeneration Facility         1194.2         0.40	Essar Power Canada ltd.	1502.4	0.48	3137
Halton Hills Generating Station         397.0         0.07         5839           Iroquois Falls Generating Station         321.0         0.07         4864           Kapuskasing Power Plant         136.6         0.03         4268           Kingston Cogen         332.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         3289.9         1.41         2337           Lennox Generating Station         120.1         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756           Nanticoke Generating Station         8544.1         3.40         2513           North Bay         133.5         0.03         4170           Ottawa Health Sciences Center Cogeneration Facility         220.0         0.07         3013           Plasco Trail Road         3.2         0.02         154           Portlands Energy Centre         457.3         0.34         1333           Sarnia Cogen Plant         362.4         0.22         1618           Sarnia Regional Cogeneration Facility         1194.2         0.40 <td>Goreway Power Station</td> <td>1209.8</td> <td>0.72</td> <td>1680</td>	Goreway Power Station	1209.8	0.72	1680
Irroquois Falls Generating Station   321.0   0.07   4864     Kapuskasing Power Plant   136.6   0.03   4268     Kingston Cogen   332.0   0.05   6775     Kirkland Lake Generating Station   321.9   0.63   513     Lake Superior Power   203.1   0.06   3692     Lambton Generating Station   3289.9   1.41   2337     Lennox Generating Station   120.1   0.07   1819     Mississauga Cogeneration Plant   363.8   0.13   2756     Nanticoke Generating Station   8544.1   3.40   2513     North Bay   133.5   0.03   4170     Ottawa Health Sciences Center Cogeneration Facility   220.0   0.07   3013     Plasco Trail Road   3.2   0.02   154     Portlands Energy Centre   457.3   0.34   1333     Sarnia Cogen Plant   362.4   0.22   1618     Sarnia Regional Cogeneration Facility   1194.2   0.40   2971     St. Clair Energy Center   357.6   0.29   1216     Thorold Cogen Generating Station   305.5   0.20   1543     Tunis Power Plant   109.3   0.08   1401     Whitby Cogeneration   189.3   0.09   2175     Windsor Essex Cogeneration Plant   109.3   0.08   1401     Whitby Cogeneration   487.6   0.24   2008     Dundas Operation   487.6   0.24   2008     Dund	Greenfield Energy Center	937.9	2.18	431
Kapuskasing Power Plant       136.6       0.03       4268         Kingston Cogen       332.0       0.05       6775         Kirkland Lake Generating Station       321.9       0.63       513         Lake Superior Power       203.1       0.06       3692         Lambton Generating Station       3289.9       1.41       2337         Lennox Generating Station       120.1       0.07       1819         Mississauga Cogeneration Plant       363.8       0.13       2756         Nanticoke Generating Station       8544.1       3.40       2513         North Bay       133.5       0.03       4170         Ottawa Health Sciences Center Cogeneration Facility       220.0       0.07       3013         Plasco Trail Road       3.2       0.02       154         Portlands Energy Centre       457.3       0.34       1333         Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08 <td< td=""><td>Halton Hills Generating Station</td><td>397.0</td><td>0.07</td><td>5839</td></td<>	Halton Hills Generating Station	397.0	0.07	5839
Kingston Cogen         332.0         0.05         6775           Kirkland Lake Generating Station         321.9         0.63         513           Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         3289.9         1.41         2337           Lennox Generating Station         120.1         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756           Nanticoke Generating Station         8544.1         3.40         2513           North Bay         133.5         0.03         4170           Ottawa Health Sciences Center Cogeneration Facility         220.0         0.07         3013           Plasco Trail Road         3.2         0.02         154           Portlands Energy Centre         457.3         0.34         1333           Sarnia Cogen Plant         362.4         0.22         1618           Sarnia Regional Cogeneration Facility         1194.2         0.40         2971           St. Clair Energy Center         357.6         0.29         1216           Thorold Cogen Generating Station         305.5         0.20         1543           Tunis Power Plant         109.3         0.08	Iroquois Falls Generating Station	321.0	0.07	4864
Kirkland Lake Generating Station       321.9       0.63       513         Lake Superior Power       203.1       0.06       3692         Lambton Generating Station       3289.9       1.41       2337         Lennox Generating Station       120.1       0.07       1819         Mississauga Cogeneration Plant       363.8       0.13       2756         Nanticoke Generating Station       8544.1       3.40       2513         North Bay       133.5       0.03       4170         Ottawa Health Sciences Center Cogeneration Facility       220.0       0.07       3013         Plasco Trail Road       3.2       0.02       154         Portlands Energy Centre       457.3       0.34       1333         Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07<	Kapuskasing Power Plant	136.6	0.03	4268
Lake Superior Power         203.1         0.06         3692           Lambton Generating Station         3289.9         1.41         2337           Lennox Generating Station         120.1         0.07         1819           Mississauga Cogeneration Plant         363.8         0.13         2756           Nanticoke Generating Station         8544.1         3.40         2513           North Bay         133.5         0.03         4170           Ottawa Health Sciences Center Cogeneration Facility         220.0         0.07         3013           Plasco Trail Road         3.2         0.02         154           Portlands Energy Centre         457.3         0.34         1333           Sarnia Cogen Plant         362.4         0.22         1618           Sarnia Regional Cogeneration Facility         1194.2         0.40         2971           St. Clair Energy Center         357.6         0.29         1216           Thorold Cogen Generating Station         305.5         0.20         1543           Tunis Power Plant         109.3         0.08         1401           Whitby Cogeneration         189.3         0.09         2175           Windsor Essex Cogeneration Plant         202.1         0.07	Kingston Cogen	332.0	0.05	6775
Lambton Generating Station       3289.9       1.41       2337         Lennox Generating Station       120.1       0.07       1819         Mississauga Cogeneration Plant       363.8       0.13       2756         Nanticoke Generating Station       8544.1       3.40       2513         North Bay       133.5       0.03       4170         Ottawa Health Sciences Center Cogeneration Facility       220.0       0.07       3013         Plasco Trail Road       3.2       0.02       154         Portlands Energy Centre       457.3       0.34       1333         Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24 <td< td=""><td>Kirkland Lake Generating Station</td><td>321.9</td><td>0.63</td><td>513</td></td<>	Kirkland Lake Generating Station	321.9	0.63	513
Lennox Generating Station       120.1       0.07       1819         Mississauga Cogeneration Plant       363.8       0.13       2756         Nanticoke Generating Station       8544.1       3.40       2513         North Bay       133.5       0.03       4170         Ottawa Health Sciences Center Cogeneration Facility       220.0       0.07       3013         Plasco Trail Road       3.2       0.02       154         Portlands Energy Centre       457.3       0.34       1333         Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744	Lake Superior Power	203.1	0.06	3692
Mississauga Cogeneration Plant       363.8       0.13       2756         Nanticoke Generating Station       8544.1       3.40       2513         North Bay       133.5       0.03       4170         Ottawa Health Sciences Center Cogeneration Facility       220.0       0.07       3013         Plasco Trail Road       3.2       0.02       154         Portlands Energy Centre       457.3       0.34       1333         Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032     <	Lambton Generating Station	3289.9	1.41	2337
Nanticoke Generating Station       8544.1       3.40       2513         North Bay       133.5       0.03       4170         Ottawa Health Sciences Center Cogeneration Facility       220.0       0.07       3013         Plasco Trail Road       3.2       0.02       154         Portlands Energy Centre       457.3       0.34       1333         Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Smelter       201.1       0.10       1971      <	Lennox Generating Station	120.1	0.07	1819
North Bay       133.5       0.03       4170         Ottawa Health Sciences Center Cogeneration Facility       220.0       0.07       3013         Plasco Trail Road       3.2       0.02       154         Portlands Energy Centre       457.3       0.34       1333         Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971 <tr< td=""><td>Mississauga Cogeneration Plant</td><td>363.8</td><td>0.13</td><td>2756</td></tr<>	Mississauga Cogeneration Plant	363.8	0.13	2756
Ottawa Health Sciences Center Cogeneration Facility         220.0         0.07         3013           Plasco Trail Road         3.2         0.02         154           Portlands Energy Centre         457.3         0.34         1333           Sarnia Cogen Plant         362.4         0.22         1618           Sarnia Regional Cogeneration Facility         1194.2         0.40         2971           St. Clair Energy Center         357.6         0.29         1216           Thorold Cogen Generating Station         305.5         0.20         1543           Tunis Power Plant         109.3         0.08         1401           Whitby Cogeneration         189.3         0.09         2175           Windsor Essex Cogeneration Plant         202.1         0.07         2846           Haggersville Mine         52.0         0.04         1406           Beachville Operation         487.6         0.24         2008           Dundas Operation         406.4         0.23         1744           Northern Lime Limited         90.8         0.09         1032           Copper Cliff Nickel Refinery         51.3         0.03         1654           Copper Cliff Smelter         201.1         0.10         1971	Nanticoke Generating Station	8544.1	3.40	2513
Plasco Trail Road       3.2       0.02       154         Portlands Energy Centre       457.3       0.34       1333         Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135 <td>North Bay</td> <td>133.5</td> <td>0.03</td> <td>4170</td>	North Bay	133.5	0.03	4170
Portlands Energy Centre       457.3       0.34       1333         Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34	Ottawa Health Sciences Center Cogeneration Facility	220.0	0.07	3013
Sarnia Cogen Plant       362.4       0.22       1618         Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	Plasco Trail Road	3.2	0.02	154
Sarnia Regional Cogeneration Facility       1194.2       0.40       2971         St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	Portlands Energy Centre	457.3	0.34	1333
St. Clair Energy Center       357.6       0.29       1216         Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	Sarnia Cogen Plant	362.4	0.22	1618
Thorold Cogen Generating Station       305.5       0.20       1543         Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	Sarnia Regional Cogeneration Facility	1194.2	0.40	2971
Tunis Power Plant       109.3       0.08       1401         Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	St. Clair Energy Center	357.6	0.29	1216
Whitby Cogeneration       189.3       0.09       2175         Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	Thorold Cogen Generating Station	305.5	0.20	1543
Windsor Essex Cogeneration Plant       202.1       0.07       2846         Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	Tunis Power Plant	109.3	0.08	1401
Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	Whitby Cogeneration	189.3	0.09	2175
Haggersville Mine       52.0       0.04       1406         Beachville Operation       487.6       0.24       2008         Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	Windsor Essex Cogeneration Plant	202.1	0.07	2846
Dundas Operation       406.4       0.23       1744         Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234		52.0	0.04	1406
Northern Lime Limited       90.8       0.09       1032         Copper Cliff Nickel Refinery       51.3       0.03       1654         Copper Cliff Smelter       201.1       0.10       1971         Mississauga Lubricants Center - Petro-Canada       365.04       0.08       4680         Nanticoke Refinery - Imperial Oil       1058.08       7.83       135         Sarnia Manufacturing Center       759.47       0.34       2234	Beachville Operation	487.6	0.24	2008
Copper Cliff Nickel Refinery51.30.031654Copper Cliff Smelter201.10.101971Mississauga Lubricants Center - Petro-Canada365.040.084680Nanticoke Refinery - Imperial Oil1058.087.83135Sarnia Manufacturing Center759.470.342234	Dundas Operation	406.4	0.23	1744
Copper Cliff Smelter 201.1 0.10 1971 Mississauga Lubricants Center - Petro-Canada 365.04 0.08 4680 Nanticoke Refinery - Imperial Oil 1058.08 7.83 135 Sarnia Manufacturing Center 759.47 0.34 2234	Northern Lime Limited	90.8	0.09	1032
Copper Cliff Smelter201.10.101971Mississauga Lubricants Center - Petro-Canada365.040.084680Nanticoke Refinery - Imperial Oil1058.087.83135Sarnia Manufacturing Center759.470.342234	Copper Cliff Nickel Refinery	51.3	0.03	1654
Nanticoke Refinery - Imperial Oil 1058.08 7.83 135 Sarnia Manufacturing Center 759.47 0.34 2234		201.1	0.10	1971
Nanticoke Refinery - Imperial Oil 1058.08 7.83 135 Sarnia Manufacturing Center 759.47 0.34 2234	Mississauga Lubricants Center - Petro-Canada	365.04	0.08	4680
Sarnia Manufacturing Center 759.47 0.34 2234	<del>-</del>			
Sarnia кепnery- Suncor 628.00 4.69 134	Sarnia Refinery- Suncor	628.00	4.69	134

Sarnia Refinery Plant - Imperial Oil	1270.44	2.43	523
Dofasco Hamilton	4939.9	9.23	535
Essar Steel Algoma Inc.	2219.1	0.90	2468
Gerdau Whitby	83.7	0.28	295
Hamilton Works - U.S. Steel Canada	2674.7	2.45	1093
Ivaco Rolling Mills	74.5	0.20	369
Lake Erie Works - U.S. Steel Canada	1387.6	1.49	931

Table S2: Grouping of EDGAR v4.2 SNAP sectors to SOCE inventory sectors

SOCE Sector	EDGAR v4.2 SNAP Sectors
Area	1A4 + (6A+6C) + 1A2 + 1A1a + 2C + 2A
Point	1B2a + (4C+4D) + (2B+3) + 1A2 + 1A1a + 2C + 2A
Marine	1A3d
On-road	1A3b
Off-road	1A3a + 1A3c + 1A3e + 1A3d

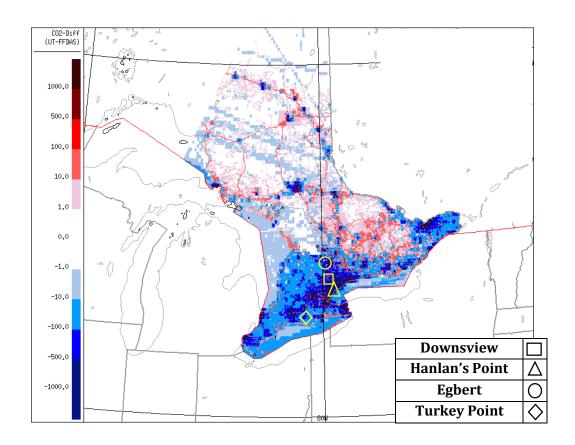


Figure S1: Annual mean difference in anthropogenic  $CO_2$  emissions (units: g  $CO_2$ /second/grid cell) between the SOCE and the FFDAS v2 inventories (SOCE – FFDAS v2) for a weekday in February 2010. Locations of in-situ measurements of  $CO_2$  are shown

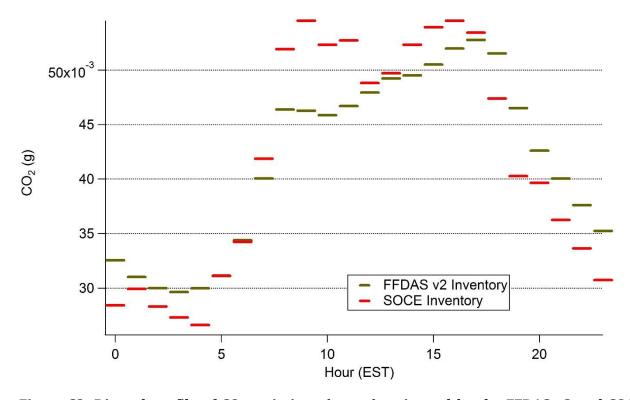


Figure S2: Diurnal profile of  $CO_2$  emissions (grams) estimated by the FFDAS v2 and SOCE inventories for January-March for the black-box domain in Figure 2a.

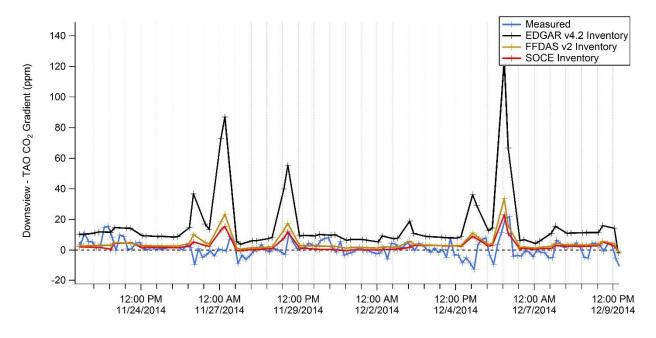


Figure S3: Time series of measured (blue) and modelled Downsview – TAO gradient  $CO_2$  mixing ratios. The black, red and gold lines are the modelled mixing ratios when using the EDGAR v4.2, FFDAS v2 and SOCE  $CO_2$  inventories, respectively.

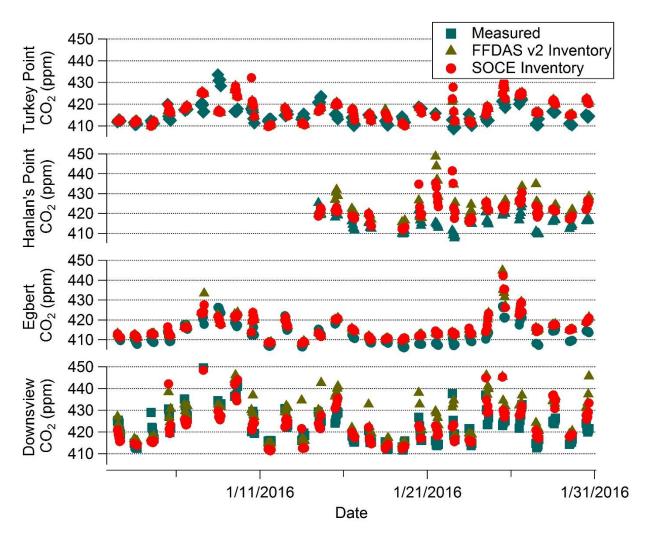


Figure S4: Time series of measured (blue) and modelled January afternoon (12:00-16:00 EST)  $CO_2$  mixing ratios for the four sites used in this study. The red and gold markers are the modelled mixing ratios when using the SOCE  $CO_2$  inventory and the FFDAS v2 inventory, respectively.

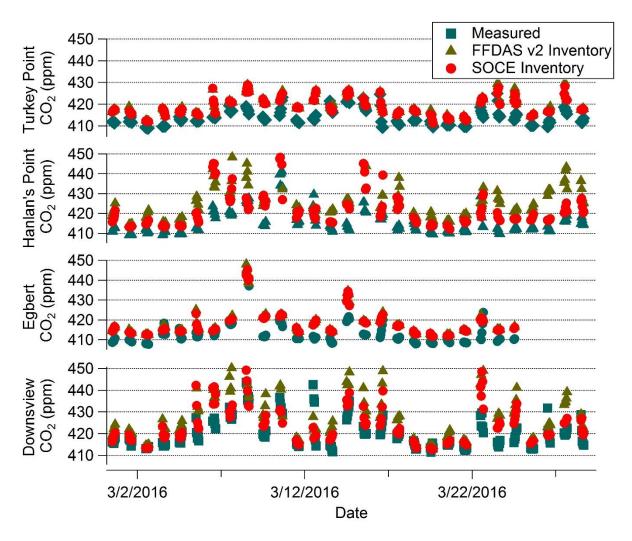


Figure S5: Time series of measured (blue) and modelled March afternoon (12:00-16:00 EST)  $CO_2$  mixing ratios for the four sites used in this study. The red and gold markers are the modelled mixing ratios when using the SOCE  $CO_2$  inventory and the FFDAS v2 inventory, respectively.

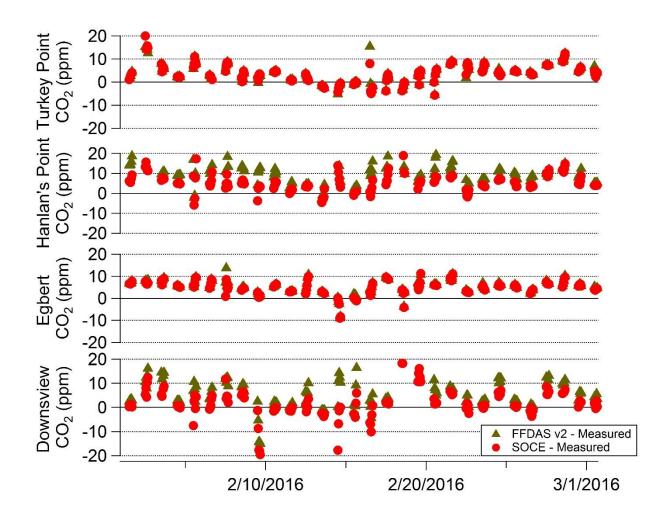


Figure S6: Time series of the difference between modelled and measured  $CO_2$  mixing ratios in February (12:00-16:00 EST) for the four sites used in this study. The red and gold markers are the differences when using the SOCE  $CO_2$  inventory and the FFDAS v2 inventory, respectively.

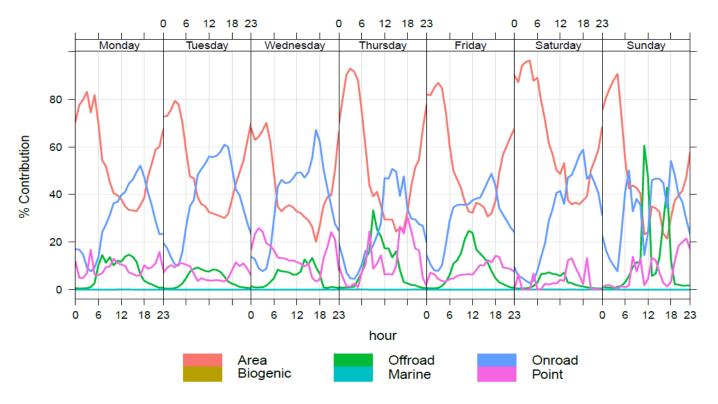


Figure S7: Modelled sectoral percent contributions to diurnal local  $CO_2$  enhancement for January 2016 at Downsview averaged by day of week. Note: Area = Area + Residential natural gas combustion + Commercial natural gas combustion. (Time zone is EST).

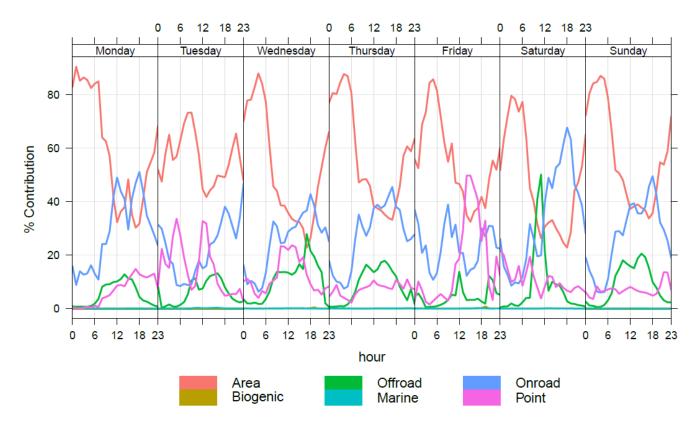


Figure S8: Modelled sectoral percent contributions to diurnal local  $CO_2$  enhancement for March 2016 at Downsview averaged by day of week. Note: Area = Area + Residential natural gas combustion + Commercial natural gas combustion. (Time zone is EST).