

Carbon Emissions for *The Upside of Down* book tour

Thank you for choosing Zerofootprint Offsets. We have calculated the greenhouse gas emissions that will be produced by Professor Homer-Dixon's book tour. These results are outlined in three tables on the following pages. But the most important figure is this: the tour will produce approximately 5.0 metric tons of climate-changing carbon dioxide. We applaud your decision both to turn your attention to this consequence of the tour, and to do something about it. We also recognize Professor Homer-Dixon's commitment to changing the way we do things, and are delighted to be able to contribute.

All greenhouse gas emissions were calculated according to the Greenhouse Gas Protocol (www.ghgprotocol.org). We use this standard for three reasons:

- It brings together leading experts on greenhouse gas emissions to develop internationally accepted accounting and reporting standards.
- It is backed by both the World Business Council for Sustainable Development and the World Resources Institute, two of the most prestigious non-governmental organizations in the world.
- It has achieved significant global uptake, and is used internally by companies, including Ford Motor Company, IKEA International and Sony Electronics.

Required Carbon Dioxide Offsets

1. Air Travel

The carbon dioxide emissions resulting from each leg of Thomas Homer-Dixon's book tour are presented below. Table 1 outlines the emissions from air travel, while Table 2 outlines the emissions from car travel. The total emissions are presented in Table 3, on the following page.

Table 1 - Carbon Dioxide Emissions Caused by Air Travel during Book Tour

Date	Flight		Distance (km)	Co2e Emissions (kg)
	Departing from:	Arriving at:		
Oct. 27	Stanford	Toronto	3612	397.32
Oct. 31	Toronto	New York	589	74.214
Nov. 1	New York	Washington, DC	367	66.06
Nov. 3	Washington, DC	Toronto	556	70.056
Nov. 5	Toronto	Vancouver	3355	369.05
Nov. 7	Vancouver	Seattle	205	36.9
Nov. 8	Seattle	San Francisco	1092	137.592
Nov. 9	San Francisco	Los Angeles	543	68.418
Nov. 10	Los Angeles	Victoria	1685	185.35
Nov. 12	Victoria	Calgary	729	91.854
Nov. 13	Calgary	Edmonton	246	44.28
Nov. 14	Edmonton	Winnipeg	1190	149.94
Nov. 16	Winnipeg	Toronto	1507	189.882
Nov. 23	Toronto	Boston	718	90.468
Nov. 27	Boston	Chicago	1395	175.77
Nov. 29	Chicago	Toronto	702	88.452
Dec. 1	Toronto	Montreal	508	64.008
Dec. 4	Montreal	Ottawa	152	27.36
Dec. 5	Ottawa	Toronto	364	65.52
Jan. 25	Toronto	New York	589	74.214
Jan. 27	New York	Toronto	589	74.214
			TOTAL:	2540.922

Table 1 calculations

These emissions were calculated using emission factors from the Greenhouse Gas Protocol, Mobile Combustion CO₂ Emissions Calculation Tool, Version 1.2. These emission factors are listed below.

Short haul flight (<452km) emission factor: 0.1800 kg CO₂/km
 Medium haul flight (452-1600km) emission factor: 0.1260 kg CO₂/km
 Long haul flight (>1600km) emission factor: 0.1100 kg CO₂/km

2. Ground Travel

Given that Zerofootprint Offsets is unaware of the exact distances Professor Homer-Dixon will be traveling by car, we have established a proxy value of 100 kilometers per day (over 44 days), plus 3000 kilometers to account for travel between Toronto Pearson Airport and his home in Fergus, Ontario.

Table 2 - Carbon Dioxide Emissions Caused by Ground Travel during Book Tour

Car Type	Distance (km)	Co2e Emissions (kg)
Mid-size vehicle	7400	730.8
<i>TOTALS</i>	7400	1802.64

Table 2 Calculations

These emissions were calculated using emission factors from the Greenhouse Gas Protocol, Mobile Combustion CO₂ Emissions Calculation Tool, Version 1.2. For your information, these emission factors are listed below.

Medium car (10.2 L/100km) emission factor: 0.2436 kg CO₂/km traveled

3. Total Carbon Dioxide Emissions

The final table compiles the results of Tables 1 and 2, and outlines the total greenhouse gas emissions that will be associated with the book tour, according to our calculations.

Table 3: Total Carbon Dioxide Emissions for Ground / Air Travel during Book Tour

	Co2e Emissions (kg)
Air	2540.922
Ground	1802.64
<i>TOTAL:</i>	4343.562

Offsetting Carbon Emissions

Zerofootprint Offsets has calculated that Professor Homer-Dixon's book tour will release 4.34 metric tons of greenhouse gases. We would round this figure up to 5.0 metric tons to ensure the full environmental impact of the tour travel is offset.

Professor Homer-Dixon has requested that we offset his tour through renewable energy investments. We have selected the Creststreet Kettles Hill Wind Energy Project as our carbon offset provider. We also suggest that all 5 tonnes be purchased from this project for maximum impact. Zerofootprint is delighted to cover the entire offset to sponsor this project.

Project Description

The Creststreet wind energy project (constructed and operated by Kettles Hill Wind Energy Inc.) is being completed near Pincher Creek, Alberta. This project began in early 2006 with the installation of five 1.8 MW wind turbines. An additional thirty 1.8 MW wind turbines will be installed by the end of 2006.

The project is EcoLogo certified under the Environmental Choice Program. This means that the wind farm has quantifiable and verifiable environmental benefits. A key to this certification is what is called "additionality." What this means is that any project that has been certified is bringing about a reduction in emissions that would not otherwise have occurred.

Assessing the project from an environmental perspective, since the majority of electricity capacity being added to the grid in Alberta is from non-renewable sources, all renewable energy added to the grid provides additional environmental benefit by displacing the need for more energy derived from fossil fuels.

From an economic perspective, the wind farm is only viable if it can market its carbon savings (please see the Creststreet Kettles Hill Windpower LP prospectus at www.creststreet.com for more information). As the return on investment for the project relies on the inclusion of the environmental credit potential, the project can be viewed as economically "additional."

Creststreet sells Renewable Energy Certificates (RECs), which represent the bundled environmental benefits associated with the production of renewable energy. Offsetting the tour calls only for carbon dioxide offsets (carbon credits). In order to convert the more comprehensive REC into a carbon credit, we apply an emission factor of 0.417. The

average emission intensity for the marginal supply of electricity is 0.417 tonnes of CO₂e per megawatt-hour, as specified by Alberta Environment. Because we're buying RECs to offset only carbon dioxide, we'll also cut smog-creating emissions as an unintended benefit.

Finally, a word on carbon accounting. In order to address the risk of double-counting emission reductions, an audit of the renewable energy credits created at the renewable energy facility is completed on an annual basis. This is a requirement for EcoLogo certification. This system prevents double counting by providing an audit trail from receipt through sale, and is audited annually to ensure continued compliance.

Zerofootprint Offsets has a large portfolio of other offset projects, including projects certified by Green-e, Environmental Resources Trust, and ISO 14064-part 2. If you would like to discuss other sources of carbon credits, we would be happy to oblige.

If you have any questions regarding this document, please contact Peter Howard at peter.howard@zerofootprint.net or 416.365.7557.