Profile of an Average U.S. Supermarket's Greenhouse Gas Impacts from Refrigeration Leaks Compared to Electricity Consumption

This is a profile of an average U.S. supermarket and the resulting Greenhouse Gas (GHG) impacts from leaked refrigerants and electricity consumption in a given year. The GHG estimates are based on the assumptions and industry information cited below and provided in pounds and metric tonnes of carbon dioxide equivalent (CO_2eq). To calculate your specific store's GHG impact from refrigeration leaks and electricity consumption use the corresponding GreenChill calculator.

U.S. Supermarket Store Size[1]	46,000 square feet
Annual Electricity Consumption Intensity for U.S. Supermarkets[2]	51 kilowatt hours per square foot
Annual Electricity Consumed (Annual Consumption Intensity x Store Size)	2,346,000 kilowatt hours per year
Electricity Use Emission Factor (U.S. Average)[3]	1.30 pounds of CO_2eq per kilowatt hour
Annual CO_2eq Emissions from Electricity Consumption	**3,120,180 pounds of CO_2 per year**
Annual CO_2eq Emissions from Electricity Consumption (metric)	**1,383 metric tonnes of CO_2 per year**

Typical Commercial Refrigerant Used[4]	R-404A
Global Warming Potential (AR4 standard)[5]	3,921.6
Commercial Refrigeration Charge Size[6]	3,500 pounds
Annual Commercial Refrigeration Leak Rate[7]	25% per year
Annual Volume of Commercial Refrigerant Leaked	875 pounds per year
Annual CO_2eq of R-404A Leaked	**3,431,400 pounds of CO_2eq per year**
Annual CO_2 eq of R-404A Leaked (metric)	**1,556 metric tonnes of CO_2eq per year**

[1] Food Market Institute. n.d. Supermarket Facts. *FMI | Food Marketing Institute | Food Marketing Institute - Facts & Figures*. Retrieved May 26, 2011. From www.fmi.org/facts_figs/?fuseaction=superfact

[2] U.S. EPA. July 2008. Sector Collaborative on Energy Efficiency Accomplishments and Next Steps: A Resource of the National Action Plan for Energy Efficiency. *Sector_Collaborative.pdf*. Retrieved May 26, 2011. From www.epa.gov/cleanenergy/documents/suca/sector_collaborative.pdf

[3] U.S. EPA. May 2011. eGRID2010 Version 1.1, Year 2007 Summary Tables. Retrieved May 27, 2011 from http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2010V1_1_year07_SummaryTables.pdf.

[4] Most widely used non-ozone depleting commercial refrigerant based on U.S. EPA Refrigerant Vintaging Model, March 23, 2011

[5] Intergovernmental Panel on Climate Change. nd. IPCC Fourth Assessment Report: Climate Change 2007. *2.10.2 Direct Global Warming Potentials.* Retrieved May 26, 2011. From www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14

[6] , [7] I.C.F. Consulting. November 30, 2005.Revised Draft Analysis of U.S. Commercial Supermarket Refrigeration Systems. *EPASupermarketReport_PUBLIC_30Nov05.pdf (application/pdf Object).* Retrieved May 26, 2011. From www.epa.gov/greenchill/downloads/EPASupermarketReport_PUBLIC_30Nov05.pdf