

**City of Chico General Plan Update
GHG Emission Calculations**

Land Use	Dwelling Units (DU) / Square Feet (SF)		Electricity Demand (kWh) per unit	Electricity Demand (kWh)	
	2008	2030		2008	2030
Residential (DU)	41,438	62,933	6,992	289,734,496	440,027,536
Commercial (SF)	9,167,755	15,004,304	14.3	131,098,897	214,561,547
Office (SF)	3,476,055	5,237,649	17.3	60,135,752	90,611,328
Hospital	453,456	453,456	27.5	12,470,040	12,470,040
Other	2,093,948	2,277,697	22.5	47,113,830	51,248,183
Industrial (SF)	10,650,592	18,631,378	7.6	80,944,499	141,598,473

Sources:

Energy Information Administration. 2005. <http://www.eia.doe.gov/emeu/recs/recs2005/c&e/summary/pdf/tableus8.pdf> (Accessed April 2010)

Energy Information Administration. 2006. http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set10/2003pdf/c14.pdf (Accessed April 2010)

Land Use	Dwelling Units (DU) / Square Feet (SF)		Natural Gas Demand (converted to kWh) per unit	Natural Gas Demand (converted to kWh)	
	2008	2030		2008	2030
Residential (DU)	41,438	62,933	13,540	561,070,520	852,112,820
Commercial (SF)	9,167,755	15,004,304	9.2	84,343,346	138,039,597
Office (SF)	3,476,055	5,237,649	9.5	33,022,523	49,757,666
Hospital	453,456	453,456	32.9	14,918,702	14,918,702
Other	2,093,948	2,277,697	20.2	42,297,750	46,009,479
Industrial (SF)	10,650,592	18,631,378	7.0	74,554,144	130,419,646

Sources:

Energy Information Administration. 2005. <http://www.eia.doe.gov/emeu/recs/recs2005/c&e/summary/pdf/tableus9.pdf> (Accessed April 2010)

Energy Information Administration. 2006. http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set11/2003pdf/c24.pdf (Accessed April 2010)

Water Demand	2008	2030
Acre-Feet	32,917	55,029

Source: Section 4.12 Public Services and Utilities

Direct Emissions

2008	URBEMIS CO2 Output	Conversion Factor	Total CO2 Emissions
Area Source	178,304 tons/year	0.907 metric ton/English ton	161,722 MT/yr
Mobile Source	534,016 tons/year	0.907 metric ton/English ton	484,353 MT/yr
2030	URBEMIS CO2 Output	Conversion Factor	Total CO2 Emissions
Area Source	275,426 tons/year	0.907 metric ton/English ton	249,811 MT/yr
Mobile Source	682,362 tons/year	0.907 metric ton/English ton	618,902 MT/yr

Indirect Emissions

Indirect Emissions from Electricity and Natural Gas Consumption

	CO2 Emissions			CH4 Emissions		N2O Emissions		Total CO2e MT/yr
	MWh/yr	lb/MWh	GWP	lb/MWh	GWP	lb/MWh	GWP	
2008	1,431,704	724.12	1	0.03020	23	0.0081	296	472,260
2030	2,181,775	724.12	1	0.03020	23	0.0081	296	719,677

Indirect Emissions from Water Use

	MG/yr	MWh/MG	MWh/yr	Total CO2e MT/yr
2008	10,728	3.95	42,374	13,977
2030	17,934	3.95	70,839	23,367

2008 Total Direct and Indirect Long-Term Emissions

1,132,311 CO2e metric tons per year

2030 Total Direct and Indirect Long-Term Emissions

1,611,757 CO2e metric tons per year

Sources:

California Climate Action Registry. 2009. General Reporting Protocol v 3.1.

California Energy Commission. 2005. California Energy - Water Relationship Staff Report. <http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF>

(Accessed January 2010)

	Service			
	Population	Employment	Population (SP)	MT CO2e/SP
2008	99,451	42,884	142,335	7.96
2030	151,039	68,466	219,505	7.34

AB 32 2020 Goal GHG emissions (metric tons CO2e) per Service Population

6.6

Source: Bay Area Air Quality Management District. 2009. California Environmental Quality Act Guidelines Update: Proposed Thresholds of Significance.

<http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/Proposed%20Thresholds%20of%20Significance%20Dec%207%202009.ashx> (Accessed January 2010)