

FY 2009
Cornell University
Energy Fast Facts¹

PRIMARY ENERGY CONSUMPTION

Primary Consumption (trillion Btu)	<u>1990⁽²⁾</u>	<u>2009</u>
Electricity (Grid Purchased)	0.60	0.75
Coal	1.33	1.21
Hydro	0.02	0.02
Natural Gas	0.28	0.44
Oil	0.14	0.06
Total Primary Energy Consumption	2.35	2.48

Primary Consumption (MMBtu) per sq. ft. **0.20** **0.18**

ENERGY CONSUMPTION BY BUILDING

Building Type: (trillion Btu)	<u>1990</u>	<u>2009</u>
Research/Teaching	NA	2.11
Campus Life	NA	0.30
Administration	NA	0.07

ELECTRICITY

Cornell Utilities Generated (Mwh)	<u>1990</u>	<u>2009</u>
Cornell Utilities Hydro	5,200	4,800
Cornell Utilities Steam Turbine - Cogen	21,000	18,100
Cornell Utilities Gas Turbine - CCHPP ⁽³⁾	0	0
Total Cornell Utilities Generated	26,200	22,900

Electricity (Grid Purchased) (Mwh) 174,500 219,900
Total Electricity (Mwh) **200,700** **242,800**

Electricity (Grid Purchased) Sources ^{4,5}	<u>1990</u>	<u>2009</u>
Biomass	0%	<1%
Coal	74%	16%
Natural Gas	5%	23%
Hydro	14%	19%
Nuclear	5%	30%
Oil	2%	11%
Solar	0%	<1%
Solid Waste	0%	1%
Wind	0%	<1%

ADDITIONAL STATISTICS

	<u>1990</u>	<u>2009</u>
Total Enrollment	18,581	20,273
Campus Area (1000 sq. ft.)	11,800	13,944
Square Feet per Student	635	688
Heating Degree Days (7182 Normal)	6,919	7,299
Cooling Degree Days		312

NOTES

- Information provided is for Ithaca central utility campus only.
- Kyoto Base Year is 1990
- Cornell Combined Heat and Power Project (CCHPP) expected start-up FY 2010. Cornell Utilities Department will generate the majority of Ithaca Campus electrical demand utilizing natural gas turbines. Waste heat from the gas turbines will be used by a heat recovery steam generator to provide steam to Campus. Coal use will decline and natural gas usage will increase as a result of the CCHPP.
- 1990 grid purchased electric emission rate determined from New York State Electric & Gas (NYSEG) 1990 annual report.
- Beginning FY 2008, grid purchased electric emission rate from eGRID region upstate New York
- Chilled water input Btu's are the energy input to the central plants for production and distribution of cooling water.

ENERGY RELATED CARBON DIOXIDE (CO₂) EMISSIONS

Energy Source	<u>1990</u>	<u>2009</u>
Electricity (Grid Purchased)	167.4	90.7
Cornell Utilities	165.2	158.1
Total CO₂ Emissions (thousand tons)	332.6	248.8

CO ₂ Emissions By Primary Energy Type:	<u>1990</u>	<u>2009</u>
Coal	42%	51%
Electricity (Grid Purchased)	50%	36%
Hydro	0%	0%
Natural Gas	5%	10%
Oil	4%	2%

CO ₂ Emissions By Utility Type:	<u>1990</u>	<u>2009</u>
Electricity to Campus (Grid Purchased)	44%	36%
Electricity (Cornell Generated)	3%	3%
Steam	47%	61%
Chilled Water	6%	1%

STEAM

Total Steam Export (trillion Btu) 1.31 1.33

Steam Fuel Sources (trillion Btu)	<u>1990</u>	<u>2009</u>
Coal	1.33	1.21
Natural Gas	0.28	0.44
Oil	0.14	0.06
Total Energy Input (trillion Btu)	1.74	1.71

Thermal Efficiency 69% 69%

CHILLED WATER

	<u>1990</u>	<u>2009</u>
Total Chilled Water Production (trillion Btu)	0.338	0.476
Total Energy Input (trillion Btu) ⁽⁶⁾	0.072	0.019

System Coefficient of Performance 4.7 25.0

Chilled Water Sources	<u>1990</u>	<u>2009</u>
Mechanical Chillers	83%	1%
Lake/Free Cooling	17%	99%

GLOSSARY

Btu: British thermal unit
 Primary: Central Plant Usage
 MMBtu: Million Btu
 Mwh: mega watt-hour