

**Fiscal Year 2011  
Cornell University  
Central Energy Plant (CEP) Fast Facts<sup>1</sup>**

<b>CEP PRIMARY ENERGY CONSUMPTION</b>		
Primary Consumption (trillion Btu)	<b>1990<sup>(2)</sup></b>	<b>2011</b>
Electricity (Grid Purchased)	0.60	0.25
Coal	1.33	0.20
Hydro (electric)	0.02	0.01
Natural Gas	0.28	2.47
Oil	0.14	0.00
<b>Total Primary Energy Consumption</b>	<b>2.35</b>	<b>2.94</b>

<b>CENTRAL ENERGY PLANT EFFICIENCY</b>		
Energy Output (trillion Btu)	<b>1990</b>	<b>2011</b>
Total Steam Generation	1.31	1.36
Total Turbine Electric Generation	0.07	0.69
<b>Total Energy Output</b>	<b>1.38</b>	<b>2.05</b>

Fuel Sources (trillion Btu)	<b>1990</b>	<b>2011</b>
Coal	1.33	0.20
Natural Gas - Boilers	0.28	0.18
Natural Gas - Turbines	0.00	1.99
Natural Gas - Duct Burners	0.00	0.30
Oil	0.14	0.00
<b>Total Energy Input (trillion Btu)</b>	<b>1.74</b>	<b>2.68</b>
<b>Total Central Plant Efficiency</b>	<b>69%</b>	<b>77%</b>

Total Steam Sales (trillion Btu)	NA	1.16
Total Steam Losses (%)	NA	15%

<b>ELECTRICITY</b>		
Cornell Utilities Generated (Mwh)	<b>1990</b>	<b>2011</b>
Cornell Utilities Hydro	5,200	4,200
Cornell Utilities Steam Turbine - Cogen	21,000	28,000
Cornell Utilities Gas Turbine - CCHPP <sup>(3)</sup>	0	178,000
<b>Total Cornell Utilities Generated</b>	<b>26,200</b>	<b>210,200</b>
Electricity Exported to Grid (Mwh)	0	(30,900)
Electricity (Grid Purchased) (Mwh)	175,000	67,500
<b>Total CEP Electricity (Mwh)</b>	<b>201,200</b>	<b>246,800</b>
<b>Total Campus Sales (Mwh)</b>	<b>NA</b>	<b>234,000</b>
Electricity LSC (Grid Purchased) (Mwh)	0	6,500

Electricity (Grid Purchased) Sources	<b>1990</b>	<b>2011</b>
Other Renewables	0%	4%
Coal	74%	7%
Natural Gas	5%	44%
Hydro	14%	11%
Nuclear	5%	13%
Petroleum	2%	16%
Other Gases	0%	<1%
Pumped Storage	0%	4%

<b>CHILLED WATER</b>		
Energy Output & Input (trillion Btu)	<b>1990</b>	<b>2011</b>
Total Chilled Water Production (trillion Btu)	0.338	0.560
Total Energy Input (trillion Btu) <sup>(6)</sup>	0.072	0.029
<b>System Coefficient of Performance</b>	<b>4.7</b>	<b>19.3</b>
Total Campus Sales (trillion Btu)	N/A	0.569
<b>Chilled Water Sources</b>		
Mechanical Chillers	83.2%	3%
Lake Source Cooling	17%	97%

<b>ENERGY RELATED CARBON DIOXIDE (CO<sub>2</sub>) EMISSIONS</b>		
Purchased Electric	<b>1990</b>	<b>2011</b>
Grid CO <sub>2</sub> Emission Factor (lbs/MWh)	1,918	669
Grid Electric CO <sub>2</sub> (1,000 tons)	167	25
<b>Cornell Central Energy Plant</b>		
Cornell Coal <sup>(4)</sup>	138	21
Cornell Natural Gas <sup>(5)</sup>	15	124
Cornell Oil	12	0.3
Total CEP CO <sub>2</sub> Emissions (1,000 tons)	165	146
<b>Total CO<sub>2</sub> Emissions (1,000 tons)</b>	<b>333</b>	<b>170</b>

CO <sub>2</sub> Emissions By Primary Energy Type:	<b>1990</b>	<b>2011</b>
Electricity (Grid Purchased)	50%	14%
On-Site Coal	42%	12%
On-Site Natural Gas	5%	73%
On-Site Oil	4%	0%
On-Site Hydro	0%	0%

<b>CENTRALLY CONNECTED BLDG GSF x 1,000</b>		
	<b>1990</b>	<b>2011</b>
Electric (provided via CEP)	NA	13,700
Steam (provided via CEP)	NA	12,600
Chilled Water (provided via CEP)	NA	8,000

<b>ENERGY METRICS (KBTU/GSF) PER YEAR</b>		
	<b>1990</b>	<b>2011</b>
Electric Sales	NA	58
Steam Sales	NA	92
Chilled Water Sales	NA	71

<b>ENERGY CONSUMPTION BY BUILDING</b>		
Building Type: (trillion Btu)	<b>1990</b>	<b>2011</b>
Research/Teaching	NA	2.12
Campus Life	NA	0.59
Administration	NA	0.24

<b>POPULATION AND WEATHER</b>		
	<b>1990</b>	<b>2011</b>
Students	18,389	20,776
Staff/Non-Faculty	7,690	8,081
Faculty	1,617	1,564
Ithaca Campus <sup>(6)</sup> (1000 GSF)	11,800	15,200
Campus GSF per Student	642	732
Heating Degree Days (7,220 Normal)	6,919	7,221
Cooling Degree Days (337 Normal)	312	605

**GLOSSARY & NOTES**

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

- (1) Info for CEP only, not all campus facilities part of CEP
- (2) Kyoto Base Year is 1990
- (3) Combined Heat & Power Plant start-up FY 2010
- (4) "Beyond Coal" begins FY 2012
- (5) GHG adjusted for exported electric
- (6) Ithaca Campus includes non-CEP connected facilities