

**Fiscal Year 2015  
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>2015</b>
Electricity (Grid Purchased)	0.60	0.18
Coal	1.33	0.00
Hydro (electric)	0.02	0.01
Natural Gas	0.28	2.94
Oil	0.14	0.01
<b>Total Primary Energy Consumption</b>	<b>2.35</b>	<b>3.14</b>

<b>CENTRAL ENERGY PLANT EFFICIENCY</b>		
Energy Output (trillion Btu)	<b>1990</b>	<b>2015</b>
Total Steam Generation <sup>(3)</sup>	1.49	1.32
Total Turbine Electric Generation	0.07	0.74
<b>Total Energy Output</b>	<b>1.56</b>	<b>2.06</b>

Fuel Sources (trillion Btu)	<b>1990</b>	<b>2015</b>
Coal	1.33	0.00
Natural Gas - Boilers	0.28	0.23
Natural Gas - Turbines	0.00	2.35
Natural Gas - Duct Burners	0.00	0.36
Oil	0.14	0.01
<b>Total Energy Input (trillion Btu)</b>	<b>1.74</b>	<b>2.95</b>
<b>Total Central Plant Efficiency</b>	<b>90%</b>	<b>70%</b>
Total Steam Sales (trillion Btu)	1.10	1.00
Total Distrib and Building Steam Losses (%)	17%	18%
Total Steam Condensed for Electric (trillion Btu)	0.00	0.09

<b>ELECTRICITY</b>		
Cornell Utilities Generated (Mwh)	<b>1990</b>	<b>2015</b>
Cornell Utilities Hydro	5,200	3,500
Cornell Utilities Steam Turbine - Cogen	21,000	26,400
Cornell Utilities Gas Turbine - CCHPP <sup>(3)</sup>	0	193,700
<b>Total Cornell Utilities Generated</b>	<b>26,200</b>	<b>223,600</b>
Electricity Exported to Grid (Mwh)	0	(45,000)
Electricity (Grid Purchased) (Mwh)	174,500	47,000
<b>Total CEP Electricity (Mwh)</b>	<b>200,700</b>	<b>225,600</b>
<b>Total Campus Sales (Mwh)</b>	<b>190,626</b>	<b>213,000</b>
LSC Electricity (Grid Purchased) (Mwh)	0	4,400

Electricity (NY Grid) Sources	<b>1990</b>	<b>2015</b>
Other Renewables	0%	3%
Coal	19%	3%
Natural Gas	17%	40%
Hydro	21%	19%
Nuclear	17%	31%
Petroleum	25%	2%
Other	1%	2%
Total	100%	100%

<b>CHILLED WATER</b>		
Energy Output & Input (trillion Btu)	<b>1990</b>	<b>2015</b>
Total Chilled Water Production (trillion Btu)	0.381	0.490
Total Energy Input (trillion Btu) <sup>(6)</sup>	0.072	0.017
<b>System Coefficient of Performance</b>	<b>5.3</b>	<b>28.8</b>
Total Campus Sales (trillion Btu)	0.348	0.504
<b>Chilled Water Sources</b>		
Mechanical Chillers	85%	1%
Lake Source Cooling	0%	99%
"Free" Cooling	15%	0%

<b>ENERGY RELATED CARBON DIOXIDE (CO<sub>2</sub>) EMISSIONS</b>		
Purchased Electric	<b>1990</b>	<b>2015</b>
Grid CO <sub>2</sub> Emission Factor (kg/MWh)	870	186
Grid Electric CO <sub>2</sub> (1,000 metric tons)	152	10
<b>Cornell Central Energy Plant</b>		
Cornell Coal <sup>(4)</sup>	125	0
Cornell Natural Gas <sup>(5)</sup>	15	157
Cornell Oil	11	1
Total CEP CO <sub>2</sub> Emissions (1,000 metric tons)	151	158
<b>Total CO<sub>2</sub> Emissions (1,000 metric tons)</b>	<b>303</b>	<b>167</b>

CO <sub>2</sub> Emissions By Primary Energy Type:	<b>1990</b>	<b>2015</b>
Electricity (Grid Purchased)	50%	6%
On-Site Coal	41%	0%
On-Site Natural Gas	5%	94%
On-Site Oil	4%	0%
On-Site Hydro	0%	0%

<b>CENTRALLY CONNECTED BLDG GSF x 1,000</b>		
	<b>1990</b>	<b>2015</b>
Electric (provided via CEP)	NA	14,000
Steam (provided via CEP)	NA	12,800
Chilled Water (provided via CEP)	NA	8,700

<b>ENERGY METRICS (KBTU/GSF) PER YEAR</b>		
	<b>1990</b>	<b>2015</b>
Electric Sales	NA	55
Steam Sales	NA	103
Chilled Water Sales	NA	56

<b>ENERGY CONSUMPTION BY BUILDING</b>		
Building Type: (trillion Btu)	<b>1990</b>	<b>2015</b>
Research/Teaching	NA	2.35
Campus Life	NA	0.56
Administration	NA	0.22

<b>POPULATION AND WEATHER</b>		
	<b>1990</b>	<b>2015</b>
Students	18,389	20,796
Staff/Non-Faculty	7,690	9,168
Faculty	1,617	1,578
Ithaca Campus <sup>(6)</sup> (1000 GSF)	11,800	15,825
Campus GSF per Student	642	761
Heating Degree Days (7,220 Normal)	6,919	7,822
Cooling Degree Days (337 Normal)	312	404

<b>GLOSSARY &amp; NOTES</b>		
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 NOT adjusted for exported electric		
(6) Ithaca Campus GSF includes non-CEP connected facilities		