

**Fiscal Year 2016
Cornell University
Central Energy Plant (CEP) Fast Facts¹**

CEP PRIMARY ENERGY CONSUMPTION		
Primary Consumption (trillion Btu)	1990⁽²⁾	2016
Electricity (Grid Purchased)	0.60	0.05
Coal	1.33	0.00
Hydro (electric)	0.02	0.02
Natural Gas	0.28	3.02
Oil	0.14	0.00
Total Primary Energy Consumption	2.35	3.09

CENTRAL ENERGY PLANT EFFICIENCY		
Energy Output (trillion Btu)	1990	2016
Total Steam Generation ⁽³⁾	1.35	1.30
Total Turbine Electric Generation	0.07	0.88
Total Energy Output	1.42	2.18

Fuel Sources (trillion Btu)		
	1990	2016
Coal	1.33	0.00
Natural Gas - Boilers	0.28	0.09
Natural Gas - Turbines	0.00	2.71
Natural Gas - Duct Burners	0.00	0.21
Oil	0.14	0.00
Total Energy Input (trillion Btu)	1.74	3.02
Total Central Plant Efficiency	81%	72%
Total Steam Sales (trillion Btu)	0.99	0.83
Total Distrib and Building Steam Losses (%)	17%	19%
Total Steam Condensed for Electric (trillion Btu)	0.00	0.24

ELECTRICITY		
Cornell Utilities Generated (Mwh)	1990	2016
Cornell Utilities Hydro	5,200	5,200
Cornell Utilities Steam Turbine - Cogen	21,000	24,500
Cornell Utilities Gas Turbine - CCHPP ⁽³⁾	0	236,900
Total Cornell Utilities Generated	26,200	266,600
Electricity Exported to Grid (Mwh)	0	(59,000)
Electricity (Grid Purchased) (Mwh)	174,500	11,600
Total CEP Electricity (Mwh)	200,700	219,200
Total Campus Sales (Mwh)	190,626	212,000
LSC Electricity (Grid Purchased) (Mwh)	0	4,400

Electricity (NY Grid) Sources		
	1990	2016
Other Renewables	0%	5%
Coal	19%	6%
Natural Gas	17%	30%
Hydro	21%	29%
Nuclear	17%	29%
Petroleum	25%	0%
Other	1%	0%
Total	100%	100%

CHILLED WATER		
Energy Output & Input (trillion Btu)	1990	2016
Total Chilled Water Production (trillion Btu)	0.381	0.486
Total Energy Input (trillion Btu) ⁽⁶⁾	0.072	0.021
System Coefficient of Performance	5.3	23.2
Total Campus Sales (trillion Btu)	0.348	0.488
Chilled Water Sources		
Mechanical Chillers	85%	1%
Lake Source Cooling	0%	98%
"Free" Cooling	15%	0%

ENERGY RELATED CARBON DIOXIDE (CO₂) EMISSIONS		
Purchased Electric	1990	2016
Grid CO ₂ Emission Factor (kg/MWh)	870	186
Grid Electric CO ₂ (1,000 metric tons)	152	3
Cornell Central Energy Plant		
Cornell Coal ⁽⁴⁾	125	0
Cornell Natural Gas ⁽⁵⁾	15	161
Cornell Oil	11	0
Total CEP CO ₂ Emissions (1,000 metric tons)	151	161
Total CO₂ Emissions (1,000 metric tons)	303	164

CO₂ Emissions By Primary Energy Type:		
	1990	2016
Electricity (Grid Purchased)	50%	2%
On-Site Coal	41%	0%
On-Site Natural Gas	5%	98%
On-Site Oil	4%	0%
On-Site Hydro	0%	0%

CENTRALLY CONNECTED BLDG GSF x 1,000		
	1990	2016
Electric (provided via CEP)	NA	14,000
Steam (provided via CEP)	NA	12,800
Chilled Water (provided via CEP)	NA	8,700

ENERGY METRICS (KBTU/GSF) PER YEAR		
	1990	2016
Electric Sales	NA	53
Steam Sales	NA	102
Chilled Water Sales	NA	56

ENERGY CONSUMPTION BY BUILDING		
Building Type: (trillion Btu)	1990	2016
Research/Teaching	NA	2.32
Campus Life	NA	0.56
Administration	NA	0.22

POPULATION AND WEATHER		
	1990	2016
Students	18,389	21,190
Staff/Non-Faculty	7,690	9,255
Faculty	1,617	1,574
Ithaca Campus ⁽⁶⁾ (1000 GSF)	11,800	15,825
Campus GSF per Student	642	747
Heating Degree Days (7,220 Normal)	6,919	6,461
Cooling Degree Days (337 Normal)	312	392

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 NOT adjusted for exported electric		
(6) Ithaca Campus GSF includes non-CEP connected facilities		