Fiscal Year 2021
Cornell University
Central Energy Plant (CEP) Fast Facts[1]

CEP PRIMARY ENERGY CONSUMPTION		
Primary Consumption (trillion Btu)	1990 (2)	2021
Electricity (Grid Purchased)	0.60	0.07
Coal	1.33	0.00
Hydro (electric)	0.02	0.02
Natural Gas	0.28	2.87
Oil	0.14	0.01
Total Primary Energy Consumption	**2.35**	**2.96**

CENTRAL ENERGY PLANT EFFICIENCY		
Energy Output (trillion Btu)	1990	2021
Total Steam Generation (3)	1.35	1.36
Total Turbine Electric Generation	0.07	0.83
Total Energy Output	1.42	2.18
Fuel Sources (trillion Btu)	1990	2021
Coal	1.33	0.00
Natural Gas - Boilers	0.28	0.19
Natural Gas - Turbines	0.00	2.45
Natural Gas - Duct Burners	0.00	0.23
Oil	0.14	0.01
Total Energy Input (trillion Btu)	1.74	2.88
Total Central Plant Efficiency	81%	76%
Total Steam Sales (trillion Btu)	0.99	0.83
Total Distrib and Building Steam Losses (%)	17%	23%
Total Steam Condensed for Electric (trillion Btu)	0.00	0.16

ELECTRICITY		
Cornell Utilities Generated (Mwh)	1990	2021
Cornell Utilities Hydro	5,200	4,900
Cornell Utilities Steam Turbine - Cogen	21,000	29,400
Cornell Utilities Gas Turbine - CCHPP (3)	0	212,400
Total Cornell Utilities Generated	**26,200**	**246,700**
Electricity Exported to Grid (Mwh)	0	(66,200)
Electricity (Grid Purchased) (Mwh)	174,500	13,400
Total CEP Electricity (Mwh)	**200,700**	**193,900**
Total Campus Sales (Mwh)	**190,626**	**185,000**
LSC Electricity (Grid Purchased) (Mwh)	0	6,000
Electricity (NY State Grid) Sources	1990	2021
Other Renewables	0%	7%
Coal	19%	1%
Natural Gas	17%	26%
Hydro	21%	35%
Nuclear	17%	31%
Petroleum	25%	1%
Other	1%	<1%
Total	100%	100%

CHILLED WATER		
Energy Output & Input (trillion Btu)	1990	2021
Total Chilled Water Production (trillion Btu)	0.381	0.563
Total Energy Input (trillion Btu) (6)	0.072	0.026
System Coefficient of Performance	**5.3**	**21.7**
Total Campus Sales (trillion Btu)	0.348	0.509
Chilled Water Sources		
Mechanical Chillers	85%	2%
Lake Source Cooling	0%	98%
"Free" Cooling	15%	0%

ENERGY RELATED CARBON DIOXIDE (CO_2) EMISSIONS		
Purchased Electric	1990	2021
Grid CO_2 Emission Factor (kg/MWh)	870	106
Grid Electric CO_2 (1,000 metric tons)	152	2
Cornell Central Energy Plant		
Cornell Coal (4)	125	0
Cornell Natural Gas (5)	15	152
Cornell Oil	11	1
Total CEP CO_2 Emissions (1,000 metric tons)	151	153
Total CO_2 Emissions (1,000 metric tons)	**303**	**155**
CO_2 Emissions By Primary Energy Type:	1990	2021
Electricity (Grid Purchased)	50%	1%
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	2021
Electric (provided via CEP)	NA	14,000
Steam (provided via CEP)	NA	13,100
Chilled Water (provided via CEP)	NA	11,100

ENERGY METRICS (KBTU/GSF) PER YEAR		
	1990	2021
Electric (CEP to Campus)	NA	47
Steam (gross Generation)	NA	104
Chilled Water (gross Production)	NA	51

ENERGY CONSUMPTION BY BUILDING		
Building Type: (trillion Btu)	1990	2021
Research/Teaching	NA	2.26
Campus Life	NA	0.48
Administration (includes CEP)	NA	0.22

POPULATION AND WEATHER		
	1990	2021
Students	18,389	22,747
Staff/Non-Faculty	7,690	9,578
Faculty	1,617	1,543
Ithaca Campus (6) (1000 GSF)	11,800	16,025
Campus GSF per Student	642	704
Heating Degree Days (7,220 Normal)	6,919	6,768
Cooling Degree Days (337 Normal)	312	725

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