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