## Fiscal Year 2022 Cornell University Central Energy Plant (CEP) Fast Facts<sup>1</sup>

CEP PRIMARY ENERGY CONS	UMPTION		ENERGY RELATE
Primary Consumption (trillion Btu)	<u>1990</u> (2)	2022	Purchased Electric
Electricity (Grid Purchased)	0.60	0.19	Grid CO <sub>2</sub> Emiss
Coal	1.33	0.00	Grid Electric CC
Hydro (electric)	0.02	0.03	Cornell Central Ene
Natural Gas	0.28	2.53	Cornell Coal <sup>(4)</sup>
Oil	0.14	0.00	Cornell Natural
Total Primary Energy Consumption	2.35	2.75	Cornell Oil
CENTRAL ENERGY PLANT EFFICIENCY			Total CEP CO <sub>2</sub> Emissio
	1000	2022	101111111111111111111111111111111111111
Energy Output (trillion Btu)  Total Steam Generation <sup>(3)</sup>	<u>1990</u> 1.35	<u>2022</u> 1.30	CO <sub>2</sub> Emissions
Total Turbine Electric Generation			
Total Energy Output	0.07 1.42	0.68 1.98	Electricity (Grid On-Site Coal
= = = = = = = = = = = = = = = = = = =	1.72	1.00	
Fuel Courses (Avillian Day)	4000	2022	On-Site Natural
Fuel Sources (trillion Btu)	<u>1990</u>	<u>2022</u>	On-Site Oil
Coal	1.33	0.00	On-Site Hydro
Natural Gas - Boilers	0.28	0.34	OFNITRALLY CON
Natural Gas - Turbines	0.00	1.96	CENTRALLY CON
Natural Gas - Duct Burners	0.00	0.23	
Oil _	0.14	0.00	Electric (provided v
Total Energy Input (trillion Btu)	1.74	2.53	Steam (provided via
Total Central Plant Efficiency	81%	78%	Chilled Water (prov
Total Steam Sales (trillion Btu)	0.99	0.84	
Total Distrib and Building Steam Losses (%)	17%	24%	ENERGY METRICS
Total Steam Condensed for Electric (trillion Btu)	0.00	0.07	
ELECTRICITY			Electric (CEP to Ca
Cornell Utilities Generated (Mwh)	<u>1990</u>	<u>2022</u>	Steam (gross Gene
Cornell Utilities Hydro	5,200	7,500	Chilled Water (gros
Cornell Utilities Steam Turbine - Cogen	21,000	26,600	
Cornell Utilities Gas Turbine - CCHPP (3)	0	172,900	ENERGY CONSUM
Total Cornell Utilities Generated	26,200	207,000	Building Type: (trillie
			Research/Teacl
Electricity Exported to Grid (Mwh)	0	(52,600)	Campus Life
Electricity (Grid Purchased) (Mwh)	174,500	48,700	Administration (
Total CEP Electricity (Mwh)	200,700	203,100	
Total Campus Sales (Mwh)	190,626	193,000	POPULATION AND
LSC Electricity (Grid Purchased) (Mwh)	0	6,400	
			Students
Electricity (NY State Grid) Sources	<u>1990</u>	<u>2022</u>	Staff/Non-Faculty
Other Renewables	0%	8%	Faculty
Coal	19%	0%	Ithaca Campus (6) (
Natural Gas	17%	26%	Campus GSF per S
			Heating Degree Da
Hydro	21%	35%	
Hydro Nuclear	21% 17%	35% 31%	Cooling Degree Day
•			Cooling Degree Da
Nuclear	17%	31%	
Nuclear Petroleum Other Total	17% 25%	31% 0%	GLOSSARY & NO
Nuclear Petroleum Other Total  CHILLED WATER	17% 25% 1% 100%	31% 0% <1% 100%	GLOSSARY & NO  Btu: British therma  Primary: Central Pl
Nuclear Petroleum Other Total  CHILLED WATER Energy Output & Input (trillion Btu)	17% 25% 1% 100%	31% 0% <1% 100%	GLOSSARY & NO' Btu: British therma Primary: Central Pl MMBtu: Million Btu
Nuclear Petroleum Other Total  CHILLED WATER  Energy Output & Input (trillion Btu)  Total Chilled Water Production (trillion Btu)	17% 25% 1% 100%  1990 0.381	31% 0% <1% 100% 2022 0.594	GLOSSARY & NO' Btu: British therma Primary: Central Pi MMBtu: Million Btu Mwh: mega watt-ho
Nuclear Petroleum Other Total  CHILLED WATER  Energy Output & Input (trillion Btu)  Total Chilled Water Production (trillion Btu)  Total Energy Input (trillion Btu)  Total Energy Input (trillion Btu)	17% 25% 1% 100%  1990 0.381 0.072	31% 0% <1% 100% 2022 0.594 0.028	GLOSSARY & NO' Btu: British therma Primary: Central Pl MMBtu: Million Btu Mwh: mega watt-ho (1) Info for CEP onl
Nuclear Petroleum Other Total  CHILLED WATER  Energy Output & Input (trillion Btu)  Total Chilled Water Production (trillion Btu)  Total Energy Input (trillion Btu) <sup>(6)</sup> System Coefficient of Performance	17% 25% 1% 100%  1990 0.381 0.072 5.3	31% 0% <1% 100% 2022 0.594 0.028 21.2	GLOSSARY & NO Btu: British therma Primary: Central Pl MMBtu: Million Btu Mwh: mega watt-ho (1) Info for CEP onl (2) Kyoto Base Yea
Nuclear Petroleum Other Total  CHILLED WATER  Energy Output & Input (trillion Btu)  Total Chilled Water Production (trillion Btu)  Total Energy Input (trillion Btu)  System Coefficient of Performance  Total Campus Sales (trillion Btu)	17% 25% 1% 100%  1990 0.381 0.072	31% 0% <1% 100% 2022 0.594 0.028	GLOSSARY & NOT Btu: British thermal Primary: Central Pl MMBtu: Million Btu Mwh: mega watt-ho (1) Info for CEP onl (2) Kyoto Base Yea (3) Combined Heat
Nuclear Petroleum Other Total  CHILLED WATER  Energy Output & Input (trillion Btu)  Total Chilled Water Production (trillion Btu)  Total Energy Input (trillion Btu)  System Coefficient of Performance Total Campus Sales (trillion Btu)  Chilled Water Sources	17% 25% 1% 100%  1990 0.381 0.072 5.3	31% 0% <1% 100%  2022 0.594 0.028 21.2	GLOSSARY & NOT Btu: British thermal Primary: Central Pl MMBtu: Million Btu Mwh: mega watt-ho (1) Info for CEP onl; (2) Kyoto Base Yea (3) Combined Heat (4) "Beyond Coal" b
Nuclear Petroleum Other Total  CHILLED WATER  Energy Output & Input (trillion Btu)  Total Chilled Water Production (trillion Btu)  Total Energy Input (trillion Btu) (6)  System Coefficient of Performance  Total Campus Sales (trillion Btu)  Chilled Water Sources  Mechanical Chillers	17% 25% 1% 100%  1990 0.381 0.072 5.3 0.348	31% 0% <1% 100%  2022 0.594 0.028 21.2 0.537	GLOSSARY & NO Btu: British thermal Primary: Central Pl MMBtu: Million Btu Mwh: mega watt-ho (1) Info for CEP onl (2) Kyoto Base Yea (3) Combined Heat (4) "Beyond Coal" b (5) GHG NOT adjus
Nuclear Petroleum Other Total  CHILLED WATER  Energy Output & Input (trillion Btu)  Total Chilled Water Production (trillion Btu)  Total Energy Input (trillion Btu)  System Coefficient of Performance Total Campus Sales (trillion Btu)  Chilled Water Sources	17% 25% 1% 100%  1990 0.381 0.072 5.3	31% 0% <1% 100%  2022 0.594 0.028 21.2	GLOSSARY & NOT Btu: British thermal Primary: Central Pl MMBtu: Million Btu Mwh: mega watt-ho (1) Info for CEP onl (2) Kyoto Base Yea (3) Combined Heat (4) "Beyond Coal" b (5) GHG NOT adjus (6) Ithaca Campus

Grid CO <sub>2</sub> Emission Factor (kg/MWh) Grid Electric CO <sub>2</sub> (1,000 metric tons)  Cornell Central Energy Plant Cornell Coal <sup>(4)</sup> Cornell Natural Gas <sup>(5)</sup> Cornell Oil  Total CEP CO <sub>2</sub> Emissions (1,000 metric tons)  Total CO <sub>2</sub> Emissions (1,000 metric tons)  CO <sub>2</sub> Emissions By Primary Energy Type:  Electricity (Grid Purchased) On-Site Coal On-Site Natural Gas On-Site Oil On-Site Hydro	870 152 125 15 11 151 303 1990 50% 41% 5% 4%	106 (134 (134 140 2022 4%
Cornell Central Energy Plant  Cornell Coal <sup>(4)</sup> Cornell Natural Gas <sup>(5)</sup> Cornell Oil  Total CEP CO <sub>2</sub> Emissions (1,000 metric tons)  Total CO <sub>2</sub> Emissions (1,000 metric tons)  CO <sub>2</sub> Emissions By Primary Energy Type:  Electricity (Grid Purchased)  On-Site Coal  On-Site Natural Gas  On-Site Oil	125 15 11 151 303 1990 50% 41% 5%	134 134 140 2022 4%
Cornell Coal <sup>(4)</sup> Cornell Natural Gas <sup>(5)</sup> Cornell Oil Total CEP CO <sub>2</sub> Emissions (1,000 metric tons)  Total CO <sub>2</sub> Emissions (1,000 metric tons)  CO <sub>2</sub> Emissions By Primary Energy Type:  Electricity (Grid Purchased) On-Site Coal On-Site Natural Gas On-Site Oil	15 11 151 303 1990 50% 41% 5%	134 (134 140 2022 4%
Cornell Natural Gas <sup>(5)</sup> Cornell Oil Total CEP CO <sub>2</sub> Emissions (1,000 metric tons)  Total CO <sub>2</sub> Emissions (1,000 metric tons)  CO <sub>2</sub> Emissions By Primary Energy Type:  Electricity (Grid Purchased) On-Site Coal On-Site Natural Gas On-Site Oil	15 11 151 303 1990 50% 41% 5%	134 (134 140 2022 4%
Cornell Oil Total CEP CO <sub>2</sub> Emissions (1,000 metric tons) Total CO <sub>2</sub> Emissions (1,000 metric tons)  CO <sub>2</sub> Emissions By Primary Energy Type: Electricity (Grid Purchased) On-Site Coal On-Site Natural Gas On-Site Oil	11 151 303 1990 50% 41% 5%	134 140 2022 4%
Total CEP CO <sub>2</sub> Emissions (1,000 metric tons)  Total CO <sub>2</sub> Emissions (1,000 metric tons)  CO <sub>2</sub> Emissions By Primary Energy Type:  Electricity (Grid Purchased)  On-Site Coal  On-Site Natural Gas  On-Site Oil	151 303 1990 50% 41% 5%	134 140 2022 4%
Total CO <sub>2</sub> Emissions (1,000 metric tons)  CO <sub>2</sub> Emissions By Primary Energy Type:  Electricity (Grid Purchased)  On-Site Coal  On-Site Natural Gas  On-Site Oil	303 1990 50% 41% 5%	2022 4%
CO <sub>2</sub> Emissions By Primary Energy Type:  Electricity (Grid Purchased)  On-Site Coal  On-Site Natural Gas  On-Site Oil	1990 50% 41% 5%	<u>2022</u> 4%
Electricity (Grid Purchased) On-Site Coal On-Site Natural Gas On-Site Oil	50% 41% 5%	4%
On-Site Coal On-Site Natural Gas On-Site Oil	41% 5%	
On-Site Natural Gas On-Site Oil	5%	0%
On-Site Oil		
	4%	96%
On-Site Hydro		0%
- ···- ·· <b>y</b> -·· -	0%	100%
CENTRALLY CONNECTED BLDG GSF x 1,000	)	
	<u>1990</u>	2022
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		
. ,	<u>1990</u>	2022
Electric (CEP to Campus)	NA	49
Steam (gross Generation)	NA	99
Chilled Water (gross Production)	NA	53
ENERGY CONSUMPTION BY BUILDING		
Building Type: (trillion Btu)	<u>1990</u>	2022
Research/Teaching	NA	1.98
Campus Life	NA	0.55
Administration (includes CEP)	NA	0.22
POPULATION AND WEATHER		
OI GEATION AND WEATHER	<u>1990</u>	2022
Students	18,389	24,507
Staff/Non-Faculty	7,690	9,990
Faculty	1,617	1,524
Ithaca Campus <sup>(6)</sup> (1000 GSF)	11,800	16,025
Campus GSF per Student	642	654
Heating Degree Days (7,220 Normal)	6,919	6,809
Cooling Degree Days (337 Normal)	312	452
GLOSSARY & NOTES		
Btu: British thermal unit		
Primary: Central Plant Usage		
MMBtu: Million Btu		
Mwh: mega watt-hour		
<ul><li>(1) Info for CEP only, not all campus facilities par</li><li>(2) Kyoto Base Year is 1990</li></ul>	rt of CEP	
(2) Ryoto Base Year is 1990 (3) Combined Heat & Power Plant start-up FY 20	010	
(4) "Beyond Coal" begins FY 2012	-	
(5) GHG NOT adjusted for exported electric		