

**Fiscal Year 2012  
Cornell University  
Central Energy Plant (CEP) Fast Facts<sup>1</sup>**

| <b>CEP PRIMARY ENERGY CONSUMPTION</b>   |                           |             |
|---|---------------------------|-------------|
| Primary Consumption (trillion Btu)      | <u>1990<sup>(2)</sup></u> | <u>2012</u> |
| Electricity (Grid Purchased)            | 0.60                      | 0.22        |
| Coal                                    | 1.33                      | 0.00        |
| Hydro (electric)                        | 0.02                      | 0.02        |
| Natural Gas                             | 0.28                      | 2.40        |
| Oil                                     | 0.14                      | 0.00        |
| <b>Total Primary Energy Consumption</b> | <b>2.35</b>               | <b>2.64</b> |

| <b>CENTRAL ENERGY PLANT EFFICIENCY</b> |             |             |
|--|-------------|-------------|
| Energy Output (trillion Btu)           | <u>1990</u> | <u>2012</u> |
| Total Steam Generation                 | 1.31        | 1.19        |
| Total Turbine Electric Generation      | 0.07        | 0.70        |
| <b>Total Energy Output</b>             | <b>1.38</b> | <b>1.88</b> |

| Fuel Sources (trillion Btu)              | <u>1990</u> | <u>2012</u> |
|--|-------------|-------------|
| Coal                                     | 1.33        | 0.00        |
| Natural Gas - Boilers                    | 0.28        | 0.09        |
| Natural Gas - Turbines                   | 0.00        | 2.04        |
| Natural Gas - Duct Burners               | 0.00        | 0.28        |
| Oil                                      | 0.14        | 0.00        |
| <b>Total Energy Input (trillion Btu)</b> | <b>1.74</b> | <b>2.40</b> |
| <b>Total Central Plant Efficiency</b>    | <b>69%</b>  | <b>78%</b>  |

|                                  |    |      |
|----------------------------------|----|------|
| Total Steam Sales (trillion Btu) | NA | 0.97 |
| Total Steam Losses (%)           | NA | 18%  |

| <b>ELECTRICITY</b>                                   |                |                |
|--|----------------|----------------|
| Cornell Utilities Generated (Mwh)                    | <u>1990</u>    | <u>2012</u>    |
| Cornell Utilities Hydro                              | 5,200          | 5,700          |
| Cornell Utilities Steam Turbine - Cogen              | 21,000         | 23,900         |
| Cornell Utilities Gas Turbine - CCHPP <sup>(3)</sup> | 0              | 182,700        |
| <b>Total Cornell Utilities Generated</b>             | <b>26,200</b>  | <b>212,300</b> |
| Electricity Exported to Grid (Mwh)                   | 0              | (31,800)       |
| Electricity (Grid Purchased) (Mwh)                   | 175,000        | 57,700         |
| <b>Total CEP Electricity (Mwh)</b>                   | <b>201,200</b> | <b>238,200</b> |
| <b>Total Campus Sales (Mwh)</b>                      | <b>NA</b>      | <b>222,000</b> |
| Electricity LSC (Grid Purchased) (Mwh)               | 0              | 5,900          |

| <i>Electricity (Grid Purchased) Sources</i> | <u>1990</u> | <u>2012</u> |
|---|-------------|-------------|
| Other Renewables                            | 0%          | 4%          |
| Coal  | 74%         | 7%          |
| Natural Gas                                 | 5%          | 44%         |
| Hydro                                       | 14%         | 11%         |
| Nuclear                                     | 5%          | 13%         |
| Petroleum                                   | 2%          | 16%         |
| Other Gases                                 | 0%          | <1%         |
| Pumped Storage                              | 0%          | 4%          |

| <b>CHILLED WATER</b>                             |             |             |
|--|-------------|-------------|
| Energy Output & Input (trillion Btu)             | <u>1990</u> | <u>2012</u> |
| Total Chilled Water Production (trillion Btu)    | 0.338       | 0.585       |
| Total Energy Input (trillion Btu) <sup>(6)</sup> | 0.072       | 0.024       |
| <b>System Coefficient of Performance</b>         | <b>4.7</b>  | <b>24.4</b> |
| Total Campus Sales (trillion Btu)                | N/A         | 0.580       |
| <b>Chilled Water Sources</b>                     |             |             |
| Mechanical Chillers                              | 83.2%       | 1%          |
| Lake Source Cooling                              | 17%         | 99%         |

| <b>ENERGY RELATED CARBON DIOXIDE (CO<sub>2</sub>) EMISSIONS</b> |             |             |
|---|-------------|-------------|
| Purchased Electric  | <u>1990</u> | <u>2012</u> |
| Grid CO <sub>2</sub> Emission Factor (lbs/MWh)                  | 1,918       | 669         |
| Grid Electric CO <sub>2</sub> (1,000 tons)                      | 167         | 21          |
| <b>Cornell Central Energy Plant</b>                             |             |             |
| Cornell Coal <sup>(4)</sup>                                     | 138         | 0           |
| Cornell Natural Gas <sup>(5)</sup>                              | 15          | 120         |
| Cornell Oil   | 12          | 0.4         |
| Total CEP CO <sub>2</sub> Emissions (1,000 tons)                | 165         | 120         |
| <b>Total CO<sub>2</sub> Emissions (1,000 tons)</b>              | <b>333</b>  | <b>141</b>  |

| CO <sub>2</sub> Emissions By Primary Energy Type: | <u>1990</u> | <u>2012</u> |
|---|-------------|-------------|
| Electricity (Grid Purchased)                      | 50%         | 15%         |
| On-Site Coal                                      | 42%         | 0%          |
| On-Site Natural Gas                               | 5%          | 85%         |
| On-Site Oil                                       | 4%          | 0%          |
| On-Site Hydro                                     | 0%          | 0%          |

| <b>CENTRALLY CONNECTED BLDG GSF x 1,000</b> |             |             |
|---|-------------|-------------|
|   | <u>1990</u> | <u>2012</u> |
| Electric (provided via CEP)                 | NA          | 13,700      |
| Steam (provided via CEP)                    | NA          | 12,600      |
| Chilled Water (provided via CEP)            | NA          | 8,000       |

| <b>ENERGY METRICS (KBTU/GSF) PER YEAR</b> |             |             |
|---|-------------|-------------|
|   | <u>1990</u> | <u>2012</u> |
| Electric Sales                            | NA          | 59          |
| Steam Sales                               | NA          | 94          |
| Chilled Water Sales                       | NA          | 73          |

| <b>ENERGY CONSUMPTION BY BUILDING</b> |             |             |
|---------------------------------------|-------------|-------------|
| Building Type: (trillion Btu)         | <u>1990</u> | <u>2012</u> |
| Research/Teaching                     | NA          | 1.90        |
| Campus Life                           | NA          | 0.53        |
| Administration                        | NA          | 0.21        |

| <b>POPULATION AND WEATHER</b>           |             |             |
|---|-------------|-------------|
|   | <u>1990</u> | <u>2012</u> |
| Students                                | 18,389      | 20,377      |
| Staff/Non-Faculty                       | 7,690       | 8,046       |
| Faculty                                 | 1,617       | 1,596       |
| Ithaca Campus <sup>(6)</sup> (1000 GSF) | 11,800      | 15,200      |
| Campus GSF per Student                  | 642         | 746         |
| Heating Degree Days (7,220 Normal)      | 6,919       | 5,767       |
| Cooling Degree Days (337 Normal)        | 312         | 570         |

**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 adjusted for exported electric
- (6) Ithaca Campus includes non-CEP connected facilities