## 2015 Utility Master Plan Summary

The 2015 Utility Master Plan report is an update to the 2005 plan and includes information regarding the existing utility distribution systems as well as recommendations as to how the campus utilities should be modified and expanded to accommodate the proposed ultimate campus build-out. The update specifically targeted the infrastructure of steam, chilled water, electrical power, and renewable energy in the context of the sanitary and domestic water analysis and recommendations. It is critical that all proposed utility infrastructure recommendations relate back to the future development phasing schedules to ensure capacity and physical space availability. A summary of the systems is listed below.

### Steam System:
There are over 25 miles of steam and condensate piping serving the campus with steam delivered to nearly every building on campus. The steam is provided by three facilities on the UW-Madison campus: Charter Street Heating Plant, Walnut Street Heating Plant, and the West Campus Cogeneration Facility, creating a total maximum capacity of 2,300,000 pounds per hour with a firm capacity\(^1\) of 2,000,000 pounds per hour. As an energy provider, the university has tremendous fuel diversity enabling the use of a chilled water thermal energy storage system to produce chilled water more efficiently via lower temperature condenser water.

### Electrical Power System:
The primary electrical system serving campus uses a combination of 4.16 kV and 13.8 kV distribution voltages. Electric power is purchased from Madison Gas and Electric at 13.8 kV and transformed on campus to the required distribution voltage. As the electric system is expanded to accommodate future load growth on campus the following general guidelines have been recommended:
- The addition of 13.8 kV circuit breaker connections for proposed buildings,
- Ensure system redundancy and reliability to maintain certifications and grant eligibility to meet the needs of research and associated building uses,
- The addition of heavy tie feeders between key campus switching stations to support backup power availability across campus.

### Renewable Energy:
The university remains committed to investigating and expanding the existing use of renewable energy sources and sustainable design. Renewable systems have been implemented across campus in building retrofits as well as completed new construction projects. The use of renewable energy strategies supports the university's goals per the 2010 Sustainability Initiative Task Force to: reduce existing building energy use; maximize purchase and generation of sustainable alternative power; and ensure robust tracking of consumption and emissions. Recommendations of the Utility Master Plan include the incorporation of renewable energy into campus design and the purchase of ‘green power’ from the electrical grid. Wind, photovoltaics, solar thermal hot water, and transpired solar collectors are identified as additional options and applicable based on the campus context and proposed future developments.

\(^1\) Firm Capacity - A calculation determined by the total system capacity after subtracting off the largest system unit.