# Water

The links between energy and water are both explicit and subtle. The explicit ones are those that are involved with steam production, evaporative cooling and the like. The subtle interconnections are the embedded energy use in water extraction, purification, transportation and wastewater treatment and the embedded water content of electricity. More importantly, water can itself be creatively used as a means for storing, modulating, and transferring energy between different sub-systems. With the above in mind, we would argue that the challenge for the campus is to reduce the use of all inputs – energy, water, and materials – simultaneously, recognizing that such an approach offers the most flexibility to achieve not just GHG reductions but potentially insulate the campus from externalities such as drought, spike in energy prices and the like.

It is also important to recognize that the Campus is a major user of water within the community. Much of this water is drawn from the Mahomet aquifer which serves as the primary water source for many communities in its vicinity. As the flagship institution of higher education in the State, and one of the leading research institutions in the world, it is a moral imperative for the campus to practice responsible stewardship of the natural resources it depends on. A progressive agenda on water conservation and reuse has the potential to create a wider ripple effect in the future through providing a local platform for multi-disciplinary scholarship integrated with practice. This would provide the UIUC campus a competitive advantage in attracting highly qualified staff and students from across the world while advancing solutions to an ever growing global need for potable water.

The 2010 iCAP goals for water had set the following targets:

Reduce potable water usage and its associated emissions from a fiscal year 2008 baseline:

* + - 20 percent by 2015
    - 30 percent by 2020
    - 40 percent by 2025.

As a first step to updating the iCAP goals, an analysis of performance to date was performed. This reveals that the targets set for reductions to be achieved in 2015 have been exceeded as of 2010 (Table 1).

Secondly, the targets as set in the 2010 iCAP plan were normalized to account for weighted number of campus users assuming a growth rate of about 1%. A further examination of water use per unit of service area was also carried out. These results, summarized in Table 2, were then compared to water use on other campuses to place them in context (Figures 1 and 2).



Figure 1 Comparative water use per area serviced among select campuses

Figure 2 Comparative water use per weighted campus user among select campuses

Based on the comparative analyses, the targets set in the 2010 iCAP for 2020 appear eminently achievable. The committee recommends that these targets continue to be the goal for campus water reduction with the following additions:

Targets

1. Normalized levels of 20,000 gallons per weighted campus user in 2020 and 16500 gallons per weighted campus user by 2025

2. Normalized levels of 46 gallons per total buildings sq. ft) by 2020 and 39 gallons per sq. ft. in 2025

The committee also recognizes that while the water reductions achieved so far have been impressive, achieving further reductions is likely to involve greater effort and expense. To this end, the committee recommends adopting the following three strategies:

Strategies

1. Undertake a bottoms-up approach to estimate consumption by end-use using best practices to determine reductions achievable by water conservation alone
2. Recognize water reuse as an essential component to continue reductions in fresh water demand on campus beyond 2025; initiate planning activities to increase water reuse on campus
3. Integrate the physical and natural elements of campus topography to reduce water demand on campus and facilitate reuse

We recommend that the following actions be taken in the short run:

1. Establish a standing committee comprised of representatives from faculty, non-academic units, and facilities & services to oversee the implementation of the strategies outlined
2. Require a review of the water impact of all new construction, modifications, or expansion across all campus units including auxillaries and athletic departments
3. Establish/publicize anticipatory yearly goals for achieving water reduction
4. Make available water quantity and quality data on a publicly accessible site to encourage transparency, encourage instructional use, and campus-wide participation in conservation activities
5. Partner with campus units such as PRI and outside agencies such as Alliance for Water Efficiency, WaterReuse foundation, AWWA etc to promote water conservation efforts.
6. Implement recommendations in the SSC sponsored project on water conservation in cooling tower operations
7. Begin utilizing non-potable water, including untreated raw water, sump pump discharge, cooling wastewater, stormwater and graywater.