Implementation Plan

- Install building utility meters and data collection/reporting mechanisms to provide regular information reporting for energy conservation and business process improvement
  - Identify poorly functioning facilities for operating cost savings opportunity
  - Determine actual utilities cost information for self-supporting divisions
  - Provide energy consumption information to determine effectiveness of energy conservation measures and communicate value of the efforts of building occupants to conserve
Approach

- Use a multi-phase approach to obtain the quickest ROI on metering investment as feasibly possible
  - Phase-1 (in progress)
    - Large and energy intense PF campus facilities
    - Significant size self-supporting division facilities
  - Phase-2
    - Mid size PF facilities
    - Balance of self-supporting division facilities
  - Phase-3
    - All remaining campus facilities which consume enough energy on a regular basis to justify metering expense
Scope

- Meter all PF facilities >100,000 GSF
- Meter major energy consuming PF facilities
- Meter self supporting division facilities >25,000 GSF

Completion Impact

- Volume of main campus utilities measured
  - 63% of heating steam
  - 51% of chilled water cooling
  - 69% of electricity
- Metering of 57% of campus GSF area
- Measurement and tracking of ~$15M/year (54%) of total annual purchased utilities expense
Phase 1

**Status**
- All campus potable water services are metered, data is utilized for sewage billing and operating cost reduction opportunity assessment
- 20 of 67 targeted facilities are 100% metered
- 49% of Ph–1 meters are installed and data collection taking place
- 14 individual utility meters are currently in construction/installation
Phase 1

- Remaining Balance of Work – Funding Need
  - Steam/Condensate metering
    - 13 PF facilities $78,000
    - 2 HFS facilities $12,000
    - 3 ICA facilities $18,000
    - $108,000 est.
  - Chilled Water metering
    - 20 PF facilities $260,000
    - 13 HFS facilities $169,000
    - 4 ICA facilities $52,000
    - $481,000 est.
Phase 1

Electric Metering
- 13 PF facilities: $156,000
- 22 HFS facilities: $264,000
- 2 ICA facilities: $24,000

Estimated Total Funding Need
- $494,000 for PF facilities
- $445,000 for HFS facilities
- $94,000 for ICA facilities

Total: $1,033,000 (in 2010$)

Estimated Time to Completion:
- Early finish – August 2010
- Late finish – December 2010
Phase 2

**Scope**
- Meter all PF facilities >20,000 GSF
- Meter balance of self supporting division facilities

**Completion Impact**
- 80% of campus GSF fully metered
- Measurement and tracking of ~$25M/year (90%) of annual purchased utilities expense
Phase 2

- **Estimated Total Funding Need**
  - $1,280,000 for PF facilities
  - $132,000 for HFS facilities
  - $0 for ICA facilities
  - **$1,409,000 in Total** (in 2010$)

- **Estimated Time to Completion:**
  - Early finish – May 2011
  - Late finish – September 2011
Scope
- Meter balance or campus facilities which justify installation of metering

Completion Impact
- +95% of campus GSF area fully metered
- Measurement and tracking of ~$28M/year (99%) of annual purchased utilities expense
Phase–3

- **Estimated Total Funding Needed**
  - $725,000 for PF facilities
  - $0 for HFS facilities
  - $0 for ICA facilities
  - **$725,000 in Total** (in 2010$)

- **Estimated Time to Completion:**
  - Early finish – January 2012
  - Late finish – May 2012
Metering Installation Expense & Annual Targeted Savings

One-time Metering Investment

Annual Targeted Savings

$ Million

Phase 1  Phase 2  Phase 3

One-time Metering Investment

Annual Targeted Savings
# Metering Summary

<table>
<thead>
<tr>
<th></th>
<th>PHASE 1</th>
<th>PHASE 2</th>
<th>PHASE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COST</strong></td>
<td>$1.033M</td>
<td>$1.409M</td>
<td>$0.725M</td>
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<tr>
<td><strong>CAPABILITY (% total annual utilities)</strong></td>
<td>54%</td>
<td>90%</td>
<td>99%</td>
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