Energy Performance Contract

- Belknap Campus, Health Sciences Center, and Shelby Campus
- $46.2 million of energy efficient facility improvements
- 88 buildings / 6.2 million square feet of space
- Will generate $64 million of guaranteed savings over the 14+ year term
- Equivalent to $4.4 million of annual savings, or $12,086 per day
- If the guarantee is not met, Siemens will pay to cover the shortfall
Reduction in Carbon Footprint

Annual Reduction in Greenhouse Gases
- 92,371,102 lbs. of carbon dioxide (CO2)
- 152,175 lbs. of nitrogen oxides (NOx)
- 463,175 lbs. of sulfur dioxide (SO2)

Annual Equivalent Reduction
- 7,690 cars driven for a year, or
- 296 acres of forest preserved from deforestation, or
- 222 rail cars of coal
### UofL Baseline Energy Use (2009)

<table>
<thead>
<tr>
<th>Campus</th>
<th>Electricity</th>
<th>Coal</th>
<th>Natural Gas</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Sciences</td>
<td>$2,924,510</td>
<td>$1,026,116</td>
<td>$109,668</td>
<td>$4,060,294</td>
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<tr>
<td>Belknap</td>
<td>$4,713,973</td>
<td>$502,281</td>
<td>$1,345,050</td>
<td>$6,561,304</td>
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<td>Shelby</td>
<td>$174,775</td>
<td>$0</td>
<td>$92,257</td>
<td>$267,032</td>
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<tr>
<td>TOTAL</td>
<td>$7,813,258</td>
<td>$1,528,397</td>
<td>$1,546,975</td>
<td>$10,888,630</td>
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</tbody>
</table>

- Energy costs are rising 5-7% annually (Public Service Commission approved 11/2011 a 18% rate increase phased in by 2016)
- LG&E provides UofL’s natural gas and electricity (with 98% of electricity generated from coal)
- Central heating system for Health Sciences campus is jointly owned by UofL, Norton’s Children Hospital, and Jewish Hospital
- UofL is committed to be carbon neutral by 2050 (American College & University Presidents' Climate Commitment)
Definition of Energy Saving Performance Contract

- **ESPC** is a no-upfront-cost contracting method. The contractor incurs the cost of implementing energy conservation measures (ECM) and is paid from the energy, water, wastewater and operations savings resulting from these ECMs.
- Turnkey solution—evaluation, assessment of alternatives, design, construction, commissioning
- Maximum contract 15 years (state limit)
- Risk sharing with guarantee of cost savings (30% at UofL)
Reallocate the University’s Utility Bill

- Pay a lower utility bill
- Pay the contractor
- Achieve cost savings for the government
Energy Efficient Motors

- Replaced 259 older motors with new premium efficiency motors
- Saves an average of 5% of the previous energy consumption
- Annual energy savings: $35,650
Energy Efficient Belts for Motors

- Replaced 213 standard V-style belts with new non-slipping synchronous belts for fan motors with variable frequency drives.
- Saves an average of 8% of the previous energy consumption
- Annual energy savings: $46,037
Low Flow Showerheads

- Replaced 616 shower heads with low flow (2.0 gallons per minute) showerheads
- Reduces hot and cold water consumption for showering by an average of 11%
- Annual energy savings: $34,444
Low Flow Faucet Aerators

- Replaced 2,042 faucet aerators with low flow, pressure independent aerators
- Reduces water consumption at sinks by an average of 58%
- Annual energy savings: $159,488
Insulated Steam Valve Jackets

- Installed 1,152 insulated steam jackets on steam valves
- Reduces heat loss at the valve by 90%
- Annual energy savings: $327,020
Energy Efficient Lighting

Installed the following:

- 117,483 fluorescent lamps for interior lighting
- 41,714 electronic ballasts
- 1,729 induction lamps for exterior lighting

- Reduces lighting energy consumption by 14%
- Annual energy savings: $915,350
Occupancy Sensors for Lighting

- Installed 2,011 occupancy sensors
- Reduces lighting energy consumption by 20-40%
- Annual energy savings: $97,550
Conversion to Natural Gas

• Remove old coal-fired boiler (~500,000 tons per year)

• Central Steam and Chill plant

• 1\textsuperscript{st} natural gas boiler installed October 2010, 2\textsuperscript{nd} backup boiler currently being installed

• Cost of each boiler is $2 million

• Estimated cost savings of $2.3 million/year