

LEED and Existing Terminals: Applicable Strategies Employed at the Dallas/Fort Worth International Airport

American Association of Airport Executives
Airports Going Green Conference

August 6, 2009

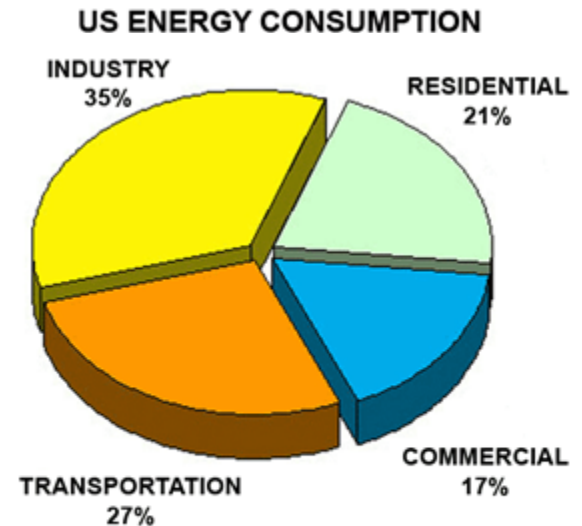
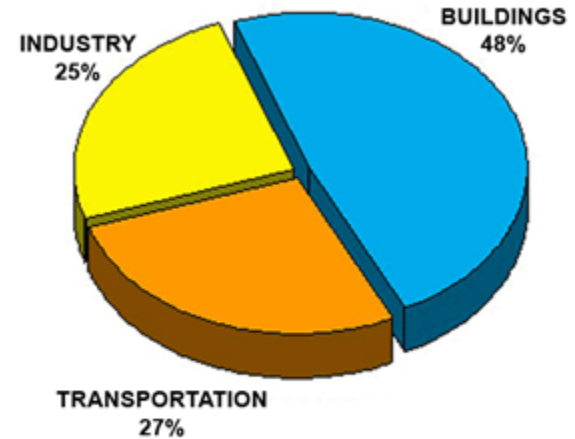
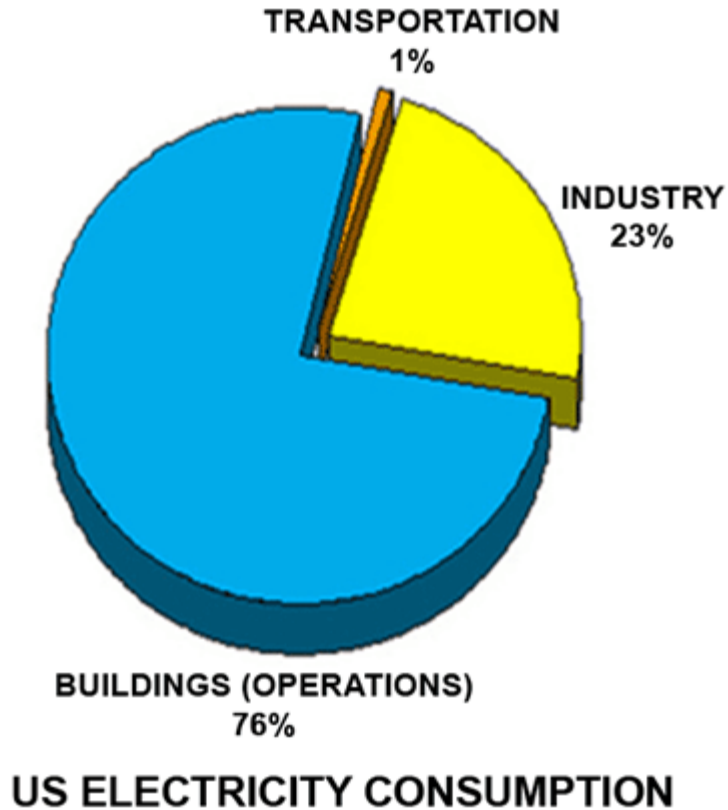




Some Context



Building Sector Energy Use

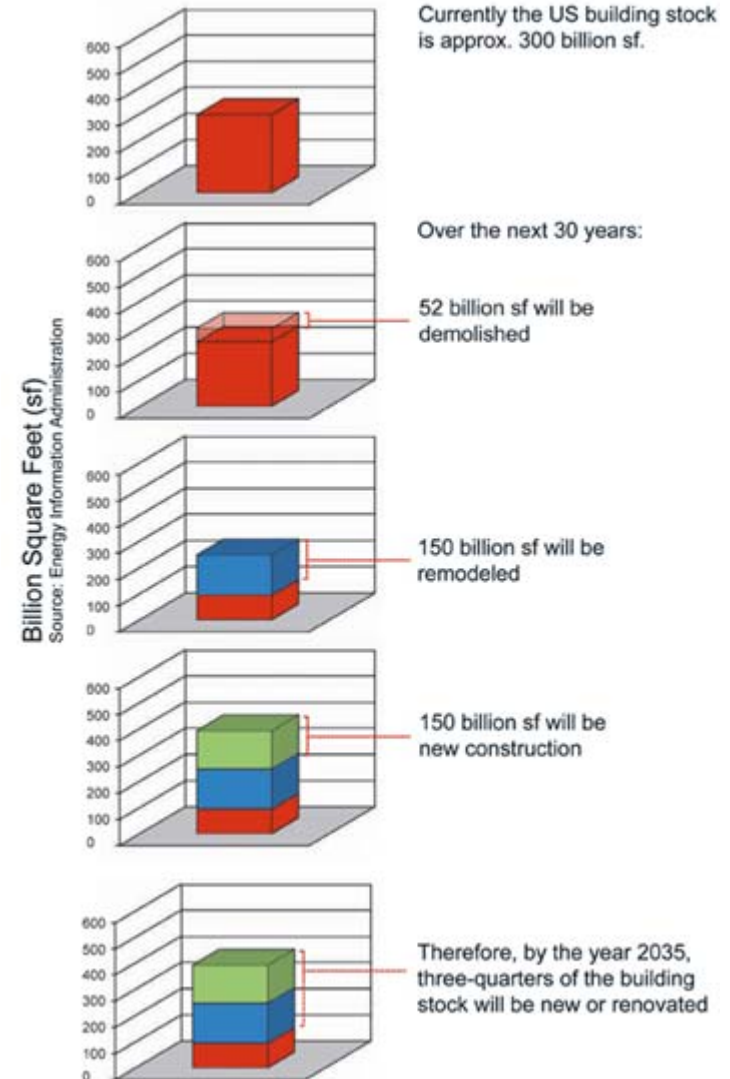


Source: U.S. Energy Information Administration statistics

U.S. Building Stock

- By 2035, three quarters of the built environment in the U.S. will be either new or renovated.
- Huge need (opportunity) to address energy use and related environmental impacts of buildings.

Source: architecture2030



Building Asset Lifecycle

75% of the decisions that drive lifecycle cost occur before/during design

75% of the cost of ownership occurs **AFTER** design and construction

Total Cost of Ownership

Operating Costs and Debt Service

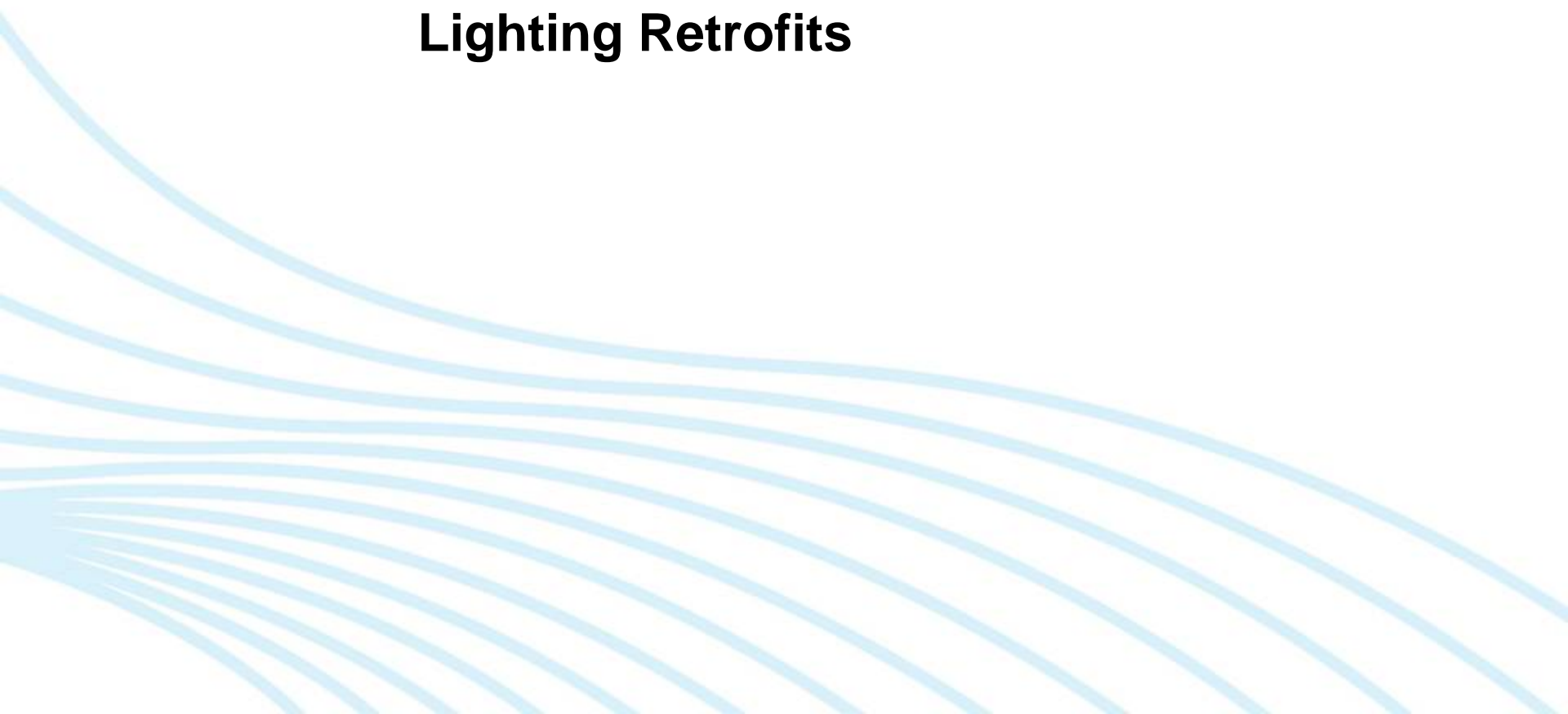
Planning Design Construction Operations

LEED NC, CS, CI / LEED D&C, Interiors

LEED EBv2.0 / LEED EB: O&M



Energy Efficiency Lighting Retrofits



Terminal Lighting Retrofits

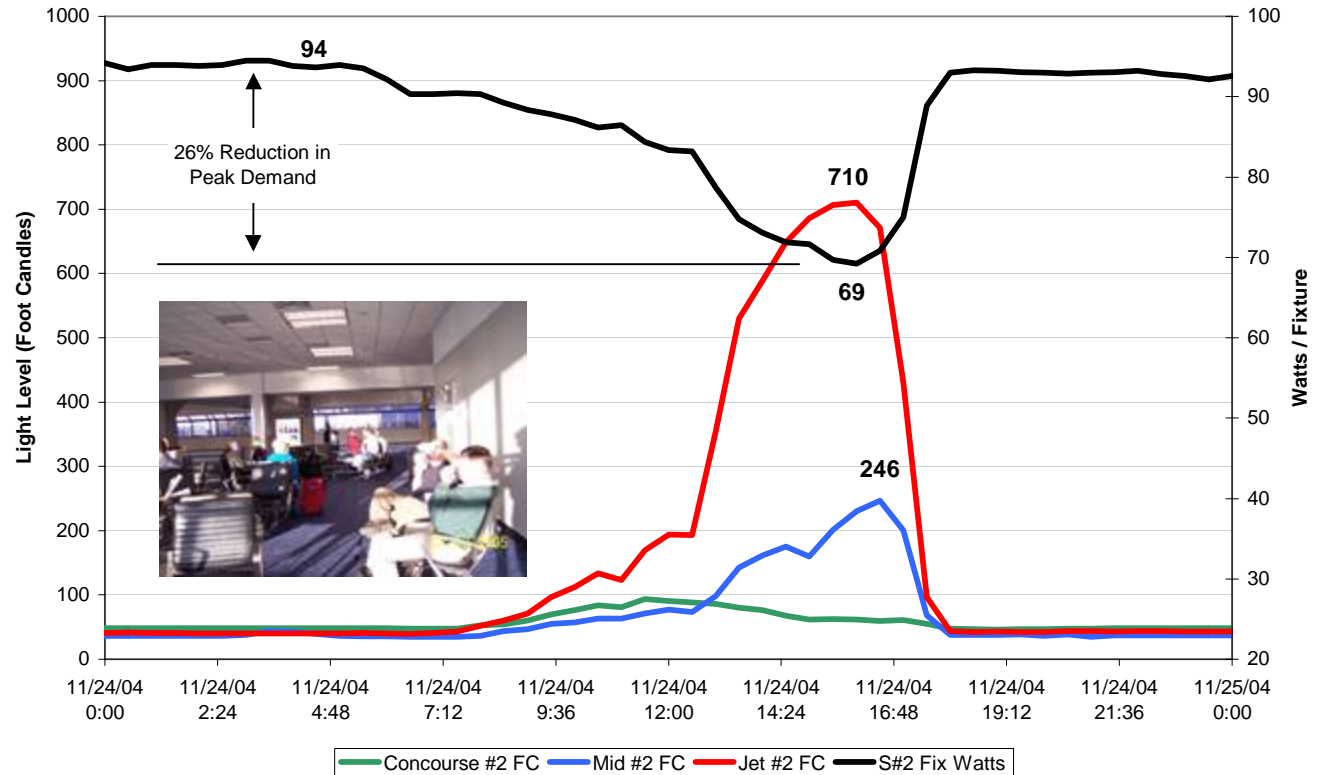
- Replaced T12 fluorescent lamps with T8s
- Replaced magnetic lighting ballasts with electronic ballasts
- Replaced incandescent exit signs with LED type
- Replaced PAR and HID down lights with CFLs
- Occupancy sensors for lighting control



Self-Dimming Fluorescent Lighting Ballast



Seating Area Watts/Fixture & Light Level Profiles
(Sunny Day - Peak Daylight)





Energy Efficiency Continuous Commissioning®

Continuous Commissioning[®]

- CC[®] optimizes energy use based actual building conditions and requirements
- Routinely achieves 10 – 25% whole building energy cost reductions
- Over 300 buildings, 15 district energy plants, 3 thermal storage systems commissioned with measured savings in excess of \$75 million since 1993
- Total building performance orientation
- M&V in accordance with IPMVP



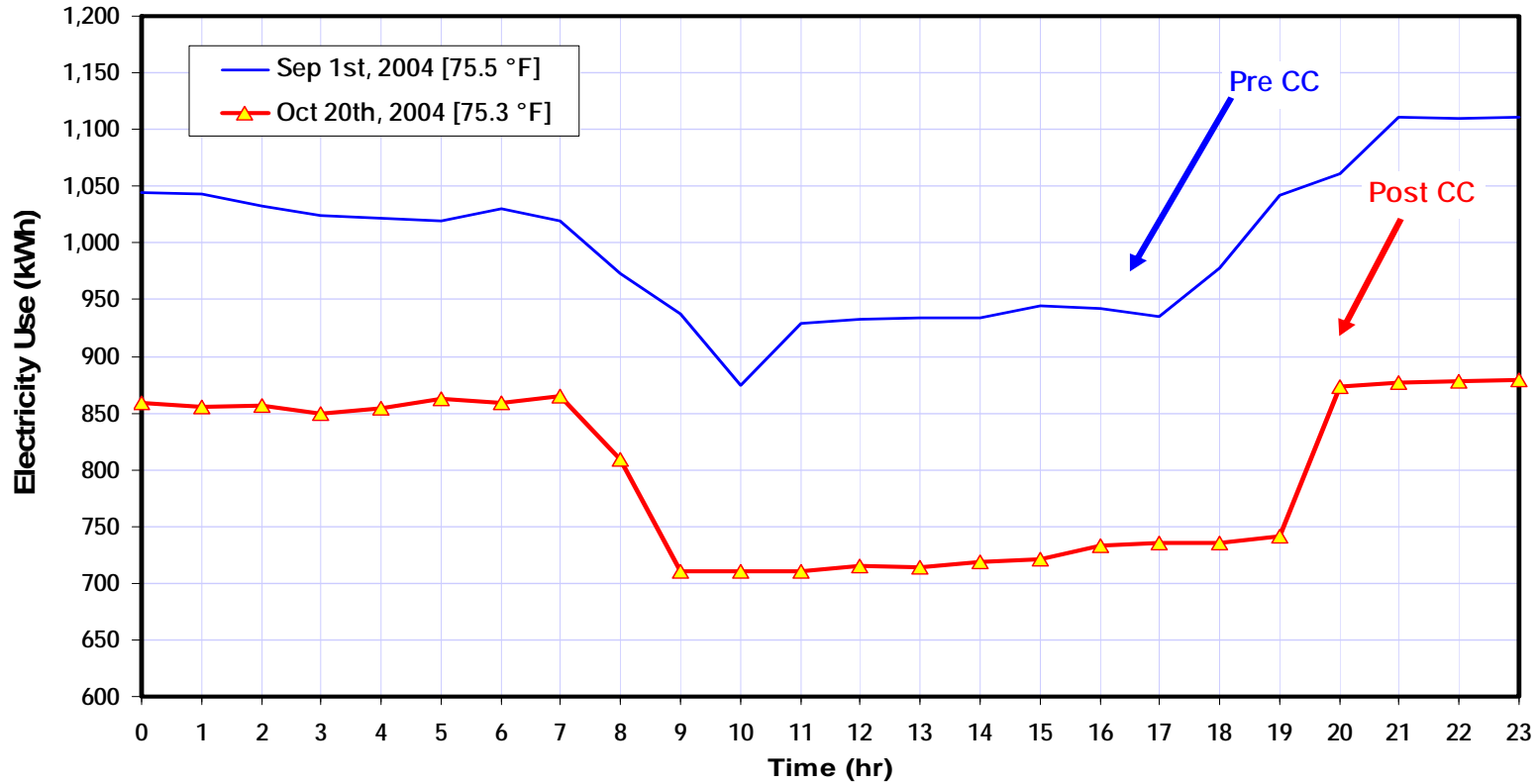
Continuous Commissioning® Projects

- DFW Rental Car Facility
- Calibrated and repaired sensors and malfunctioning devices
- Modified control sequences and implemented reset schedules
- Optimized control sequences
- Increased heating and cooling deadbands and implemented uniform space temperature setpoints throughout



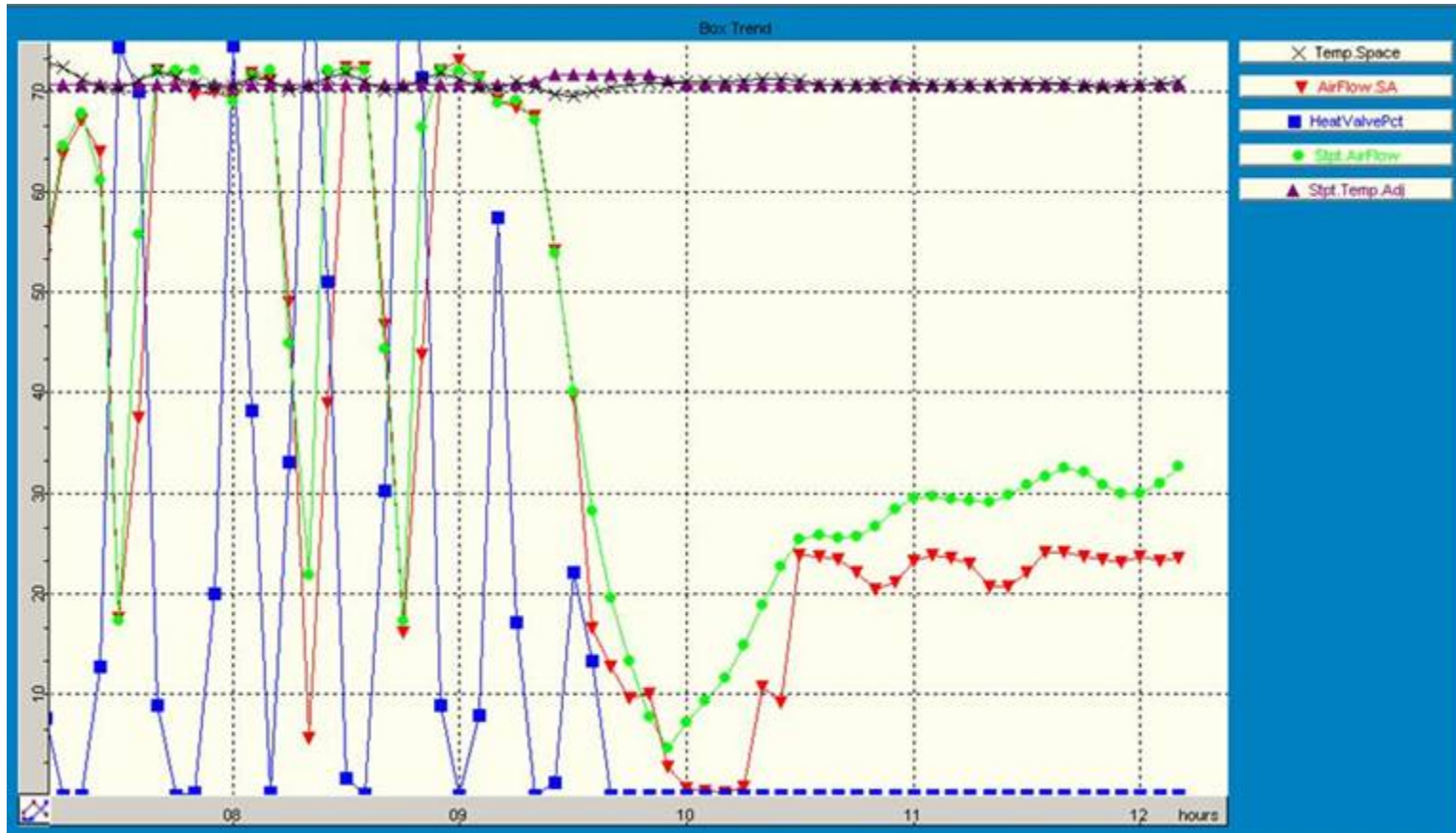
Continuous Commissioning[®] Projects

Rent-A-Car (RAC) Center at DFW Int'l Airport



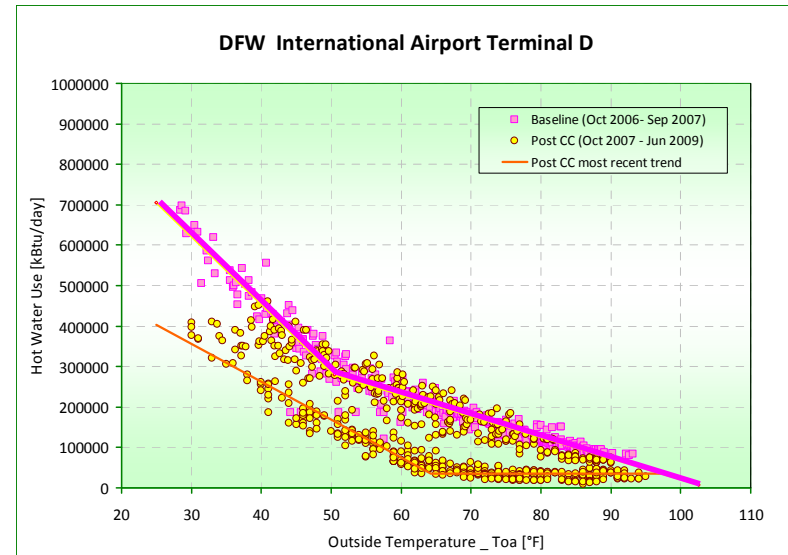
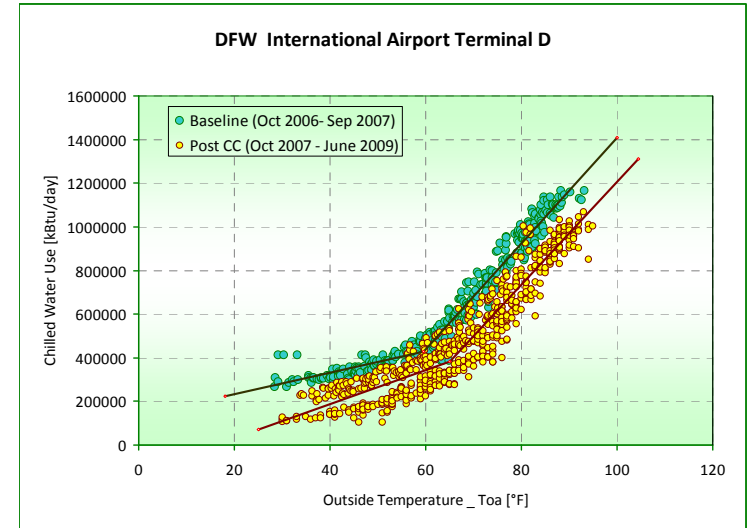
Energy Savings - 1 million (kWh) / yr (18%)

Continuous Commissioning[®] Projects



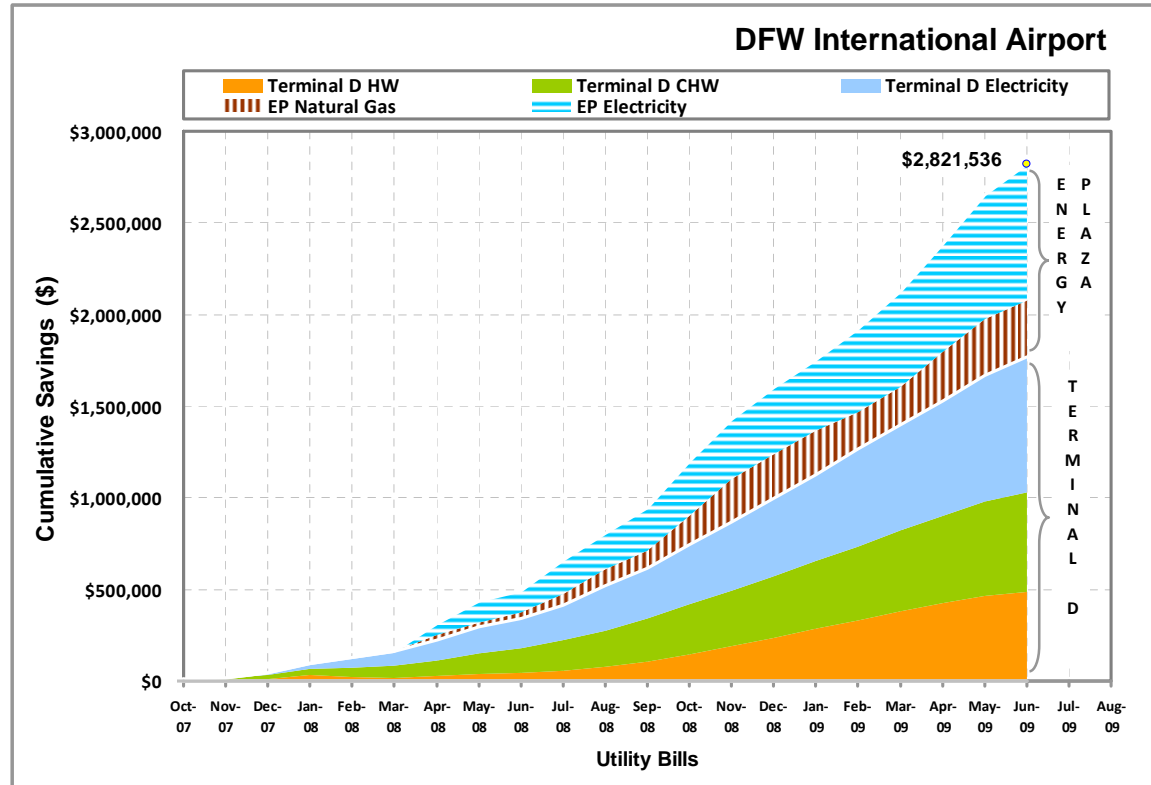
Continuous Commissioning[®] Projects

- Continuous Commissioning
 - Terminal D
 - Energy Plaza
- 2 year project
- M&V by IPMVP Option C
- Operating schedules
- Equipment staging
- Temperature and pressure reset
- Air flow settings
- Fan control



Continuous Commissioning® Projects

- \$2.8M in Energy Savings from October 2007 through June 2009
- Cash flow went positive in month 13
- Simple payback in month 18
- Reduction in Emissions
 - 18 tons of NO_x
 - 14,488 tons of CO₂





Water Efficiency High Efficiency Restroom Fixtures

High Efficiency Restroom Fixtures



- Terminal Restroom Refurbishment
- 77 restrooms in 4 existing terminals
- 223 urinals replaced with High Efficiency Urinals (0.5 gallons per flush vs. 1.0 gpf)
- 565 toilets replaced with High Efficiency Toilets (1.28 gallons per flush vs. 1.6 gpf)
- 325 sinks replaced (0.5 gallons per minute vs. (1.0 gpm))

High Efficiency Restroom Fixtures



- Anticipated water savings of 1.15 million gallons (52% reduction)
- Anticipated energy savings of 2,240 kWh (pumping energy)
- Low incremental cost of HEU/HET



Thank you for your kind attention

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