

# Phase 1, Implementation Case Studies

## Science and Engineering 1 LEED Gold, 237,000 GSF



METRIC	BENCHMARKS		TARGET	AS-OPERATED <sup>(1)</sup>		BEST PRACTICE PLANT <sup>(2)</sup>	
	VALUE	UNITS	80% OF BENCHMARK	VALUE	% OF BENCHMARK	VALUE	% OF BENCHMARK
ANNUAL SITE ELECTRICITY <sup>(3)</sup>	40.7	kWh/gsf	32.6	22.5	55%	21.4	53%
ANNUAL SITE GAS <sup>(4)</sup>	1.82	therms/gsf	1.45	1.30	71%	1.22	67%
ANNUAL SITE EUI	321	kBtu/gsf	257	207	64%	195	61%
ANNUAL SOURCE EUI <sup>(5)</sup>	557	kBtu/gsf	446	338	61%	320	57%
PEAK POWER	6.73	W/gsf	5.38	3.13	46%	n/a	
PEAK CHILLED WATER AT BUILDING	3.74	tons/1000 gsf	2.99	1.85 <sup>(6)</sup>	49%	n/a	

- (1) Measurement period; July 2007 - June 2008
- (2) Best Practice Plant efficiency assumptions compared to As-Operated:  
Chiller 0.6 kW/ton vs 1.0 kW/ton as-operated  
Hot water 85% boiler efficiency vs 76% as-operated
- (3) Including pro-rated central plant chiller energy use and distribution losses. These figures include approximately 5% transformation / distribution losses and exterior site lighting not typically a part of metered usage for stand-alone buildings.
- (4) Including pro-rated central plant heating and steam generation efficiency and loop distribution losses
- (5) Site to Source conversion factors from CalArch: 2.7 for electricity, 1.0 for natural gas
- (6) Excluding one raw observation spike associated with recovery from a chilled water plant failure

## Classroom Office Building (COB) LEED Gold, 103,000 GSF



METRIC	BENCHMARKS		TARGET	AS-OPERATED <sup>(1)</sup>		BEST PRACTICE PLANT <sup>(2)</sup>	
	VALUE	UNITS	80% OF BENCHMARK	VALUE	% OF BENCHMARK	VALUE	% OF BENCHMARK
ANNUAL SITE ELECTRICITY <sup>(3)</sup>	15.1	kWh/gsf	12.1	9.03	60%	8.49	56%
ANNUAL SITE GAS <sup>(4)</sup>	0.20	therms/gsf	0.16	0.15	75%	0.13	67%
ANNUAL SITE EUI	71.1	kBtu/gsf	56.9	45.5	64%	42.2	59%
ANNUAL SOURCE EUI <sup>(5)</sup>	159	kBtu/gsf	127	97.8	62%	91.4	58%
PEAK POWER	3.65	W/gsf	2.92	1.75	48%	n/a	
PEAK CHILLED WATER AT BUILDING	2.03	tons/1000 gsf	1.62	1.72 <sup>(6)</sup>	85%	n/a	

- (1) Measurement period; July 2007 - June 2008
- (2) Best Practice Plant efficiency assumptions compared to As-Operated:  
Chiller 0.6 kW/ton vs 1.0 kW/ton as-operated  
Hot water 85% boiler efficiency vs 76% as-operated
- (3) Including pro-rated central plant chiller energy use and distribution losses. These figures include approximately 5% transformation / distribution losses and exterior site lighting not typically a part of metered usage for stand-alone buildings.
- (4) Including pro-rated central plant heating efficiency and loop distribution losses.
- (5) Site to Source conversion factors from CalArch: 2.7 for electricity, 1.0 for natural gas
- (6) Excluding two raw observation spikes, one associated with recovery from a chilled water plant failure and one sampling anomaly

