

Whole-Building Energy Use Assessment

City of Redlands

Benchmark objectives and purpose:

- Part of the City's recently adopted Community Sustainability Plan
 - Pin-point effectiveness and results of last three years of energy conservation / efficiency policies and projects implemented thus far
 - Assess current usage to identify problem areas and systems that have the best ROI for retrofit
-

Building Profile:

- Built in 1965, campus of 3 separate buildings, Civic Center Plaza
 - Approximately 39,000 square feet
 - Approximately 100 employees
 - All electric, no gas supplied to buildings
 - Climate Zone 10
 - Evaluation Period: 2007 - 2009
-

Results: A Snapshot

- Energy Star National Performance Rating
-21
 - Absolute Energy Consumption – 11%
 - Buildings/Site Energy Intensity –
88 kBtu/sq. ft.
 - Energy Cost Performance Indicator - \$3.88/
sq. ft.
 - Carbon Emissions Intensity –
18.7 lbs CO₂e/sq. ft.
-

Energy Star National Performance Rating – Score: 21

- ❑ This rating provides the overall indication of building energy efficiency
 - ❑ 2007 – 13; 2009 - 21
 - ❑ The City's rating places it in the lowest quartile, but this score has improved by a total 8 points since 2007
-

Building/Site Energy Intensity – 88kBtu/sq.ft.

- ❑ This metric measures the intensity of overall building energy use, in comparison with similar buildings nationwide.
 - ❑ 2007 – 98.6 kBtu/sq. ft.; 2009 – 88 kBtu/sq. ft.
 - ❑ National average is 63.4 kBtu/sq. ft.
 - ❑ Since 2007, the site energy intensity of the Civic Center Plaza has decrease by 10.65%
-

Energy Cost Performance Indicator - \$3.88/sq. ft.

- ❑ Energy cost metrics measure the intensity of a facility's use of energy from a financial perspective.
 - ❑ 2007 - \$4.17/sq. ft.; 2009 - \$3.88/sq. ft.
 - ❑ Energy cost is 7% lower than 2007 costs. An 11% reduction in energy use is offset by a 4.3% increase in the cost of energy.
-

Carbon Emissions Intensity – 18.7 lbs CO₂e/sq. ft.

- ❑ Carbon emissions metrics reflect the environmental implications of energy use in buildings, this is one more way to reflect the intensity of energy use within buildings.
 - ❑ 2007 – 21.0 lbs CO₂e/sq. ft.; 2009 – 18.7 lbs CO₂e/sq. ft.
 - ❑ In close correlation to energy use, emissions levels are down 11% compared to last year.
-

Implications

- ❑ The buildings' pattern of energy use does not fluctuate. The base load consumption does not vary as it should with seasonal heating and cooling loads. The base load is more than likely excessively high.
 - ❑ Assessments and audits of the systems that drive base load are necessary.
 - ❑ Opportunities to improve the following systems should be targeted: HVAC and controls, lighting systems and controls, all other base load systems and equipment.
 - ❑ In 2009, as a result of key energy efficiency and conservation projects and measures, daily energy consumption is 11% lower overall.
 - ❑ Plug load should be investigated
 - ❑ Routine inspections of the building envelope (roof, exterior walls, windows, doors)
 - ❑ Using analytical benchmarks
-

Questions?

Danielle Garcia
City of Redlands
dgarcia@cityofredlands.org
