CASE STUDY ▶ Partners HealthCare Strategic Energy Master Plan

Benefits

- Reduction of 25% in energy consumption over 5 years on a $100m. p.a. energy bill
- Annual pollutant reduction resulting from the energy conservation measures include 21.6 tons of sulphur dioxide, 5 tons of nitrous oxide, 6,332 tons of carbon dioxide and 0.15 tons of mercury.
- According to the Practice Greenhealth Energy Impact Calculator the annual reduction in the health impact on the population is estimated to be $500,000.

The Problem

In 2008 Partners HealthCare was incurring $100m. in annual energy costs in 15 constituent facilities with a consumption escalation rate of 1.5% per year. Power sources were 49% carbon fuel, 30% hydro, 18% nuclear, and 3% renewables. Massachusetts imports over 90% of its energy and is subject to volatile price swings.

The Strategy Selected

Increasing volatility in energy costs and the availability of incentives to improve the efficiency of existing systems and to install renewable energy systems suggested the need to undertake a system-wide energy master plan.

Goals for the Strategic Energy Master Plan (SEMP):

- Reduce energy consumption by at least 25% in 5 years (2008 base)
- Identify and evaluate renewable energy sources to reduce dependence on carbon fuels
- Increase efficiency of energy delivery through on-site cogeneration
- Develop a 10-year capital plan to implement SEMP recommendations

Implementation Process

A consultant team was retained to identify opportunities for energy conservation at each campus and to evaluate the feasibility of alternative energy installations and cogeneration. Detailed evaluation of the mechanical/electrical infrastructure was undertaken. Utility sources, consumption, and cost data were collected and benchmarked.

For each campus opportunities to install cogeneration and renewable energy systems were evaluated to determine their impact on the overall reduction in purchased energy. Six renewable energy systems were evaluated: solar hot water, solar photovoltaic, wind, geothermal, biomass and biofuel, and tidal energy.

The Team:

- Co-chairs: Partners Director of Engineering and Director of Capital Planning,
- Team members: Hospital Directors of Facilities and Engineering (10 members)

Challenges and Lessons Learned

230 energy conservation measures (ECM's) were recommended with a projected aggregate energy reduction of 28%. The total cost of implementing the ECM's was estimated to be $61M and the average payback 3.7 years, representing a 27% annual return on investment.

- 18 months into the 5 year program implementing the ECM's, September 2011, 32% of the first phase energy cost savings had been realized, representing an overall reduction of 9%.
- Cogeneration facilities are in design or construction at two hospitals and being planned for a third hospital. The average simple payback on the three installations is calculated to be 7.8 years.
- An effort is underway to locate and finance an off-site 10Mw photovoltaic installation to serve several PHS hospitals.

Demographic Information

Partners HealthCare consists of 15 principal facilities in Boston and eastern Massachusetts providing acute inpatient care, ambulatory care and rehabilitation with a total of approximately 3,300 beds. Including administration, the total built assets amount to 16 million square feet, of which approximately 10 million SF is owned and 6 million SF leased.

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