Empire State Building sustainability program

Tony Malkin and the Clinton Climate Initiative established a partnership with Jones Lang LaSalle, Johnson Controls Inc., and Rocky Mountain Institute. The team worked together seamlessly to develop a replicable model for optimizing the performance of an existing building, while reducing greenhouse gas emissions and delivering measurable economic returns.

Developing tools to build on

- eQUEST
  - Baseline model of current energy performance; predicts performance under new measures
- Comprehensive carbon footprint tool
- Tenant sustainability master planning tool
  - Engage tenants; provide LEED Platinum pre-built space model and guidelines for energy management

Process of elimination

1. Identify opportunities
   - 60+ energy efficiency ideas were narrowed to 17 implementable projects
   - Team estimated theoretical minimum energy use
   - Developed eQUEST energy model

2. Evaluate measures
   - Net present value
   - Greenhouse gas savings
   - Dollar to metric ton of carbon reduced
   - Calculated for each measure

3. Create packages
   - Maximize net present value
   - Balance net present value and CO₂ savings
   - Maximize CO₂ savings for a zero net present value
   - Maximize CO₂ savings

4. Model iteratively
   - Iterative energy and financial modeling process to identify final eight recommendations

What are the top five unique things we are doing?
- “Right steps in the right order” retrofit for whole-systems optimization
- Utilized both industry sustainability ratings, plus created new tools
- Demonstrating that a building retrofit can cost-effectively achieve upwards of 35 percent energy savings
- Innovative commercial model and measurement and verification model
- Designing a model pre-built office suite as a physical example of an integrated sustainability program that bridges base-building and tenant space improvements

What are the top three results we are expecting to see?
- Achieve an energy use reduction of 19 percent in the initial phase, and gradually increase the savings to 38 percent as the longer-term projects are completed
- Create a competitive advantage in the marketplace
- Cause an increase in the number of multi-tenant building retrofits that seek more dramatic energy use reductions by tackling tenant as well as base-building systems

“...” - Anthony E. Malkin, Empire State Building

Income savings $4.4M
Annual energy savings 8 mos.
Energy reduction 38%

EVALUATE current capital projects
- Weekly charrettes
- Integrated workshops
- Phase presentations and summary findings reports

PERFORM comprehensive energy audit
- Weekly charrettes
- Integrated workshops
- Phase presentations and summary findings reports

DEVELOP list of potential facility improvement measures
- Weekly charrettes
- Integrated workshops
- Phase presentations and summary findings reports

BALANCE
- Energy performance optimization
- Carbon footprint reduction
- Maximize energy savings
- Positive net present value

FINAL PACKAGE
of implementable facility improvement measures

IMPLEMENTATION

PHASE I
- Contracts
- Budget
- Schedule
- Design
- Bid

IMPLEMENTATION
PHASE II
- Construction
- On-going measurement and verification through energy performance contract