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First Net Zero Electric Commercial Building in the U.S.

Presented by : John Grabowski
NTIS Joint Venture / American Energy Partners

Federal Information Experts

Bridging the gap between government information and those who put it to work

What is net zero energy?

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- Term applied to a building with a net energy consumption of zero over a typical year.

  Equation: Net Zero = energy produced - energy used

- Buildings that produce a surplus of energy over a typical year may be known as “energy Plus+”

Equation: Net Plus = energy produced - energy used

At the end of the year the Net Zero Electric project resulted in 1 full month of excess energy!

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31 Tannery Rd

Project Awards

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- Perfect 100 pt Energy Star Rating
- ASHRAE (American Society of Professional Engineers) award for High Performance Building
- 2008 DIGGIE award from REALCOMM for excellence in innovation and application of energy technology
- 2008 Globe award form ARTBA for environmental project of the year
- Clean Energy Market Innovator award from State of NJ
- Business and Industry Environmental Quality Award
- Radiant Flooring Association Commercial Project of the Year
- Two U.S. Senate Citations for work in energy efficiency and reducing green house gases

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Achievements of the “31 Tannery Project”

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- **First Net Zero Electric commercial building in the US**

- First building in NJ to meet NJ State Executive order 54 for reduction of Green House Gas emissions – 80% by 2050. Achieved a reduction in emissions of 86% - that is 6% above target and 50 years ahead of schedule

- Reduced buildings CO2 emissions by 1 million pounds per year – equivalent of taking 100 cars off the road.

- 80% reduction in overall gas and electric energy use combined over typical construction building per ASHRAE and DOE standards

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“31 Tannery Project – Back to the Grid”
High Performing Buildings - ASHRAE

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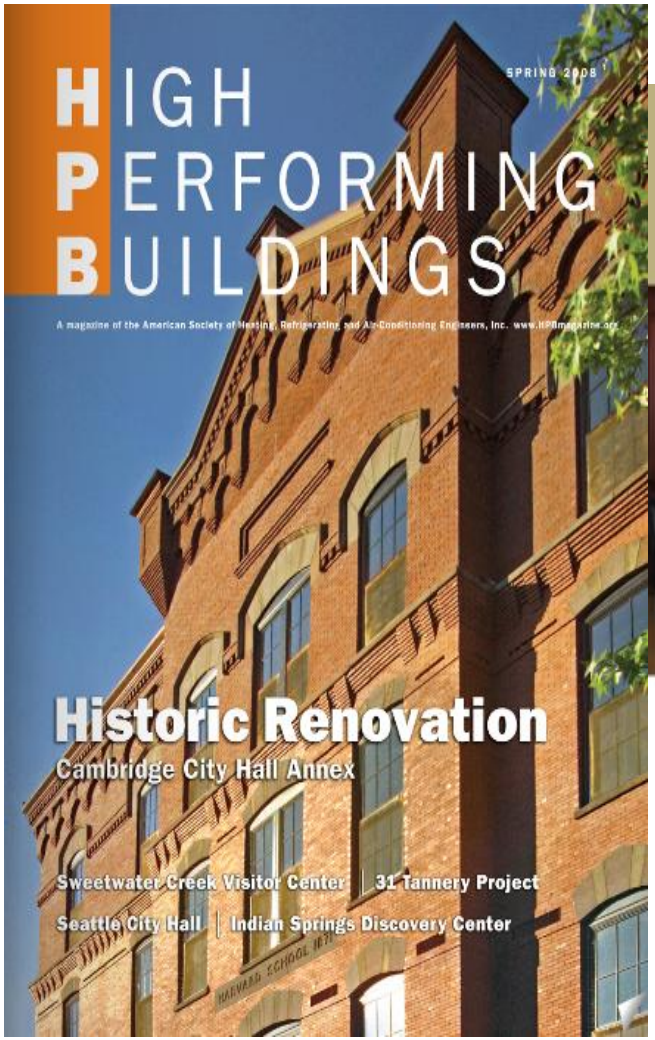
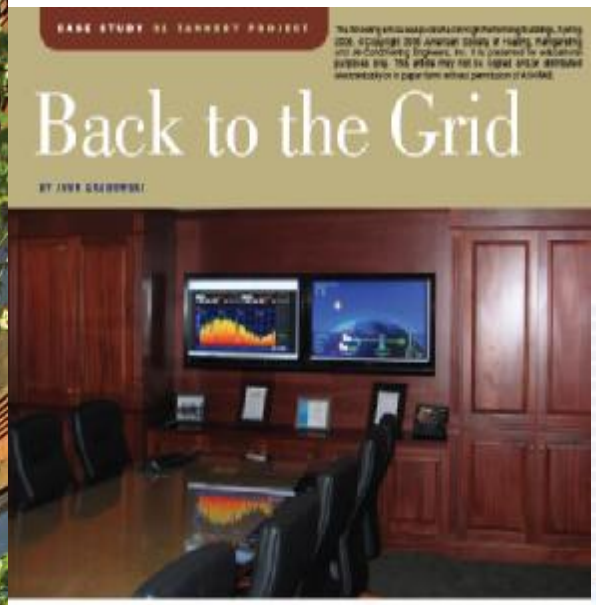
http://www.hpbmagazine.org/images/stories/articles/Back%20to%20the%20Grid.pdf





What appears as an ordinary prefabricated building produces from renewable energy all the electricity needed to run an approximately 42,000 ft² commercial facility for a full year. In addition, it produces a surplus of energy equivalent to a full month's electricity supply that is pushed out to the grid for others to use. Documented energy use for one year shows 31 Tannery Project generated more electricity from renewable energy than it consumed, making it a net zero commercial electric building.

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The Net Zero Formula ©

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- Renewable energy is only part of the picture – the “exercise”
- Renewable without efficiency is like exercise without diet.
- Real time monitoring is the “personal trainer” of systems performance

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Diet = Energy Efficiency

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Exercise = Renewable Energy

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Trainer = Continuous Energy Monitoring

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Actual Performance of the Net Zero Building

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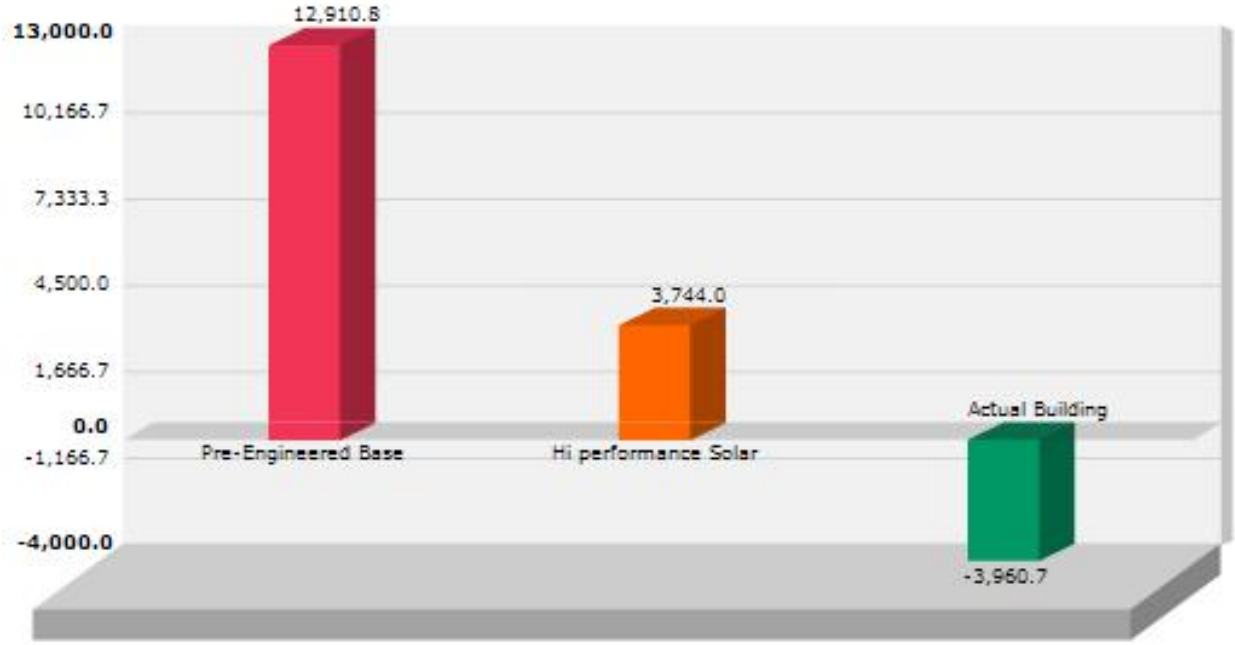
As of **June 10 2008 7:38:06 pm**

Kilowatt Hours

Electricity consumed from the grid this month:



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100% Return on Investment

5 to 7 years

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Continuous Energy Monitoring

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- Our Future depends on reducing energy use in buildings
- Energy Use in buildings is dynamic. Even a building that is built and rated as Energy Efficient will change over time.
- Being Green with Energy is not a one time effort it requires continuous effort and continous monitoring

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Brendan Owens, USGBC's vice president for technical development of LEED pointed out that ***"monitoring a building's ongoing operations and maintenance is as important as designing a green building in the first place.*** High performance is a process that requires the ongoing discipline and commitment to green practices in order to deliver these savings over time."

Conclusion

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Key Points

- Renewable energy is only part of the picture – the "exercise"
- Renewable without efficiency is like exercise without diet.
- Real time monitoring is the "personal trainer" of systems performance
- You can implement renewable energy and high efficiency in a commercial environment and get a strong return on investment
- You MUST use high efficiency systems and renewable energy to get the greatest benefit
- REAL TIME MONITORING of your systems is critical

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For more information Contact

www.ntis.gov

Shannon Burrington – Associate Director NTIS
703-605-6136
sburrington@ntis.gov

NTIS Joint Venture - American Energy Partners
John Grabowski – 856-816-3161
johng@aepartnersllc.com

The Office of Business Development
703-605-6835
obdinfo@ntis.gov

http://www.ntis.gov/services/eng-mgmt.aspx