



# **Sustainable School Buildings: Economics of Energy & LEED**

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# Energy Efficiency

- **Existing school buildings**
- **New school buildings**



Lycee Francais de New York

**Energy & LEED**



Kingswood Oxford's Chase - Tallwood Science Math Technology Center

**Steven Winter, FAIA**

# Energy Savings in Existing School Buildings: Strategies

- **Benchmarking**
- **Walk-throughs**
- **Audits (Levels II and III)**
- **Testing, M&V, monitoring**
- **Retro-Commissioning**

**Energy & LEED**



**Livingston Board of Education Facilities  
Steven Winter, FAIA**

# Economic Benefits

- **Lighting..... 0.5 – 5yrs**
- **Motors..... 1 – 5 yrs**
- **HVAC Retro-Commissioning..... 0.5 – 5 yrs**
- **HVAC & ducts..... 3 – 10 yrs**
- **Hot Water..... 3 – 10 yrs**
- **Appliances..... 2 – 5 yrs**
- **Envelope..... 0.5 – 5 yrs**
- **Procurement..... < 1 yr**
- **On-site generation.. 5 – 10 yrs**
- **Education..... 0 yrs**



# Energy Savings in New School Buildings: Strategies

- **Modeling**
- **Commissioning**
- **Whole-building and whole-campus approach**



Harlem Village Academy High School

# LEED

- **LEED for Existing Buildings**
- **LEED for Schools**



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**Wintonbury Early Childhood Magnet School**

**Steven Winter, FAIA**

# LEED/EBOM Benefits

- **Operating Costs Decrease..... 8-9%**
- **Building Value Increases..... 7.5%**

Green Building Facts from the USGBC



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# LEED for Schools: Cost Premium



- **Certified or silver..... 0 - 2%**
- **Gold..... 3 - 6%**
- **Platinum..... 7 - 15%**



# School Energy Case Study

## Livingston Board of Education

- **Level II Energy Audit with Investment grade lighting audit, 298,000sf**
- **6 ECMs recommended**
- **Simple payback of 1.9 years on investment of \$11,700 for ECMs**



**Livingston High School**

# School LEED Case Study

## Chase-Tallwood Science Math Technology Center

- **Targeting LEED for Schools version 2.0 Gold Certification**
- **34.6% annual energy savings**
- **46.7% annual water savings**
- **37% Materials recycled content**
- **41% Regional materials**
- **Enhanced acoustical performance**
- **Low-emitting paints, coatings, adhesives, sealants, flooring and composite wood**



**Kingswood Oxford School  
West Hartford, CT**

**Energy & LEED**

**Steven Winter, FAIA**

# LEED PROJECT EXAMPLES



**Wesleyan University**

**Energy & LEED**

**Steven Winter, FAIA**



# LEED PROJECT EXAMPLES



**Oberlin College**

**Energy & LEED**

**Steven Winter, FAIA**



# LEED PROJECT EXAMPLES



**Clinton Presidential Library**



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# Resources

- [www.usgbc.org](http://www.usgbc.org)
- [www.greenschoolsalliance.org](http://www.greenschoolsalliance.org)
- [www.ashrae.org](http://www.ashrae.org)
- [www.leeduser.com](http://www.leeduser.com)
- [www.usgbc.org/k12toolkit](http://www.usgbc.org/k12toolkit)
- <http://www.energystar.gov/>
- [http://www.thirteen.org/edonline/wue/energy2\\_overview.html](http://www.thirteen.org/edonline/wue/energy2_overview.html)
- <http://www1.eere.energy.gov/buildings/energysmartschools/>

**THANK YOU**



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