SINEWAVE
ENERGY TECHNOLOGIES

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# Return on Investment and Environmental Benefits Calculations

Date: November 8, 2006
Project: Parking Garage Fluorescent Lamp Dimming
Location: Philadelphia, PA
Owner:
Contact:
Tel:

| | | | |
|---|---|---|---|
| **Sinewave Energy Dimmers** | | | |
| Dimmer Cost | 16 units required | $ | 26,400 |
| Estimated Installation Cost (with sensors) | | $ | 9,200 |
| Total Instrallation Cost | | $ | 35,600 |
| **Energy Analysis** | | | |
| Energy Cost/kW | | **$** | **0.109** |
| Annual Operating Hours | | | **8,760** |
| # of Fixtures | | | **955** |
| Lamp Wattage per Fixture | | | **110** |
| Ballast Wattage per Fixture[1] | | | **11** |
| Total Wattage | | | 115,555 |
| **Current Non-Dimming Scenario** | | | |
| Energy Consumption (kW) | | | 1,012,262 |
| **Annual Energy Cost without Dimming** | | **$** | **110,337** |
| **Proposed Dimming Schedule Scenario[2]** | **% Operating Hrs.** | | **kW Used** |
| Annual Operating Hrs. @ 100% Energy Output | **0%** | | 0 |
| Annual Operating Hrs. @ 90% Energy Output | **50%** | | 455,518 |
| Annual Operating Hrs. @ 75% Energy Output | **0%** | | 0 |
| Annual Operating Hrs. @ 50% Energy Output | **0%** | | 0 |
| Annual Operating Hrs. @ 30% Energy Output | **50%** | | 151,839 |
| **Annual Energy Consumption with Dimming** | **100%** | | **607,357** |
| **Energy Savings Analysis** | | | |
| Energy Savings in kW | | | **404,905** |
| Annual Dollar Savings | | **$** | **44,135** |
| **Economic Payback (Years)** | | | **0.81** |
| **Environmental Benefits** | | | |
| Reduction in Carbon Dioxide Emission (lbs/year)[3] | | | **563,627** |
| Equivalent Acres of Trees Absorbing $CO_2$ | | | **76.17** |
| Equivalent Cars Taken off the Road[4] | | | **49.23** |

The calculations shown do not include any potential tax credits or utility rebates which could further reduce the cost by as much as 50% and improve the payback.

NOTES:

[1] In almost all instances, lamps can be dimmed to 90% power with negligible impact on the light provided, so lamps should be operated at 100% energy output only in exceptional circumstances (such as during televised sporting events). Also, higher wattage lamps lose only a small portion of their output when they are dimmed, so dimming to 50% of wattage in most cases results in more than 50% light output.

[2] The ballast uses wattage that is in addition to the wattage used by the lamp. If you do not know the ballast wattage, you may contact the ballast manufacturer or Sinewave.

[3] Actual emissions vary by utility district. This calculation uses the national average of 1,392 lbs per MWh of power generated.

[4] The EPA estimates that an acre of trees absorbs 7,400 pounds of C02 annually and that 11,450 represents the pounds of CO2 emitted annually by an average car.

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Project: Parking Garage HID Lamp Dimming
Location: Philadelphia, PA
Owner:
Contact:
Tel:

| | | | |
|---|---|---|---|
| **Sinewave Energy Dimmers** | | | |
| Dimmer Cost (each dimmer is $1,650) | 7 units required | $ | 11,550 |
| Estimated Installation Cost (with sensors) | | $ | 5,600 |
| Total Instrallation Cost | | $ | 17,150 |
| **Energy Analysis** | | | |
| Energy Cost/kW | | **$** | **0.109** |
| Annual Operating Hours | | | **8,760** |
| # of Fixtures, Floors 2-7 | | | **210** |
| # of Fixtures, Top Floor 8 | | | **10** |
| Lamp Wattage per Fixture, Floors 2-7 | | | **175** |
| Lamp Wattage per Fixture, Top Floor 8 | | | **400** |
| Ballast Wattage per Fixture[1], Floors 2-7 | | | **30** |
| Ballast Wattage per Fixture[1], Floors 8 | | | **65** |
| Total Wattage | | | 47,700 |
| **Current Non-Dimming Scenario** | | | |
| Energy Consumption (kW) | | | 417,852 |
| **Annual Energy Cost without Dimming** | | **$** | **45,546** |
| **Proposed Dimming Schedule Scenario[2]** | **% Operating Hrs.** | | **kW Used** |
| Annual Operating Hrs. @ 100% Energy Output | **0%** | | 0 |
| Annual Operating Hrs. @ 90% Energy Output | **50%** | | 188,033 |
| Annual Operating Hrs. @ 75% Energy Output | **0%** | | 0 |
| Annual Operating Hrs. @ 50% Energy Output | **50%** | | 104,463 |
| Annual Operating Hrs. @ 30% Energy Output | **0%** | | 0 |
| **Annual Energy Consumption with Dimming** | **100%** | | **292,496** |
| **Energy Savings Analysis** | | | |
| Energy Savings in kW | | | **125,356** |
| Annual Dollar Savings | | **$** | **13,664** |
| **Economic Payback (Years)** | | | **1.26** |
| **Environmental Benefits** | | | |
| Reduction in Carbon Dioxide Emission (lbs/year)[3] | | | **174,495** |
| Equivalent Acres of Trees Absorbing $CO_2$ | | | **23.58** |
| Equivalent Cars Taken off the Road[4] | | | **15.24** |

The calculations shown do not include any potential tax credits or utility rebates which could further reduce the cost by as much as 50% and improve the payback.

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