Greening Your Business
Energy Efficiency in Buildings

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Overview

- Introduction – Where is the Money?
- A Little About SEDAC
- Energy Efficiency Opportunities

About the Money…

- DCEO – Public Sector Electric Efficiency Program – now called Illinois Energy Now.
- Ameren Illinois – Act on Energy
- ComEd – Smart Ideas

SEDAC Background

- Since starting in 2005 SEDAC has completed about 720 Energy Audits with report.
- 58 million sf of buildings audited, 10 million sf of audit projects on the books currently
- About 31 percent energy cost savings on average
- Have audited a wide variety of building types

SEDAC
Levels of Service

- Level 1 Telephone or E-mail Consultation on Energy Issues
- Level 2 and 3 Energy Audits and Design Assistance
- Level 4 Implementation Support
- All levels of service are free of charge to eligible clients

Typical SEDAC L3 Service

- Design Review and/or Site Inspection
- Computer Modeling of Base Case and Alternatives with ECRMs
- Energy Savings Analysis
- Life Cycle Cost Analysis
- Final Report with Recommendations

What SEDAC Needs From You

- A completed application (for Level 2, 3 and 4 services).
- Building Plans (paper, pdf, CAD, back of envelope).
- Utility Bills (for existing buildings).
- Your time during our site visit (as necessary), and follow-up meeting.

Quick Sample of Buildings Audited

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A Variety of Building Types -

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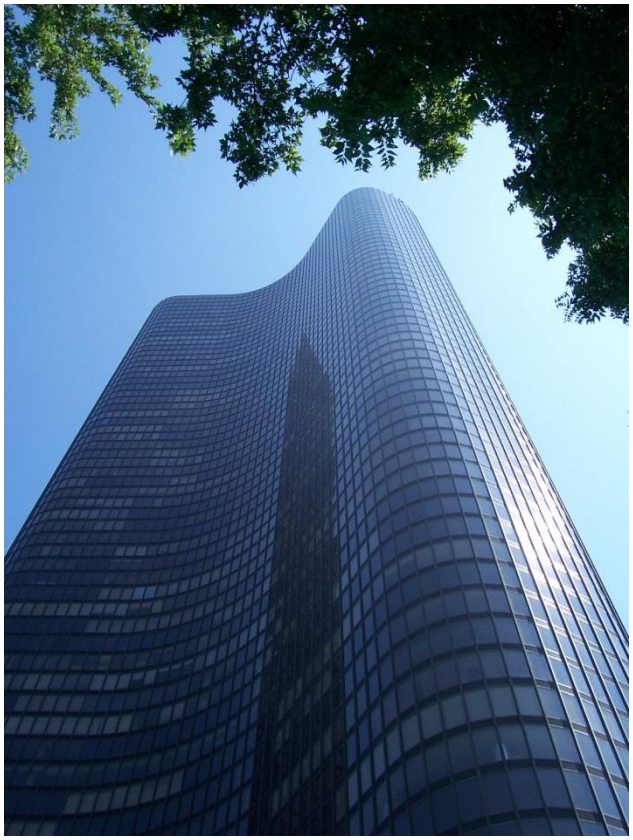
High Rise



Restaurants and Ice Rinks?

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Manufacturing and Libraries

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Energy Efficiency Opportunities

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Benchmarking (Is it a Hog?)

- Use your energy bills to estimate:
- $/sf per year (quick and dirty use with caution)
  - around $1/sf to $2/sf = good
  - $2 to $3/sf = fair to slightly poor (typical)
  - $3 to $4/sf = probably room for improvement
  - $4/sf and above = oink (unless there is a process)
- kBtu/sf per year – more accurate than dollar metric – can use TargetFinder

ENERGY STAR Target Finder : ENERGY STAR - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://www.energystar.gov/index.cfm?c=new_bldg_design.bus_target_finder Go Links

ENVIRONMENTAL LEADERSHIP ADDS VALUE TO YOUR BOTTOM LINE AND CORPORATE REPUTATION

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Guidelines for Energy Management

Tools & Resources
+ Portfolio Manager
+ Target Finder
+ Trainings and Presentations

Find Labeled Buildings

Find Expert Help:
+ Most Active Service & Product Providers
+ Service & Product Provider Directory
+ Directory of Energy Efficiency Programs
+ Find a Professional Engineer

Small Business

TARGET FINDER

Save Energy, Money, and Time

- Determine an annual energy target for your building design
- Compare energy use from simulations with your target
- Monitor your design's energy performance as building plans progress
- Evaluate the cost effectiveness of energy efficiency measures
- Minimize potential greenhouse gas emissions associated with your building design

Enter Target Finder

EPA's energy performance target rating uses a 1–100 scale. Lower energy use yields a higher

Benefits & Recognition

Active A&E Firms

Target Finder - EPA Rating

Building Design Guidance

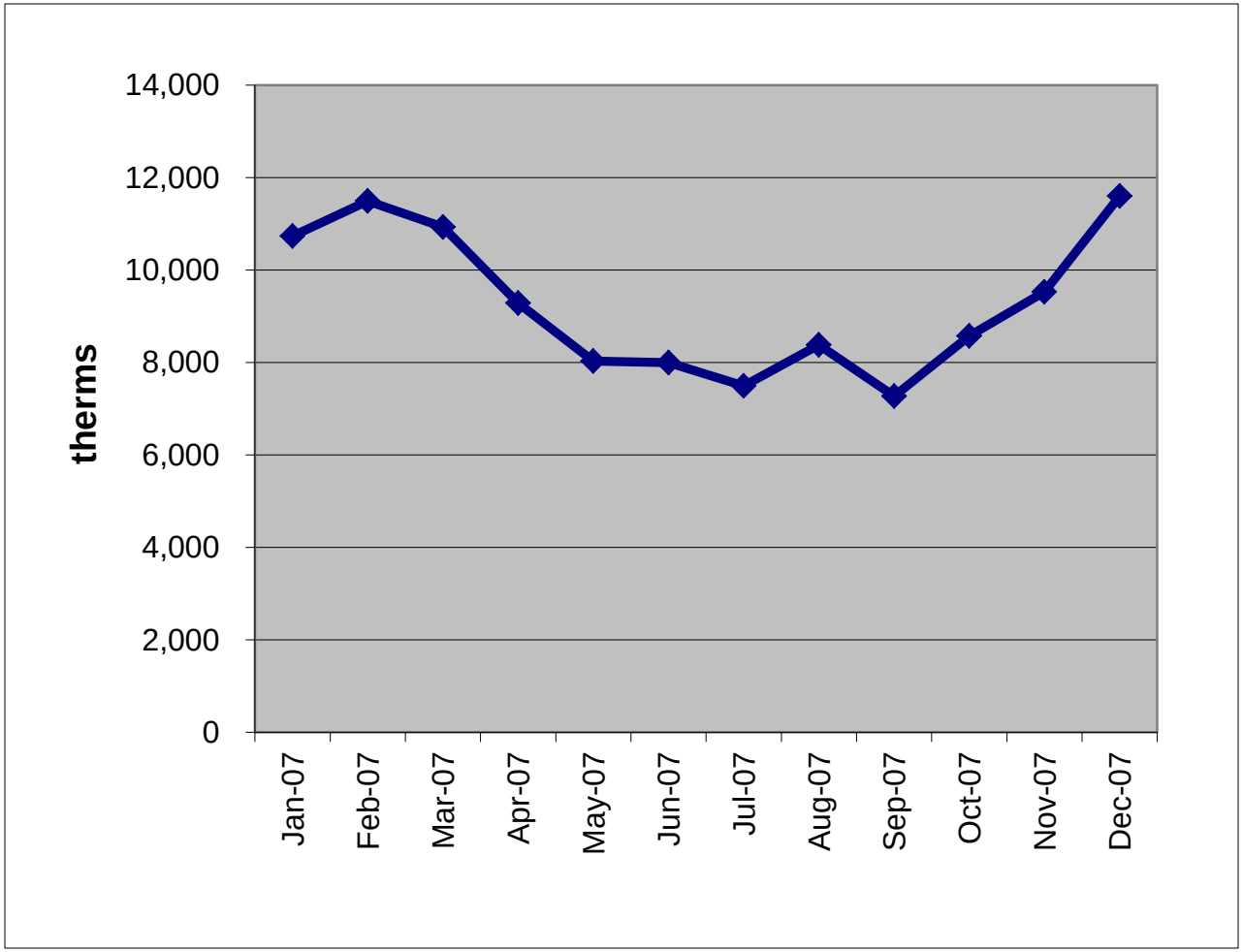
News & Resources

Classes & Conferences

NBD Home

Done Internet

Trouble Shooting with Simple Graphs



How Buildings Use Energy

- Building Envelope (Walls, Roof, Windows, Floors)
- Lighting
- Heating, Ventilating, and Air Conditioning (HVAC)
- Internal and Process Loads (cooking, hot water, swimming pools, manufacturing, etc.)

Compact Fluorescent

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Super T8 and Low Wattage T8

- **Super T8** systems can produce energy savings as **high as 40 percent** over standard T8.
- To identify a Super T8, look for lamps that are at least 3100 initial lumens [as opposed to 2850 for a standard T8] and have a barrier coat design and high lumen maintenance.
- Super T8 lamps include the **SYLVANIA "Xtreme**," **Philips "Advantage"** and **GE "HL**." Ballasts include the **SYLVANIA "Xtreme," Advance "Optanium," Universal Triad "HE" and GE "UltraMax.**

Occupancy Sensors

- Use them for office lighting
- Restroom lighting
- Storage Areas
- Mechanical Rooms
- Warehouse Aisles - Fluorescent
- Get creative – use for HVAC in individual rooms or zones.

Isole – Personal Occupancy Sensor

LED Exit Signs

- Payback is quick
- Rebates available
- Very basic lighting energy savings measure
- Chicago approved

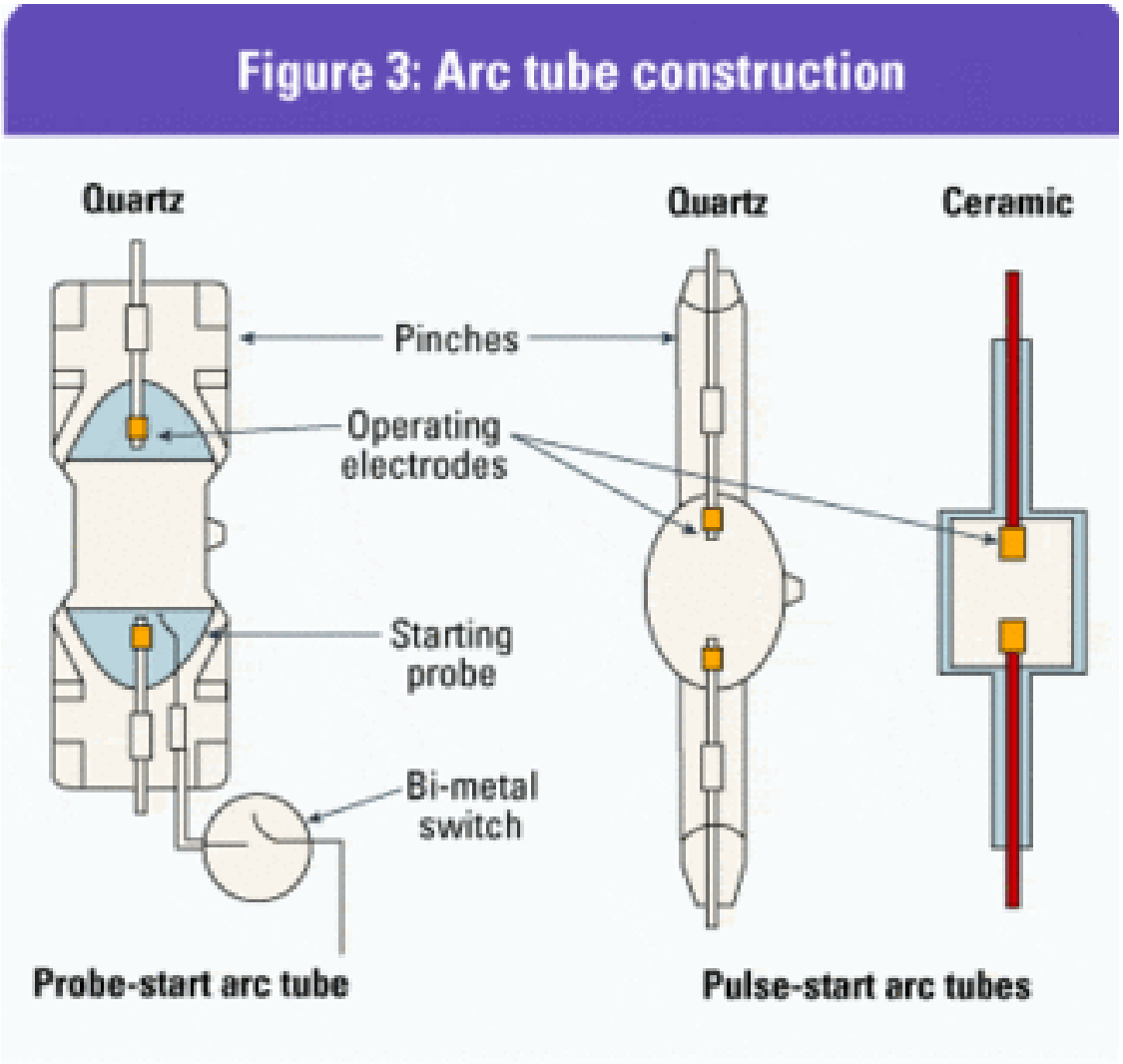
HID to Fluorescent Retrofit

- **Existing System:**
  - **400watt High Pressure Sodium and 400watt Metal Halide.**
  - **Each fixture uses 455 watts (400 for lamp, 55 for ballast)**
- **Retrofit**
  - **Each fixture uses 234 watts (lamps and ballast combined)**
  - **Light levels increased 10-20%**

Street and Parking Lot Lighting

- Probe Start HID to Pulse Start HID a typical retrofit.
- Fluorescent Induction, and LEDs making moves into market

Probe vs. Pulse Start

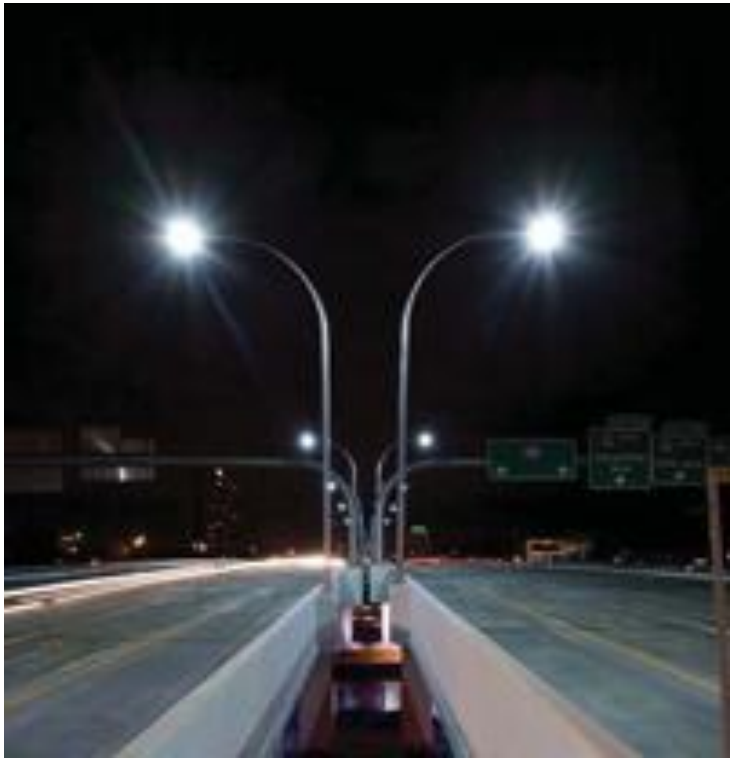


LED Traffic Signals

- Application is very popular
- Energy savings 50 to 75 percent
- Good LED application: directed light and switched on and off

LED Street Lighting – DOE I-35 Minneapolis Gateway Study

- The LED luminaires offered a conservative **13% energy savings** relative to the baseline HPS system.
- **Simple payback was found to be quite long** at current luminaire pricing.
- Overall public reaction to the LED bridge lighting has been very positive, with "positive" comments outweighing "negative" comments by about five-to-one.



Other DOE Gateway Results

http://www1.eere.energy.gov/buildings/ssl/

Oakland Street lighting – 15 year payback

Supermarket Parking Lot 70 percent savings – 5 year payback

Programmable Thermostats

- They work when you use them.
- Consider Internet enabled thermostats as retrofits

VAV Supply Air Temp. Reset

- Saves cooling energy
- Saves reheat energy
- Increases hours when economizer can be utilized.

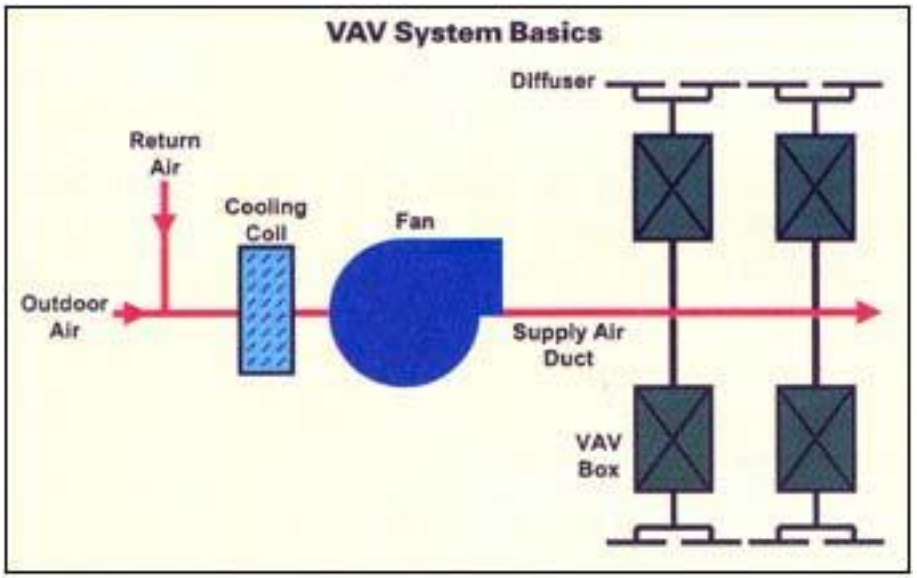


Fig 1 – Simplified Schematic of a VAV System

VAV Fans

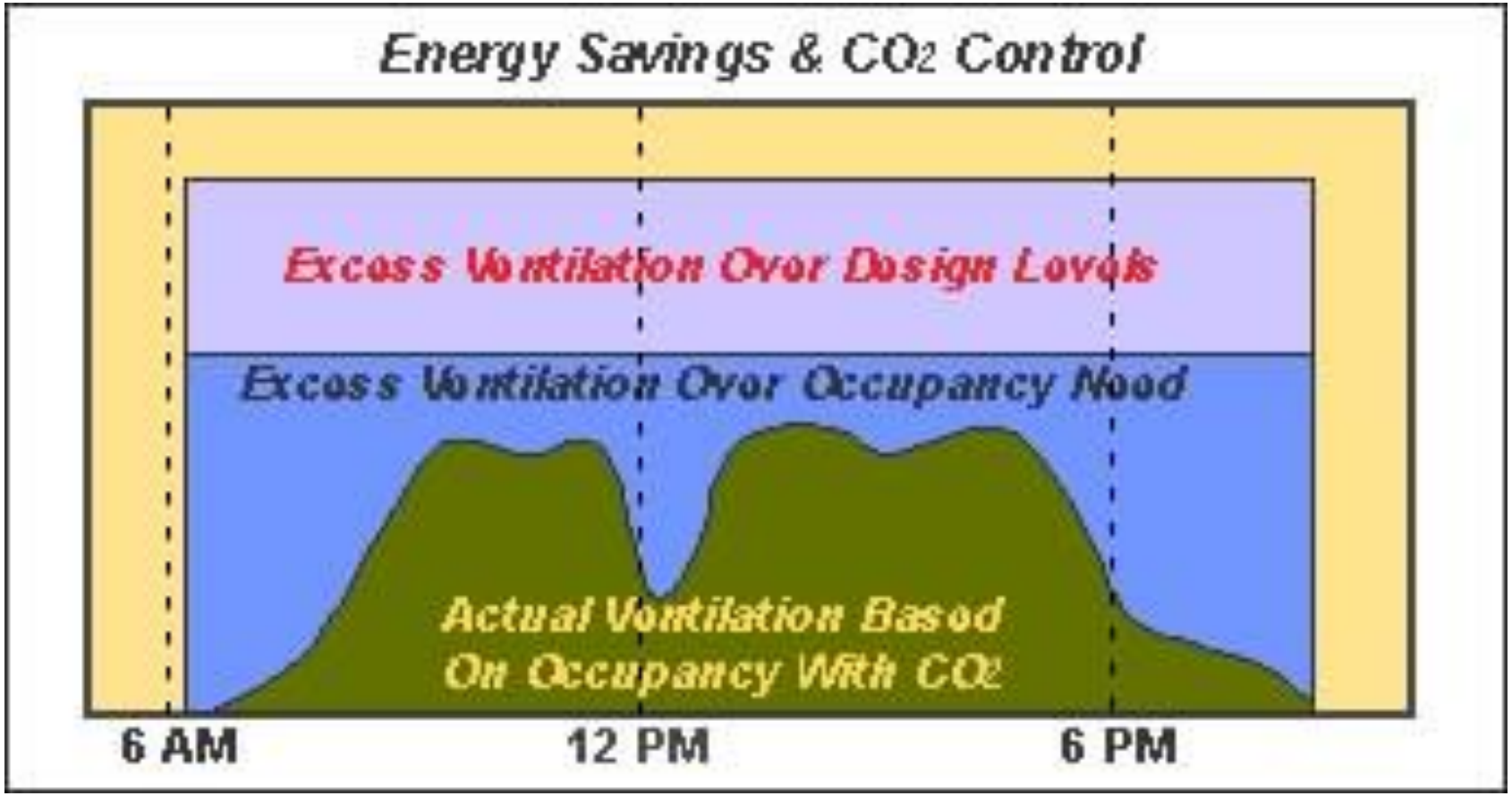
- Static Pressure Reset on VAV Systems.
  - Provides significant fan energy savings since system is often at part load
  - Reduces fan noise

VAV Control Deadband

"Variable air volume (VAV) terminal units shall be programmed to operate at the minimum airflow setting without addition of reheat when the zone temperature is within the set deadband."

To meet this requirement, the control system must allow separate heating and cooling setpoints that are at least 5°F apart. If, for example,the cooling setpoint is 75°F, then the control system cannot enable the reheat coil until the space temperature drops to 70°F or below.

Demand Control Ventilation



Variable Frequency Drives

- Variable Frequency Drives can save 20 percent or more in electrical usage.
- Often there are additional benefits in process control and quality.
- Fans and Pumps both HVAC and process are key applications for VFD.

To Apply for SEDAC Assistance

- Call 1-800-214-7954 or,
- Visit the SEDAC web site at www.sedac.org and download an application.