



**Connecticut  
Light & Power**  
The Northeast Utilities System



[www.CTSavesEnergy.org](http://www.CTSavesEnergy.org)



*The United Illuminating Company*

Connecticut's Energy Efficiency Programs are funded by the Conservation Charge on customer electric bills.

# Commercial & Industrial Programs

**Presented by: Rick Galipeau,  
Supervisor C&I Programs**

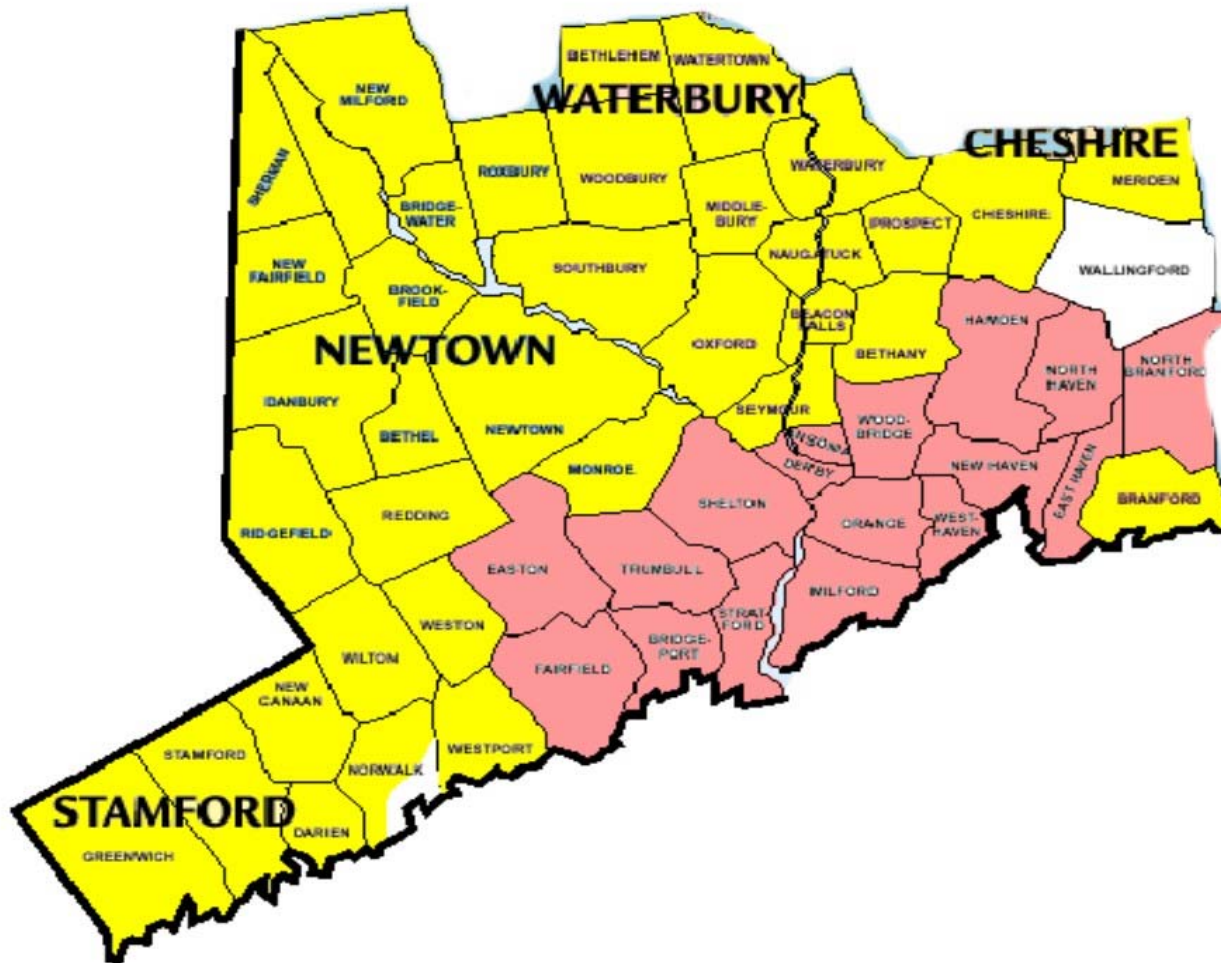
**October 12, 2006**



# Objective of CEEF Programs

Provide technical assistance and cash incentives to CL&P and UI customers designing or upgrading their facilities using energy-efficient equipment

# Southwest Connecticut (SWCT) Towns





# Efficiency First

- Measures to consider
- Lighting Changes
- Financing Options

# Measures to consider

## Including but not limited to:

- Lighting and occupancy sensors
- Chillers and Plate and Frame Waterside Economizers.
- Dedicated small chiller for operating rooms so that main plant CHW temp can be raised.
- EMS upgrade or install
  - EMS RCx – Replacing sensors, repairing economizers and VAV boxes, updating front end
  - Converting pneumatic to DDC, reprogramming, etc.

# Measures to consider (continued)

- Replace/repair leaking reheat steam valves that are false loading the chiller.
- Desiccant heat wheel for exhaust air heat/cool recovery.
- Repair of leaking ductwork.
- VFDs on pumps and AHUs.
- Consolidate multiple chilled water systems into common loop and stage chillers.
- Convert dry bulb economizers to comparative enthalpy.
- Convert DX air handlers to chilled water.

# Lighting Consumes.....

*Lighting uses 25% of all electrical energy in the US. This is despite a 50%+ drop in connected power per unit area since 1973.*

# 5 Biggest Trends in Lighting

- T-5 Lighting
- Ceramic Metal Halide Track and Display Lighting
- Pendant Mounted Lighting for Offices, Schools and other Commercial and Institutional Lighting
- Light Emitting Diodes (LEDs)
- High Wattage Ceramic HID with Electronic Ballasts

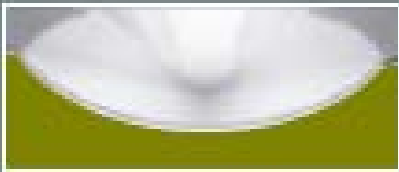




# Trend: T-5 Luminaire Systems

- New Generation T5 troffers
- Direct small aperture
- Asymmetric (wallwash)
- Asymmetric (aimable)
- Asymmetric (cove)
- Direct/indirect
- Indirect and semi-indirect
- Specialty

# New Generation T5 troffers



90%  
efficient

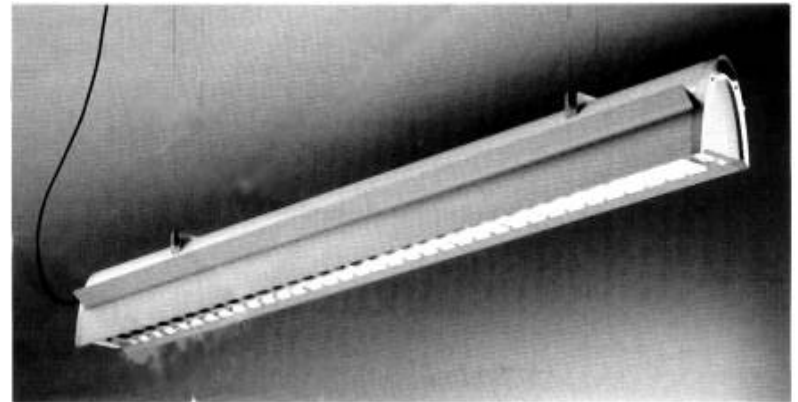
3" tall

Two level  
electronic  
ballast

Standard  
or  
overdrive  
ballasts

# Direct Small Aperture

- Theoretically requires 40% of the dimensions of a T-12 luminaire to achieve the same efficiency
- A new product family?



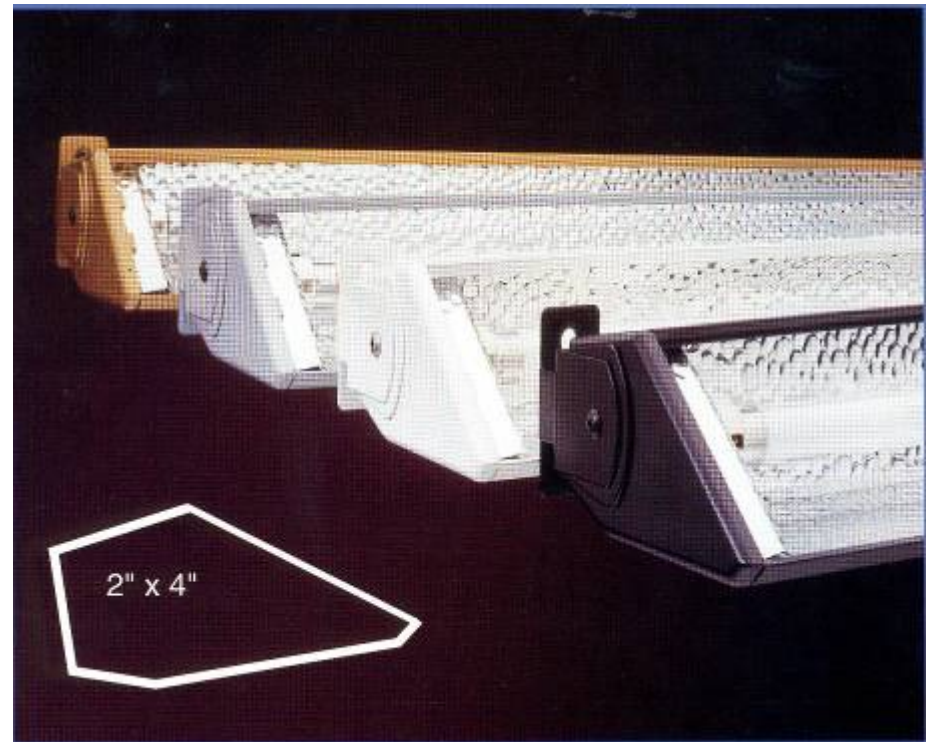
# Direct HID Replacement

- Use 4 T5HO instead of 250 watt HID
- Use 6 T5HO instead of 400 watt HID
- Narrow distribution
- Immediate “on” and “off”
- Fully dimmable
- High CRI 86+
- High lumen maintenance LLD=90+



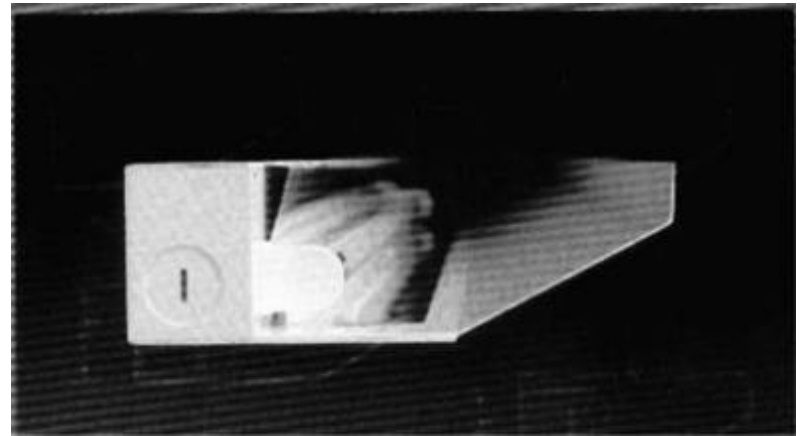
# Asymmetric Wallwash

- Requires only 20% of the volume of a T-12 luminaire
- Makes linear luminaire cross-section similar to a quartz luminaire



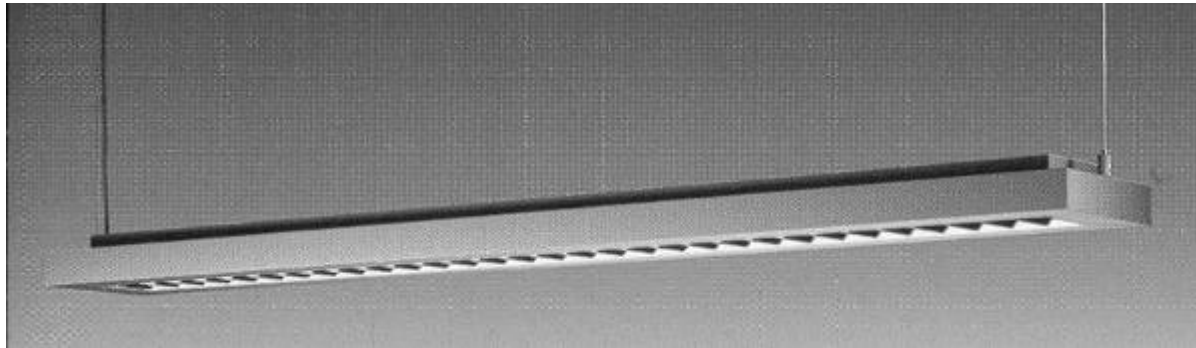
# Asymmetric Cove

- Reduced overall dimensions now 2" x 6" include ballast
- Small profile can include adjustability



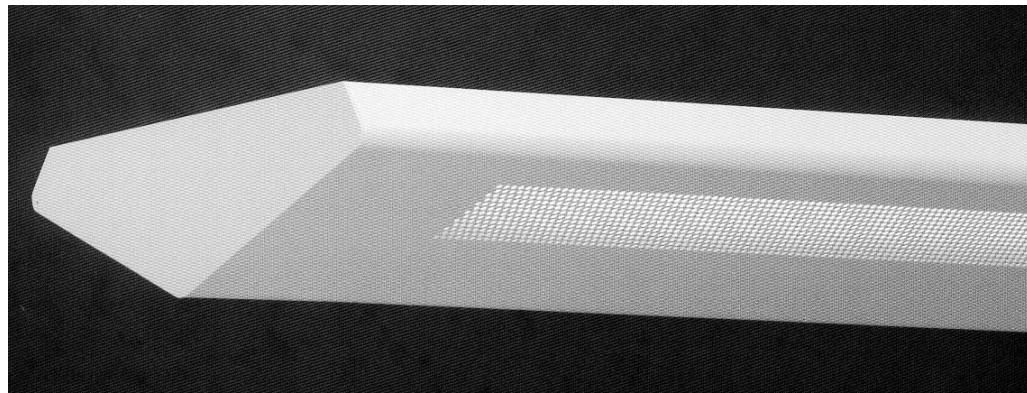
# Direct/Indirect

- Smaller profile, less material, lighter weight
- Potential for high efficiency
- Conventional and advanced designs



# Indirect

- Smaller profile
- Potentially optimum use of the T-5 HO lamp
- Minimum downlight %





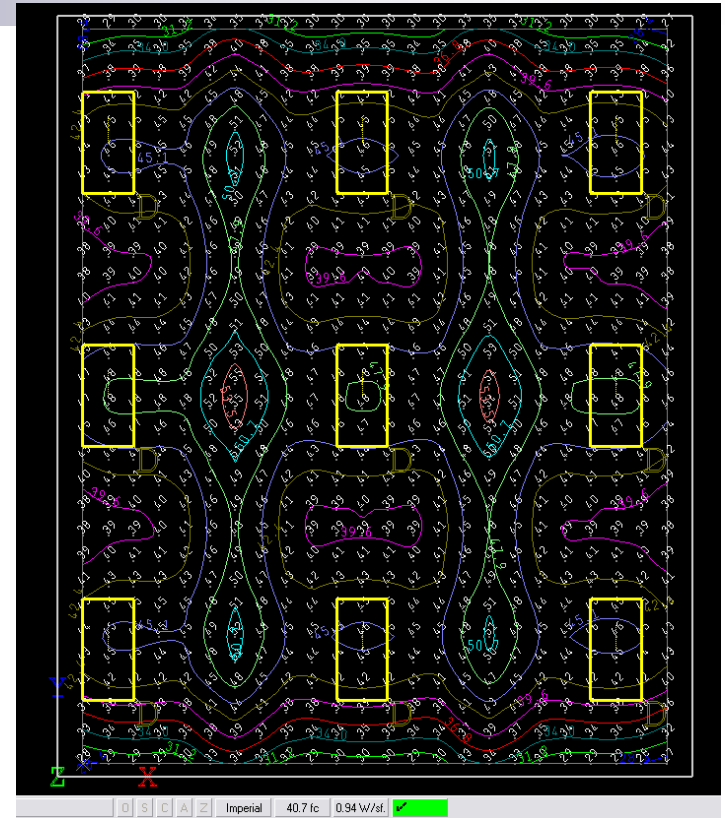


# Hospital Applications

# Hospital Space

*New construction or retrofit*

- 25 ft x 30 ft ~ 750 sq ft space
- 9.5 ft ceiling height
- 9 3-lamp parabolic fixtures
- Target illuminance: 30-50 fc
- 80/50/20 reflectances
- 24 hour operation w/o occupancy sensors (nursing stations, corridors, waiting rooms)



# Impact of Energy Codes on Hospitals/Medical Buildings

## ■ ASHRAE/IESNA Standard 90.1

### □ Space-by-Space Method:

- 2001 – 1.5 W/sq ft
- 2004 – 1.3 W/sq ft

### □ Building Area Method:

- 2001 – 1.6 W/sq ft
- 2004 – 1.2 W/sq ft

**Potential to earn 2-10 points of Energy & Atmosphere (Credit 1) as part of the LEED Green Building Rating System**

*\* Lighting power adjustment factors available when passive controls are used.*

Hospital New Construction 3-lamp Systems	System Wattage	Watts per sq ft	Maint. fc	LEED Points Earned	Pass/Fail ASHRAE 2001/2004	% Exceeding 90.1 -2001 Sp by Sp (%/Ded.)
F34CW/SS MB3x40/277RS	121	1.5	44	0	√ / X	0% \$0.00
FO32/741/ECO QTP3x32T8/UNV ISN	87	1.0	47	5	√ / √	33% \$0.46
FO28/XP/SS/ECO QHE3x32T8/UNV ISN	72	0.87	45	7	√ / √	42% \$0.60
FO30/XP/SS/ECO QHE3x32T8/UNV ISL	69	0.80	42	8	√ / √	46% \$0.60
FO32/XP/SS/ECO QTP3x32T8/UNV PSX	68	0.80	38	8	√ / √	46% \$0.60
FO28/XP/SS/ECO QTP3x32T8/UNV PSX	65	0.80	37	8	√ / √	46% \$0.60

# System Comparisons

Hospital New Construction 3-lamp Systems	Ballast Factor	Initial System Lumens	Mean System Lumens*	Lumen Maint.	System Wattage**	Lamp Life (cont.)
<i>FO32/741/ECO QTP3x32T8/UNV ISN</i>	0.88	7392 (100%)	6653 (100%)	0.90	87	28,000
<i>FO28/XP/SS/ECO QHE3x32T8/UNV ISN</i>	0.88	7194 (97%)	6758 (102%)	0.94	72	32,000
<i>FO30/XP/SS/ECO QHE3x32T8/UNV ISL</i>	0.78	6669 (90%)	6271 (94%)	0.94	69	32,000
<i>FO32/XPS/ECO QTP3x32T8/UNV PSX</i>	0.71	6710 (91%)	6369 (96%)	0.95	71	36,000
<i>FO28/XP/SS/ECO QTP3x32T8/UNV PSX</i>	0.71	5804 (79%)	5453 (82%)	0.94	65	32,000

\* Mean system lumens based on light at 40% of rated life.

\*\* System wattage based on 277V.

# System Comparisons

Open Office New Construction 3-lamp Systems	Ballast Factor	Initial System Lumens	Mean System Lumens*	Lumen Maint.	System Wattage**	Lamp Life (12 hrs/start)
<b>FO32/741/ECO QTP3x32T8/UNV ISN</b>	<b>0.88</b>	<b>4928 (100%)</b>	<b>4435</b>	<b>0.90</b>	<b>87</b>	<b>24,000</b>
<b>FO30/XP/SS/ECO QHE3x32T8/UNV ISN</b>	<b>0.88</b>	<b>5016 (102%)</b>	<b>4717</b>	<b>0.94</b>	<b>77</b>	<b>26,000</b>
<b>FO32/XPS/ECO QTP3x32T8/UNV PSX</b>	<b>0.71</b>	<b>4473 (91%)</b>	<b>4246</b>	<b>0.95</b>	<b>71</b>	<b>34,000</b>
<b>FO30/XP/SS/ECO QTP3x32T8/UNV PSX</b>	<b>0.71</b>	<b>4047 (82%)</b>	<b>3806</b>	<b>0.94</b>	<b>68</b>	<b>30,000</b>
<b>FP28PM/ECO QS2x28T5/UNV PS95</b>	<b>0.95</b>	<b>5795 (118%)</b>	<b>5505</b>	<b>0.95</b>	<b>58</b>	<b>24,000</b>

• Mean system lumens based on light at 40% of rated life.

\*\* System wattage based on 277V.



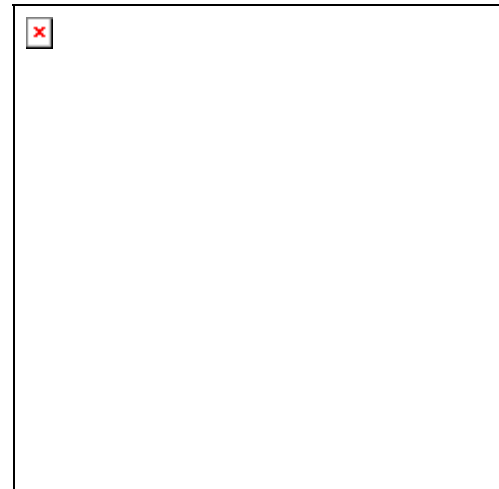
# Financing Options

- CL&P's Small C&I Loan
- CHA Loan Program
- Performance Contracting

# Small C&I Financing Program (CL&P)

- 0% Interest loans through CitiCapital
- Min \$5,000 & Max \$100,000 loans
- Industrial customers\* with SIC Code 2000 – 3999 and 100 employees or less
- Commercial customers\* with average demand of 350 kW or less

\* In business for minimum of three years







# CHA Conservation Loan Program

## “Purpose”

- Funds available to Type 1a CHA Member hospitals in the CL&P service area for electric conservation measure implementation
- Can be used for feasibility studies and training related to conservation
- Provide technical/engineering assistance to evaluate measures



# CHA Conservation Loan Program “Features”

- 0% Interest
- Loan repaid on a monthly basis
- Maximum loan term of 7 years
- Maximum loan amount for feasibility studies is \$30k and 3 year term
- Funds provided directly to hospital for work performed based on invoices



# CHA Conservation Loan Program “Selection Process”

- Evaluation and approval based on
  - Simple payback
  - Peak load reduction
  - KWH savings
- Only electric savings allowed in Simple Payback calculation
- Projects with simple payback beyond 12 years will not be considered



# CHA Conservation Loan Program “Non-Qualifying Projects”

- Cogeneration Projects
- Projects with primarily thermal energy savings
- Fuel switching



# CHA Conservation Loan Program “Contact”

For more information or to obtain a  
Loan application package contact:

Robert Sandler

(860) 286-3138

[rsandler@lifechoiceopo.org](mailto:rsandler@lifechoiceopo.org)



# Program Organization

- Energy Conscious Blueprint (Lost Opportunity)
- Energy Opportunities (Retrofit)
- O&M Services
- Demand Reduction
- Energy Independence Act



# **Energy Conscious Blueprint (Lost Opportunity)**

## **Qualifying Projects**

- New Construction
- Major Renovations
- New Equipment
- Replacement Equipment
- Process Improvement

# Energy Conscious Blueprint

## Typical Measures

Lighting\*

Motors

Refrigeration

Process Improvements

Lighting Controls

HVAC

VFDs

Others

## Incentives

- Prescriptive incentives are used when available
- Custom incentives are possible
- Cover up to 100% of incremental cost

\* All lighting projects must use Watts/sq. ft. calculations relative to ASHRAE baselines



# Energy Opportunities (EO)

## Qualifying Projects

- Retrofit
- Elective replacement of operational equipment



# Energy Opportunities

## Typical Measures

Lighting

Compressed Air Systems

Motors

Lighting Controls

HVAC

VFDs

## Prescriptive Incentives

- Prescriptive incentives are used when available
- “Express” Lighting Rebate for retrofit/replacement or existing lighting fixtures

## Custom Incentives

- Up to 50% of installed cost, 50% of the “reasonable” cost or 75% of the measure value (based on kWh and kW savings), whichever is less

Not for Small Business Energy Advantage eligible projects



# Operations & Maintenance

## Typical Measures

Clean HVAC Ducts and Coils

Repair Leaking Ductwork

Modify Compressed Air System

Repair Compressed Air Leaks

Retro Commissioning (Pilot)

HVAC Tune-Up (Pilot)

## Incentives

- Focused studies for potential energy-saving measures
- Up to 50% of installed costs; 100% in SWCT

# Demand Reduction

## Eligible Customers

- C&I customers capable and willing to control kW demand during peak times through real-time monitoring and control

## Typical Measures

- Remote load control and curtailment
- Load aggregation

## Incentives

- Southwest Connecticut
  - Lesser of \$1,000 per kW or 50% of installed costs
- Remainder of Connecticut
  - Lesser of \$500 per kW or 50% of installed costs



# **Energy Independence Act (Public Act 05-01)**

- Distributed Resources
- Gas Cooling Efficiency Pilot

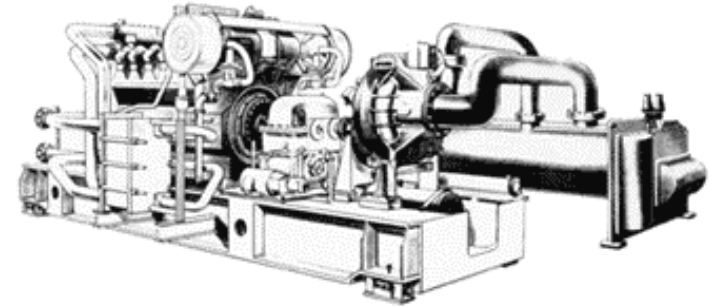
# Energy Independence Act Gas Cooling Efficiency Pilot

## Qualifying Projects

- Natural gas engine driven chiller
- Implemented through ECB or EO
- Installed and operating by April 2007

## Incentives

- Up to \$750 per kW saved



# ENERGY STAR® Lighting Fairs

- Target: C&I customer employees
- An event held at your facility that allows employees to purchase ENERGY STAR® light bulbs and lighting fixtures for their homes
  - Wide variety of energy-efficient lighting products
  - Employees can take home their product purchases the same day
  - Products are discounted through CEEF funding

# How do you get involved?

- Whenever purchasing new electric consuming equipment, engage CL&P
- Consider energy-efficiency alternatives early in planning the project – some of these alternatives may cost more, many will be eligible for incentives
- Sign a Letter of Agreement ***prior*** to proceeding with the project
  - (Outside of the Express Services, these are not rebate programs!)



# CL&P Contact Information

- **Energy Conscious Blueprint:** John Matchett (860) 810-1808
- **Energy Opportunities and O&M Services:** Chris Saunders (860) 810-1839 (John Matchett – Lighting Projects)
- **Express Services:** Paul Kuraitis (860) 810-1837
- **SBEA:** Peter Ptak (860) 832-4921
- **Small C&I Loan Financing:** Randy Vagnini (860) 832-4753
- **PRIME:** Jim Motta (860) 810-1803
- **Demand Reduction and ISO Load Response:** Dave Dobratz (860) 832-4804
- **Power Factor:** Marlon Cunningham (203) 352-5461
- **Gas Energy Efficiency Pilot:** Mike Santangelo (860) 810-1815
- **ENERGY STAR® Lighting Fairs:** Gary Elliot (860) 832-4961
- **Internet:** [www.cl-p.com](http://www.cl-p.com)
- **1-877-WISE-USE (1-877-947-3873)**

# UI Contact Information

- **Energy Conscious Blueprint:** Roy W. Haller (203) 499-2025
- **Cool Choice:** Michelle LeMoine (203) 499-5828
- **MotorUp:** Michelle LeMoine (203) 499-5828
- **Energy Opportunities:** Roy W. Haller (203) 499-2025
- **Express Lighting:** Kathleen Karas (203) 499-2055
- **Small Business Energy Advantage:** Dennis O'Connor (203) 499-2025
- **O&M Services:** Roy W. Haller (203) 499-2025
- **Load Response:** Roddy Diotalevi (203) 499-3632
- **Distributed Resources:** Anthony Cortiglio (203) 499-2285
- **Internet:** [www.uinet.com](http://www.uinet.com)
- **1-877-WISE-USE (1-877-947-3873)**



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# Thank You!

# Any Questions?