

Utility Savings & Management

“Back-to-Basics”



Clean '07

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Presented by:

TURN  **KEY**

industrial engineering
services, inc.



Utility Savings & Management

Primary utilities:

- Electrical
- Water
- Natural gas



Utility Savings & Management

Answer the following questions:

- How do I track it?
- How much do I use?
- How much does it cost?
- What can I do to save \$\$\$?



Electrical – How do I track it?

- Meter readings
- Electrical bill
- 2 Parts
 - Demand (kW)
 - Usage (kWh)
- Tracking demand is tricky:
 - Instantaneous occurrence
 - Meter to continuously track demand levels
- Track in kWh per pound or cwt



Electrical – How much do I use?

Depends on:

- Equipment
 - Vacuum Soil Count Systems
 - Washers
 - Dryer
 - Air Compressors
 - A/C Systems
- Lighting
- “The little things”
- kWh per cwt = 6.50 – 10.00



Electrical – How much does it cost?

Components of a monthly electric bill

- **Demand (kW)**
 - Cost to supply peak power for your operation.
 - **Peak power at a given moment**
- **Kilowatt hours (kWh)**
 - Cost to supply power for your operation over a certain amount of time.
 - **Total power over a period of time**



Electrical – What can I do to save?

- Turn off lights and equipment ASAP
- Stagger start-up of equipment w/ large loads
- Use high efficiency motors (lower power demand during start-up)
- Load washroom equipment properly
- Keep electrical connections clean and tight (more energy to overcome dirt, gaps, etc.)



Electrical – What can I do to save?

- Verify rate schedule is the best available
- Verify actual usage
- Proper maintenance
 - Keep belts properly tensioned
 - Properly lubricate bearings on powered equipment

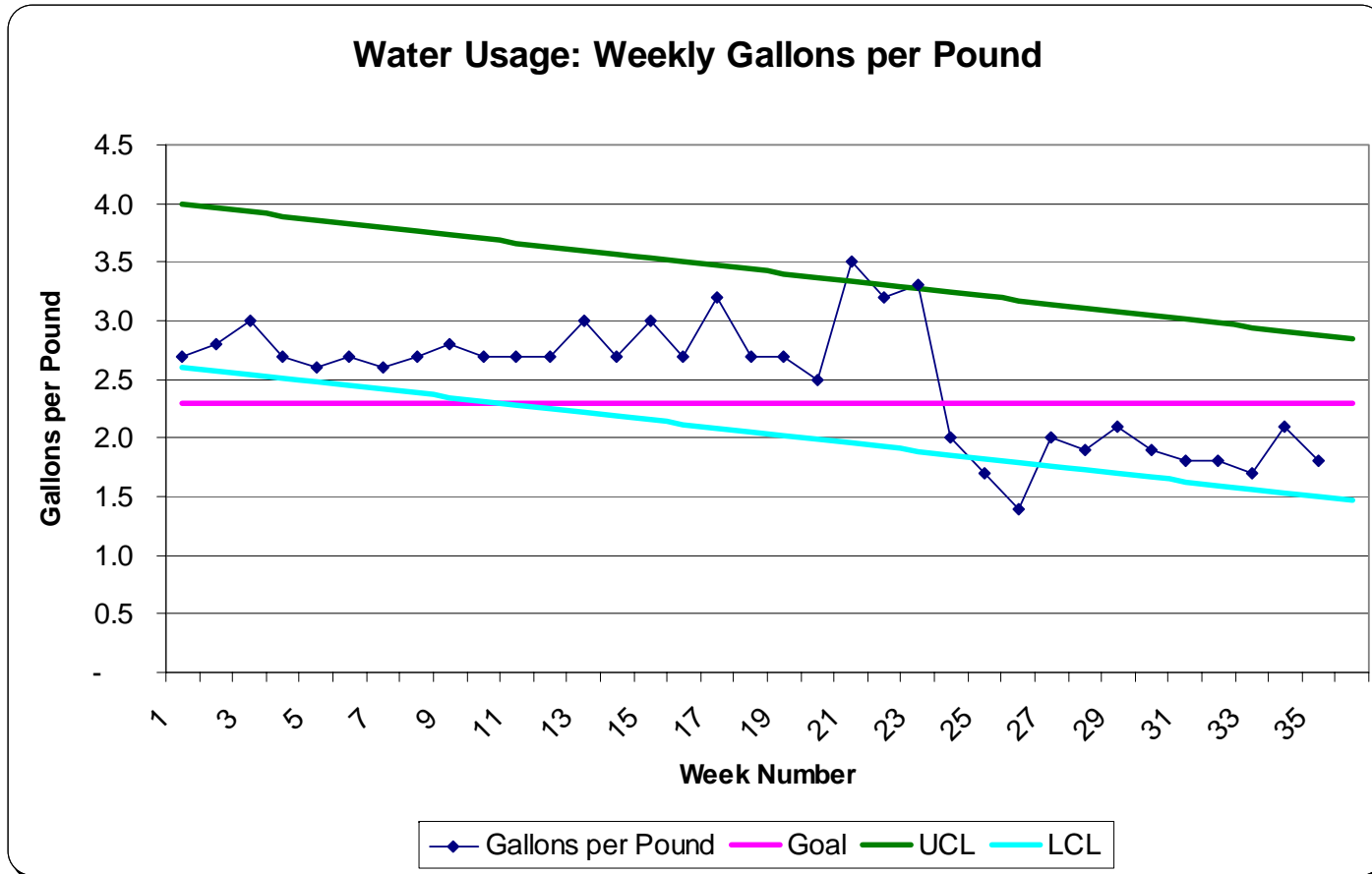


Water – How do I track it?

- Meter readings
- Water bill
- 2 Parts
 - Influent (supply)
 - Effluent (sewer)
- Track in gallons per pound



Water – How do I track it?





Water – How much do I use?

Depends on:

- Product mix
- Washroom equipment
- Reuse & recycle systems

Gallons per Pound:

- Linen = 1.0 – 2.5
- Industrial = 1.5 – 3.0



Water – How much does it cost?

How much does a “little” leak cost?

- Drip = 15,618 gals per year
 - Cost per drip >\$67 per year
- 1/16” dia. leak = 387,763 gallons per year
 - Cost per 1/16” leak >\$1,667 per year

Notes:

- Cost of water estimated @ \$4.30 per 1,000 gallons.
- Actual costs range from \$3.00 - 15.00.



Water – What can I do to save?

- Check washer drains
- Repair leaks immediately
- Re-use or recycle water
- Evaporation credits with local POTW
- Proper maintenance



Water – What can I do to save?

Evaporation credits

- Effluent meter
- Evaporation study
 - Boiler make-up water usage
 - Process water evaporation study
- Contact local POTW for guidance

Quick Quiz

POTW = Public Owned Treatment Works

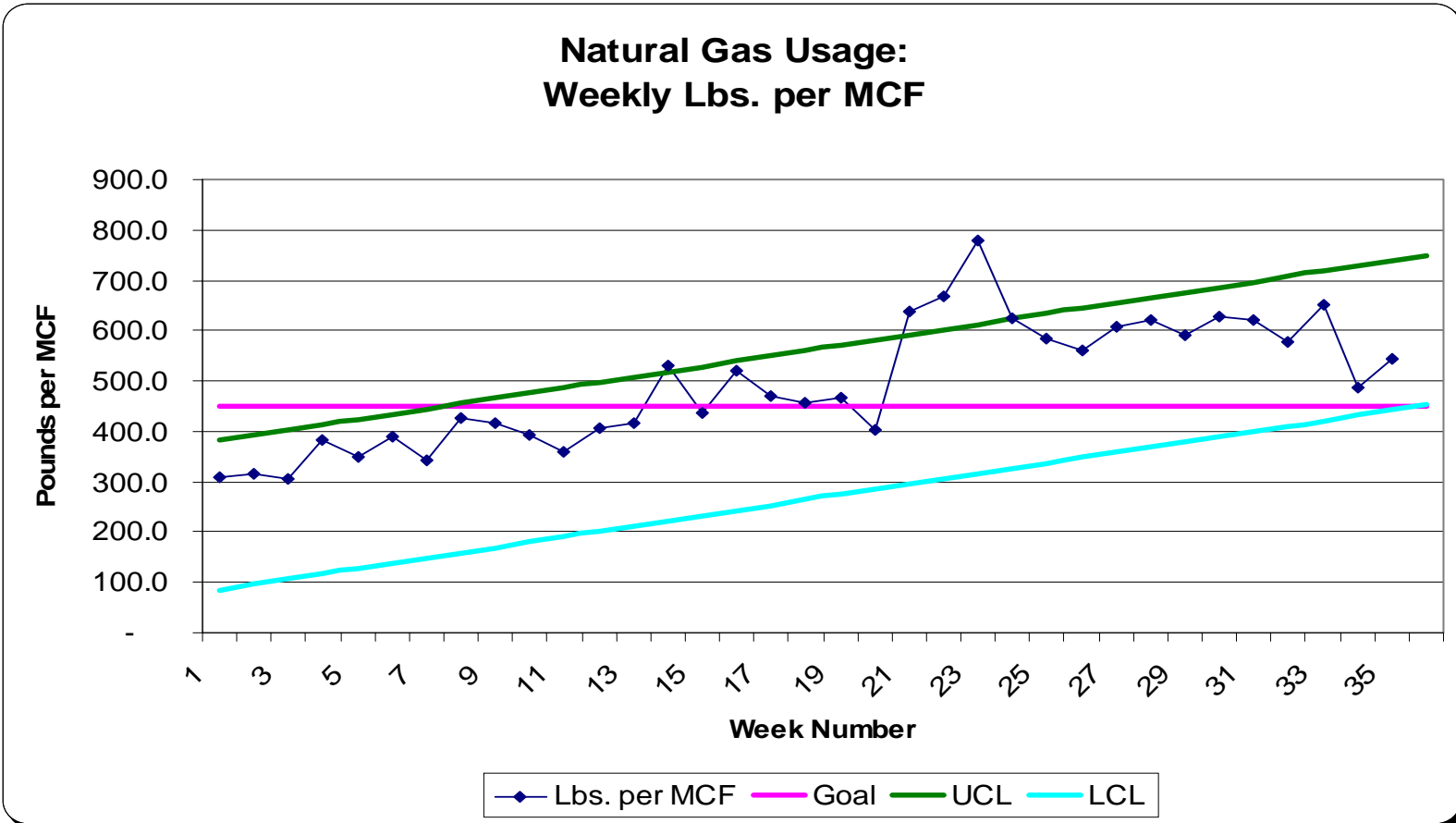


Natural Gas – How do I track it?

- Meter readings
- Gas bill
- Track in:
 - BTU's per pound
 - Pounds per MCF
- Conversions:
 - 1 MCF = 1,000,000 BTU's
 - 1 Therm = 100,000 BTU's



Natural Gas – How do I track it?





Natural Gas – How much do I use?

Depends on:

- Equipment
 - Dryers
 - Garment Tunnel
 - Ironers
 - Boiler
- Steam Piping
- Heat reclaimer/stack economizer
- BTU's per pound = 1,200 – 4,000



Natural Gas – How much does it cost?

- Cost per MCF = \$7.50 to 12.00
- 3 components
 - Commodity price (NYMEX)
 - Transportation costs (Basis)
 - City Gate to Burner Tip costs



Natural Gas – How much does it cost?

- Long term vs. short term contracts
- Energy brokers
- Buying groups
- Interruptible vs. non-interruptible



Natural Gas – What can I do to save?

Garment Tunnel

- Clean lint screens 4 times per shift
- Clean blower wheels daily
- Clean exhaust stack screens daily
- Check exhaust fans
- Monitor temperature of garments



Natural Gas – What can I do to save?

Boiler

- Tune up boiler annually
- Monitor stack exhaust temperature
- Ensure the boiler water treatment system keeps the heating surfaces clean
- Return condensate to the system
- Upgrade burner & controls technology



Natural Gas – What can I do to save?

Steam Piping

- 1/8” dia. steam leak
 - Wastes 65 lbs/hr of steam;
 - 900 MCF per year = \$6,750 - 10,800
- Check steam traps and valves
- Inspect the piping system periodically
- Insulate all steam lines



Natural Gas – What can I do to save?

Insulation Guidelines								
Hot Water Piping								
Nominal Pipe Size	Bare Pipe Heat Loss (Btu/hr/100 ft)	Insulation Thickness (inches)	Insulated Heat Loss (Btu/Hr/100 ft)	Energy Saved (Btu/hr/100 ft)	Annual Energy Savings (Therms/yr/100 ft)	Value of Energy Saved (\$ / 100 ft per month)	Insulation Cost (\$ / 100 ft)	Material Cost Recovery Time (Months)
1	10,300	1	1,450	8,850	230	\$26	\$109	4.3
2	17,800	1	2,190	15,610	406	\$45	\$144	3.2
3	25,500	1	2,970	22,530	586	\$65	\$174	2.7
4	32,100	1.5	2,730	29,370	764	\$85	\$328	3.9
6	46,000	2	3,040	42,960	1117	\$124	\$592	4.8
8	58,800	2	3,750	55,050	1431	\$159	\$719	4.5
Notes:								
200 Degree F Hot water pipe temperature								
80 degrees F ambient room temperature								
Standard fiberglass insulation with kraft jacket available from Johns-Manville or Owens Corning								
Insulation cost is 2005 retail cost by Dover Insulation, Inc.-picked up								
Annual Savings are based on 10 Hours per day and 260 days per year								
Steam System Efficiency is 75%								
Cost of Fuel per Therm is \$.70 or \$7.00 per MCF								



Natural Gas – What can I do to save?

Ironers

- Maximize production to minimize run time
- Proper steam pressure
- Clean chest
- Vacuum system operating properly
- Maintain pads
- Proper maintenance



Natural Gas – What can I do to save?

Dryers

- Very inefficient piece of equipment
- Only 65 - 70% efficient when brand new
- Load properly
- Keep the air flowing
- Calibrate controls



Natural Gas – What can I do to save?

Dryers

- Increase washer extraction time
- Do not over dry
- Clean lint filters
- Keep wiper and door seals in good condition
- Monitor gas usage per dryer
- Eliminate negative air pressure



Natural Gas – What can I do to save?

Heat Reclaimer

- How does a heat reclaimer work?
- 10°F approach temperature
- Example heat reclaimer savings
 - Operate 60 hours per week
 - Natural gas \$10.00 to burner tip
- Conservative annual savings:

\$55,300.00



Natural Gas – What can I do to save?

Heat Reclaimer

✓ Keys to System Performance

- Ensure heat exchanger tubes are clean
- Back flush the system
- Maintain adequate wastewater supply
- Daily monitoring of the approach temperature



Natural Gas – What can I do to save?

Other Heat Recovery Systems

- Water re-use & recycle
- Boiler stack economizer



Natural Gas – What can I do to save?

Other Savings Opportunities

- Energy rebates for new equipment
 - ✓ Increase equipment efficiencies
 - ✓ Subsidies from utilities and government
- Washroom chemistry
 - ✓ Lower wash temperature
 - ✓ Decrease steps in formulas
- Building improvements
 - ✓ Increase R-factor in roof & walls
 - ✓ More efficient HVAC / Energy Mgmt



Quick Hits for Energy Savings

- Fix all leaks in all systems.
- Turn it off if it is not in use.
- Educate your employees.
- Perform proper maintenance.
- Read and verify bills (keep demand low.)
- Track utilities.

“Opportunity is missed by most people because it is dressed in overalls and looks like work.”

Thomas Alva Edison



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Question & Answer

Thank you for your attention.

TURN  KEY

industrial engineering
services, inc.

1758 Worth Park, Suite C • Charlottesville, VA • 22911
Phone: (434) 962-8075 • www.turnkeyies.com