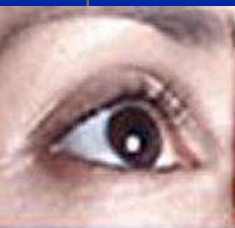


Cogeneration at Roche, Nutley, New Jersey
Climate Leaders Partners Meeting
Chicago, Illinois
October 7, 2008



Roche's Climate Leaders Activities

- Original Goal:
 - 10% GHG Reduction by 2008 vs. 2001 (**Absolute**)
 - Achieved 10.8% Reduction by 2006
- Second Goal:
 - 15% GHG Reduction by 2010 vs. 2001 (**Absolute**)
 - Achieved 11.6% Reduction by 2007

Why Cogeneration at Nutley?

- Need to reduce and control energy costs
- Corporate commitment to sustainability
- Good fit to electric and steam loads
- Strong internal technical resources



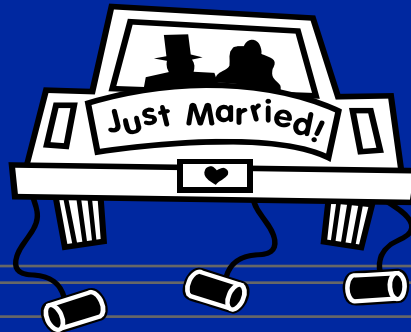
Original Cogeneration Plant (mid 1980's)



- (3) Turbines @ 3.8 MW each
- 4th Engine for Spare
- Gas Compressor
- Base Loaded
- Steaming Range: 90-135klb/hr (Constant Duct Firing)

The Early Years (mid-1980's to mid-1990's)

- Reliable Engine Performance
- Reduced Operating Costs
- Need to Run Duct Burners for CO Control
- Gas Compressor Headaches
- New High Pressure Gas Service
- Orphaned Engines



The Honeymoon Ends (late 1990's)

- Reduction in Plant Loads (especially summer steam)
- Steam Venting
- SUT, Exit Fees and Other Attacks
- Engine Problems.....



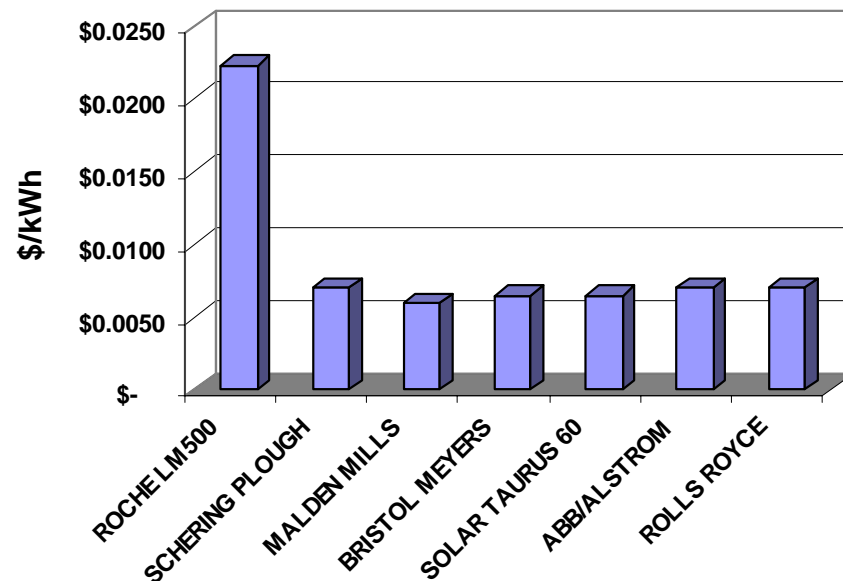
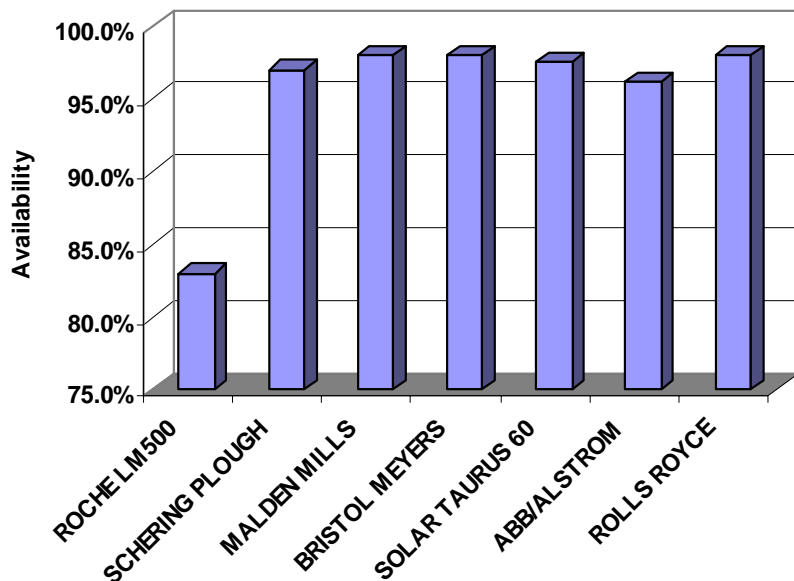
ORIGINAL ENGINES NEAR RETIREMENT



- OLDER ENGINES
- POOR AVAILABILITY
- HIGH MAINTENANCE COSTS

AVAILABILITY BELOW BENCHMARKS

MAINTENANCE COSTS ABOVE BENCHMARKS



To Cogenerate or Not to Cogenerate (The Multi-Million Dollar Question)

- Original Plant was Approaching Economic Obsolescence
- Modernizing Required Large Capital Investment
- After Extensive Analysis...No Better Way to Reduce Energy, Carbon and Dollars
- Decision in 2002 to Repower

Repowering Project

- Shutdown 12/03
- 2 New Turbine-Gen Sets
- 5.2 MW Each
- Kept Old Exhaust Train
- Restart 5/04



Cogeneration Today

- High Availability
- Service Contract/Engine Overhaul
- Black Start/Island Mode Capable
- Inlet Air Cooling
- Ease of Operation
- New Absorption Chillers
- Optional Duct Burning
- Electrical Load Following
- Impacts to Energy Procurement



Cogeneration: What It Takes To Win

- Careful Feasibility Assessment
- Long-Term Commitment
- Management Focus
- Attention to Detail
- Regulatory/Legislative Alertness
- Market Attention



Not for Casual Players



Cogeneration's Big Payoff

- Reduced Operating Costs
- Better Budget Control
- Greater Energy Efficiency
- Improved Reliability
- Decreased Greenhouse Gas Emissions

