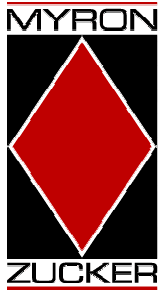


DTE Energy

**ESD-DTE ENERGY
2010 Energy Conference & Exhibition
Rock Financial Showplace
Novi, MI
May 4, 2010**

**Rob Stork – Myron Zucker, Inc.
*Strategies for Energy Efficiency
Power Factor Correction***

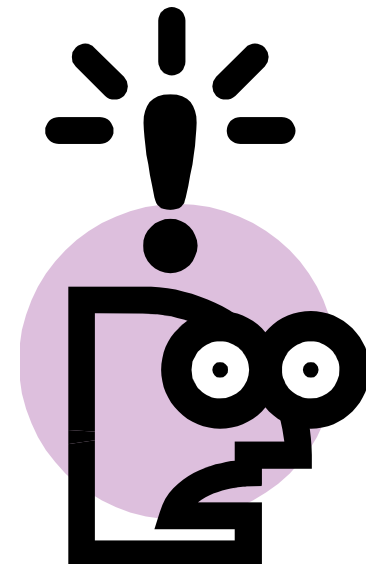


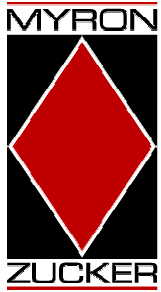
Power Factor Correction Benefits

Implement power factor correction technology and you will...

Reduce electrical utility bills by 30% !!!

Reduce electrical usage by 30% !!!

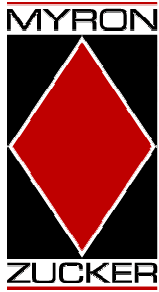




Power Factor Correction

Please do not believe the previous slide!

But believe the next slides.....



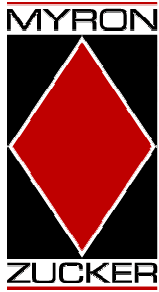
Power Factor Correction

Myths



Myth 1: PFC improves the efficiency of electrical devices

Myth 2: PFC directly reduces kW and resultant energy consumption



Power Factor Correction Truths

Truth 1: Reduces total current

Truth 2: Reduces voltage drop

Truth 3: Save Money

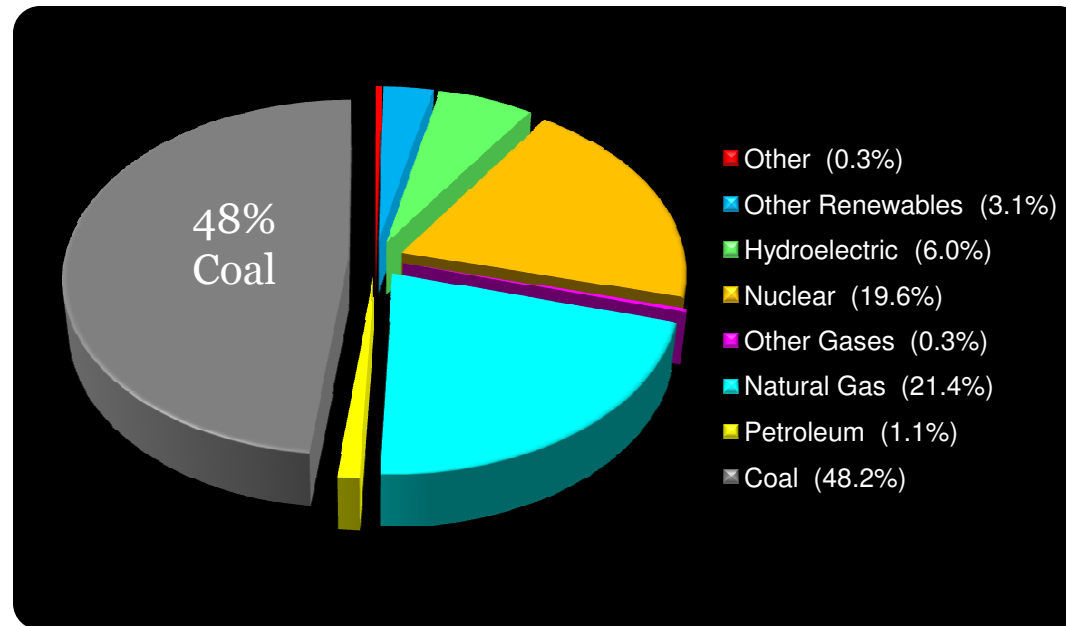
- Reduce current related losses (kW)
- Reduce adjustments levied by utility provider

Truth 4: Reduces infrastructure
Free up capacity

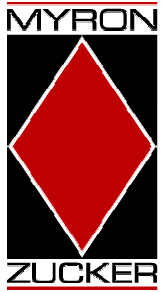


US Annual Electrical Consumption Total - 2008

Total Energy Sold: 3800 Billion kWh
Fraction From Coal: 48% or 1824 Billion kWh
CO2 Emissions: 2337 Million Tons



Ref: US Energy Information Administration – Electric Power Annual 2008 (Published January 2010)



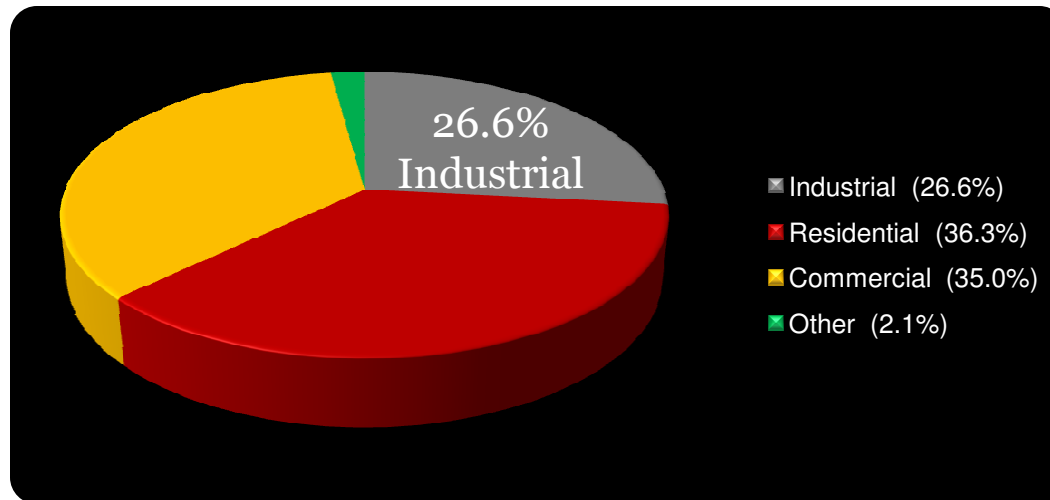
US Annual Electrical Consumption By Sector - 2008

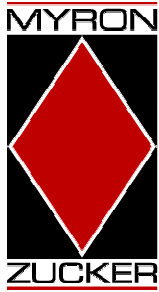
Of 3800 Billion kWh, 26.6% was sold to the Industrial Sector

Industrial Energy Sold: 1010 Billion kWh

Fraction From Coal: 485 Billion kWh

CO₂ Emissions: 622 Million Tons





US Annual Electrical Consumption Industrial Sector - 2008

65 % Electrical Industrial Consumption is from Electric Motors

Energy for Electric Motors: 656 Billion kWh

Fraction From Coal: 315 Billion kWh

CO₂ Emissions: 404 Million Tons

Determine how pfc can result in energy savings...



Effects of Industry-Wide Power Factor Correction

2-5% Facility Distribution Loss (IEEE)

assume 3%

Current that contributes to distribution losses can be reduced through power factor correction

How much reduction in losses can be achieved?

Typical Power Factor Correction results in **30% reduction** in distribution loss. Example: Power factor from .78 to .93

Approximately 1% of kW ($3\% * 30\%$)



Effects of Industry-Wide Power Factor Correction

PFC Applied to half of the motors and based on 3% distribution loss results in 1% Reduction in distribution losses.

	Energy Billion kWh	Coal Billion kWh	CO2 Emissions Million Tons
US Total	3800	1824	2337
Industrial Sector (26.6% of Total)	1010	485	622
Electric Motor Load (65% of Industrial)	656	315	404
Select 1/2 motor load to apply PFC	328	157	202
1% kW Reduction Energy saved when PFC is applied to Motors	3.28	1.57	2.02



Effects of Industry-Wide Power Factor Correction

3.3 B kWh total energy saved through reduction in facility distribution losses

- This is equivalent to the energy required to power 290,000 average households
- Results in reduction of 2 Million tons CO₂



River Rouge Power Plant is a coal-fired power station owned and operated by [DTE Energy](#) near River Rouge, Michigan.

River Rouge plant is a medium sized plant that uses approx. 115 rail cars of coal every 3 days

Owner: [Detroit Edison](#) Company

Parent Company: [DTE Energy](#)

Plant Nameplate Capacity: 651 MW (Megawatts)

Units and In-Service Dates: 293 MW (1957), 358 MW (1958)

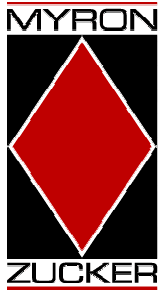
Emissions Data

2006 CO2 Emissions: 3,094,070 tons

2006 SO2 Emissions: 13,307 tons

2006 NOx Emissions: 3,967 tons

2005 Mercury Emissions: 120 lb.



Summary

- Industrial Facility Motor Load PFC
 - kW Reduction
 - CO₂ Reduction
- Other Potential
 - Commercial Sector
 - Transmission and Distribution