



Promising Technologies for Reducing Carbon Emissions, Cost and Energy Use

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Climate Leaders Partners Meeting

platts

Biodiesel for Fleets, Generators, and Boilers



Biodiesel Facts

Biodiesel typically made from plant oils

Substitute for diesel in existing equipment

Sold pure or in mix with petroleum diesel

Most diesel sold in Europe is B5 (5% biodiesel)

CO₂ emissions counted as zero

All other emissions lower than conventional diesel except potential small increase in NOx

Usually costs more . . . but not always

Many Fleets Run On Biodiesel

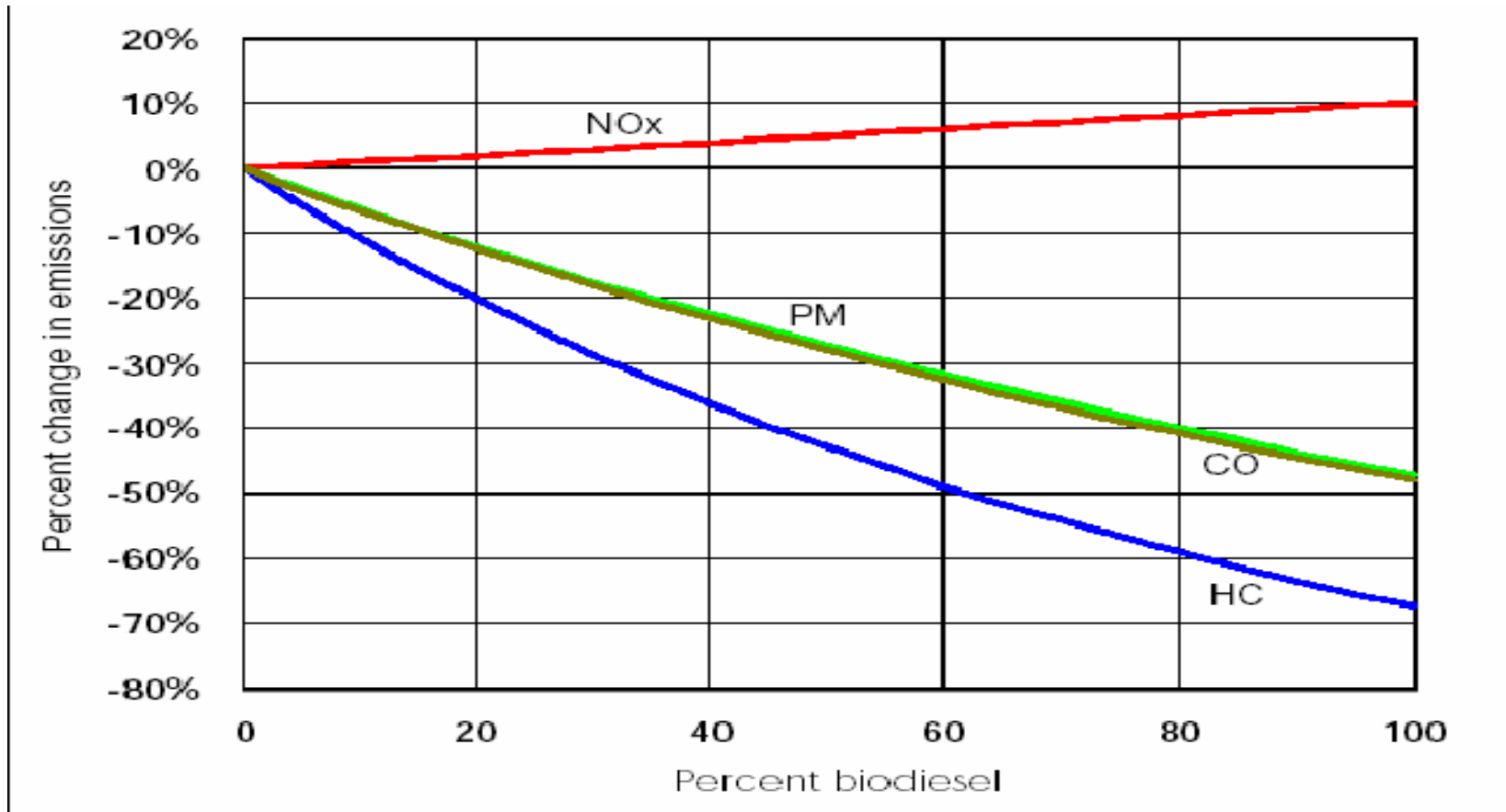


Minimizing the Food vs. Fuel Conflict

- Jatropha trees being grown on marginal, arid land that won't support food crops.
- Produce nuts very high in oils converted readily to biodiesel
- One UK firm planting millions of acres across developing world
- See www.D1plc.com



Biodiesel Emissions in Reciprocating Engines



Plug-In Hybrids: Fuel Optional



Courtesy: Valence Technology Inc. [7]

Quiet “Pollution-Free” Delivery



National Plug-In Partnership

Official launch January 24, 2006

Dozens of organizations and governments have already signed on, some with “soft orders”

Cities: Austin, Seattle, San Francisco, Chicago

Utilities: PG&E, SCE, APPA, NYPA, Omaha

Plug-In Hybrid Resources

www.pluginAustin.org

www.calcars.org

www.hybridconsortium.org

Mine Your Computers for Savings

High efficiency power supplies

LCD Monitors

Power management software

80 PLUS Power Supplies

Standard power supplies 60-70% efficient
80PLUS program promoting 80%+ efficient
15 to 25% reduction in computer energy use

- 85 kWh/y for PCs, 300 kWh/y for servers

Less heat, longer life, lower cooling load

Canada, Kansas, New York City, Portland and various corporations incorporating 80 PLUS in purchasing specs

EPA considering

www.80PLUS.org

LCD Monitors Save Space and Energy



LCD Monitors Use 80% Less Energy

Monitor Size (in)	Power draw (watts)						Annual Savings (kWh)*
	CRT Monitors			LCD Monitors			
	Active	Suspend	Off	Active	Suspend	Off	
15	61.0	19.0	3.0	11.7	3.4	0.6	98
17	90.0	9.0	4.0	16.7	4.8	0.8	134
18	N/A	N/A	N/A	25.0	7.2	1.2	N/A
19	104.0	13.0	4.0	N/A	N/A	N/A	N/A
20 / 21	135.0	14.0	5.0	31.7	9.2	1.6	180

*Assumes 1,500 hours active, 500 hours suspended, 6,760 hours off.

Source: Platts; data from Arthur D. Little

Networked Power Management Software Can Yield Big Savings for Low Cost

Shuts off PCs and monitors when idle

Savings of 100 to 300 kWh/year per user

Several products available

Cost: \$10 to \$20 per user

Computer Power Management Software

	Surveyor	EZ Save	EZ GPO	Energy Saver Pro	Night Watchman
Controls:					
• PCs	✓		✓	✓	✓
• Monitors	✓	✓	✓	✓	✓
System shutdown	✓	✓	✓		✓
Group-specific settings	✓			✓	✓
Consumption & savings reports	✓	✓		✓	
Simulation of savings	✓			✓	

Vendor Contact Information

Program	Web site	Telephone
Surveyor	www.verdiem.com	866-837-3436
EZ Save	www.energystar.gov/index.cfm?c=power_mgt.pr_power_management	202-343-9123
EZ GPO	www.energystar.gov/index.cfm?c=power_mgt.pr_power_management	202-343-9123
Energy Saver Pro	www.edubusinesssolutions.com/energysaverpro.html	888-673-8424
Night Watchman	www.1e.com/SoftwareProducts/NightWatchman/Index.aspx	866-696-5614

Zero Energy Photoluminescent Exit Signs



Courtesy: American Peralight [2]

Exit Sign Economics

	LED exit sign	Photoluminescent exit sign
Equipment cost (\$)	62	75
Installation cost (\$)	38 (69 for unit with a battery)	15
Operating cost (\$/y)	4	0

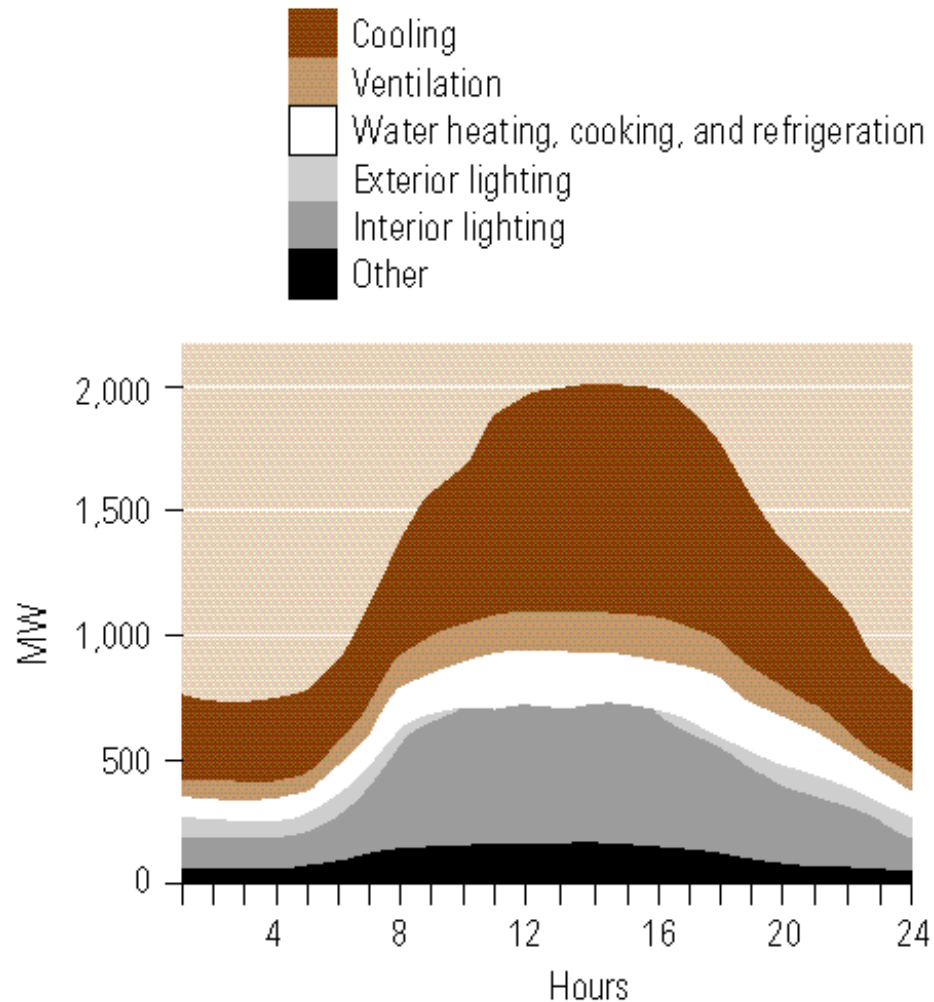
Low Hanging Fruit Keeps Growing Back: The Tale of Super T8s

Super T8s offer far better performance:

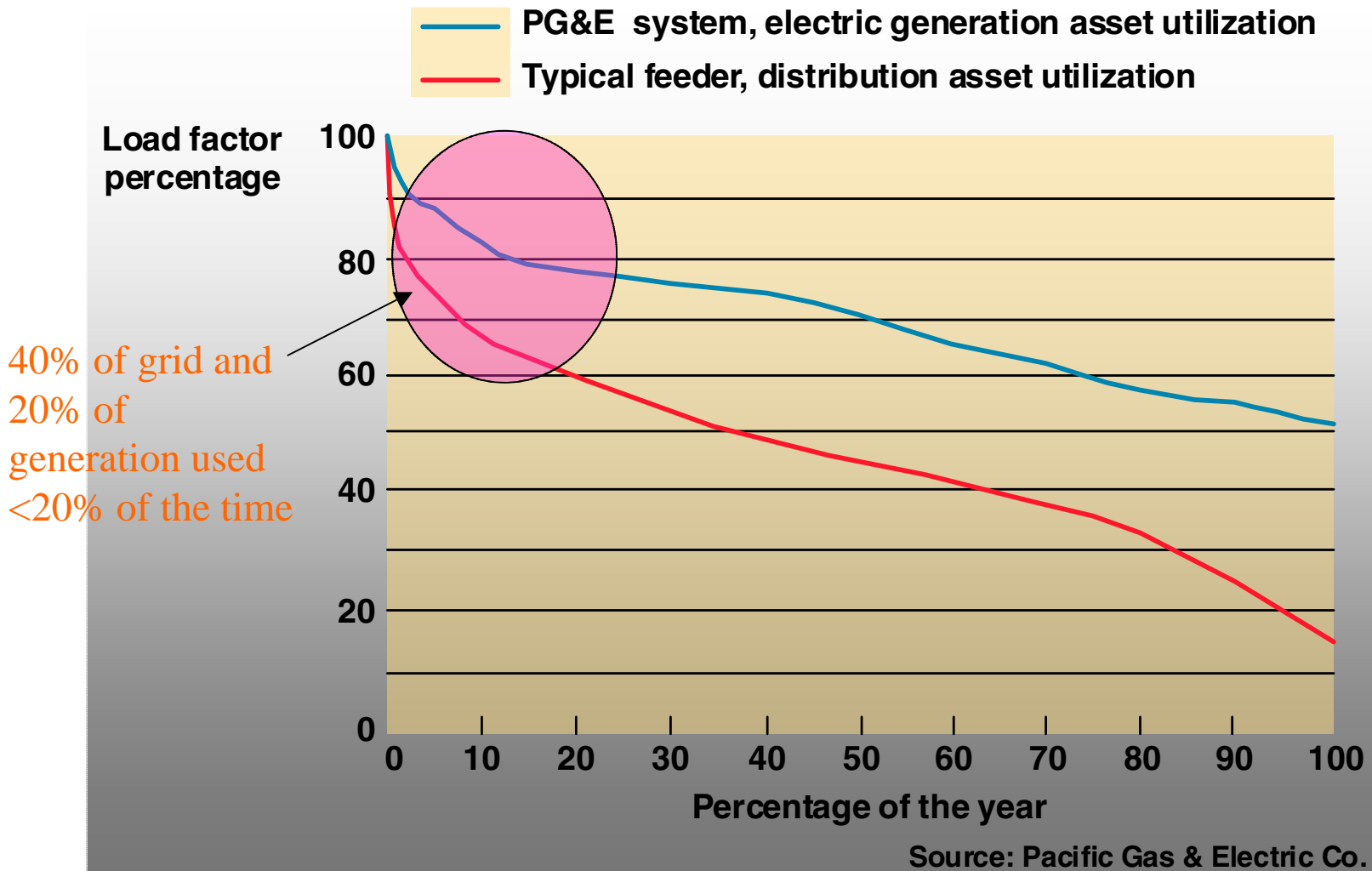
Technology	Light output (mean lumens/watt)	Improvement in efficacy (%) Over original T12	Improvement in efficacy (%) Over generic T8
T12 F40 magnetic	54		
T12 F34 magnetic	54		
Generic T8 IS ballast	75	39	
Super T8 programmed start	92	70	23
Super T8 instant-start	98	81	31

Source: Platts; data from Benya
Lighting Design and Rising Sun
Enterprises

Air Conditioning: The Load From Hell



Costly, Underutilized Assets



Solving the Cooling Problem Has Huge Leverage

Reduce cooling load

- Lighting, plug loads, glazing, orientation

Use alternative, compressor-less cooling

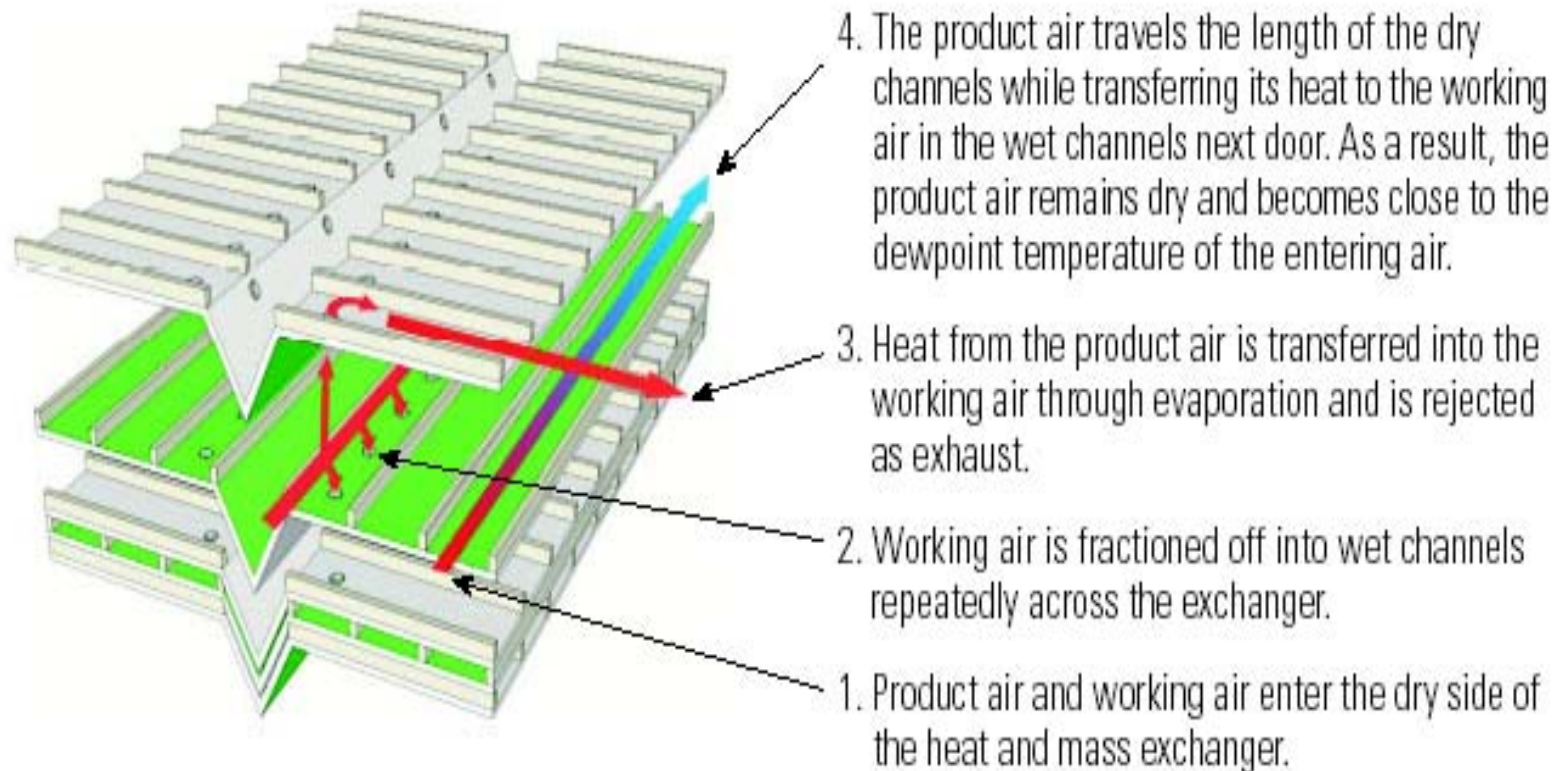
Thermal storage

Right sizing

Boulder Library is Evaporatively Cooled



Death of the Swamp Thing: Evaporative Cooling Delivers Dry Air



Courtesy: Coolerado [4]

Danfoss Turbocor Boosts Efficiency for Cooling Medium Size Buildings

30% more efficient than screws

Magnetic bearings

Quieter

Reduced maintenance

Smaller footprint

Retrofit or new systems

www.turbocor.com



For More Information

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