

National Idling Reduction Planning Conference

May 14th, 2004

Advanced Energy Systems Session



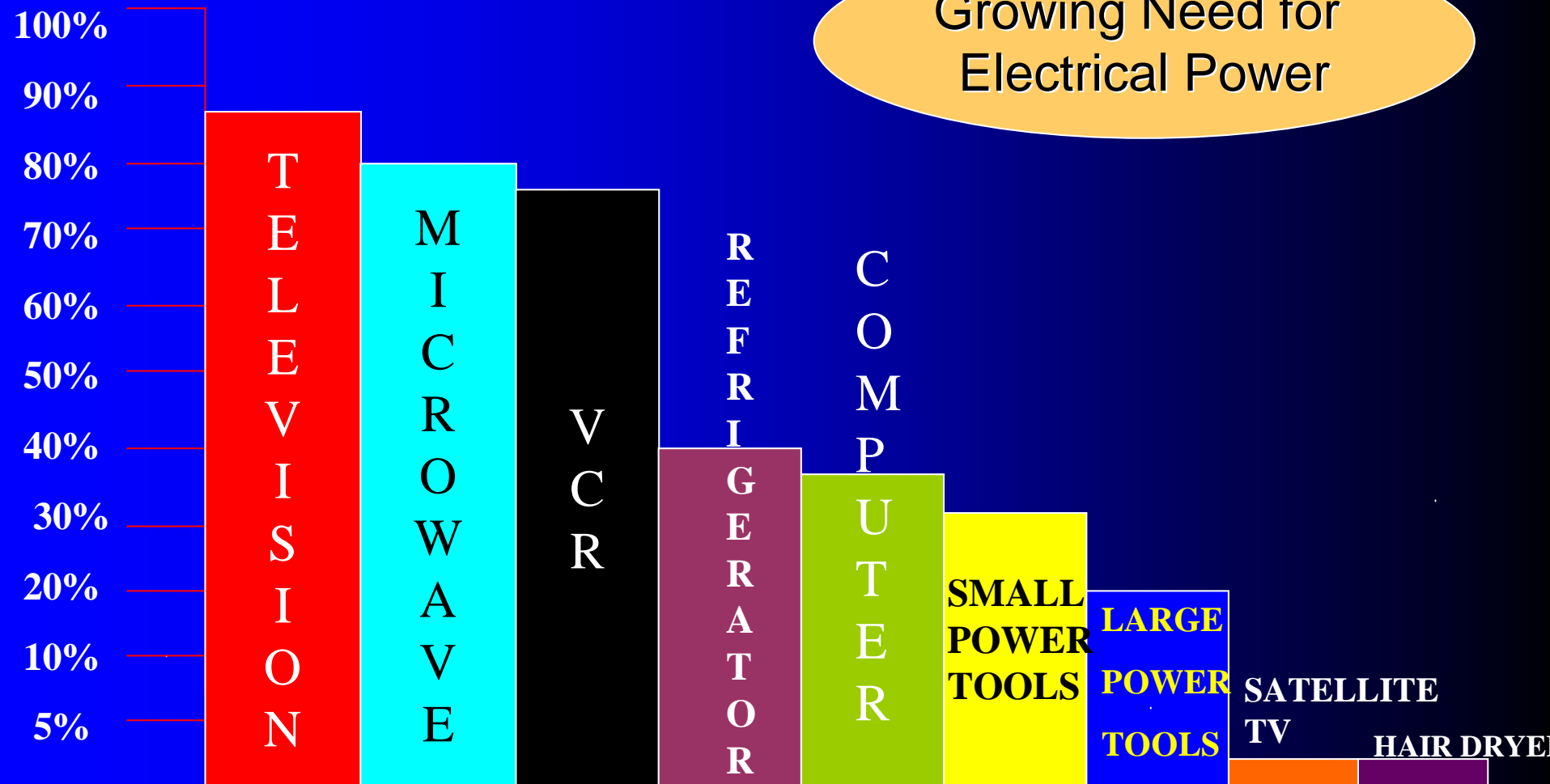
David Orr

MorElectric™ System Commercial Manager

Caterpillar Electronic & Electrical Systems Division

Truck Survey

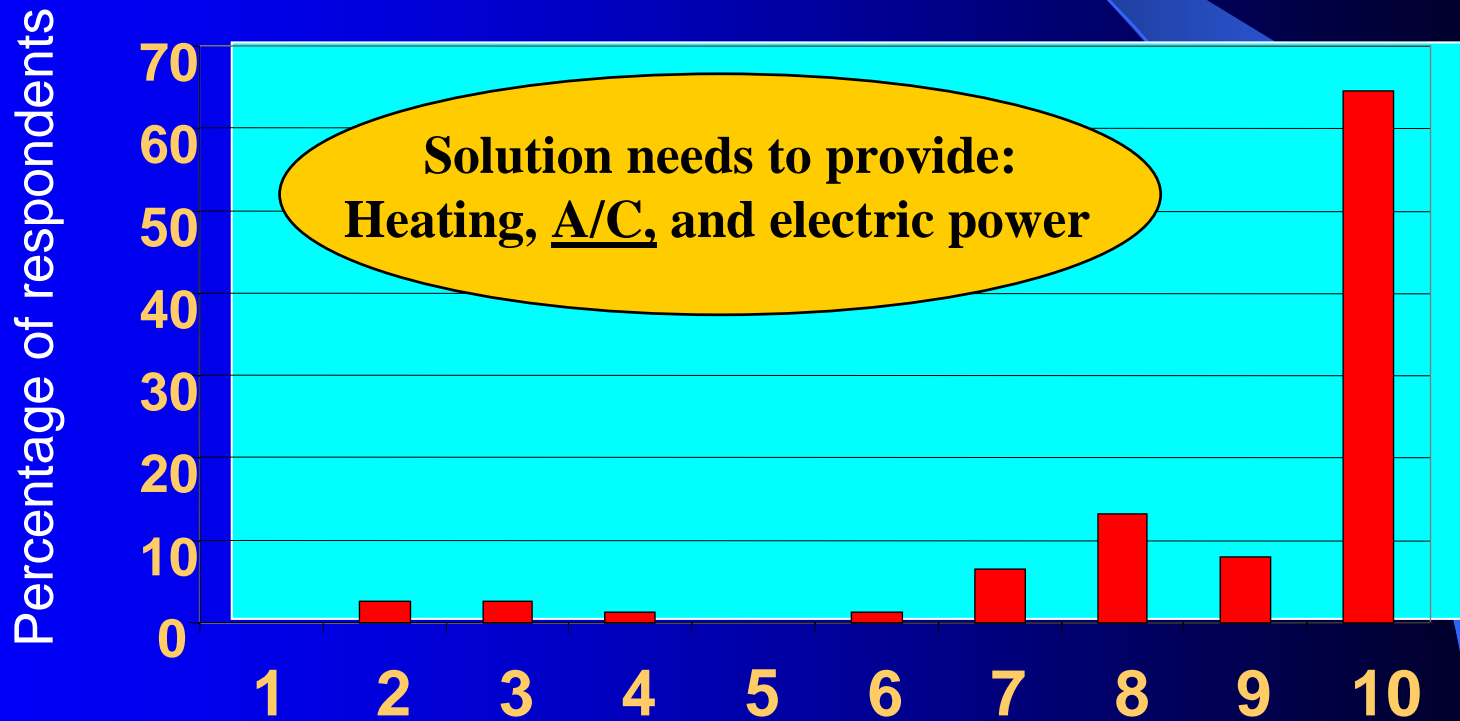
Growing Need for
Electrical Power



Truck Survey – Idling Issue

How important is it to have an alternative for providing heat, A/C, and electrical power in the cab with the engine off?

IMPORTANCE OF IDLE REDUCTION SOLUTIONS



Source: Caterpillar Business Intelligence

Changes occurring in the Marketplace....

- **Fuel Prices:** \$1.75+/gal... \$2.00 in some states
- **New Hours of Service:** 10 hrs = 8 sleep + 2 entertainment
- **Driver Shortage** – Cab comfort as recruitment/retention

All factors:

- 1) Increasing need for Idling Solutions
- 2) Enhance the Payback Period

Class 8 Truck Survey – Voice of the Customer

Owner/op idle average of 2,075 hours/yr
Fleets idle an average of 1,425hours/yr

DOE: 1,838 hours/year

62% indicate they operate in areas where idling is sensitive issue.

Motivations for Idle Reduction Solutions

- ✓ Fuel Savings
- ✓ Reduced Engine Wear & Tear
- ✓ Driver Comfort
- ✓ Legal Compliance

OBSTACLES to Market Acceptance

- ✓ Cash flow (acquisition costs)
- ✓ Lack of trust and credibility of idle reduction products
- ✓ Perception that the laws will not be enforced.
- ✓ Can't see how Shore-Power will happen....

What is the Idling Fuel Savings Opportunity?

- **Shore Power, 8.6% Fuel Savings**

$$\begin{aligned} \text{Idling Engine } .9 \text{ GPH} \times \text{Idling } 1838 \text{ hr/yr} \times \$1.50/\text{gal} &= \$2,480/\text{Yr} \\ &\times \$2.00/\text{gal} = \$3,300/\text{Yr} \end{aligned}$$

Savings Directly Dependent on Plug-in Availability

- **APU, 6% Fuel Savings**

$$\begin{aligned} \text{Idling Engine @ } .9 \text{ GPH, APU @ } .2 \text{ GPH} \\ (.9-.2) \text{ Gal/Hr} * 1838 \text{ Hr/Yr} \times \$1.50/\text{gal} &= \$1,930/\text{Yr} \\ &\times \$2.00/\text{gal} = \$2,570/\text{Yr} \end{aligned}$$

Savings Dependent on amount of idling time.

The financial incentive to reduce idling exist....
...Need cost effective and reliable solutions.

Two Universal Idle Reduction Solutions

Shore-Power....

Lowest Wt & \$

Runs off utility grid.

*Challenge: plug-in sites
will take time.*



APUs....

Cab comfort anytime/anywhere

Uses only .2 gallons/hour

Challenge: Wt & \$



Market Uncertainly Exists

- **No National Standards & Codes**
- **Need Nationwide All-Season Universal TSE Solution**
- **Market Timing and Size Unknown... heavily dependent on government action (incentives/enforcement).**

If Government will assist in reducing the uncertainly....
Industry will invest and develop commercially viable solutions.

Which Receptacle/Plug?



Shore-Power Pedestal

STRAIGHT BLADE DEVICES (SEE PAGES 317, 318 & 324)

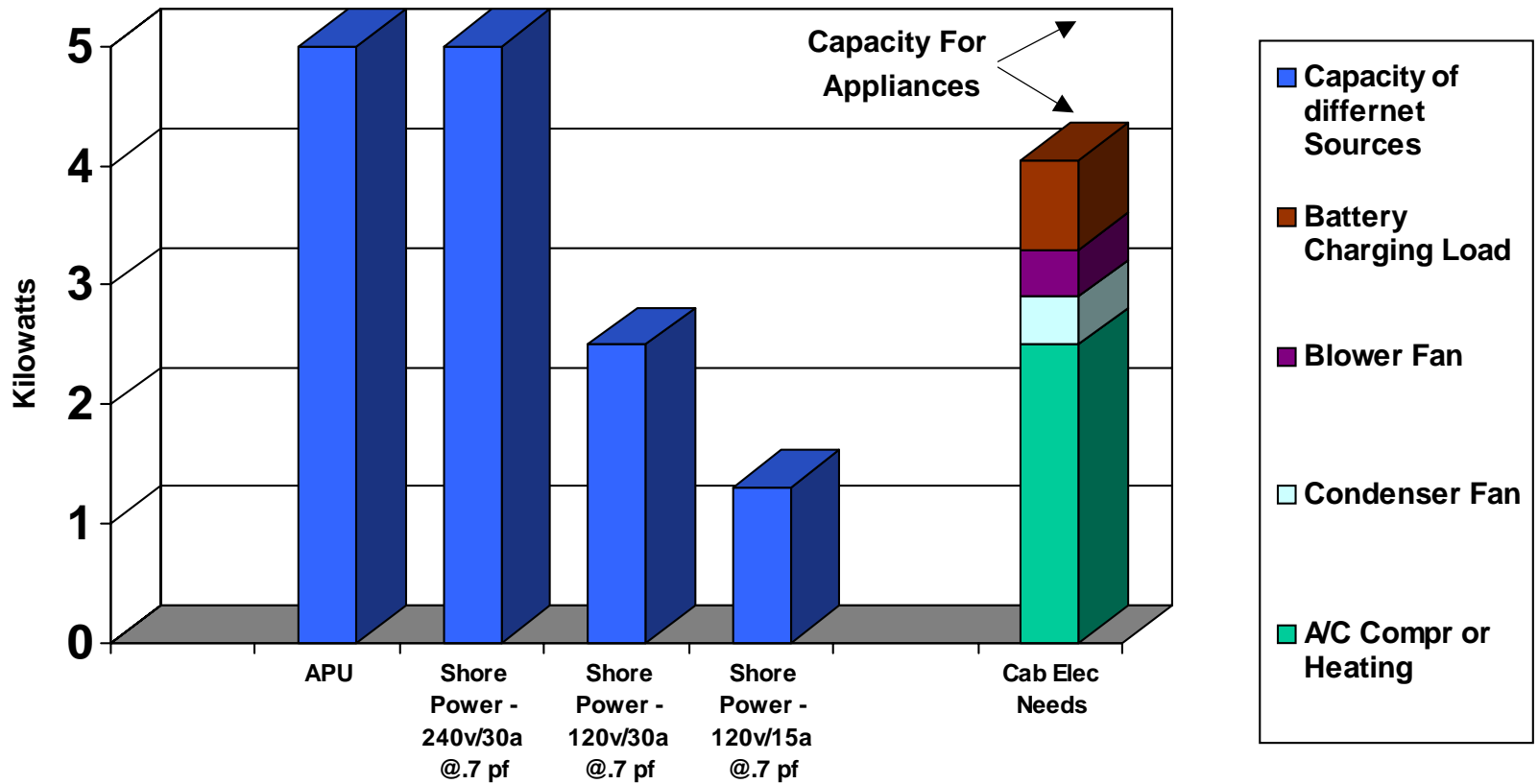
1-15P	2-20P	2-20R	5-15R	5-15P	5-20R	5-20P	5-30R	5-30P		
5-50P	6-15R	6-15P	6-20R	6-20P	6-30R	6-30P	6-50R	6-50P	7-15R	7-15P
10-20P	10-30R	10-30P	10-50R	10-50P	14-20R	14-20P	14-30R	14-30P	14-50R	14-50P
14-60P	15-20R	15-20P	15-30R	15-30P	15-50R	15-50P	15-60R	15-60P	18-60R	18-60P

TWIST-LOCK DEVICES (SEE PAGES 326, 327, 328 & 330)

ML-1P	ML-2R	ML-2P	ML-3R	ML-3P	L1-15R	L1-15P	L2-20R	L2-20P	L5-15R	L5-15P
L5-20P	L5-30R	L5-30P	L6-15R	L6-15P	L6-20R	L6-20P	L6-30R	L6-30P	L7-15R	L7-15P
L7-20P	L8-20R	L8-20P	L9-20R	L9-20P	L8-30R	L8-30P	L14-20R	L14-20P	L14-30R	L14-30P
L15-20P	L15-30R	L15-30P	L16-20R	L16-20P	L16-30R	L16-30P	L17-30P	L17-30R	L18-20R	L18-20P
L18-30P	L19-30R	L19-30P	L21-20R	L21-20P	L21-30R	L21-30P	L22-20R	L22-20P	L22-30R	L22-30P

**Need 240 vAC 30 amps
For All-Season Nationwide
Shore-Power Standard**

**The Power Available...vs... The Power
Needed**



Advanced Energy Systems

Base System: HVAC + Generator

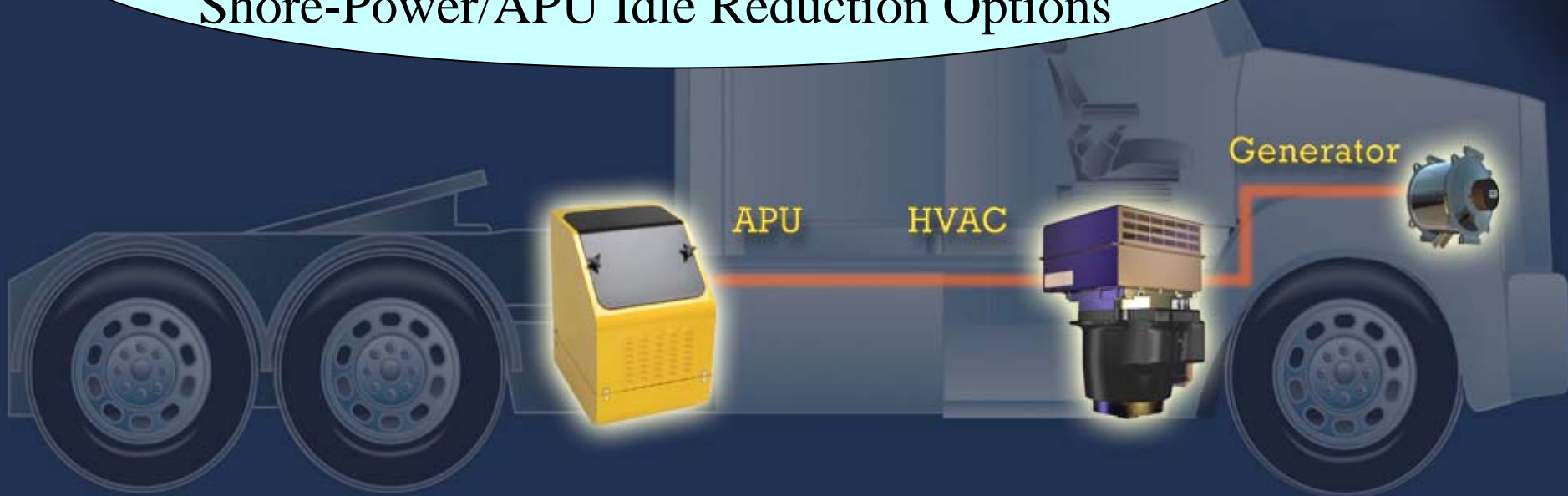
- ✓ 2% On-Road Fuel Savings
- ✓ Addresses 2 of top 5 rel/durability

Base System's Value provides
18 month payback



One HVAC for both on-road and during rest periods.

With Electric HVAC cost justified....
Can add Cost Effective
Shore-Power/APU Idle Reduction Options



MorElectric™ Technology Electrically Driven Accessories

Benefits:

- ✓ Fuel Savings Up to 8%
2% On-Road + 6% Reduced Idling
- ✓ Improves Reliability & Durability
- ✓ Two Cost Effective Idling Reduction Options:
Shore-Power or APU

