



On-board Devices

Linda Gaines

*National Idling Reduction Planning Conference
Albany, NY
May 17-19, 2004*

***Center for Transportation Research
Argonne National Laboratory***



*A U.S. Department of Energy Laboratory
Operated by The University of Chicago*



On-board devices available anywhere, anytime

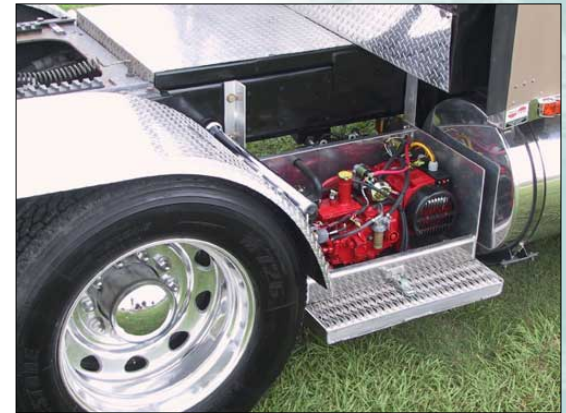
System	Services	Advantages	Disadvantages
Idling	All	No investment	High emissions, noise, fuel use
Automatic start-stop	All, intermittently	Low cost	Noisy, minimal benefit in winter
APU or similar device	All	Doubles as survival system	High cost and weight
Heater	Heating	Low cost and weight	Not full service
Air conditioner	Cooling	Low cost	Not full service, battery heavy

**NO ENDORSEMENTS IMPLIED!
VISIT THE EXHIBITS.**



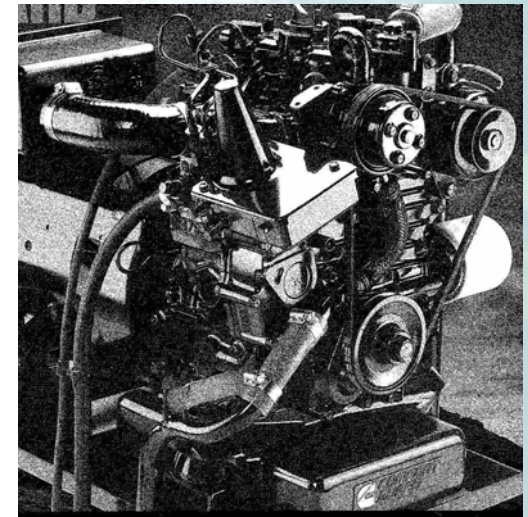
Various designs provide full service

- **Auxiliary power unit (APU) or gen set**
 - Diesel-fueled engine and generator
 - Fuel cell
 - Reformed methanol or diesel fuel, or H₂
 - Under development
 - Battery-powered
- **Inverter/charger with batteries**
- **Typically weigh up to 400 lb and cost ~\$7000**
- **Lighter and less expensive units would be desirable**
 - Manufacturers have made some improvements



CARB raises emission issue

- **Proposal to require reduced truck idling by 2010**
 - Devices currently available
- **Delayed to then because of PM emissions**
- **2007 standards will make main engine very clean**
- **APU engine meets less stringent standards**
 - Little demand for cleaner small engines
- **CARB claims APU emissions will exceed main engine's**
 - Unclear if this is true
 - Energy use still reduced
- **Cummins introduced factory APU at MATS '04**
 - APU exhaust routed through main emission system
 - **Cost is \$3000**
 - **Will be available in 2005**
 - **Information has been forwarded to CARB**

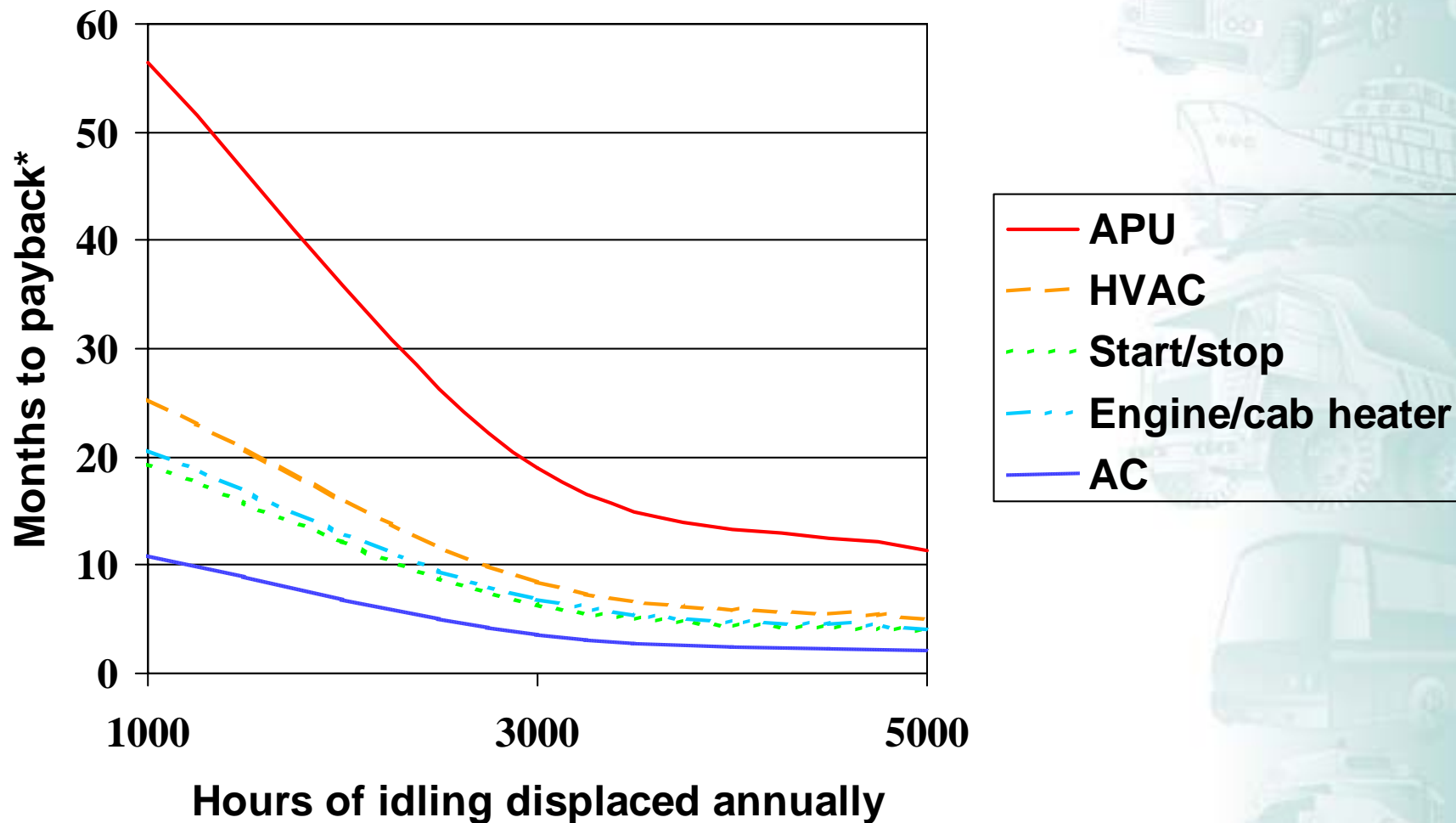


Heaters or air conditioners provide one service

- **Heaters usually diesel-fuelled**
 - Very small and efficient
 - Used widely in Europe
 - Used on trucks, buses, boats
- **Air conditioners generally rely on batteries**
 - One system uses evaporative cooling
 - Thermal storage being developed
 - May just cool localized, enclosed area
- **Heaters and air conditioners can be combined**
 - Electrical service from battery may be sufficient



On-board devices have good payback times for high idlers



*No resale value assumed

