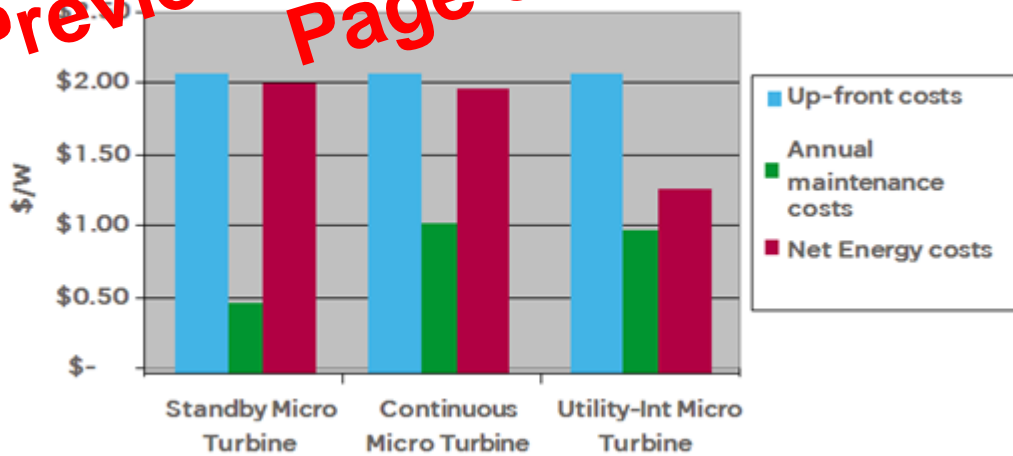


Slide 18: Determining Total Cost of Ownership

This graph shows us that the different modes of microturbines all have the same up-front costs but that they differ in annual maintenance and energy costs.

Preview from Notesale.co.uk
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Slide 19: Determining Total Cost of Ownership

An additional consideration is the elimination of other equipment.

Slide 22: Other Considerations

Many discussions of fuel cells and micro-turbines suggest that this technology could eliminate other devices in the power system, potentially reducing cost, increasing availability, and increasing efficiency. Elimination of the UPS or batteries is commonly discussed.

Slide 23: Other Considerations

In the case of utility interactive mode operation, a UPS is still required to isolate the critical load from the raw utility. In the case of continuous mode operation, a UPS is still required to buffer the critical load from the effect of other facility loads like air conditioners. In the case of standby mode operation, the UPS is required to carry the critical load until the generator can start.

Slide 24: Other Considerations

The backup time of the UPS when used in continuous mode or utility-interactive mode could, in principle, be lower than the UPS backup time of a system operated in standby mode. Consequently, the battery could be smaller. However, reducing battery run time for a given load increases the stress on the battery and decreases system reliability. Reducing the battery size to bring the run time under 5 minutes is not practical using current battery technology.

The use of UPS with flywheels in conjunction with a continuous mode or line-interactive mode power generation system could eliminate batteries. However, the data does not indicate that this offers any TCO advantage. Furthermore, real world data center failure suggests that the backup time provided by batteries can provide time for human intervention during abnormal fault conditions which can prevent downtime.

Conversion from AC to DC power is another consideration that needs to be examined.

Slide 25: Other Considerations

Some discussions of fuel cells and micro-turbines suggest that this technology could eliminate the use of AC power in the data center or network room. The concept is that Direct Current (DC) power would be provided