Microturbines…. Are they for real?

It has been more than three years since microturbines burst upon the scene, billed as a “disruptive technology” and offering the promise of lower cost, lower emissions and higher reliability.

Since that time and to no one’s surprise, a few things have changed. The question on everyone’s mind is “are microturbines for real?”

It is true that the technologies have been moving at a slower pace than was projected and most of the programs are running about two years behind original schedules for one reason or another.

The selling prices, ex-factory to the first step of distribution, are approximately $650/kW, rather than the $350-450 first advertised. The efficiencies are 26-27% LHV before output transformer and gas booster parasitics are applied, compared to the 30% original targets.

Although not yet apparent, the looming electric generating capacity overbuild will force relative electricity generation prices lower, while natural gas prices have doubled since these original projections were announced. This combined effect will narrow the spark spread and challenge the purely economic project justification.

There is ample room for technology improvements that would improve competitiveness. Remember that, for the most part, these are first generation units. Cost improvement is foremost, as two logical configuration options and duty cycles emerge.

A legitimate cogen application has always been seen as a good opportunity for microturbines and most of the manufacturers are now offering this configuration as a standard option. But given today’s fuel prices, an end-user buying the equipment and fuel at retail price levels is going to be hard pressed to make a purely economic case. The increased emphasis on cogeneration and the use of opportunity fuels (think “free”) support the notion that a pure economic justification is marginal.

A cogen unit will typically operate 8000 hours per year and to be successful manufacturers will need to focus on improved electrical efficiency and simplifying the cogen installation itself. It will also be necessary for these units to run through a grid outage. In so doing, they will earn a substantial “emotional justification” to support such an investment.

As we move more toward real time pricing and the electricity prices become more volatile, effective peak shaving can reward the savvy investor with rapid

pay-backs. I have yet to meet one of those investors who intend to pass along any of the presumed savings to end users. At the end of the day, the savvy end user is also going to realize this and do some peak shaving of his own.

A powergen or peak-shaving configuration will likely operate on a 3500 hour per year peak and mid-peak, and like its larger simple-cycle counterparts, will need to focus on lower installed first cost. These units may also be used in both power quality and reliability solutions on the customer side of the meter.

Any successful business approach will need to address the equipment sales & distribution model. The cost pressures will not support multiple steps of distribution. It is imperative to come as close as possible to a “factory-direct” distribution model, while still providing effective local installation and service support. This will remain a challenge as the industry attempts to achieve critical mass.

The current business models will also need to be re-assessed, and fuel aggregation will remain the critical issue.

Given these added uncertainties, I still believe that microturbines will be successful in ways that are not yet envisioned, and that the industry will probably sell units 2000 units next year.

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