

United Technologies Hits Cost Targets While Achieving Design Goals

PRICE Consultant Helps United Technologies Research Team Meet DoE Goals Lowering the Cost of Solid Oxide Fuel Cell Technology Development

Solid Oxide Fuel Cells are one of the cleanest and most efficient technologies for generating electricity. In fact, fuel cells are so clean that regulatory authorities in Massachusetts, Connecticut, and Southern California have exempted them from air quality permitting requirements!

That's one reason why the United States Department of Energy is driving a major initiative to bring about dramatic reductions in the cost of fuel cells, also known as SOFCs. The goal is to cut costs as low as \$400 per kilowatt by the end of this decade, a price point that would make fuel cells competitive for virtually every type of commercial or residential power application.

To help the DoE achieve this goal, United Technologies Research Center (UTRC) was asked to design a fuel cell that would have a manufacturing cost of \$800 per kilowatt within four years; \$600 per kilowatt within seven years; and \$400 per kilowatt within ten years.

To get the cost estimates for their design right, the UTRC did the right thing: they contracted with PRICE Systems to help develop an approach to meet the DoE's goals. Executive Consultant Toan Nguyen, who holds degrees in both industrial and manufacturing engineering and a Masters in operations research, brought his energy and experience to bear on the problem. A former cost estimator for Boeing, Toan has contributed to the success of a number of nationally significant programs, including the NASA Space Shuttle and National Missile Defense.

Working with UTRC's technical design team, Toan developed a series of cost-technical trade studies, using parametric cost estimates and the Cost As An Independent Variable (CAIV) process. Says Toan, "In a matter of three weeks, we were able to successfully substantiate the cost goals with a relatively high level of detail."

As a result, the UTRC design team was able to successfully develop SOFC design concepts that would meet the \$800 per kilowatt architecture. Using that as the baseline, the team derived the \$600/kw and \$400/kw architectures, based on further advancements in fuel cell technology. According to Toan, "More affordable fuel cells are on the way!"



CASE STUDY

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