DOE Hydrogen and Fuel Cells Program Record	
Record #: 5005	**Date:** March 20, 2005
Title: Fuel Cell System Cost - 2002 vs 2005	
Originator: Patrick Davis	
Approved by: JoAnn Milliken	**Date:** May 22, 2006

Item:

"Reduced the high-volume cost of automotive fuel cells from $275/kW (50kW system) in 2002 to $110/kW (80kW system) in 2005."

Supporting Information:

In 2002, TIAX reported a cost of $324/kW for a 50-kW automotive PEM fuel cell system operating on gasoline reformate, based on their modeling of projected cost for 500,000 units per year. See Eric Carlson et al., "Cost Analyses of Fuel Cell Stack/System." *U.S. DOE Hydrogen Program Annual Progress Report*. (2002) at http://www.eere.energy.gov/hydrogenandfuelcells/pdfs/33098_sec4-1.pdf. Also see "Cost Modeling of PEM Fuel Cell Systems for Automobiles," Eric Carlson et al., SAE Publication 2002-01-1930.

Since that time, the DOE program has shifted its emphasis from gasoline fuel cell systems to direct-hydrogen fuel cell systems for transportation. In fact, onboard fuel processing was eliminated as a research area by the DOE Hydrogen Program in 2004. See http://www.eere.energy.gov/hydrogenandfuelcells/pdfs/committee_report.pdf.

To estimate the 2002 cost of a direct-hydrogen fuel cell system, the cost of the reformer ($76/kW) was subtracted from the TIAX system cost number, yielding $248/kW. To convert that number into 2005 dollars, $248/kW was multiplied by 1.10 - the change in the Consumer Price Index (CPI) from 2002 to 2005 – yields $273/kW (for CPI see http://woodrow.mpls.frb.fed.us/Research/data/us/calc/index.cfm). This number was rounded up to $275/kW.

For details on the analysis of fuel cell system cost in 2005, see Eric Carlson et al., "Cost Analysis of PEM Fuel Cell Systems for Transportation," National Renewable Energy Laboratory Subcontractor Report, NREL/SR-560-39104 (September 30, 2005) at http://www.nrel.gov/hydrogen/pdfs/39104.pdf. The analysis led to a fuel cell system cost of $108/kW which was rounded up to $110/kW in DOE documents. The 2005 cost estimate accounts for higher platinum costs ($900 per troy ounce) than used in 2004. The decrease in costs is mainly attributed to a 70% increase in power density from 350 to 600 mW/cm^2.

The methodology and results of this cost analysis were independently assessed in 2006. See http://www.hydrogen.energy.gov/peer_review_system.html for details of the assessment.