Item:

Effect of Electricity Price on Distributed Hydrogen Production Cost

(Assumes: 1500 GGE/day, electrolyzer at 76% efficiency, and capital cost of $250/kW)

Reference:
The graph is based on the 2010 target of a 1500 kg/day water electrolysis refueling station described on page 3-12 of the Hydrogen, Fuel Cells and Infrastructure Technologies Program Multi-Year Research, Development and Demonstration Plan, February 2005. The graph uses all the same assumptions associated with the target, except for electricity price:

- 76% efficient electrolyzer
- 75% system efficiency
- 20 year analysis period
- 10% IRR after taxes
- 100% equity financing
- 1.9% inflation
- 38.9% total tax rate
- MACRS 7-year depreciation
- 70% capacity factor
- $250/kW system capital costs
The data in the graph was determined using the H2A model, with the electricity price varied by one cent from $0.02/kWh to $0.08/kWh. The results for each run are shown below:

<table>
<thead>
<tr>
<th>Cost of Electricity ($/kWh)</th>
<th>0.02</th>
<th>0.03</th>
<th>0.04</th>
<th>0.05</th>
<th>0.06</th>
<th>0.07</th>
<th>0.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed Hydrogen Cost ($/kWh)</td>
<td>1.89</td>
<td>2.36</td>
<td>2.84</td>
<td>3.31</td>
<td>3.79</td>
<td>4.26</td>
<td>4.74</td>
</tr>
<tr>
<td>Capital Costs ($/kg of H2)</td>
<td>0.60</td>
<td>0.61</td>
<td>0.62</td>
<td>0.63</td>
<td>0.65</td>
<td>0.66</td>
<td>0.67</td>
</tr>
<tr>
<td>Fixed O&amp;M ($/kg of H2)</td>
<td>0.36</td>
<td>0.36</td>
<td>0.36</td>
<td>0.36</td>
<td>0.36</td>
<td>0.36</td>
<td>0.36</td>
</tr>
<tr>
<td>Electricity Costs ($/kg of H2)</td>
<td>0.93</td>
<td>1.39</td>
<td>1.85</td>
<td>2.32</td>
<td>2.78</td>
<td>3.24</td>
<td>3.71</td>
</tr>
<tr>
<td>Other Variable Costs (including utilities) ($/kg of H2)</td>
<td>0.005</td>
<td>0.005</td>
<td>0.005</td>
<td>0.005</td>
<td>0.005</td>
<td>0.005</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Information Sources:

For details on the H2A model, see:
http://www.hydrogen.energy.gov/h2a_analysis.html

The standard H2A economic assumptions can be found at