



October 16, 2009

Steve Church  
Research Division  
California Air Resources Board  
1001 I Street  
Sacramento, CA 95812

RE: ETAAC Advanced Technology Development Draft Report

Dear Mr. Church:

Thank you for offering the opportunity to review the Draft Report and provide comment to you. We commend the ETAAC for encouraging the State of California to have a more active role in commercialization of technologies and products that will further compliance with Greenhouse Gas (GHG) goals defined in AB32. IdaTech offers a brief set of comments herein.

I am writing to encourage the Committee to clearly identify stationary fuel cell power systems as one of the contributing technologies that can definitively help achieve GHG reduction goals. Inherent lower emissions of fuel cell systems are obvious, however their lower life cycle cost (i.e. cost of ownership) means they will be preferred power sources by an increasing set of markets, increasing their adoption and the environmental benefits that accompany them.

Several fuel cell companies have deployed products in California, and IdaTech is a contributor with small Proton Exchange Membrane (PEM) Fuel Cell systems, ranging from 3 to 5 kilowatts in installed capacity. These systems are typically employed as backup power generators; accordingly, their impact to GHG emissions is modest. However, PEM systems are supporting early markets such as the telecommunications industry, wherein small PEM systems will be deployed by the tens of thousands globally over the next three years, and hundreds of thousands thereafter.

Inherent higher efficiencies of PEM systems, and low emissions derived from catalytic processes used for electricity generation render PEM systems attractive both in terms of reduced GHG impacts and reduced smog. The figure below compares a IdaTech ElectraGen™ XTi system ('XTi' representing an extended run, fully integrated power plant) with a comparable diesel generator used currently for telecommunications backup at Base Transceiver Stations. Emissions of NOx and particulates are extremely small for fuel cell systems. Also, the attractive life cycle cost of fuel cell systems compared with high maintenance and repair generator sets indicates that carriers will choose fuel cell systems for total cost of ownership reasons, which carry the emission advantages of fuel cell plants whether or not there are regulatory encouragements.

It is recommended that the Report feature a section for renewable fuel cell systems. IdaTech is currently testing biomethanol derived from waste streams as an affordable and practical alternative to conventional fossil fuels. California offers a substantial incentive for siting fuel cell systems fueled with biofuels; we anticipate that IdaTech's customers will choose, for example, biomethanol for systems operations for reasons of the incentive and emissions profiles.



## Telecom Backup Power Technology Comparison

### Fuel Cell System vs. Diesel Generator

	<b>ElectraGen XTi System</b> Fuel Cell system with Methanol/Water Reformer	<b>Diesel Generator</b>
<b>Exhaust Emissions<sup>1,2</sup></b>		
Nitrogen Oxides (NOx)	< 0.01 g/kWh	7.5 g/kWh
Carbon Monoxide (CO)	0.2 g/kWh	8.0 g/kWh
Particulate Matter	0 g/kWh	0.8 g/kWh
<b>Noise Emissions</b>		
Decibel rating	<b>Quiet</b> 65 dB at 1 m	<b>Loud</b> 68 dB at 7 m
<b>System Efficiency</b>		
System Efficiency (%)	30%	10-25%
<b>Operational Costs</b>		
Maintenance (visits per year)	1	2-4
Life cycle cost	Relatively lower	Relatively higher
Reliability	Few moving parts	Many moving parts

Note 1: ElectraGen™ XTi System emissions data from IdaTech test results

Note 2: Diesel generator emissions data from EPA standards for 2007 and newer generators, *EPA Standards of Performance for Stationary Compression Ignition Internal Combustion Engines; Final Rule July 11, 2006*

Last, IdaTech has pioneered the hybridization of PEM power systems with other clean generators. Several photovoltaic and fuel cell systems have been sited to take advantage of the benefits for both systems. An additional benefit is the extension of fuel cell system life enabled by the generation of electricity by the PV component. We believe there will be significant market demand for hybrid systems as acquisition prices for PEM systems continue their decline.

Last, the draft report cites that fuel cell systems are characterized by higher acquisition cost, which has been true in the past. Recent National Fuel Cell Research Center reports have, for the first time, determined the monetized value of large and small fuel cell systems. The principal conclusions of the studies are that fuel cell systems are cost competitive on a life cycle basis, and can be used to reduce GHG emissions. These reports are posted on the Center's web site, [nfcrc.uci.edu](http://nfcrc.uci.edu).

Although this submission is brief, we hope that it favorably contributes to the effort of the Committee. Please contact me with questions.

Sincerely,

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