

PS Statement 5-23-11 CEC Meeting

Statement of Paul Staples at the 5-23-11 2011-2012 Advisory Committee Meeting and Public Workshop for the Alternative and Renewable Fuel and Vehicle Technology Program.

Note: Please accept my apologies for any lack of clarity of my statement on 5-23-11, as I tried to make a complete statement, I was hurried as I was limited to 3 minutes, which was a hindrance to making a clear and complete statement. Please find herein my clear, and complete statement for the record.

My thanks to the committee and those attending the meeting for your patience and understanding.

Paul Staples, Chairman/CEO
HyGen Industries

DOCKET	
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DATE	MAY 23 2011
RECD.	JUN 03 2011

Acronyms:

FCEV(s) – Fuel Cell Electric Vehicle(s).

BEV(s) – Battery Electric Vehicle(s).

EV(s): Electric Vehicle(s)

gge – gallon of gasoline equivalent.

kg – kilogram of hydrogen (approx. 1.1 gallons of gasoline equivalent).

SMR – Steam Methane Reformation - process of making hydrogen from natural gas.

First I have a couple of questions, and then my statement:

I saw 10.2 mil, in the presentation, so is it \$10 mill, or \$8 mill being proposed for the 2011-2012 business plan?

Any option for increasing the amount if the REP response is good?

What will the amount be for the upcoming RFP?

Would the committee consider combining the proposed amount into the upcoming RFP?

Funding for hydrogen infrastructure is anemic and destined to cause FCEVs to fail upon rollout.

- It is counter productive and will sabotage rollout.
- The only successful strategy is to increase leading up to rollout, not decrease - which will stifle rollout.
- Amount should reflect an increase before rollout, certainly no reduction?? – \$16 mil – \$20 mil./RFP 2x/yr. until 2017.
- The upcoming RFP should be for all renewable H2, to catch-up with previous awards – which were mostly fossil fuel hydrogen.
- Hydrogen is the only 100% sustainable option farther into the future anyone can foresee or calculate. It is truly the forever fuel. Even NG reforming for FCEVs is more sustainable, cleaner, operationally and economically viable, than any other option being considered today.
- Distributed generation, on-site/on-demand infrastructure deployment and conversion is quicker and less expensive to convert and deploy than any other option,
 - BEVs – will require major investment in residential grid upgrades – BIG \$\$\$-Hundreds of Billions, possibly a Trillion+ to meet energy demand for nations residential grid,
 - Biofuels – major cost to station owners in just relining tanks, more than cost of on-site generator.

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- Economies of scale are necessary to bring price down. Only Government can do this. Private sector business never invests in infrastructure building or conversion. The Hoover Dam, TVA, Rural Electrification, all done in less than 10 years by government funding and a commitment to build.
- BEVs are getting \$1.5 billion to deploy infrastructure from the Federal Government.??? Even though they will never be as cost competitive as FCEVs. (battery costs = \$300.00 - \$400.00/kw even in mass production, vs \$53.00/kw for FCs – as per DOE.).
 - So why are you reducing the amount the closer we get to rollout? I ask again, are you favoring one technology over another as the Obama administration is? Even though the automakers are required by law and legal settlement with the state and federal governments to deploy FCEVs, and BEVs are not required, just allowed?
 - These cuts can only be seen as a decision to undermine the rollout of FCEVs. Because that is what it will do. It is too clear and obvious to anyone.
- This program is funded through Auto Reg. Fees and not part of the general budget. Should not require additional funding requests from the budget, as its source does not depend on the General Fund. Just a decision to allocate it. Can be done by the committee. Unless there are politics involved. Is there?
- Fueling Outlets do not want biofuels either, due to the relining of the tanks due to the caustic nature of biofuels, and the lower energy value per gallon over gasoline. \$300,000.00 plus losses due to station shutdown.

Response to previous public comments made:

Original Investment Plans:

- CaFCP – Central Generation is long term solution. Funding is sufficient???
- Funding is sufficient???
 - I categorically disagree. There is not enough funding, for reasons already stated earlier in this statement.
- Central Generation is the long-term solution.
 - Central generation is illogical and impractical. It is way too expensive for pipeline infrastructure conversion, and inefficient and polluting by tanker truck delivery.
 - Central generation is only more efficient if delivered by pipeline vs. delivered electricity for clean renewable/sustainable on-site/on-demand electrolytic generation by PPA. This is mostly due to lower energy losses by pipeline – 2% – 4%, vs up to 8% by electric transmission. However, if cleanly produced electrolytically by solar/wind/wave/geothermal, etc., there is no increase in efficiency in electrolytic hydrogen generation over distributed electrolytic generation except in transmission. (No additional efficiencies over distributed generation are realized).

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- If central generated by Natural Gas SMR (less efficient than electrolysis which is 88% efficient @ 400 psi – DOE webcast on May 23, 2011 12:00 PM - 1:30 PM EDT), more water used/kg-gge, than electrolysis (which is less than 2.5 gal/kg - 98% feedstock efficiency – lowest water used by any and all alternatives being considered, even less than gasoline – 3 – 5/gal/gal of gasoline, 21 gallons per gallon of biofuel produced, ref. - DOE), SMR is not sustainable for the long term, less efficient in the short term, just more available on the short term. Should only be used in short term to assist in vehicle FCEV rollout. Solves no problems, still a finite fossil fuel. It is adding GHGs and CO, and NOx as well as that produced by diesel powered tanker delivery trucks (although less than gasoline and less than BEVS with grid mix), is subject to regional failure causing shortages of fuel for a region – much less likely in distributed generation.
- With Pipeline? – WAY TO MUCH \$\$\$! WAY TOO LONG TO DEPLOY! TOO INSECURE AND SUBJECT TO MASSIVE REGIONAL SHUTDOWNS AND SHORTAGES JUST LIKE REFINERIES, ALSO DANGER DUE TO NEED FOR MASSIVE STORAGE – TOO MUCH DANGER. A SECURITY RISK! No different than refineries. You want to get away from that paradigm, it is so less secure. Unlike distributed generation, which is a lower risk of regional shut down due to much lower onsite storage, much less than gasoline (up to 30,000 gallons at stations, millions of gallons at refineries, only 100-300 gge storage at on-site/on-demand distributed electrolytic generators – even at full market penetration), or delivered hydrogen from central generation (thousands of kg/gge on-site storage). Onsite Electrolyzers are just as efficient at on-site generation than large central electrolytic generation.
 - Central Generation – not viable even in long term. Energy security, cost for infrastructure – (pipeline is only efficient option for efficiency and GHG due to transport by tanker fossil fuel use.)
 - NG SMR: Okay for short term rollout where not technically viable for Renewables.
- Rural Electrification/TVA/Hoover Dam, all were a gamble. They had no guarantee that everyone would use at the time, but the Gov. took a chance. It Paid off. All done in the 1930s.
- Auto Company estimates are a response to the CEC request for commitments – commitments are based on requirements and used to estimate Fueling Station deployment and funding: In order to not over extend their costs and commitment, in case there are not enough stations providing fuel, and vehicles sales are not enough to increase production (only will happen if fueling stations are not available), they low balled the estimate in order to avoid not meeting gov requirements (appropriate for any business to due to limit liability). Other non-committal market estimates show much higher estimates and expectations. If Fueling Stations are sufficient (much more needed than being funded), vehicles will succeed and result in mass production, and consumer demand will far exceed those commitments. But not at current level of deployment.
- Transit allocation is due to activists trying to eliminate passenger vehicles from use in SF – does not work as well for L.A., S.D., and others.
- No such thing as sustainable biofuels, cellulosic or otherwise. Not enough farm land and open available federal lands to produce more than 10% of all our energy need (cellulosic or no cellulosic). And even at that, all of us would have to give up eating and drinking, as all of the water would be used to make biofuels – 21 gallons of water per gallon of biofuels produced.
- EV guy: FCEVs are EVs. The most viable EVs, FCEVs, have out performed BEVs in every field.

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- Fast Charging is not viable – Still takes too long and reduces the lifespan of the battery pack requiring replacement in just a couple of years - \$20k +. Also commercial fueling stations will not site – no business model for them – source –Station owners. Ask any of them and why (so long as you are not coming from a place of activism and just doing research).
- Battery exchange has no business model for a gas station. Can serve only one vehicle every 3 minutes (and only if all battery packs are designed the same and are identical in all vehicles by all auto makers – good luck in that. Otherwise much longer), were as now all stations can serve up to 12 or more vehicles in 3 – 5 minutes. It's a huge and expensive system takes up a whole lot for 1 vehicle every 3 minutes. Not viable, not acceptable to the station owner, or the average customer. Let's be real.
- Retrofits: One of those making a public comment spoke to vehicle retrofits. Retrofits require CARB approved FTP dyno emissions certification of each class to certify for emissions. Very expensive which is why only large automakers or parts manufacturers take it on, because it needs to be done for every class of engine.

My thanks to the commission and all those that attended.



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