Andrew,

Some quick reactions:

- You have a method for calculating CO2 emissions from electricity as a fuel, why not go ahead and apply that rather than keeping TBD in the tables?

- Since most of these states have renewable portfolio standards (RPS), you might as well include that in the projections , e.g. DE has a 20% RPS, so assuming no other improvements in the power system nor in EVs or PHEVs, that means that driving on electricity will produce only 80% of the carbon it does today.

- Most of the renewable power in this region will be coming from offshore wind. That, like any wind, is limited in total penetration by fluctuations. You can do a lot with transmission, but EVs with charge-discharge capability (like those we are driving today) will enable much larger wind penetration. We have modeled this and it is a significant effect, e.g. several ten's of percentage points, in increased wind penetration. Therefore, EVs will have a secondary carbon benefit that is not captured in the currently written low-carbon fuels standard. An Australian analysis that I have not tracked down and verified holds that this "secondary" carbon benefit of EVs with proper controls is MORE than the effect of the low-carbon fuel itself. Whether it is greater or less, the point is -- I understand that you may not be ready to add to the low-carbon ratings, but at least this "secondary" benefit should be mentioned prominently in the text. There is nothing like this secondary benefit for the other low-carbon fuels, and it is a significant adder. For a quantitative model run of this, see the Lund and Kempton article at: http://www.ceoe.udel.edu/windpower/articles.html

- I don't recall any discussion of which of these low-carbon fuels scale. Shouldn't this be included in the calculus somewhere? There's no way that biofuels scale to 100%, it just gives us a few % before the impact on the food system starts to get unacceptable. Electricity requires more generation to get to 100%, but we're planning to put gigawatts of offshore wind in place, our local offshore wind resource runs all the cars on the east coast, many times over.

- Price for electricity may not be worth the amount of analysis you give it. At 15 cents/kWh, electricity is something like $1/gallon equivalent. I see no way that electricity could ever be as expensive as gasoline.

- I know there's lots of arguments that there will be twice as many PHEVs and EVs on the road, like your projections for 2020. It doesn't affect your results but we're driving several EVs here continuously and we find that dubious. Just look at the pricing on Volt versus the Nissan Leaf -- and look at what a dog the plug-in Prius is. Once people get used to driving on electricity and find ways to manage slower refuel, the appeal of paying $5,000 or more extra for a redundant drive train will fade. Today I'm betting on 3:1 ratio of EV:PHEV by 2025 (hunch, no analysis behind that ratio).

Good luck with this effort.

Sincerely,

Willett Kempton
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