Hydrogen fuel cells get a lift

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I was reading one of the logistics magazines I regularly get and found out something amazing. By about 2020, roughly 80 percent of the lift trucks in America will be powered by hydrogen fuel cells. The fuel cell advantage is constant voltage output and longer continuous run time. In addition, recharging time is short because you don't really recharge you refuel. On the other hand, you really don't recharge batteries in the ordinary way. But you do switch battery packs, which takes longer than refueling and requires one or two spare battery packs for each truck if they are operated for two or three shifts. Battery lifetime is on the order of five years. Fuel cells last for ten years. In lift truck applications, battery weight is not a drawback that it might be for an auto. Which is one of the reasons hydrogen fuel cells are gaining traction in automotive applications [1].

There is also a case for hydrogen fuel cells as battery and diesel gen-set replacements in telecom applications.

What are the limitations? High subsidies are one. If that disappears the economics given current market prices for fuel cells and hydrogen production make fuel cells uneconomical. However, as with many things higher production volumes will lower costs.

Here are some links for those of you wishing to do further study. [2]

Green Way [2] discusses the economic case in some slides which are presented in pdf format.

Raymond Corporation [3], a manufacturer of lift trucks, makes the case for fuel cells. From July of 2009. [4]

FedEx [4] details their progress as of May 2012.

Hydrogenics [5], a manufacturer of fuel cells, gives product details of their system. [6]

Toyota [6] has a hydrogen fuel cell lift truck prototype. There is also a hybrid engine/battery lift truck on the same page.

The list is not exhaustive but it should be enough to get you started. What does it mean for engineers? Opportunities for system design. Electric motor design. Control design. Hydrogen sensor designs for safety. And of course design of all the related equipment that may be required. LEDs. Touch screens. Weight sensors. etc.

M. Simon's e-mail can be found on the sidebar at Space-Time Productions [7].

Engineering is the art of making what you want from what you can get at a profit.

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[1] http://edition.cnn.com/2012/11/25/business/eco-hydrogen-fuel-cell-cars
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