

ZEB Program Progress and Comments

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ISE is a supplier of hydrogen fueled buses



The first Hybrid Electric Fuel Cell Bus



2005 Hybrid Electric Fuel Cell Bus



'HHICE' (Hybrid Hydrogen Internal Combustion Engine) Bus

First Public Demonstration
United Nations World Environment Day

San Francisco June 2, 2005



40' Hybrid Electric Fuel Cell Bus
With UTC 120kw FC



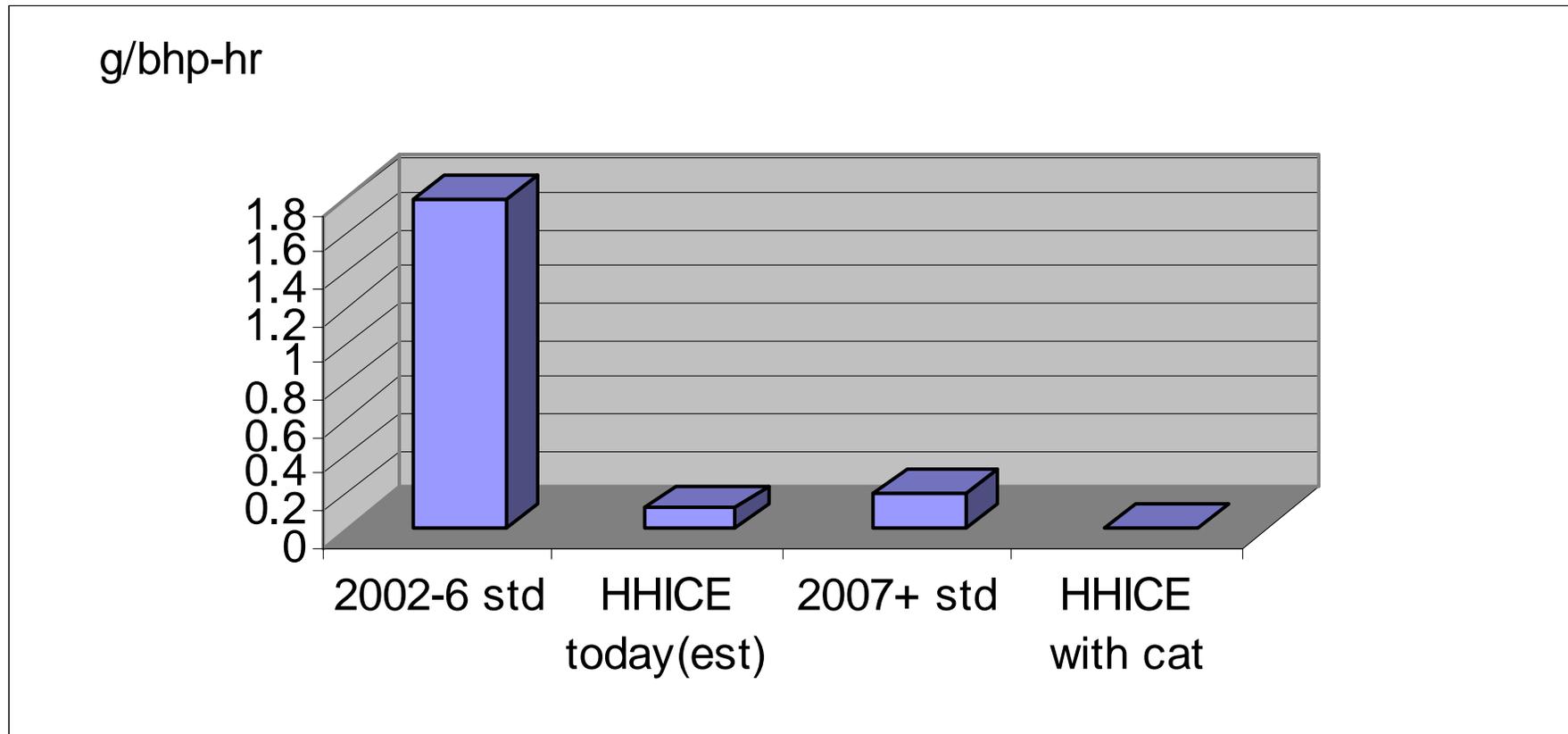
HHICE (or FCB) + Wind Hydrogen = Carbon Free Transport!



HHICE as an NZEV

- With no exhaust gas treatment (as operating at SunLine) NO_x typically 20-30 ppm (estimated 0.1 gm/bhp-hr)
- Recent measurements with exhaust gas treatment suggest goal of 0.2 ppm NO_x, a fraction of automotive SULEV levels

Comparing NOx emissions



Plea to Continue Program, Credit NZEV HHICE:

- ZEBs now in revenue service at three agencies. New Second Generation Hybrid FCBs are greatly improved, they are “fruit” of the ZEB program!
- Essential to not delay program, although “softened entry” to production buses can make sense
- National FCB Program (FTA/DOT) and Canadian “Olympics” bus build will assure increased production and lower cost
- Propose that properties that prefer can choose NZEV HHICE (Hydrogen Hybrid Internal Combustion Engine) buses, receive credit for a FCB for every two HHICE buses in service.