

MEMORANDUM

December 17, 2007

TO: NHA Legislative Affairs Council
FR: Jerry Hinkle
RE: *H2 and FUEL CELL PROVISIONS in H.R. 6*

Here is a review of the major provisions related to hydrogen and fuel cells included in H.R. 6, the *Energy Independence and Security Act of 2007* (www.energy.senate.gov, 12/14/07 H.R. 6). This might be useful for discussion purposes—particularly with regard to how the DoE should be encouraged to implement their considerable new authority. We may want to offer thoughtful advice to DoE and the Committees on how these programs could be implemented, especially in the FY 2009 budget and throughout 2008.

Title I—ENERGY SECURITY THROUGH IMPROVED VEHICLE FUEL ECONOMY (Subtitle A includes the new CAFÉ standards)

Subtitle B—IMPROVED VEHICLE TECHNOLOGY (pp 37-65)

- Sec. 131. Transportation Electrification: Definitions—includes fuel cell and rail in a family of electric drive hybrids, airports, truck stops, ports, materials handling, non-road, auxiliary, ancillary infrastructure; a cost-shared competitive grants program for a range of governments and local authorities, plus education—authorizes \$450 M in appropriations through 2012
- Sec. 132. Domestic Manufacturing Conversion Grant Program
- Sec. 133. Inclusion of Electric Drive in Energy Policy Act of 1992: includes “fuel cell electric vehicle” as defined in EAct 05 (Sec. 803), along with a widely defined family of electric drive vehicles (EDV)
- Sec. 134. Loan Guarantees for Fuel-Efficient Automobile Parts Manufacturers: loans and grants for EDV
- Sec. 136. Advanced Technology Vehicles Manufacturing Incentive Program: funding up to 30% of reequipping, expanding, or establishing mfg. facilities in the U.S., and for engineering integration—direct loans (\$25 B) from the Federal Financing Bank

Subtitle C—FEDERAL VEHICLE FLEETS (pp 59-65)

- Sec. 141. Federal Vehicle Fleets: amends EAct 92 to require light and medium duty vehicles that are low GHG emitters (should work well with the market transition aspects of Secs. 781-3 of EAct 05)
- Sec. 142. Federal Fleet Conservation Requirements

Title II—ENERGY SECURITY THROUGH INCREASED PRODUCTION OF BIOFUELS (pp 65-143)

Subtitle A—Renewable Fuel Standard

- Sec. 201. Definitions: amends the Clean Air Act to define “Advanced Biofuel” to include a range of bio-derived fuels (other than ethanol from corn starch) that have at least 50% fewer GHG emissions over their life cycle—and “(VII) Other fuel derived from cellulosic biomass.” (I have been assured by senior Energy Committee staff that this would include H₂—meaning that the subsequent 2009-2022 requirements for advanced renewable fuels of up to 21/36 B gals/yr {in 2022 about 1.4 Mb/d, or ~ 8% energy equivalent of LDV demand in 2030, or ~ 5% of total Xport demand} would include bioH₂)
- Authorizes another \$1.63 B for renewable and bioenergy R&D from 2008-2010 over EAct 05 (Sec. 931, EAct 05)
- Sec. 232. Environmental Research and Development: reinforces and expands the basic science role of DoE in Sec. 977 (pp 111-112) from EAct 05 in bioH₂
- Sec. 244. Renewable Fuel Infrastructure Grants (p 122), Sec. 246. Federal Fleet Refueling Centers (p 138): may apply to H₂ blends with other biofuels

Title III—ENERGY SAVINGS THROUGH IMPROVED STANDARDS FOR APPLIANCE AND LIGHTING; Title IV—ENERGY SAVINGS IN BUILDING AND INDUSTRY; Title V—ENERGY SAVINGS IN GOVERNMENT AND PUBLIC INSTITUTIONS (pp 143-485): the more imaginative may find places for H₂&FC, especially with regard to stationary and portable power, and in public buildings. A more ambitious approach was proposed in H.R. 805 (not enacted by Congress), which would have required federal buildings to have FC for backup power. There could be places where Energy Savings Performance Contracts (ESPCs), Title V, Subtitle B would apply to FCs (this was actively contemplated when drafting the H₂ title in EAct 05).

- Sec. 542. Energy Efficiency and Conservation Block Grants and Sec. 544 Use of Funds (p 474): apply to fuel cells

Title VI—ACCELERATED RESEARCH AND DEVELOPMENT (pp 485-565)

Subtitle D, Energy Storage for Transportation and Electric Power (p 520): Sec. 641. Energy Storage Competitiveness—establishes an Energy Storage Advisory Council, and most importantly in (g) Applied Research Program, “(1)(H) hydrogen as an energy storage medium.”—which applies generally to both electrical grid and electric drive vehicle applications—including R&D, demonstrations. Considerable opportunity lies here for the H₂ community if these programs are fully implemented. Cost sharing and merit review per EAct 05, Secs. 988 and 989.

(We should also remember that in EAct 05 Title VIII—Hydrogen, and Subtitle F of Title VII—Vehicles and Fuels {through Secs. 781-783—implementing market transition} were expressly intended to accelerate RD&D and market transition for hydrogen and fuel cell applications—noticed at last by DoE.)

- Sec. 606 Solar Air Conditioning R&D Program (p 491)—applies to fuel cells

Subtitle E—Miscellaneous Provisions

- Sec. 651. Lightweight Materials Research and Development (p 536)—also noted but not implemented by DoE in the “Systems Demonstrations” subparagraphs in Sec. 808. Demonstrations of EAct 05. A highly valuable component of vehicle performance emphasized here (Amory Lovins reminds us that only about 1.3% of the fuel energy in the average LDV propels the payload—leaving considerable room for improvement)
- Sec. 654. H-Prize (pp 539-553). At last, after long negotiations between the House, Senate and DoE, an improved version that is based on the H-Prize bills (Reps. Inglis, Lipinski and Sens. Dorgan, Graham) that passed the House in 2006 (416-6) and 2007 (408-8). Most importantly, DoE actively contributed to its passage, which suggests their intent to implement it. A real opportunity for the H2 community to dramatize advanced technologies; from 2008-2017, authorizes \$54 M
- Sec. 656. Renewable Energy Innovation Manufacturing Partnerships (p 562)—applies to fuel cells

Title VII—CARBON CAPTURE AND SEQUESTRATION (pp 565-596)

May offer some opportunity to initiate demonstrations and commercial coproduction of electricity and hydrogen from coal. This might be seen to reinforce (along with other provisions) EAct 05, Sec. 411. Integrated Coal/Renewable Energy System—provides incentives for hydrogen and electricity production with carbon capture and storage.

Title IX—INTERNATIONAL ENERGY PROGRAMS (pp 618-682)

Could be useful in helping the transfer of advanced renewable H&FC technologies internationally. Should work with Sec. 813. Technology Transfer, from the Hydrogen Title in EAct 05.

Title XI—ENERGY TRANSPORTATION AND INFRASTRUCTURE (pp 703-723)

Limited utility, but does create the Office of Climate Change and Environment in DoT (Sec. 1101). Subtitle B—Railroads, Sec. 1111. Advanced Technology Locomotive Grant Pilot Program (in DoT and likely in RITA, Research and Innovative Technology Administration—Paul Brubaker is their Administrator, who has a high regard for the promise of H2)—for cleaner and more efficient locomotives, authorizes \$40 M; although not specifically mentioned, H2 and

FC advanced locomotives will fit, including work done by DoD and some states.

Title XII—SMALL BUSINESS ENERGY PROGRAMS (pp 723-777)

Sec. 1201. Express Loans for Renewable Energy and Energy Efficiency (p 723-726): a renewable energy system includes “hydrogen derived from biomass or water using an energy source described in item (aa)” —a wide range of biomass sources. Several other sections would apply regarding pilot programs, energy efficiency, larger loan limits, energy saving debentures, and a renewable fuel capital investment company.

Title XIII—SMART GRID (pp 777-805)

Included somewhere in this title should be opportunities for the H2 community, especially with regard to the “dynamic optimization of grid operations and resources” applied to hydrogen’s use as a storage medium (Sec. 641), scheduled with wind and other renewables (Sec. 1201) to dampen variability in renewable sources or create business upstream of congestion nodes (DoE has had just such wind-to-H2 pilot project in ND over the last four years).

Title XIV—POOL AND SPA SAFETY (pp 806-820)

(Apparently introduced for entertainment purposes—hardly germane).