

표 1. 자동차용 연료전지 정보 (Light-Duty Fuel Cell Vehicle Information)

| Manufacturer                          | Model                      | Fuel Cell Type | Development Stage   | General system description |                                             | Fuel Cell Type                        | Batteries/Storage Device Type |
|---------------------------------------|----------------------------|----------------|---------------------|----------------------------|---------------------------------------------|---------------------------------------|-------------------------------|
|                                       |                            |                |                     | Fuel                       | System                                      |                                       |                               |
| Hyundai                               | Santa Fe (FCEV)            | PEM            | Prototype           | hydrogen                   | FC system                                   | UTC Series 300                        |                               |
|                                       | Santa Fe (FCHEV)           | PEM            | Prototype           | hydrogen                   | FC hybrid system                            | UTC Series 300                        | NiMH                          |
|                                       | Tuscon                     |                | Concept             | hydrogen                   | FC hybrid system with Enova drivetrain      | UTC                                   | Li polymer                    |
| Anuvu                                 | Nissan Frontier            | PEM            |                     | hydrogen                   | FC hybrid system                            | Anuvu Power X                         |                               |
|                                       | Suzuki Esteem              | PEM            | Prototype           |                            | FC hybrid system                            | Anuvu                                 |                               |
| BMW                                   | 7-series                   | none           | Plans               | liquid hydrogen/gasoline   | Hydrogen and gasoline powered ICE           |                                       |                               |
|                                       | 750hl                      | PEM            | Demonstration       | LH2/gasoline               | ICE operating on H2 with FC for Aux loads   | UTC PEM (in place of regular battery) |                               |
|                                       | Mini Cooper                |                | Concept             | LH2                        | 1.6L ICE                                    |                                       |                               |
| DaimlerChrysler                       | Natrium                    | PEM            | Demonstration       | Sodium boro-hydride        |                                             | Ballard                               | Li ion                        |
|                                       | NECAR 4A                   | PEM            | Demonstration in CA | hydrogen                   |                                             | Ballard Mark 900                      |                               |
|                                       | NECAR 5                    | PEM            | Concept             | methanol                   | FC system w/MeOH reformer                   | Ballard Mark 900                      |                               |
|                                       | Go-cart                    | DMFC           | Concept             | methanol                   | Direct Methanol PEM FC                      | Ballard                               |                               |
|                                       | NECAR 4                    | PEM            | Prototype           | liquid hydrogen            |                                             | Ballard Mark 700                      |                               |
|                                       | F-Cell                     | PEM            | Demonstration       | hydrogen                   | PEM FC hybrid w/65kW motor                  | Ballard                               | NiMH (air cooled)             |
| Ford                                  | Focus FCV                  | PEM            | Demonstration       | hydrogen                   | FC hybrid + Enova Hybrid Power Converter    | Ballard Mark 902                      | NiMH                          |
|                                       | FC5                        | PEM            | Concept             | methanol                   |                                             | Ballard                               |                               |
|                                       | Focus                      | PEM            | Demonstration       | methanol                   | PEM FC by Xcellsis + Ecostar motor          | Ballard Mark 901                      |                               |
|                                       | Focus FCV                  | PEM            | Demonstration       | hydrogen                   | PEM FC by Xcellsis + Ecostar motor          | Ballard Mark 900                      |                               |
|                                       | P2000                      | PEM            | Prototype           | Hydrogen / LH2             | Zetec ICE, 2L, V4                           | Ballard Mark 700 PEM                  |                               |
| GM                                    | AUTOmomy                   |                | Concept             | hydrogen                   | FC system platform in a "scateboard"        |                                       |                               |
|                                       | Hy-Wire                    | PEM            | Prototype           | hydrogen                   | FC System same as in HydroGen 3             | GM PEM                                |                               |
|                                       | S-10                       | PEM            | Prototype           | LS gasoline                | GM PEM fuel cell system w/on-board reformer | GM Stack 2000                         |                               |
| GM/Opel                               | Zafira HydroGen3           | PEM            | Demonstration       | LH2                        | Non-hybrid FC System                        | GM                                    |                               |
|                                       | HydroGen1 (Zafira 2nd gen) | PEM            | Concept             | LH2                        |                                             | GM                                    |                               |
|                                       | Zafira                     | PEM            | Concept             | methanol                   |                                             | GM                                    |                               |
| GM/Shanghai Automotive Industry Corp. | Phoenix (Buick GL8)        |                | Concept             | hydrogen                   | GM fuel cell                                |                                       |                               |
| Honda                                 | FCX                        | PEM            | Demonstration       | hydrogen                   | FC hybrid system using ultracaps            | Honda Next-Gen                        | Ultracaps                     |
|                                       | FCX-V1                     | PEM            | Concept             | hydrogen                   | Honda/Ballard                               | Ballard                               |                               |
|                                       | FCX-V2                     | PEM            | Prototype           | methanol                   | Honda/Ballard                               | Ballard PEM                           |                               |
|                                       | FCX-V3                     | PEM            | Prototype           | hydrogen                   |                                             | Honda Polymer Electrolyte FC stack    | Ultracaps                     |
| Hypercar Inc.                         | Revolution                 | PEM            | Prototype           | hydrogen                   | FC hybrid system                            | UTC                                   | NiMH                          |
| John Deere                            | Pro-Gator                  | PEM            | Prototype           | hydrogen                   | FC system with solectria drive train        | Hydrogenics Hy-PM-LP2 PEM             | NiMH                          |
| Toyota                                | FCHV                       | PEM            | Demonstration       | hydrogen                   | FC hybrid system                            | TMC PEM stack                         | NiMH                          |
|                                       | FCHV-5                     | PEM            | Prototype           | 0-S Gasoline               |                                             | Toyota PEM w/Toyota reformer          | NiMH                          |
|                                       | FCHV-3                     | PEM            | Prototype           | hydrogen                   |                                             | Toyota PEM                            | NiMH                          |
|                                       | Fine-N                     | PEM            | Concept             | hydrogen                   | Fuel cell hybrid system                     | Toyota fuel cell                      | Li ion                        |
|                                       | Fine-S                     |                | Concept             | hydrogen                   | Fuel cell hybrid system                     | Toyota fuel cell                      |                               |

| Manufacturer                              | Model                         | Fuel Cell Type | Development Stage               | General system description |                                          | Fuel Cell Type                                    | Batteries/Storage Device Type |
|-------------------------------------------|-------------------------------|----------------|---------------------------------|----------------------------|------------------------------------------|---------------------------------------------------|-------------------------------|
|                                           |                               |                |                                 | Fuel                       | System                                   |                                                   |                               |
| VW                                        | Bora HY-POWER                 | PEM            | Demonstration                   | LH2                        |                                          | Paul Scherrer Institute (PSI) PEM                 | supercaps                     |
| Whistler, Inc.                            | Golf cart                     | PEM            | Demonstration                   |                            |                                          | Anuvu PEM                                         |                               |
| Jeep                                      | Commander                     | PEM            | Concept                         | gasoline/other             |                                          |                                                   |                               |
|                                           | Commander 2                   | PEM            | Concept                         | methanol                   |                                          | Ballard Mark 705, with on-board methanol reformer | NiMH                          |
|                                           | Treo                          |                | Design Study                    |                            |                                          |                                                   |                               |
| Audi                                      | A2H2                          | PEM            | Prototype                       | hydrogen                   | FC hybrid system                         | Ballard                                           |                               |
| AvtoVAZ                                   | Lada Antel-2                  |                | Concept                         | hydrogen                   |                                          |                                                   |                               |
| Daihatsu                                  | MOVE FCV                      | PEM            |                                 | methanol                   | FC system                                | PEM                                               | NiMH                          |
|                                           | MOVE FCV-K-2                  | PEM            | Concept                         | hydrogen                   | Toyota FC stack                          | Toyota FC stack                                   | NiMH                          |
| Fiat                                      | Panda                         |                | Prototype                       | hydrogen                   |                                          | Nuvera Andromeda FC stack                         |                               |
|                                           | Seicento (Phase 2)            | PEM            |                                 | hydrogen                   |                                          | Nuvera                                            |                               |
|                                           | Seicento Elettra H2           |                | Prototype                       | hydrogen                   | Fuel cell EV with batteries              | Nuvera PEM                                        |                               |
| Honda                                     | KIWAMI                        |                | Design Study                    |                            |                                          | Honda next generation stack                       | Ultracaps                     |
| Mazda                                     | Demio FCEV                    | PEM            | Prototype                       | hydrogen                   |                                          | Polymer electrolyte (Mazda)                       | Ultracapacitor                |
|                                           | Premacy FC-EV                 | PEM            | Prototype testing in Japan 2/15 | methanol                   |                                          | Ballard Mark 901                                  |                               |
| Mercedes-Benz                             | Sprinter                      |                | Demonstration                   | hydrogen                   |                                          | Ballard                                           |                               |
| Micro-Vette                               |                               | PEM            |                                 |                            |                                          | PEM                                               | Zebra                         |
| Mitsubishi                                | FCV                           |                | Concept                         | methanol                   |                                          | Mitsubishi group                                  | Li ion                        |
|                                           | Grandis                       |                |                                 | hydrogen                   | FCV using DaimlerChrysler system         | Ballard PEM                                       | Nickle-hydrogen               |
|                                           | Space Liner                   | PEM            | Concept                         | methanol                   | same as Necar 5                          |                                                   |                               |
| Nissan                                    | Xterra                        | PEM            | Demonstration                   | hydrogen                   |                                          | Ballard Mark 900                                  | Li ion                        |
|                                           | Effis                         |                | Concept                         | hydrogen                   |                                          | UTC Neo PEM                                       | Li ion                        |
|                                           | FCV (Altra based)             |                | Concept                         | methanol                   |                                          | Ballard                                           | Li ion                        |
|                                           | Rhessa                        | PEM            | Concept                         | methanol                   |                                          | Ballard                                           |                               |
|                                           | X-Trail FCV                   | PEM            | Demonstration (Jp)              | hydrogen                   | FC hybrid system                         | UTC PEM                                           | Li ion                        |
| Peugeot/Citroen                           | H2O                           |                |                                 | sodium boro-hydride        | FC system using Millinium Cell's fueling |                                                   |                               |
|                                           | Hydro-Gen                     | PEM            |                                 | hydrogen                   |                                          | Nuvera                                            | NiMH                          |
|                                           | Taxi PAC                      | PEM            | Concept                         | hydrogen                   | FC hybrid system                         | H Power                                           | NiMH (EV-95)                  |
| Shanghai ShenLi High Tech Co/Tongji Univ. | Start 1 (Based on VW Santana) |                | Concept                         | hydrogen                   | Fuel cell hybrid system                  |                                                   | Li                            |
|                                           | Chao Yue I                    |                |                                 | hydrogen                   |                                          |                                                   |                               |
| Suzuki                                    | Covie                         |                | Concept                         |                            | electric drive w/FC to charge battery    | GM                                                | Li ion                        |
|                                           | Mobile Terrace                |                | Concept                         |                            | GM Fuel Cell system (from Hy-wire)       | GM stack                                          |                               |
|                                           | MR Wagon FCV                  |                | Concept                         | hydrogen                   | Joint Suzuki/GM system                   |                                                   | No secondary battery          |
| VW/Volvo                                  |                               |                |                                 | methanol                   |                                          |                                                   |                               |
| Zevco                                     | Taxi/van                      |                | Production                      | hydrogen                   |                                          | Alkaline                                          |                               |

자료출처 : [www.avt.nrel.gov/overview](http://www.avt.nrel.gov/overview) Last update on: 2004-07-02

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