## Fuel Cell Buses - Worldwide

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<tr>
<td>Perth, Australia</td>
<td>2006-2009</td>
<td>Extension of the 2004-2006 STEP (Sustainable Transport Energy for Perth) deployment - 3 fuel cell buses, project operated in conjunction with HyFLEET: CUTE</td>
<td>STEP/ HyFLEET: CUTE</td>
<td>- Bus manufacturer and model: Mercedes-Benz Citaro 40-ft</td>
<td>124-186 mi/200-300 km</td>
<td>N/a</td>
<td>![ Perth Bus ]</td>
</tr>
<tr>
<td>Perth, Australia</td>
<td>2004-2006</td>
<td>STEP project operated in conjunction with CUTE - 3 buses were deployed in regular transit service</td>
<td>STEP/ CUTE</td>
<td>- Bus manufacturer and model: Mercedes-Benz Citaro 40-ft</td>
<td>124 mi/200 km</td>
<td>48 mph/ 80 km/h</td>
<td>![ Perth Bus ]</td>
</tr>
<tr>
<td>Belgium</td>
<td>Deployed in 2007</td>
<td>UTC Power/Van Hool - Hybrid Fuel Cell Bus continuously deployed in various locations</td>
<td>N/a</td>
<td>- Bus manufacturer and model: Van Hool 43-ft</td>
<td>250-300 mi/402-483 km</td>
<td>70 mph/ 113 km/h</td>
<td>![ Belgium Bus ]</td>
</tr>
<tr>
<td>Brussels, Belgium</td>
<td>Shown in 1994</td>
<td>Ansaldo Fuel Cell Bus demonstration, fuel cell and components were housed in a trailer behind the bus</td>
<td>EUREKA</td>
<td>- Bus manufacturer and model: Van Hool 59-ft</td>
<td>N/a</td>
<td>N/a</td>
<td>![ Brussels Bus ]</td>
</tr>
<tr>
<td>Rio de Janeiro, Brazil</td>
<td>Deployed in 2009</td>
<td>Urban transit use, additional fuel cell buses will be added</td>
<td>UNDP</td>
<td>- Bus manufacturer and model: Padron 40-ft</td>
<td>186 mi/300 km</td>
<td>N/a</td>
<td>![ Rio de Janeiro Bus ]</td>
</tr>
<tr>
<td>Sao Paulo, Brazil</td>
<td>Deployed in 2009</td>
<td>First bus deployed in 2009 by transit agency EMTU, Ballard to supply 25 more FC modules</td>
<td>UNDP/GEF</td>
<td>- Bus manufacturer: Daimler/ Evobus</td>
<td>186 mi/300 km</td>
<td>44 mph/ 70 km/h</td>
<td>![ Sao Paulo Bus ]</td>
</tr>
<tr>
<td>Burnaby, British Columbia, Canada</td>
<td>1991-1992</td>
<td>Ballard P1 Fuel Cell Bus proof of concept</td>
<td>N/a</td>
<td>- Bus manufacturer: New Flyer 100 km PEM fuel cell engine</td>
<td>100 mi/161 km</td>
<td>N/a</td>
<td>![ Burnaby Bus ]</td>
</tr>
<tr>
<td>Vancouver, British Columbia, Canada</td>
<td>1998-2000</td>
<td>Coast Mountain Transit - 3 buses deployed in regular transit service</td>
<td>N/a</td>
<td>- Bus manufacturer and model: New Flyer 40-ft</td>
<td>N/a</td>
<td>N/a</td>
<td>![ Vancouver Bus ]</td>
</tr>
<tr>
<td>Winnipeg, Manitoba, Canada</td>
<td>Deployed in 2006</td>
<td>Natural Resources Canada - Fuel cell bus deployed by Winnipeg Transit</td>
<td>N/a</td>
<td>- Bus manufacturer and model: New Flyer 40-ft Fuel cell manufacturer: Hydrogenics</td>
<td>249 mi/400 km</td>
<td>N/a</td>
<td>![ Winnipeg Bus ]</td>
</tr>
<tr>
<td>Prague, Czech Republic</td>
<td>Deployed in 2009</td>
<td>Fuel Cells Czech Hydrogen Bus Project</td>
<td>FCZ H2-BUS</td>
<td>- Bus manufacturer and model: Skoda Electric Pilsen trolley bus</td>
<td>N/a</td>
<td>N/a</td>
<td>![ Prague Bus ]</td>
</tr>
<tr>
<td>China</td>
<td>2007</td>
<td>Made under the co-operation with WanXiang automobile company</td>
<td>N/a</td>
<td>- Bus manufacturer: WanXiang</td>
<td>N/a</td>
<td>N/a</td>
<td>![ China Bus ]</td>
</tr>
<tr>
<td>China</td>
<td>2007</td>
<td>Demonstrated at 2nd China International Hydrogen Forum, under co-operation with Shanghai Shenglong automobile company</td>
<td>N/a</td>
<td>- Bus manufacturer: Shenglong</td>
<td>N/a</td>
<td>N/a</td>
<td>![ China Bus ]</td>
</tr>
<tr>
<td>China</td>
<td>Shown in 2006</td>
<td>Prototype - shown at Busworld Asia in 2006 – Developed in conjunction with Shanghai Jiao Tong University</td>
<td>UNDP/ GEF</td>
<td>- Bus manufacturer and model: Suzhou King Long City Bus</td>
<td>N/a</td>
<td>48 mph/ 80 km/h</td>
<td>![ China Bus ]</td>
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**Updated May 2013**
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| China       | 2006 | Participated in the Industry Exposition 2006 in cooperation with Shanghai ShengWo automobile company | N/a                                                                    | - Bus manufacturer: ShengWo  
- Fuel cell manufacturer: Shen-Li High Tech.  
- Fuel cell engine                                                                 | N/a            | N/a                 |         |
| China       | 2006 | Shen Li High Tech Co. - Higer fuel cell city bus                        | N/a                                                                    | - Bus manufacturer: Higer  
- Fuel cell manufacturer: Shen-Li High Tech.  
- Fuel cell engine                                                                 | N/a            | N/a                 |         |
| China       | 2006 | Shen Li High Tech Co. - Sunwin fuel cell city bus                       | N/a                                                                    | - Bus manufacturer: Sunwin  
- Fuel cell manufacturer: Shen-Li High Tech.  
- Fuel cell engine                                                                 | N/a            | N/a                 |         |
| China       | 2005 | Shen Li High Tech Co.- Qing Neng No.1 and No.3 buses have operated for over 60,000 km in China | High-Tech 863 Program Developed in conjunction with Tsinghua University | - Bus model: 36-ft shuttle bus  
- Fuel cell manufacturer: Shen-Li High Tech.  
- Fuel cell/battery hybrid  
- 60 kW PEM fuel cell                                                                 | N/a            | 43 mph/70 km/h      | ![image](image1.png) |
| China       | 2005 | Shen Li High Tech Co.- Qing Neng No. 3 fuel cell bus  
Qing Neng No.1 and No.3 buses have operated for over 60,000 km in China | High-Tech 863 Program Developed in conjunction with Tsinghua University | - Bus model: 36-ft shuttle bus  
- Fuel cell manufacturer: Shen-Li High Tech.  
- Fuel cell/battery hybrid  
- 100 kW PEM fuel cell                                                                 | N/a            | 53 mph/85 km/h      | ![image](image2.png) |
| Beijing, China | 2009 | Tsinghua University - fuel cell bus demonstrated at Shanghai Expo | N/a                                                                    | - Fuel cell manufacturer: Shen-Li High Tech.  
- 100 kW PEM fuel cell engine                                                                 | >186 mi/300 km | >53 mph/85 km/h    | ![image](image3.png) |
| Beijing, China | Deployed in 2008 | 2 buses transported Olympic athletes in Beijing, China, developed in conjunction with Tsinghua University | High-Tech 863 Program | - Fuel cell manufacturer: Shen-Li High Tech.  
- 100 kW PEM fuel cell engine                                                                 | >186 mi/300 km | >53 mph/85 km/h    | ![image](image4.png) |
| Beijing, China | Operated 2008-2009 | Tsinghua University - fuel cell bus demonstrated in Olympic Games and along Beijing Bus routes | N/a                                                                    | - Fuel cell/battery hybrid  
- 100 kW PEM fuel cell  
- Compressed hydrogen                                                                 | 124 mi/200 km | 48 mph/80 km/h     | ![image](image5.png) |
| Beijing, China | 2006 - 2009 | HyFLEET:CUTE project deployed 47 hydrogen buses (33 fuel cell) in 10 cities on 3 continents, 3 buses deployed in Beijing | HyFLEET: CUTE | - Bus manufacturer and model: Mercedes-Benz Citaro 40-R  
- Fuel cell manufacturer: Ballard  
- 300 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-405 bar                                                                 | 124-186 mi/200-300 km | N/a               | ![image](image6.png) |
| Beijing, China | 2005 | Tsinghua University fuel cell bus                                       | N/a                                                                    | - Fuel cell/battery hybrid  
- 130 kW fuel cell  
- Compressed hydrogen                                                                 | N/a            | N/a                 | ![image](image7.png) |
| Beijing, China | 2004 | Shen Li High Tech Co. - Preliminary fuel cell city bus shown at 2nd Int’l H2 Forum in Beijing, China | UNDP/GEF and MOST FC City Bus Demo Program | - Bus manufacturer and model: Tsinghua University B-Type City Bus  
- Fuel cell manufacturer: Shen-Li High Tech.  
- 120 kW PEM fuel cell engine                                                                 | N/a            | N/a                 | ![image](image8.png) |
| Beijing, China | 2004 | Shen Li High Tech Co.- Number 863 fuel cell city bus operated more than 5,000 km in China, developed in conjunction with Tsinghua University | High-Tech 863 Program | - Bus manufacturer and model: Tsinghua University Platform City Bus  
- Fuel cell manufacturer: Shen-Li High Tech.  
- Fuel cell/battery hybrid  
- 50 kW PEM fuel cell                                                                 | 93 mi/150 km  | 40 mph/65 km/h      | ![image](image9.png) |
| Beijing, China | 2004 | Tsinghua University fuel cell bus                                       | N/a                                                                    | - Fuel cell/battery hybrid  
- 100 kW fuel cell  
- Compressed hydrogen                                                                 | N/a            | N/a                 | ![image](image10.png) |
| Beijing, China | 2003 | Tsinghua University fuel cell bus                                       | N/a                                                                    | - Fuel cell/battery hybrid  
- 60 kW fuel cell  
- Compressed hydrogen                                                                 | N/a            | N/a                 | ![image](image11.png) |
| Beijing, China | 2002 | Tsinghua University fuel cell bus                                       | N/a                                                                    | - Fuel cell/battery hybrid  
- 50 kW fuel cell  
- Compressed hydrogen                                                                 | N/a            | N/a                 | ![image](image12.png) |
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<tr>
<td>Beijing, China</td>
<td>2001</td>
<td>Tsinghua University fuel cell light bus developed in conjunction with Beijing Green Power Co. (battery manufacturer)</td>
<td>N/a</td>
<td>- Bus manufacturer and model: Light bus 12-passenger</td>
<td>120 mi/193 km</td>
<td>48 mph/80 km/h</td>
<td><img src="image1.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Beijing, China</td>
<td>1999</td>
<td>Tsinghua University fuel cell bus</td>
<td>N/a</td>
<td>- Fuel cell/battery hybrid</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image2.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Dalian, China</td>
<td>Shown in 2001</td>
<td>Dalian University - prototype fuel cell bus</td>
<td>N/a</td>
<td>- 30 kW PEM fuel cell engine</td>
<td>N/a</td>
<td>40 mph/65 km/h</td>
<td><img src="image3.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Guangzhou, China</td>
<td>Nov. - Dec. 2010</td>
<td>A fleet of more than 50 fuel cell buses shuttle athletes and government officials during the Asian Games</td>
<td>N/a</td>
<td>- Bus manufacturer: Clean Energy Automotive Engineering Centre (CEAEC) of Tongji University</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image4.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Hefei City, China</td>
<td>2006</td>
<td>Demonstrating in Ankai factory under the cooperation with AnHui Ankai automobile company</td>
<td>N/a</td>
<td>- Bus manufacturer: Ankai</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image5.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Shanghai, China</td>
<td>Deployed in 2010</td>
<td>6 fuel cell hybrid buses operate at the Shanghai World Expo Park</td>
<td>UNDP/GEF, Chinese government</td>
<td>- Fuel cell manufacturer: Ballard</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image6.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Suzhou City, China</td>
<td>2005</td>
<td>Shen Li High Tech Co. - Chuang Xin No.1 fuel cell city bus operated between Fengxian District and Suzhou City, China accumulating over 13,000 km</td>
<td>High-Tech 863 Program</td>
<td>- Fuel cell manufacturer: Shen-Li High Tech.</td>
<td>99 mi/160 km</td>
<td>&gt;56 mph/90 km/h</td>
<td><img src="image7.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Wuhan Hubei, China</td>
<td>Shown in 2001</td>
<td>Dong Feng Motor Corp - Prototype Fuel Cell Light Bus</td>
<td>N/a</td>
<td>- Bus manufacturer: Dong Feng light bus</td>
<td>N/a</td>
<td>40 mph/65 km/h</td>
<td><img src="image8.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Copenhagen, Denmark</td>
<td>Deployed 2002 – 2003</td>
<td>MAN- Fuel Cell City Bus deployed for 3 months</td>
<td>THERMIE</td>
<td>- Bus manufacturer and model: MAN NL223 40-ft</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image9.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>European Countries</td>
<td>1 bus, deployed 2005</td>
<td>Hydrogenics FC Hybrid Midibus owned by Hydrogenics, deployed at major events Europe-wide</td>
<td>N/a</td>
<td>- Bus manufacturer and model: Tecnobus Gulliver, 18-ft, 22 passenger</td>
<td>125 mi/200 km</td>
<td>21 mph/33 km/h</td>
<td><img src="image10.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Barth, Germany</td>
<td>2006 - present</td>
<td>Ostseebus Fuel Cell Midibus - 1 bus deployed</td>
<td>N/a</td>
<td>- Bus manufacturer and model: NeoPlan 26-ft articulated</td>
<td>112 mi/180 km</td>
<td>43 mph/70 km/h</td>
<td><img src="image11.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Berlin, Germany</td>
<td>2006 - present</td>
<td>Deployed in regular transit service by transit agency, BVG</td>
<td>ZIP Program</td>
<td>- Bus manufacturer and model: Neoplan Artic 60-ft articulated</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image12.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Berlin, Germany</td>
<td>2002 – 2003</td>
<td>MAN – Fuel Cell City Bus deployed for 9 months</td>
<td>THERMIE</td>
<td>- Bus manufacturer and model: MAN NL223 40-ft</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image13.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Cologne, Germany</td>
<td>2011</td>
<td>Transit operator RVK is operating 2 buses</td>
<td>Hy-COLOGNE</td>
<td>- Fuel cell hybrid bus</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image14.jpg" alt="Picture" /></td>
</tr>
<tr>
<td>Location</td>
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</tr>
</tbody>
</table>
| Dresden, Germany  | debuted in 2005 | Fraunhofer Institute for Transportation and Infrastructure Systems Prototype AutoTram | N/a                                        | - Bus manufacturer and model: Artic 80-ft bi-directional, 300-passenger  
- Fuel cell manufacturer: Ballard  
- 80 kW PEM fuel cell engine  
- Compressed hydrogen @ 200 bar | N/a            | N/a                  |         |
| Düsseldorf, Germany | 2006 - present  | Fuel Cell Hybrid 2 Midibuses operated in regular service by Rheinbahn at Messe Düsseldorf fairgrounds route | NRW Ministry of Transport/ Public Transit | - Bus manufacturer and model: Tecnobus Gulliver, 18-ft, 22-passenger  
- Fuel cell manufacturer: Hydrogenics  
- Fuel cell/battery hybrid  
- 12 kW PEM fuel cell  
- Compressed hydrogen @ 200 bar | 124 mi/ 200 km | 21 mph/ 33 km/h     |         |
| Emscher-Lippe Region, Germany | 2009 - present  | HyChain Mini-Trans 3-bus, 3-year demo in Bottrop, Gladbeck, and Herten | EC FP6 Lighthouse Project | - Bus manufacturer and model: Tecnobus Gulliver, 18-ft, 22 passenger  
- Fuel cell manufacturer: Hydrogenics  
- Fuel cell/battery hybrid  
- 12 kW PEM fuel cell  
- Compressed hydrogen @ 200 bar | 125 mi/ 200 km | 21 mph/ 33 km/h     |         |
- Fuel cell manufacturer: Siemens Power Generation  
- Fuel cell/battery hybrid  
- 120 kW PEM fuel cell  
- Compressed hydrogen @ 250 bar | 155 mi/ 250 km | N/a                  |         |
- Fuel cell manufacturer: Siemens Power Generation  
- Fuel cell/battery hybrid  
- 120 kW PEM fuel cell  
- Compressed hydrogen @ 250 bar | 155 mi/ 250 km | N/a                  |         |
| Hamburg, Germany   | 2010            | Hamburg Fuel Cell Bus fleet 10 buses deployed | "Sustainable Bus System of the Future" (NaBuZ) | - Bus manufacturer and model: Daimler Citaro 40-ft  
- Fuel cell manufacturer: Daimler  
- Fuel cell/battery hybrid  
- Hydrogen | 156 mi/ 250 km | N/a                  |         |
| Hamburg, Germany   | 2009            | University Clinic (Klinik) Hamburg-Eppendorf (UKE) - 1 bus deployed at hospital complex | Project of City-State of Hamburg | - Bus manufacturer and model: Tecnobus Gulliver, 18-ft, 22-passenger  
- Fuel cell manufacturer: Hydrogenics  
- Fuel cell/battery hybrid  
- 12 kW PEM fuel cell  
- Compressed hydrogen @ 200 bar | 124 mi/ 200 km | 21 mph/ 33 km/h     |         |
| Hamburg, Germany   | 2006 - 2009     | HyFLEET: CUTE project deployed 47 hydrogen buses (33 fuel cell) in 10 cities on 3 continents | HyFLEET: CUTE | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 300 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 mi/200-300 km | N/a                  |         |
| Hamburg, Germany   | 2003 - 2006     | CUTE project deployed 27 buses deployed across 9 cities in Europe and Australia (3 per city) | CUTE | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 205 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 mi/ 200-300 km | N/a                  |         |
| Huerth, Germany    | deployed May 2011 | 5-year demo of two buses in regular transit service | NRW Ministry of Transport/ Public Transit | - Bus manufacturer and model: APTS Phileas, 54 ft articulated, 140 passengers  
- Fuel cell manufacturer: Ballard  
- Fuel Cell/battery/super cap hybrid  
- 150 kW PEM fuel cell  
- Compressed hydrogen @ 350 bar | 190 mi/ 300 km | 50 mph / 80 km/h   |         |
| Munich, Germany    | deployed in 2000 - 2001 | Fuel Cell Bus deployed on scheduled route near the Munich Airport | H2argemuc | - Bus manufacturer and model: MAN A23 40-ft  
- Fuel cell manufacturer: Ballard  
- Fuel cell/battery hybrid  
- 68 kW PEM fuel cell  
- Compressed hydrogen @ 350 bar | 155 mi/ 250 km | N/a                  |         |
| Munich, Germany    | shown in 2000   | Bayernbus I - shown at Munich’s Fuel Cell ] | N/a                                        | - Bus manufacturer and model: MAN NL263  
- Fuel cell manufacturer: Siemens-KWU  
- 120 kW PEM fuel cell engine  
- Compressed hydrogen @ 25 MPa | 124 mi/ 200 km | N/a                  |         |
| Munich, Germany    | shown in 2000   | Bayernbus II Prototype, shown At Munich’s Fuel Cell Day | N/a                                        | - Bus manufacturer and model: NeoPlan N8012  
- Fuel cell manufacturer: Proton Motor  
- 80 kW PEM fuel cell engine  
- Compressed hydrogen | 93-155 mi/150-250 km | 48 mph/ 80 km/h |         |
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- Fuel cell manufacturer: Siemens Power Generation  
- Fuel cell/battery hybrid  
- 120 kW PEM  
- Compressed hydrogen @ 250 bar | 155 mi/250 km                          | N/a                                    | ![Picture](image1.png) |
| Stuttgart, Germany| 2003 - 2006 | HyFLEET/CUTE project deployed 47 hydrogen buses (33 fuel cell) in 10 cities on 3 continents | HyFLEET: CUTE                           | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 205 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 mi/200-300 km                     | N/a                                    | ![Picture](image2.png) |
| Reykjavik, Iceland| Deployed 2006 - 2009 | ECTOS (Ecological City Transport Systems) operated in conjunction with HyFLEET:CUTE project that deployed 47 hydrogen buses (33 fuel cell) in 10 cities on 3 continents | ECTOS/ HyFLEET: CUTE                     | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 300 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 mi/200-300 km                     | N/a                                    | ![Picture](image3.png) |
| Italy             | Shown in 1997 | Ansaldo - Fuel Cell Bus Subsequent demonstration was planned in Brescia, Italy but never took place | EQHHPP                                  | - Bus manufacturer and model: Macchi-Ansaldo City Bus  
- Fuel cell manufacturer: De Nora (now Nuvera)  
- Fuel cell/battery hybrid  
- 45 kW PEM fuel cell  
- Liquid hydrogen | 186 mi/300 km                           | N/a                                    | ![Picture](image4.png) |
| Perugia, Italy    | 2007 - 2008 | Fuel cell bus                                                                                | Rampini fuel cell bus project            | - Bus manufacturer and model: Rampini ZEV A16 26-ft  
- Fuel cell manufacturer: Hydrogenics  
- Two 16 kW PEM fuel cell engines  
- Compressed hydrogen @ 350 bar | 105-118 mi/170-190 km                     | 31 mph/50 km/h                    | ![Picture](image5.png) |
| Rome, Italy       | 2006-present | University of Rome "La Sapienza"1 midi-bus deployed                                          | N/a                                      | - Bus manufacturer and model: Tecnobus Gulliver, 18-ft, 22 passenger  
- Fuel cell manufacturer: Hydrogenics  
- Fuel cell/battery hybrid  
- 12 kW PEM fuel cell  
- Compressed hydrogen @ 200 bar | 124 mi/200 km                          | 21 mph/33 km/h                    | ![Picture](image6.png) |
| Torino, Italy     | 2004 - 2006 | CityCell - Fuel Cell Bus Project. 1 bus in transit service and showcased at Winter Olympics | N/a                                      | - Bus manufacturer and model: Irisbus Iveco CityClass  
- Fuel cell manufacturer: UTC Power  
- Fuel cell/battery hybrid  
- 60 kW PEM fuel cell  
- Compressed hydrogen @ 20 MPa | N/a                                    | 37 mph/60 km/h                    | ![Picture](image7.png) |
| Japan             | Deployed Mar-Sep 2005 | Toyota-Hino FCHV-BUS2 - 8 buses were deployed as a shuttle at Aichi Expo                         | Japan Fuel Cell Bus Demonstration Program | - Bus manufacturer and model: Toyota/Hino Motors 34.5-ft  
- Fuel cell manufacturer: Toyota  
- Fuel cell/battery hybrid  
- 180 kW PEM fuel cell  
- Compressed hydrogen @ 5,000 psi | 155 mi/250 km                          | 48 mph/80 km/h                    | ![Picture](image8.png) |
| Japan             | Shown in 2001 | Toyota-Hino FCHV-BUS1 Prototype driven on test course                                         | Japan Fuel Cell Bus Demonstration Program | - Bus manufacturer and model: Toyota/Hino Motors 34.5-ft  
- Fuel cell manufacturer: Toyota  
- Fuel cell/battery hybrid  
- 90 kW PEM fuel cell  
- Compressed hydrogen @ 25 MPa | >186 mi/ >300 km                      | >48 mph/ >80 km/h                   | ![Picture](image9.png) |
| Tokyo, Japan      | 2012        | Transports travelers to and from Kansai International Airport’s Terminal Building 2          | METI Demonstration Program/ HySUT          | - Bus manufacturer: Toyota/Hino  
- Fuel cell/battery hybrid | N/a                                    | 50 mph/80 km/h                    | ![Picture](image10.png) |
| Tokyo, Japan      | 2010        | Tokyo-Haneda Airport fuel cell bus operates between downtown Tokyo and the airport          | HySUT                                     | - Bus manufacturers: Toyota/Hino Motors  
- Fuel cell manufacturers: Toyota/Hino Motors  
- Fuel cell/battery hybrid  
- Two 90 kW PEM fuel cells  
- Compressed hydrogen @ 35 MPa | N/a                                    | 50 mph/80 km/h                    | ![Picture](image11.png) |
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<th>Max. Speed</th>
<th>Picture</th>
</tr>
</thead>
</table>
| Tokyo, Japan              | 2006 - present | Toyota-Hino FCHV-BUS 3 buses shuttle passengers between the passenger terminal and airplanes on the tarmac at Nagoya, Japan’s Centrair Airport | Japan Fuel Cell Bus Demonstration Program                              | - Bus manufacturers and model: Toyota/Hino Motors 34.5-ft  
- Fuel cell manufacturer: Toyota  
- Fuel cell/battery hybrid  
- 180 kW PEM fuel cell  
- Compressed hydrogen @ 350 bar | 155 mi/250 km  
113 km/h | N/a        | ![Image](https://via.placeholder.com/150) |
| Tokyo, Japan              | 2003 - 2004 | Toyota-Hino FCHV-BUS21 bus placed in regular transit service by the Tokyo Metropolitan Transportation Service | Japan Fuel Cell Bus Demonstration Program                              | - Bus manufacturers and model: Toyota/Hino Motors 34.5-ft  
- Fuel cell manufacturer: Toyota  
- Fuel cell/battery hybrid  
- 180 kW PEM fuel cell  
- Compressed hydrogen @ 350 bar | N/a  
124-186 km/200-300 km | 48 mph/80 km/h | ![Image](https://via.placeholder.com/150) |
| Luxembourg                | 2006 - 2009 | HyFLEET:CUTE project deployed 47 hydrogen buses (33 fuel cell) in 10 cities on 3 continents | HyFLEET: CUTE                                                         | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 300 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 km/200-300 km | N/a        | ![Image](https://via.placeholder.com/150) |
| Luxembourg                | 2003 - 2006 | CUTE project deployed 27 hydrogen buses deployed across 9 cities in Europe and Australia (3 per city) | CUTE                                                                 | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 206 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 km/200-300 km | N/a        | ![Image](https://via.placeholder.com/150) |
| The Netherlands           | Deployed in 2007 | UTC Power/Van Hool - Hybrid Fuel Cell Bus continuously deployed in various locations | N/a                                                                 | - Bus manufacturer and model: Van Hool 43-ft  
- Fuel cell manufacturer: UTC Power  
- Fuel cell/battery hybrid  
- 120 kW PEM fuel cell  
- Compressed hydrogen @ 5,000 psi | 250-300 km/402-483 km  
60 miles/100 km/h | 70 mph/113 km/h | ![Image](https://via.placeholder.com/150) |
| Amsterdam, The Netherlands | 2006 - 2009 | HyFLEET:CUTE project deployed 47 hydrogen buses (33 fuel cell) in 10 cities on 3 continents | HyFLEET: CUTE                                                         | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 300 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 km/200-300 km | N/a        | ![Image](https://via.placeholder.com/150) |
| Amsterdam, The Netherlands | 2003 - 2006 | CUTE project deployed 27 hydrogen buses deployed across 9 cities in Europe and Australia (3 per city) | CUTE                                                                 | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 206 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 km/200-300 km | N/a        | ![Image](https://via.placeholder.com/150) |
| Arnhem, The Netherlands   | 2011       | HyMove demonstration project deployed a fuel cell bus and fueling station, and will deploy hydrogen cars. | HyMove                                                                | - Bus manufacturer and model: VDL Ambassador Low-Entry  
- Fuel cell manufacturer: Nedstack  
- 30 kW PEM fuel cell engine  
- 50 kWh Li-ion battery pack | 250 km  
60 mph/100 km/h | N/a        | ![Image](https://via.placeholder.com/150) |
| Oslo, Norway              | 2012       | Fuel cell buses – CHIC project placing 26 fuel cell hybrid buses in daily public transport operations and bus routes in 5 cities, will operate 5 buses | CHIC                                                                  | - Bus manufacturer: Van Hool | N/a        | ![Image](https://via.placeholder.com/150) |
| Oslo, Norway              | 1999       | NEBUS - New Electric Bus Prototype, shown in cities around the world, demonstrated 2 weeks in Oslo, Norway in 1999 | N/a                                                                 | - Bus manufacturer and model: Daimler-Chrysler  
Fuel cell manufacturer: Ballard  
Fuel cell/battery hybrid  
120 kW PEM fuel cell engine  
Compressed hydrogen @ 300 bar | 156 miles/251 km | N/a        | ![Image](https://via.placeholder.com/150) |
- Fuel cell manufacturer: Nuvera  
- Fuel cell/battery hybrid  
- 120 kW PEM fuel cell  
- Liquid hydrogen | N/a        | N/a        | ![Image](https://via.placeholder.com/150) |
| Porto, Portugal           | 2003 - 2006 | HyFLEET:CUTE project deployed 47 hydrogen buses (33 fuel cell) in 10 cities on 3 continents | HyFLEET: CUTE                                                         | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 206 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 km/200-300 km | N/a        | ![Image](https://via.placeholder.com/150) |
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</table>
| Singapore                 | Deployed in 2010| Tsinghua University Nanyang Technological University fuel cell bus deployed by SBS Transit in daily service, shuttled athletes & officials during Youth Olympic Games in Singapore, tested beforehand in China | N/a                                                                     | - Bus manufacturer: Higer  
- Fuel cell/battery hybrid  
- 50 kW fuel cell                  | N/A            | N/A               | ![Image](235x696 to 377x756) |
| Jeju Island, South Korea  | 2006 - present  | Hyundai FCB I - 1 bus operated in routine service                       | N/a                                                                     | - Bus Model: 27-passenger buses  
- Fuel cell manufacturer: Hyundai Motor Co.  
- Fuel cell/battery hybrid  
- 160 kW fuel cell  
- Compressed hydrogen @ 35 MPa   | 186 mi/300 km  | N/A               | ![Image](235x371) |
| Seoul, South Korea        | 2009            | Hyundai FCB II at the Seoul Motor Show                                  | N/a                                                                     | - Bus manufacturer and model: Hyundai Low Floor Aero City bus platform  
- Fuel cell manufacturer: Hyundai Motor Co.  
- 200 kW fuel cell engine  
- Compressed hydrogen @ 350 bar  | 225 mi/360 km  | 62 mph/100 km/h  | ![Image](235x355) |
| Seoul, South Korea        | 2006 - present  | Hyundai FCB I - 1 bus operated in routine service. Hyundai has contract with Seoul to start supplying fuel cell buses starting in 2013 | N/a                                                                     | - Bus model: 27-passenger buses  
- Fuel cell manufacturer: Hyundai Motor Co.  
- Fuel cell/battery hybrid  
- 160 kW fuel cell  
- Compressed hydrogen @ 35 MPa   | 186 mi/300 km  | N/A               | ![Image](235x500) |
| Barcelona, Spain          | 2006 - 2009     | HyFLEET:CUTE project deployed 47 hydrogen buses (33 fuel cell) in 10 cities on 3 continents | HyFLEET: CUTE                                                          | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 300 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar               | 124-186 mi/200-300 km  | N/A               | ![Image](235x487) |
| Barcelona, Spain          | 2003 - 2006     | CUTE project deployed 27 buses deployed across 9 cities in Europe and Australia (3 per city) | CUTE                                                                  | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 205 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar               | 124-186 mi/200-300 km  | N/A               | ![Image](235x128) |
| Castille-Léon Spain       | 2009            | HyChain Mini-Trans 3-bus, 3-year demo                                  | EC FP6 Lighthouse Project                                               | - Bus manufacturer and model: Tecnobus Gulliver, 18-ft, 22 passenger  
- Fuel cell manufacturer: Hydrogenics  
- Fuel cell/battery hybrid  
- 12 kW PEM fuel cell  
- Compressed hydrogen @ 200 bar               | 125 mi/200 km  | 21 mph/33 km/h  | ![Image](235x516) |
| Madrid, Spain             | 2006 - 2009     | HyFLEET:CUTE project deployed 47 hydrogen buses (33 fuel cell) in 10 cities on 3 continents | HyFLEET: CUTE                                                          | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 300 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar               | 124-186 mi/200-300 km  | N/A               | ![Image](235x472) |
| Madrid, Spain             | 2003 - 2006     | CUTE project deployed 27 buses deployed across 9 cities in Europe and Australia (3 per city) | CUTE                                                                  | - Bus manufacturer and model: Mercedes-Benz Citaro 40-ft  
- Fuel cell manufacturer: Ballard  
- 205 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar               | 124-186 mi/200-300 km  | N/A               | ![Image](235x302) |
| Madrid, Spain             | Deployed in 2003| CityCell - Fuel Cell Bus Project,1 bus deployed                          | N/a                                                                     | - Bus manufacturer and model: Irisbus Iveco CityClass  
- Fuel cell manufacturer: UTC Power  
- Fuel cell/battery hybrid  
- Compressed hydrogen @ 35 MPa               | N/A            | 37 mph/60 km/h  | ![Image](235x161) |
| Zaragoza, Spain           | 2008-present    | 3 midi-buses deployed at ExpoAgua International Exposition starting in 2008 | N/a                                                                     | - Bus manufacturer and model: Tecnobus Gulliver, 18-ft, 22 passenger  
- Fuel cell manufacturer: Hydrogenics  
- Fuel cell/battery hybrid  
- 12 kW PEM fuel cell  
- Compressed hydrogen @ 200 bar               | 124 mi/200 km  | 21 mph/33 km/h  | ![Image](235x110) |
- Fuel cell manufacturer: Ballard  
- 205 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar               | 124-186 mi/200-300 km  | N/A               | ![Image](235x245) |
<table>
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</table>
| Aargau, Switzerland       | 2011 | Fuel cell buses – CHIC project placing 26 fuel cell hybrid buses in daily public transport operations and bus routes in 5 cities, will operate 5 buses | CHIC      | - 5 Mercedes-Benz Citaro FuelCELL Hybrid buses  
- Operating on routes in and around Brugg in the canton of Aargau.  
- Aargau Canton supporting the project - subsidy of 1.5 million Swiss francs from the Swisslos lottery fund.  
- Will save 2,000 tonnes of CO2 during the 5-year test. | N/a           | N/a        | ![Image](image.png) |
| London, England, United Kingdom | 2010 | CHIC project deploying 26 fuel cell hybrid buses in daily public transport operations and bus routes in 5 cities across Europe, London will operate 8 buses (5 presently deployed) in daily transit service on an all-fuel cell bus route | CHIC (Clean Clean Hydrogen In European Cities) Project | N/a                        | N/a        | ![Image](image.png) |
- Fuel cell manufacturer: Ballard  
- 300 kW PEM fuel cell engine  
- Compressed hydrogen @ 350-450 bar | 124-186 mi/200-300 km | N/a        | ![Image](image.png) |
| London, England, United Kingdom | 2003-2004 | CUTE project deployed 27 buses deployed across 9 cities in Europe and Australia (3 per city) | CUTE      | - Bus manufacturer and Model: Mercedes-Benz Citaro | N/a           | N/a        | ![Image](image.png) |
| Pontypridd, Wales, United Kingdom | Deployed 2008 | University of Glamorgan, Uses “tribid” configuration of fuel cell, battery and ultra capacitors | Wales Accelerate Clusters | - Bus manufacturer: IVECO Daily  
- Fuel cell manufacturer: Hydrogenics  
- Fuel cell/battery hybrid  
- 12 kW PEM fuel cell  
- Compressed hydrogen @ 200 bar | 150 mi/241 km  
90 km/h  
55 mph | N/a        | ![Image](image.png) |
| Worldwide                 | Shown in 2001 | Scania – fuel cell midi-bus | N/a       | - Bus manufacture: Scania fuel cell -  
- Fuel cell manufacturer: Nuvera  
- Fuel cell/battery hybrid | N/a           | N/a        | ![Image](image.png) |
| Worldwide                 | Shown in 1997 | NEBUS – New Electric Bus Prototype, shown in cities around the world | N/a       | - Bus manufacturer and model: Daimler-Chrysler 0405N  
- Fuel cell manufacturer: Ballard  
- 250 kW PEM fuel cell engine  
- Compressed hydrogen @ 300 bar | 156 miles/251 km | N/a        | ![Image](image.png) |

**International Planned Fuel Cell Bus Deployments**

<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
<th>Project</th>
<th>Program</th>
<th>Vehicle Details</th>
<th>Range</th>
<th>Max. Speed</th>
<th>Picture</th>
</tr>
</thead>
</table>
| Flanders, Belgium         | Planned | Five fuel cell buses will be deployed | N/a                                               | - Bus manufacturer: Van Hool  
- Fuel cell manufacturer: Ballard  
- 150 kW FCvelocityTM-HD6 modules | N/a           | N/a        | ![Image](image.png) |
| Cologne, Germany          | Planned | Two fuel cell buses, procured by government of North Rhine Westphalia with funding support from the German National Innovation Program | N/a                                               | - Bus manufacturer: Van Hool  
- Fuel cell manufacturer: Ballard  
- 150 kW FCvelocityTM-HD6 modules | N/a           | N/a        | ![Image](image.png) |
| Bolzano, Italy            | Planned | CHIC project placing 26 fuel cell hybrid buses in daily public transport operations and bus routes in 5 cities, will operate 5 buses | CHIC | N/a                        | N/a           | N/a        | ![Image](image.png) |
### Fuel Cell Buses

<table>
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<tr>
<th>Location</th>
<th>Year</th>
<th>Project</th>
<th>Program</th>
<th>Vehicle Details</th>
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<th>Max. Speed</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Milan, Italy</td>
<td>Planned</td>
<td>Fuel cell buses – CHIC project placing 26 fuel cell hybrid buses in daily public transport operations and bus routes in 5 cities, will operate 3 buses</td>
<td>CHIC</td>
<td>- Bus manufacturer and model: Daimler/EvoBus Citaro Fuel Cell Hybrid</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image1.png" alt="Bus" /></td>
</tr>
<tr>
<td>San Remo, Italy</td>
<td>Planned</td>
<td>Five fuel cell buses will be deployed</td>
<td>N/a</td>
<td>- Bus manufacturer: Van Hool - Fuel cell manufacturer: Ballard - 150 kW FCvelocityTM-HD6 modules</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image2.png" alt="Bus" /></td>
</tr>
<tr>
<td>Aberdeen, Scotland, United Kingdom</td>
<td>Planned in 2014</td>
<td>First and Stagecoach will operate 10 fuel cell buses, supported by JTI funding through the High V.LO-City and HyTransit programs</td>
<td>N/a</td>
<td>- Bus manufacturer: Van Hool - Fuel cell manufacturer: Ballard - 150 kW FCvelocityTM-HD6 modules</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image3.png" alt="Bus" /></td>
</tr>
</tbody>
</table>

### International Buses with Fuel Cell Auxiliary Power Units (APUs)

<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
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<th>Program</th>
<th>Vehicle Details</th>
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<th>Max. Speed</th>
<th>Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>Testing in 2008</td>
<td>Hybrid APU for H2-ICE bus with ultra capacitors for energy storage; provides onboard power, AC and heat; Photo at right shows rooftop location of fuel cell APU</td>
<td>N/a</td>
<td>- Bus manufacturer: MAN - Fuel cell manufacturer: Hydrogenics - Fuel cell APU - 16 kW PEM fuel cell</td>
<td>N/a</td>
<td>N/a</td>
<td><img src="image4.png" alt="Bus" /></td>
</tr>
</tbody>
</table>