DOE Hydrogen Program

Baseline Knowledge Assessment for the Hydrogen Education Program

Determining knowledge levels for hydrogen and fuel cell technologies within the U.S.

Background

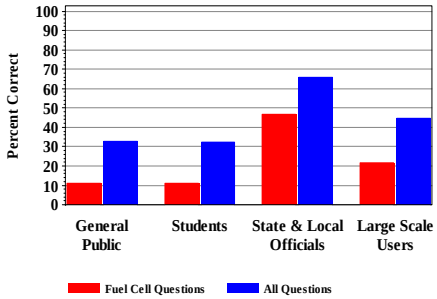
The widespread use of hydrogen as an energy carrier requires an educated human infrastructure – trained safety and code officials, an educated workforce, state and local government officials who understand the near-term realities and long-term potential of the technology, and a public that is familiar and comfortable with using a new fuel. With this in mind, the Department of Energy (DOE) Hydrogen Program established an education key activity to address the training and informational needs of target audiences that have a role in advancing the development and use of hydrogen and fuel cell technologies.

In 2004, DOE conducted scientific surveys of four populations (the general public, ages 18 and over; students, ages 12-17; state and local government officials; and potential hydrogen end users). The surveys measured knowledge levels and opinions concerning hydrogen and fuel cell technologies within the United States. Survey results were analyzed and a baseline of knowledge and understanding was established. The survey results were intended to serve (1) as a reference for designing a hydrogen education program and (2) as a baseline for measuring changes in understanding and awareness over time. The surveys will be repeated in 2008/2009 and 2011/2012.

Results of the Surveys

Scientific sampling was used to survey the four populations. The survey included about 1,000 individuals in each of the general public and student categories, about 250 state and local officials, and almost 100 large-scale end users.

The survey questions were designed to accomplish specific objectives. Technical questions were posed to measure technical understanding and awareness of hydrogen technology. Opinion questions measured attitudes about safety, cost, the environment, and convenience. Questions were posed to assess visions about the likelihood of various future applications of hydrogen technology. For most of the questions, “I don’t know” or “I have no opinion” were perfectly acceptable answers. Questions about information sources (teachers, friends, government, etc.) and media (radio, Internet, magazines, etc.) were posed to assess how energy technology information is received.



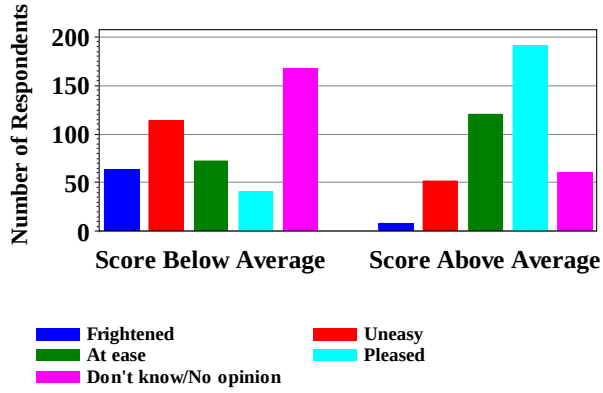
Correct technical responses by survey population

Highlights of the results of the surveys include the following:

• With the exception of state and local officials, none of the populations surveyed answered more than 50% of the technical questions accurately. For every population group, average scores on the technical knowledge questions were lower for the fuel cell questions than for the other technical questions.

• In order of importance, the general public valued (1) safety, (2) cost, (3) the environment, and (4) convenience.

• Technical understanding appears to influence opinions about safety. For the general public, student, and potential end user surveys, respondents with above-average scores on the eleven technical questions were more likely to have an opinion about hydrogen technology safety, and for those respondents who expressed an opinion, their opinion was more likely to be positive. These differences were statistically significant

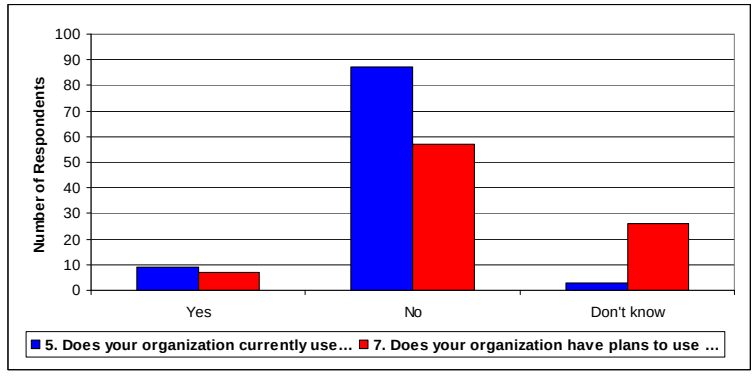


Hydrogen at gas stations: general public responses concerning reactions to a neighborhood gas station that also sells hydrogen

• State and local officials expressed more confidence in hydrogen safety than potential end users, and they were much more confident than either the general public or students.

• Respondents rated media sources for obtaining energy information. The general public and students responded that television was their primary media source of energy information. State and local officials and potential end users indicated that their primary media sources were newspapers, the Internet, and science and technology journals.

• The survey of potential end users suggested that there was little penetration of hydrogen technology at the time of the survey; nor was there much planning for implementing hydrogen technology in the future.



Current use and future plans for use of hydrogen technologies

Primary Publications

• Tykey Truett, Literature Review for the Baseline Knowledge Assessment of the Hydrogen, Fuel Cells, and Infrastructure Technologies Program, ORNL/TM-2003/258, October 2003.

• Rick Schmoyer, Tykey Truett, and Christy Cooper, Results of the 2004 Knowledge and Opinions Surveys for the Baseline Knowledge Assessment of the U.S. Department of Energy Hydrogen Program, ORNL/TM-2006/417, April 2006

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