

commentary

The Lack of a Future of Energy: Underinvestment in Alternative Energies

By Eli Nagler

The Iraq war recently reached a somber milestone with the American death toll surpassing two thousand. Many enraged critics of the war have argued that the Bush administration purposely deceived the American public by waging a war over petroleum. Our mission in the Middle East has been characterized as nothing more than a “lynchpin to controlling Persian Gulf oil” (1). Whether or not one believes that war was caused over prices at the pump, nearly everyone agrees that the current political situation at home and in the Middle East makes the need for viable alternative energies critical. However, too much effort is being exerted in the political energy policy battle and not enough is being directed toward the scientific advancement of new energy sources. Technologies such as hybrid cars, hydrogen fuel cells, and biodiesel do exist, but overall public science funding is insufficient to implement them in the manner that is needed.

Exactly how reliant are we on foreign oil? The United States spends roughly \$13 million per hour on oil and \$25 billion per year on Persian Gulf oil (2). While we have only three percent of the world’s known reserves, we consume nearly 25 percent of the world’s supply, meaning that 60% of our oil is imported (3). Most of the oil that we consume is for the purposes of transportation and heating. These numbers alone reveal a telling story. Unless we alter the direction of our energy policy, America will only become increasingly entrenched in Middle East conflicts. One can see a clear association, if not causation, between our intervention in Middle East affairs and the price of a barrel of oil. Unfortunately, our legislators are currently focused on energy policies that are “about tax breaks for expanded production, access to public lands, and nuances of electricity regulation” (4). Policies molded in this fashion are tangential to the press-

ing problem of our need for improved energy sources.

While the field of alternative energy receives a substantial amount of funding in monetary terms, it is by no means adequate. The most frightening aspect is that we have been trending in the negative direction. In his first full year in office, President Bush cut the Department of Energy’s basic research program for alternative and renewable energies by an astounding 52 percent (5). Between the 2005 and 2006 fiscal years, the president reduced funding for energy efficiency programs by 2.3 percent and for renewable energies by 5.6 percent (6). Meanwhile, the cost of the Iraq war has surpassed \$200 billion (7) and bills proposed in Congress within the last year have laid out plans for an \$8 billion tax break designed to primarily benefit the oil and natural gas sectors (8). Resources are being improperly allocated. It appears as though the priorities of our government are to find quick fixes now instead of sustainable solutions for the future.

Viable alternative energy investments have already presented themselves for some time. Hybrid car technology, for example, is “available now, not 15 or 20 years in the future” (4). There are two main forms of hybrid vehicles. In a series hybrid car, the regular combustion engine powers a generator that is able to recharge the car’s batteries, while in a parallel hybrid car, the combustible engine and the electric batteries work together to contribute to the vehicle’s driveshaft (9). Both versions can significantly reduce gasoline consumption by automobiles, one of our major uses for oil.

A more generally applicable alternative energy source is the hydrogen fuel cell. Functioning like a battery, the hydrogen fuel cell has the advantage of never needing to be recharged. Hydrogen gas in combination with a catalyst becomes polarized and then negative ions are sent in one direction, while the positive ions are sent in another. This



▲ A nation of gas guzzlers: Americans account for a quarter of world oil consumption.

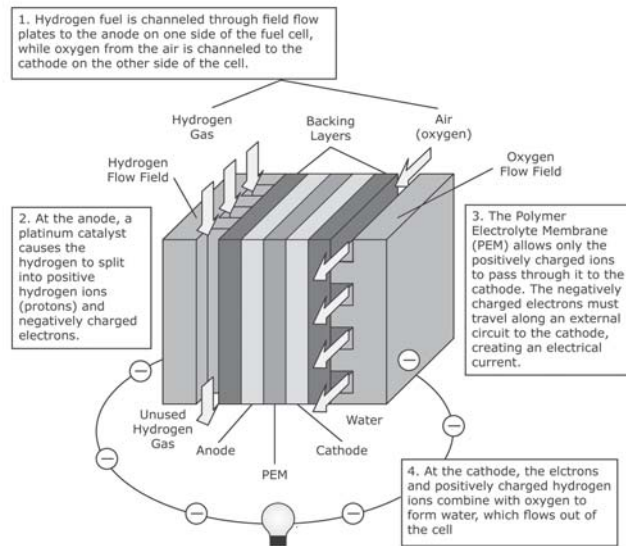
flow of charged particles creates usable energy (10). A form of hydrogen fuel cells, called proton exchange membrane (PEM) fuel cells, can also be used in cars to cut oil usage in transportation. PEM fuel cells use platinum as a catalyst to ionize the hydrogen. The positively charged ions (protons) are able to travel directly to a cathode, passing through a polymer electrolyte membrane, while the negatively charged ions (electrons) are forced into an external path that eventually leads to the cathode, creating an electric circuit (Figure 1).

A third promising energy source is biodiesel. Similar to regular diesel, biodiesel works by igniting compressed hot air. This combustion then releases energy that can be harnessed. What makes biodiesel different is that it is “produced from the refined edible vegetable oils such as sunflower oil, palm oil, and soybean oil” (11). The United States would not have to rely on others in order to use biodiesel as a fuel source.

The benefits of greater oil independence achieved through the above technologies, which represent just a small sampling of possible alternative energy sources, would be far reaching. There are clearly non-energy related reasons to be involved in Middle Eastern affairs, but by being less dependent on Middle Eastern oil we would have more leverage in the region (12). Moreover, we would free up a vast number of resources that would enable us to confront other challenges. There are also several positive environmental benefits that have not even been considered. It is a grave present concern, however, that relative lack of funding for alternative energies is indicative of a larger lapse of science funding in general. The Congressional 2005 fiscal year budget cut the National Science Foundation funds by \$105 million (13), while results from the Third International Mathematics and Science Study revealed that American students’ math and science literacy is disconcertingly low. Among normal 12th graders, Americans ranked 19th in mathematics and 16th in science out of a total of 21 countries. A comparison of only the top students in each country led to a similar outcome, with Americans ranking 15th and 16th out of 16 countries in mathematics and science, respectively (14). With inadequate science funding and what appears to be a

lack luster future talent pool, it is no wonder that America is forced to increasingly rely on others. Unless the priorities of our government shift to allow for scientific instead of political solutions to energy concerns, America is poised to become a dependent nation. **H**

—Eli Nagler '07 is an Economics concentrator in Mather House.



◀ Figure 1: A basic fuel cell

credit: U.S. Department of Energy

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