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## Fuels of the future

Nation has to adapt to keep its motors running

Reducing America's dependence on foreign oil isn't just about the current pain at the pump. More important, it's about national security, economic expansion, conservation of natural resources and environmental protection.

Which alternative fuels hold the most promise? How quickly must the U.S. convert to new fuels? What are the long-term strategic and economic implications? At the request of Sen. Richard Lugar, experts will gather for a national energy summit Tuesday at Purdue University to discuss those questions and more.

In advance of the summit, we asked Purdue President Martin Jischke, Amy Myers Jaffe of Rice University's Baker Institute for Public Policy and Sue Cischke, vice president of environmental and safety engineering at Ford Motor Co., to explore issues surrounding the nation's energy needs.

### Security at risk without changes

By Amy Myers Jaffe

It's pretty scary to think that American mobility could become more vulnerable to Middle East instability than ever before, but that's a real possibility. Security of U.S. energy supply will be highly influenced by international events in the coming years. Recent terrorist schemes and military conflicts in the Middle East have thrown a spotlight on the inherent risks associated with heavy reliance on oil supplies from the Middle East. But, disturbingly, experts agree that world dependence on Middle East oil is likely to grow rapidly in the future.

America imported 12.9 million barrels in 2004, or about 63 percent of total consumption of roughly 20.5 million barrels. That is up from 35 percent in 1973. The share of imported oil is projected to grow close to 70 percent by 2020, with the United States becoming increasingly dependent on Persian Gulf supply. U.S. imports from the Persian Gulf are expected to rise from 2.5 million barrel (22 percent of total U.S. imports) in 2003 to 4.2 million barrels (62 percent) by 2020, according to forecasts by the U.S. Department of Energy.

Previously, the industrialized West counted on the countries of the Persian Gulf and Venezuela to make the billion-dollar investments needed to meet rising global demand. But those countries are no longer investing sufficient amounts to meet the expected rise in oil demand in the United States, China and elsewhere. Expecting this reluctance to invest to change suddenly because that would suit American drivers is absurd; refusing to prepare for the opposite is clear folly.

Many Persian Gulf nations currently face both internal instability and future succession problems, boding poorly for future security of supply. Al-Qaeda has targeted vitally important oil facilities in Saudi Arabia, and Iranian assertiveness on its pursuit of nuclear weapons and international terrorism hangs over oil markets like a sword of Damocles. Any broadening of the conflict between Sunni and Shia populations in Iraq and beyond would be particularly threatening to oil supplies since large Shia populations sit on top of oil production not only in Iraq, but also in Saudi Arabia, parts of Kuwait and in Iran.

The rise in future U.S. oil imports will center squarely on the transportation sector that represents more than

two-thirds of total petroleum use and will constitute over 70 percent of the increase in demand. Rather than leave American mobility at the mercy of events in the Middle East we cannot control (a fact that the war in Iraq so painfully demonstrates), we need to mobilize backup alternative fuel solutions as quickly as possible. The fact that this cannot be implemented overnight isn't an excuse to do nothing.

We are a can-do nation. Americans would like a choice of automotive fuels -- one that mirrors the way we currently can select from over a dozen energy sources to generate household electricity. The technology already exists. We have the capability to create hybrid automobiles that can run more efficiently on more than one energy source, including a combination of electric battery, gasoline and biofuels. Our car companies are producing flexible fuel vehicles that can run on biofuels for Brazil, but could do more to get such cars on the road in the United States at an added cost of only \$40 per vehicle. If I could plug my car in at home and charge my battery, an Arab oil cutoff would not leave me stranded because almost all electricity is generated in this country without oil. If someday we could generate that electricity with solar roof panels, we could kiss Middle East oil goodbye.

Given the high stakes, waiting for the market to deliver energy security seems like a long process. California has passed emission targets that would force automakers to pony up better technologies more quickly. Japan both subsidized its car companies and poured federal dollars into public and private research and development to get hybrid cars off the drawing board and into car dealerships. A levy on a portion of energy company profits not being reinvested to create future supplies might be one way to fund a national effort. A large consumer tax on purchases of gas-guzzling vehicles would be another way to find the revenues for a serious energy program.

We cannot ensure that Middle East oil supplies will be there to meet world demand. But we can control our own consumption through regulation, conservation and technology development. The longer we wait, the more likely the transition will be forced by painful events instead of national will.

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