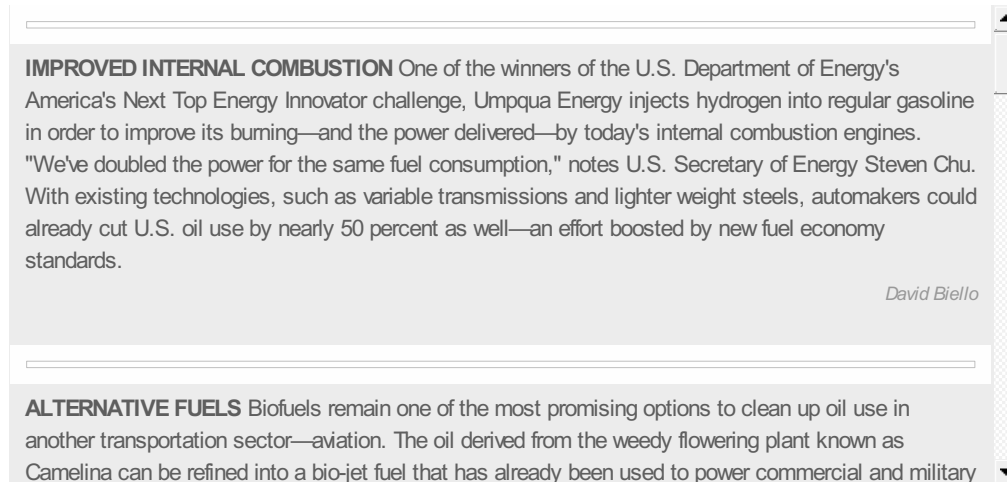


A tour of the US's clean energy future

The third annual ARPA-e summit showcases potentially transformative energy technologies.

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At least three forms of security depend on inventing a future of cheap, clean energy—national, economic and environmental. President Barack Obama launched the Advanced Research Projects Agency for Energy (ARPA-e) in 2009 to fund innovative research in the hopes of delivering such technologies.

"We need a second industrial revolution," argues U.S. Secretary of Energy Steven Chu. "A revolution that gives the developed and developing world the energy they want and need but that can also be clean energy. It is important for our national prosperity and posterity."

ARPA-e is holding its third annual summit this week, where it is showcasing the 180 projects it has funded to help seed that clean revolution, as well as many others. "We are also showcasing those teams we could not fund," says ARPA-e founding director Arun Majumdar. "We want them to succeed as well."

ARPA-e's current projects include genetically engineering plants to improve photosynthesis and finding less costly ways to capture the carbon dioxide released by coal-burning power plants. Upcoming efforts will focus on creating cheap technology to turn natural gas into fuel for cars as well as a potential open call for proposals with no guidelines. "Give us your best ideas," Majumdar says. "We will see if it works."

Already, ARPA-e has begun to deliver: one of its first awardees—Envia Systems—has now developed a lithium-ion battery with the highest energy density in the world, potentially enabling long-distance electric cars in the future. Those electric cars—combined with improvements in the fuel efficiency of existing internal combustion engines, new hybrid power trains and even fuel cell vehicles—could begin to reduce the roughly \$1 billion a day the U.S. spends importing oil. "We are engaged in the largest transfer of wealth in the history of the world, from the industrialized countries into oil producing regions," says FedEx chairman Fred Smith. "The U.S. cannot operate as a growing industrial society without access to low cost energy."



It's not just for the U.S., of course. "Cheaper energy is on the list of three to four things you would most want to happen for the poorest people in the world," notes former Microsoft CEO Bill Gates. "Having energy determines whether they can afford fertilizers or lighting& Without advances in energy they stay stuck where they are."

At the center of that effort to invent a brighter, cleaner and cheaper future for energy is ARPA-e.

"Pound for pound, dollar for dollar, it's hard to find a more effective thing government has done than ARPA-e," Smith adds.

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