



Winter 2015 Forum:

DOD's role in energy innovation

Eugene Ghotz, a leading scholar of the innovation system within the Department of Defense (DOD), presents a cautionary tale in “Military Innovation and Prospects for Defense-Led Energy Innovation” (*Issues*, Fall 2014).

When cap-and-trade legislation to impose a price on carbon emissions failed to pass the U.S. Senate in 2010, a 15-year-old assumption about how the United States was going to transition to a lower carbon economy went down with it. Cap and trade had been the almost exclusive policy focus of the climate change community ever since such an approach for acid rain was first passed, and then successfully implemented as part of the Clean Air Act Amendments of 1990. When cap and trade for carbon dioxide failed in the Senate, there was a policy vacuum—no substitute approach was readily at hand or thought-through.

One of the problems with cap and trade was that it was a pricing strategy, not a technology strategy, and it was hard to adopt a pricing

strategy without more progress on a technology strategy. Although pricing can sometimes force technology, it assumes a degree of technology readiness that was still missing in a number of key energy innovation sectors. So if the pricing strategy was on political hold, why not pursue a technology-push strategy, which was needed anyway? And why not enlist the DOD innovation system, which, after all, played a critical role in most of the technology revolutions of the 20th century—aviation, nuclear power, space, computing, and the Internet? Unlike the Department of Energy, which can take a technology from research to development and perhaps to prototype and early-stage demonstration, DOD operates at all of the implementation stages, funding research, development, prototype, demonstration, testbed, and often initial market creation and initial production. Why not enlist this connected innovation system in the cause of energy technology?

Ghotz points out that the military, particularly in an era of budget cutbacks, will focus only on their system of critical defense priorities vital to warfighters. To ask the military to go outside their mission space, he demonstrates, will produce much friction in the system. It simply won't work; it's hard enough for DOD to deliver technology advances for its core missions without taking on external causes, he illustrates. So DOD, for example, is not going to develop carbon capture and sequestration technology—that's not its problem. And it is not going to develop or support massive energy technology procurement programs.

But, realistically, is there is a range of energy technology challenges within its reach? Ghotz does a service by pointing toward that track. DOD does face tactical as well as strategic problems because of energy. Two Middle East wars made clear the vulnerability of its massive fuel supply lines and forced it into defending fixed points, jeopardizing its mobility and exposing its forces to relentless losses. The department needs to restore the operational flexibility of its

mobile forces, and solar and storage technologies are important in this context. Recent events in the Middle East suggest that the United States will not walk away from this theater anytime soon. For forces laden with the electronics of network-centric warfare, long-lasting, lightweight batteries are critical. These are two examples of the role that DOD can pursue: certain critical niche technologies, modest initial niche market creation, and the application of its strong testbed capabilities. And DOD is doing exactly this, filling some important gaps in the energy innovation system.

There is another area where DOD can play a role. As the nation's largest owner of buildings, it needs to improve the efficiency and cut the cost of its facilities. Its bases are also exposed to the insecurity of the grid, so it has a strong interest in off-grid technologies, including renewables and perhaps even small modular reactors. Where it cannot get off the grid, it has a major interest in grid security and efficiency. All this turns out to be an important menu of operational and facility energy technologies with some important dual-use opportunities. That's why the Advanced Research Projects Agency-Energy (ARPA-E) and the Office of Energy Efficiency & Renewable Energy (EERE) at the Department of Energy are collaborating with DOD.

Ghotz brings us a splash of realism about DOD's role. But some vital energy opportunities remain if, and only if, they fit the DOD mission.

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