

Bringing energy innovations from lab to market

Massachusetts Institute of Technology

The key to making improvements in the energy landscape for this country, and for the world, is finding better ways to get ideas out of the laboratory and into the marketplace. That was the theme of the eighth annual MIT Energy Conference: "From Idea to Impact: Collaborating to meet global energy challenges."

This year's student-run conference, held this past Friday and Saturday, featured several panel discussions led by leaders from energy industries and academia, as well as keynote addresses by former energy secretary Bill Richardson and by David Crane, the CEO of NRG Energy, the nation's leading independent power generator.

Crane, speaking in an informal question-and-answer with Melanie Kenderdine, executive director of the MIT Energy Initiative (MITEI), and a large audience in MIT's Stata Center, said that part of the problem with bringing innovation to the electricity sector is that "we exist in an industry of Neanderthals ... the least innovative industry in history."

"The energy model that exists is really at the end of its useful life," Crane said, adding that in a few decades, "We'll be pulling down power lines because power generation will be so distributed. Centralized power will go away."

Distributed power production and storage would replace the current grid, Crane said, including homes with rooftop solar panels and electric cars whose batteries can store power from the grid during off-peak hours. "We're going to have a competitive model, a deregulated model, where people are going to have choices," Crane said.

Most utilities are not yet aware of the transformation that's underway, he added. Crane compared today's electricity sector to telecommunications before the breakup of AT&T, which failed to appreciate the transformative nature of cellphones: At the time, one consultant estimated that worldwide demand would reach 1 million cellphones by 2000. "He was off by a factor of 130," Crane said.

While NRG is the fifth-largest user of coal in the United States, Crane said, "I don't think coal has a future in the U.S." He cited climate change, pollution and the secondary costs of burning coal as reasons why it will likely become uneconomical in the near future.

Richardson, who delivered the keynote talk on Saturday, echoed that prediction of a rapid retreat from fossil fuels. "One hundred and forty-five countries are making renewable energy the centerpiece of their policies," he said. "How do we move from a static energy policy and reliance on fossil fuels to sustainable, renewable clean energy?"

One key to moving in that direction, Richardson said: "It's important that we

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connect science and policy. It's not connected today. Policymakers don't consult scientists, and you as scientists aren't as good as you should be" at communicating with policymakers.

"What I want is an even playing field," Richardson added, "the same tax policies, the same incentives," rather than the current patchwork that favors some sectors — especially oil and natural gas, he said — over others.

Richardson said he fully agrees with the idea, expressed in a recent MITEI study, that natural gas will be a crucial "bridge" in helping the United States and other nations to make the transition to a low-carbon or no-carbon future. But, he added, "We should not do it in an indiscriminate way," citing the need for "sensible regulations" to ensure that water supplies are not contaminated in the process.

Reiterating his call for stronger connections between science and policy, Richardson said: "We need more scientists and engineers running for office. Get in there yourself, fight, be part of the process. Don't be afraid to speak out, don't be afraid to be adversarial, in a positive way."

A new feature of this year's Energy Conference was a series of "Idea Storm" brainstorming sessions, split among eight different topics: People with early-stage ideas for energy-related technologies, services or businesses could give a brief pitch, then engage in constructive dialogue with other participants.

In addition to panel discussions, speeches and brainstorming, the Energy Conference featured workshops on a variety of energy topics; a showcase also allowed students and researchers to present posters about their energy research, and companies to exhibit innovative products. The displays included systems for monitoring energy usage in homes, offices and factories; new kinds of factory-built compact nuclear reactors; and high-efficiency LED light bulbs.

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