

## NATIONAL LABORATORIES

### Berkeley lab chief share's Chu's vision of replicating Bell Lab structure at DOE

The Energy Department's national laboratories are often touted as incubators of scientific and technological innovation. But according to Paul Alivisatos, the acting director of DOE's Lawrence

Berkeley National Laboratory, the labs should also be open to finding new ways to get those technologies from the workbench to the marketplace.

"There are many successful models for how to do it, we can also try to invent new ones if they are not there," Alivisatos said in a recent interview with Platts. "We do have a pretty good track record, but we could probably do ten times better if we all put our minds to it."

Berkeley lab is located close to the high-tech venture capital heartland of California's Silicon Valley, and it is well-regarded in the research community for its technology-transfer practices, especially engaging with industry. Energy Secretary Steven Chu was the lab's director before he became part of President Barack Obama's Cabinet in January, and during his tenure, the lab aggressively pursued a \$500-million project with BP to build an advanced biofuels research center.

While it has made some strides in tech transfer, the lab is still trying to improve. Specifically, Alivisatos said he is attempting to avoid "the invented here and thrown-over-the-fence model" by bringing businesses and industry in earlier.

"We would love for them to tell us that early so we are not wasting time and money. We also know that [with] some of our discoveries, people in industry are just not aware of them early enough to take advantage," Alivisatos said.

The lab is not only trying to work more closely with industry, but also trying to help integrate applied and basic research across the department. This includes the Joint BioEnergy Institute, or JBEI, a model for DOE research integration. The facility is aimed at developing advanced plant-based biofuels, and is home to researchers looking at every



Paul Alivisatos

aspect of the problem, from plant genetics to the technology that will go into a biofuels pilot plant the lab hopes to eventually build.

The one-stop-shop model, where the scientists from a broad range of disciplines are concentrated in one location to work on a specific energy problem, is just one that DOE is embracing.

Alivisatos first met Chu when they both worked at Bell Laboratories in the 1980s. Bell labs was the source of many breakthroughs during its 50-plus-year heyday, including the laser and the transistor. Chu has said several times that he would like to replicate some of the Bell lab structure in DOE's national labs.

"Bell Labs was an amazing place," Alivisatos said. "You just walked in the door and you could feel the energy and intensity and the excitement of the place because it was just chock full of the worlds experts." Scientists could quickly test ideas by bouncing them off of more experienced colleagues, he said.

"When we are talking about making these integrated structures where we have basic and applied research together, one implicit in that is they need to be critical mass, they have to be big enough that there are enough people inside there, thinking and rubbing shoulders, that they can quickly move through issues and get to the right answers without going down blind alleys too much," he said.

But certain aspects of Bell Labs are unlikely to be replicated at DOE, according to Alivisatos. For example, while Bell Labs' funding procedures were largely determined by managers, DOE will almost certainly continue to make those decisions through the proposal system, which involves formal competitive appraisal, Alivisatos said.

DOE labs also have to deal with relatively inconsistent budgets from year to year, relying on Congress to provide enough money. Berkeley has been carefully reviewing its operations budgeting — such as food and travel services, and information technology — and comparing it to universities and private companies to make sure they are a good value, Alivisatos said.

"If a certain amount of money comes for a research program, and so much of it gets diverted into operations that we don't deliver enough science, than that is an issue, so we pay careful attention to that," he said. This benchmarking is being adopted throughout the department, according to DOE's chief financial officer.

Another budget issue that has plagued national labs is investment in infrastructure, such as new buildings. This was partially addressed with funding in the economic-stimulus package, but the history of underfunding has led to some ironic disparities.

Meanwhile, many of the energy-efficiency technologies pushed by Chu, such as compact fluorescent light bulbs and efficient roofs, have not yet been adopted by the labs themselves.

"Our lab has invented a lot of these technologies, or come up with a lot of these ideas that are out there," Alivisatos

said. "And in some cases we haven't been able to implement them in our laboratory because we don't have the resources to do it."

Alivisatos, a chemist by profession, got into the energy field after becoming intrigued with the problem of producing low-cost solar photovoltaic cells, which can produce electricity directly from sunlight. Getting the cost down is still one of the major hurdles to widespread adoption of solar power.

Alivisatos took the helm of Berkeley lab when Chu stepped down from the director's chair to head DOE. The University of California, which manages the lab, is expected to name a permanent replacement for Chu this fall.

Having a former lab director at the helm of DOE has made a difference in how the current directors coordinate and work together, according to Alivisatos.

Chu has refocused the routine meetings between DOE and directors, allowing the directors to center their attention more on the science their labs are pursuing and less on management issues, Alivisatos said. In an interview with Platts on the sidelines of the American Chemical Society's meeting in Washington on August 18, Alivisatos said the meetings have changed dramatically under Chu.

"We spent the whole time, the lab directors, talking about really important science issues. It felt very liberating because that is what our labs are good at doing," Alivisatos said. "We were talking about our mission and how are we going to cooperate to achieve it, and we were not talking about contracts. I'm not saying these things are not important, but you can get overwhelmed with bureaucratic aspects of large organizations and lose sight of what the organization's purpose is."

Chu, who is a Nobel Prize-winning physicist, has personally made research and development at the department a priority.

This experience is a drastic change from prior energy secretaries, Alivisatos said without mentioning any names.

"Some of the people who have run the department in the past have been more distant from those technologies and science [and] have probably had a harder time really differentiating, and have therefore maybe focused on other things," he said.

Some past energy secretaries not only had no energy experience, but were chosen for their antagonism toward the department. Spencer Abraham, a former Republican senator who served as energy secretary under former President George W. Bush, once sponsored legislation that would have abolished DOE.

Alivisatos welcomed Chu's leadership.

"Energy is such a science-related topic, having a first-class scientist in there is just a different world," Alivisatos said.

— Derek Sands

*Editor's Note: This is the fifth in a series of interviews with directors of the Energy Department's national laboratories, which Energy Secretary Steven Chu has said will play prominent roles in the Obama administration's plans to promote the development of transformational energy and environmental technologies for the US. Other interview stories will appear in coming editions of Inside Energy.*

## OIL

### Green groups to seek court order to halt work on Enbridge oil pipeline

A coalition of environmental groups is expected to sue the State Department this week for approving a Canadian company's plan to build an oil pipeline from tar-sands fields in Alberta to refineries in the Midwestern US.

Sarah Burt, an attorney with Earthjustice, told Platts last week that the groups will seek an injunction to prevent Calgary-based Enbridge Energy from proceeding with construction on the US portion of its Alberta Clipper pipeline project. Burt said an injunction would give the groups more time to appeal the State Department's August 20 decision to sign off on the project, which was required because the pipeline would cross the US/Canadian border.

"The environmental review the State Department did was very limited in scope," Burt said.

Burt said Earthjustice would ask for the injunction on behalf of the Sierra Club, the Minnesota Center for Environmental Advocacy, the Indigenous Environmental Network and the National Wildlife Federation.

Enbridge's Alberta Clipper pipeline is designed to carry 450,000 barrels a day of crude oil from Hardisty, Alberta, to Superior, Wisconsin. The 36-inch-diameter pipeline would cross the border near Neche, North Dakota, traversing Minnesota to an Enbridge terminal near the western shore of Lake Superior. The 1,000-mile-long project calls for the pipeline to eventually expand to 800,000 b/d.

Burt said the lawsuit will argue that the permitting process did not take into consideration the environmental impact of US refiners processing heavy crude oil derived from Canada's oil sands. She also said the State Department did not consider the impacts of greenhouse gas emissions from the increased extraction rates of Canada's oil sands, or the cumulative effect that the Clipper Line and TransCanada's Keystone line will have.

Burt said the Clipper project and the Keystone project together would bring an additional 2.9 million b/d of capacity for heavy crude from Canada.

"That's really a significant shift," she said. "None of that was considered in the environmental assessment."

The State Department said August 20 when it issued the permit that it considered several factors in its decision, including greenhouse gas emissions. The department added that reducing heat-trapping gases "is best addressed through each country's robust domestic policies and a strong international agreement." President Barack Obama "is committed to reducing overall emissions and leading the global transition to a low-carbon economy," the department said at the time.

Denise Hamsher, an Enbridge spokeswoman, said last week that she could not comment on the potential lawsuit, since nothing had been filed. However, Hamsher said she is familiar