

Energy secretary

Steven Chu

wants to change the way
people think
about global warming.



PHOTOGRAPH BY *Peter Yang*

THE

RADICAL PRAGMATIST

And that means
changing the
way they think
about China.

by DANIEL ROTH







It's late November 2009, and US energy secretary **Steven Chu** is leaning against a fake sink in a fake kitchen. Chu is 62 years old and athletically trim with graying black hair.

He's wearing a rumpled pin-striped suit, argyle socks, and gold-framed glasses. Chu is a renowned physicist, a cabinet appointee, and the winner of a Nobel Prize. But that's not why he's now being treated like a rock star. This morning a small crowd of scientists, politicians, and local businesspeople are flocking to him because he's got cash, specifically \$75 million in stimulus funds for the Ohio subsidiary of the American Electric Power utility.

Chu likes to ask questions—a lot of questions—and he can dive deep into the details of any science or technology issue very quickly. Today he's touring a lab run by AEP just outside of Columbus, Ohio, that includes a model kitchen full of energy-saving appliances. Standard protocol would suggest that he smile vapidly and hustle along. But almost immediately, he starts to wank out with Ray Hayes, the lab's white-bearded manager. They talk power meters and the feasibility of sensors that can measure which gadget is sucking down what power. Chu is enjoying himself, his hands buried in his suit-pants pockets. A small crowd, including Ohio senator Sherrod

Brown, follows the men around the room for a while, but everyone soon loses interest and strikes up side conversations. (“I didn’t know what the hell he and Ray were saying,” Brown later admits.)

Finally Chu is ready to do what he came to do. He walks outside to a tent, where in front of AEPers and politicians he announces the grant. He knows that all politics is local, especially in Ohio, a battleground state with high unemployment and strong unions. This is “a farsighted state,” he says; he mentions Toledo as the “solar valley of Ohio” and talks about the state’s prowess in manufacturing.

Still, he can’t help himself, and after a few minutes he departs from his prepared remarks. “I just came back from visiting China with the president,” he says, no longer reading. When he was there two years ago, there was little interest in doing anything about climate change or carbon emissions. “That is no longer true,” he says. “The president of China, the premier of China, the vice premier of China are all saying, ‘This is a very big deal for us. If we continue business as usual, continue to grow our carbon emissions,



inertia and endless compromise make them difficult to achieve and unlikely to have real teeth. It's smarter to deal with China alone. A massive investment by the US and China, and a series of strong treaties between the two countries, would have a big effect on actual emissions, and the pacts would also serve as a model and inspiration for other countries. In part because they're such massive polluters, the US and China have been the two countries stifling progress toward international agreements. If they could agree, others would feel the logjam had broken and follow along. It's like a high school movie: Once the jocks and the nerds unite for a common cause, everyone falls in line.

Chu has been in office for only a little over a year, and his power is largely limited to investments and arm-twisting. But he's nonetheless managed to help lay the groundwork for a fundamental shift in how the US tackles climate change—by taking it seriously and by embracing China not as a nation to fear but as a partner to encourage.

Chu is succeeding because of his indefatigable pragmatism, a trait that pleases businesspeople as much as it sometimes irks environmentalists. And he's succeeding because he has won respect from the Chinese—both because of his Nobel Prize and because of his ethnic roots. "Most of

it would be devastating for the world, devastating for China.' But they also say, 'This is our great economic opportunity.' And for that reason, they're investing over \$100 billion a year in the clean energy economy."

When Chu pivots back to the US, his point becomes clear: Spending on clean technology isn't a feel-good sideline. It's an investment that can yield jobs and profit. Someone is going to invent the technology that cleans our factories and our air—someone in Beijing or someone in the Buckeye State.

On the way back to the airport, Chu is still fired up about China. Too many times, he says, he's heard American businesses justifying their environmental inaction by saying that going green would put them at a disadvantage compared to their environmentally irresponsible Chinese competitors. Those days, he argues, are long gone. China's supposed inaction isn't an excuse; China's rapid action should be a motivation.

After China joined the World Trade Organization in 2001, its economy soared. As a result, so did its carbon emissions. To make the products the West demanded, the nation had factories operating at full tilt no matter how old or polluting. To create the infrastructure to support its new economy, China generated unimaginable amounts of energy-intensive cement and steel. In 2006, China surpassed the US in total emissions.

For Chu, this makes China the key to America's energy future. Since the US and China produce some 40 percent of the world's carbon dioxide emissions, Chu argues that far-reaching multi-country agreements aren't really necessary. All the diplomatic

OBAMA HAS SAID HE'S PROUD TO HAVE A REAL NERD IN HIS CABINET.

China's leaders are engineers and scientists, so when they see someone with the same background, they can talk," says Peggy Liu, a former venture capitalist based in Shanghai and now chair of the Joint US-China Collaboration on Clean Energy. "And Chu is Chinese, so there is some kinship. In China, if you can say that your ancestor came from the same province, you are family."

In the US, he's got something else: more than \$100 billion to lend out and \$30 billion in stimulus grants for projects like advanced vehicles and renewable energy. That's why he's in Ohio today. But any entrepreneur or company that takes his money should know that one of the things Chu wants them to do is figure out a better way to think about China: not as a competitor but as an ally.

CHU WAS RAISED IN GARDEN CITY, A SUBURB OF New York. His parents were born in China, and they came to the US to study at MIT. The future Nobel laureate did fine in school, but what he really loved were Erector sets. Chu delighted in imagining designs in his head and then turning them into reality with his hands. By the time he had enrolled at the University of Rochester, he realized that the ability to mentally rotate and fit shapes



together—in addition to his math skills—made him a natural at physics. He earned a PhD in the subject in 1976 at UC Berkeley.

By fall 1983, Chu had spent a few years working at Bell Labs, rising to the top of its quantum electronics research department. There he began the research that would lead to his Nobel Prize 15 years later: He and some colleagues devised a way to dramatically cool atoms with lasers, slowing them from their normal frenetic speeds to about the pace of an ant marching. The atoms could then serve as the heart of incredibly exact measuring devices. His work would end up making the atomic clock even more precise.

Chu went on to teach applied physics at Stanford University. In the early 2000s, he started to focus more on the environment and joined the board of directors at the Hewlett Foundation, which was just beginning to concentrate on national energy policy. “When I started doing work on climate change, I naively thought that, oh, invent something and it will be deployed,” he says. But he soon learned that a smart invention is just a start. “You’ve got to get the private sector excited,” he says. “And you’ve got to make it profitable.”

In 2004, he was appointed to head the Lawrence Berkeley National Laboratory, which is run by the Department of Energy. Since the lab’s founding in 1931, scientists there had prized science for science’s sake and were leery of the idea of uniting commerce and research too closely. Concepts like applicability and commercialization were rare in the culture.

Chu immediately set out to change that. One by one, he buttonholed the lab’s top scientists to discuss climate change and to push them to invent things that the private sector could use. Gradually, they started to come around, and soon the lab was being hailed as one of the top places for climate-change science. Out came ready-for-commercialization technologies: nano-materials that can make electric-vehicle batteries safer and longer-lasting; coin-sized DNA-analysis chips that researchers could take to rain forests to identify microbes good for producing biofuel. “He was and is in many ways a revolutionary,” says Mark Levine, a senior staff scientist at Berkeley Lab. “And his way of doing it is to be a very powerful salesperson.”

Chu also brought business into the development process. In 2007, he helped craft a deal wherein BP established the Energy Biosciences Institute with a \$500 million grant. Co-housed at Berkeley, it would concentrate on developing biofuels. BP got some of the school’s expertise; Berkeley got money.

The campus went bonkers. (*The Berkeley Daily Planet* reported: “Steve Chu said ‘this will be our mission to save the world,’ a phrase [protester Mason] Murthi said reminded him of colonialist rhetoric used by Europeans in the past to justify conquering other lands.”) But in the end, the partnership went through.

When President Obama tapped Chu to head the Department of Energy, it didn’t appear to be much of a promotion. Since its inception in 1977, the secretary post has largely been handed out

as a political plum—the “ambassador of nukes.” In 2009, the DOE had the third-smallest budget of any cabinet-level agency and a reputation as a backwater overseeing cleanup sites, radioactive waste, and the nuclear stockpile.

But Chu thought he could turn the DOE into an organization focused on the private sector and on finding practical solutions to pressing problems. Once he got the job, he started to hire people steeped in two areas: climate change and China. He managed to impress both groups. “I sit in these budget meetings and wonder what it was like when the secretary of energy didn’t know more than most of the people briefing him about most of the topics being discussed,” says David Sandalow, the assistant secretary of energy for policy and international affairs.

Chu is also making sure that those working for him realize they’re not in a bureaucracy where slowness and risk avoidance are rewarded. Before Sandalow was sworn in, Chu explained that he had one rule when dealing with businesspeople, foreign governments, and politicians: “Be nice, but don’t be patient.”

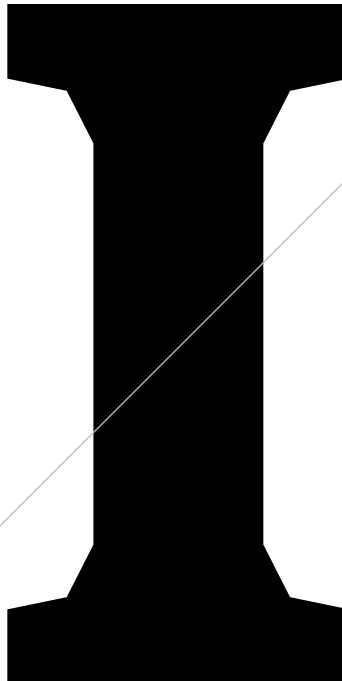
IN NOVEMBER, CHU AND OBAMA FLEW to China for talks with the Chinese government. During a welcome ceremony, they sat in a banquet room in the Great Hall of the People around a Buckingham Fountain-sized table decorated with a life-size faux-peacock centerpiece atop a gold tablecloth and listened to a choir sing “That’s What Friends Are For.” During the visit, US and Chinese leaders also signed a flurry of agreements on clean energy. One in particular pleased Chu: the creation of the US-China Clean Energy Research Center. The agreement calls for both countries to ante up \$75 million and to bring together their top clean energy scientists.

Details are still being finalized, but the plan is for the two governments to get royalty-free

access to the intellectual property that comes out of the center; private companies could buy in at low rates. IP is often a tense issue between the US and China, because American businesses are wary that their work will be stolen or pirated. The agreement, however, will attempt to bypass the conflict by mandating that both sides share.

What’s in it for China? Cash from American investors and access to US technology. While China is a leader in several areas of clean tech—it already produces 30 percent of the world’s solar photovoltaics—it lags in others, like grid technology. And China’s venture capital industry is still nascent.

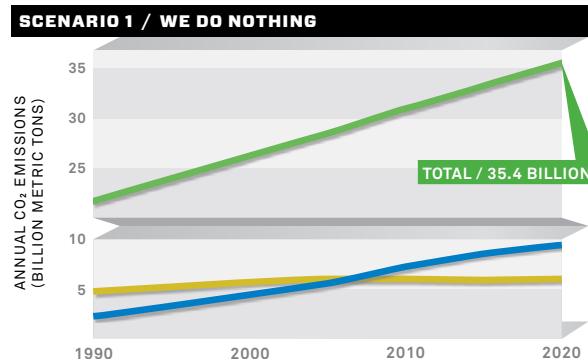
And for the US? Chu sees an opportunity for the country to expand corporate experimentation. Take building efficiency: Because China is developing so quickly—and since its zoning and construction codes are not very restrictive—it’s much easier to experiment with green buildings there. Domestic companies can get to China, learn what works, and use the information to profit back home. In other words, the US provides the raw research, and China serves as the real-life lab.



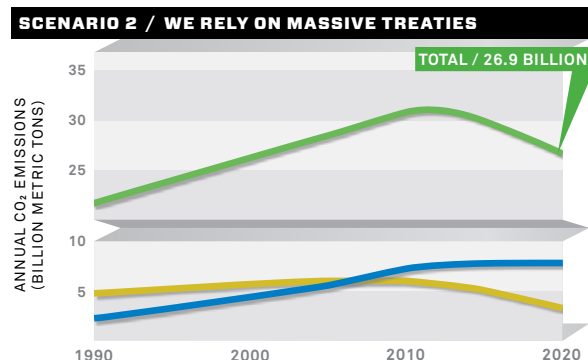
A Plan That Will Actually Work

Huge international climate deals are vexing. It would be simpler, Steven Chu says, to get the US and China to agree on cuts. Other nations would then follow. —ANGELA WATERCUTTER

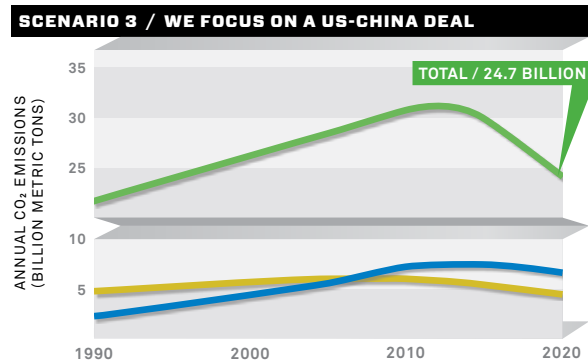
■ UNITED STATES CARBON EMISSIONS
■ CHINA CARBON EMISSIONS
■ TOTAL GLOBAL CARBON EMISSIONS



If no international agreements are reached, world carbon dioxide emissions will soar.



Accords like those discussed at the Copenhagen conference (rich countries drop emissions 25 percent below 1990 levels; poor countries by 15 percent below projected 2020 levels) would work—but good luck getting everyone to sign them.



If the US and China agree to a strong bilateral deal (say, China reducing emissions by 60 percent per unit of GDP; the US by 17 percent below 2005 levels), the move could lead other countries to drop their emissions accordingly.

THE MOOD IN COPENHAGEN WAS DARK THIS past December, as environmentalists watched years of planning for an international climate agreement fade away. It was somehow fitting that the sun was gone by 3:30 pm every day. But when I saw Chu, he was hardly moping. Socializing at a packed party in the home of the US ambassador to Denmark, holding a glass of white wine, he was confidently laughing and shaking hands. I asked him how worried he was about the deteriorating talks, and he shrugged. “Treaties are great, I’m all for treaties,” he said. “But it’s after the dust settles, that’s what matters. It’s up to us—government and private enterprise to make something happen.”

Chu’s relentless pragmatism extends even to home improvement. Chu and his wife have been arguing about whether to replace some skylights in their 1940s-era home. He knows he’ll be able to save on heating costs and use less power if he replaces them with coated fiberglass skylights—using, coincidentally, the energy-efficient coating that came out of Berkeley Lab—but it would take a couple of decades for the savings to be worth more than the cost, and he doesn’t see himself in DC for that long.

Chu’s philosophy can, of course, irritate environmentalists. One of the topics they clash over most is coal: a dark, nasty substance that is utterly crucial to the energy supplies of both the US and China but that, per unit of energy, releases roughly 40 percent more carbon dioxide than gasoline does.

Chu has called coal his “worst nightmare.” But the energy secretary also knows the big countries won’t abandon it. So he has turned his attention to what’s called clean coal. The theory: After the rocks are heated, the CO₂ would be pumped deep underground instead of into the atmosphere.

For now, clean coal is hypothetical. But because Chu wants us to figure out a way to make it happen, he announced in spring 2009 that the DOE would channel \$1 billion into FutureGen, a carbon-capturing power plant planned for Illinois. And not surprisingly, one of his next priorities has been getting China and the US to commit to clean coal projects together.

But even thinking about clean coal infuriates environmental hard-liners. Jeff Biggers is a prominent author who writes about Appalachia, a region ravaged by coal mining. “This is where Chu is a failure,” Biggers says. “He can’t look anyone straight in the face and say that within 10 years we’ll be able to capture carbon emissions.”

Chu can, however, say that he has no time for chasing all-or-nothing proposals, or ones that nobody is going to buy into. He sees the need to act now and to act fast. And most important, to act in a way that will bring China along. According to Chu, the old way to solve environmental problems was to say “Eat your peas, they’re good for you.” The new way is to invent clean energy technology and say “If you do this, you’re going to be richer, you’re going to be happier. And it turns out that it creates jobs, and oh, by the way, you have to do it anyway.”

The other countries can keep struggling to find a way to save the planet. Chu has his sights set on one path. He’ll be nice about dragging the US along. But he doesn’t plan to be patient. [W](#)

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