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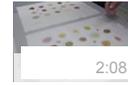
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China's Poisoned Air Prompts Economist to Devise Green Tax

By Bloomberg News - Oct 3, 2013 4:39 AM GMT-0400

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Q QUEUE

Reading in her hotel room in 1996, geology student Cao Jing noticed something alarming: the pages of her book were being coated with brown coal dust.

Her realization -- in Qinhuangdao, a tourist city where China's Great Wall meets the sea -- marks the moment when the young undergraduate at Beijing's Peking University became interested in studying the effects of China's runaway industrial pollution. It was the first step in a 17-year journey that has taken Cao, 36, into the field of economics to tackle emissions in the world's biggest producer of greenhouse gases.

Enlarge image



A man takes a photograph in front of banners of an unpolluted Hong Kong skyline at the waterfront in the Tsim Sha Tsui, Hong Kong, China, on Aug. 22, 2013. Photographer: Jerome Favre/Bloomberg

Her work gained a new urgency after a leadership change this year installed President Xi Jinping, who has promised to combat pollution even at the cost of slowing the economy. Cao's goal is to develop a tax structure that would curb harmful emissions with the least effect on growth and company profits.

"China is in urgent need of climate policies like a carbon tax to save energy and reduce emissions," said Cao, an associate professor of economics at Tsinghua University and a consultant for the World Bank. "If they are well designed, there will be no big impact on the economy. If they are poorly designed, they may bring disastrous consequences."

Enlarge image



Cao Jing, associate professor of economics at Tsinghua University in Beijing, stands for a photograph in the campus of Harvard University in Cambridge. Photographer: Kelvin Ma/Bloomberg

Cao, also a researcher at Tsinghua National Institute of Fiscal Studies funded by the Ministry of Finance, predicts the government initially will adopt a carbon tax. She says this would have a smaller economic impact and, with appropriate tax rates, would be more effective than the cap-and-trade model adopted in the European Union, where companies buy and sell permits to pollute.

Health Benefits

If China started with a tax of 10 yuan (\$1.63) a ton of carbon dioxide this year and raised it steadily to about 50 yuan by 2020, carbon emissions could fall by as much as 19 percent, while health and energy benefits would mean the effect on economic growth would be almost zero when combined with other tax changes, she said.

China's State Council has set a 2020 goal of reducing carbon-dioxide emissions per unit of gross domestic product by 40 to 45 percent from 2005 levels. Cao's study, "Towards a Low-

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Carbon Economy: The Design of a Carbon-Tax Policy for China with an Analysis of the CGE Model," won the [McKinsey China Economics Award](#) in 2011 for its contribution to the policy debate on "tackling greenhouse-gas emissions in an economically and environmentally sustainable way."

'Main Stars'

"She is one of the main stars in the energy and environmental economics field in China," said Thomas Sterner, visiting chief economist at the [Environmental Defense Fund](#) in [New York](#), whose 2011 book "Fuel Taxes and the Poor" includes contributions from Cao. "She has an unusually well-developed network of influential researchers and policy makers."

Cao was born in Wuhu, Anhui province's second-biggest city, famous for its lakes and, since 2008, a 74-meter-high tower shaped like a glass fish on a bridge over the [Yangtze River](#).

Her father was a driver and her mother worked in an egg factory, where hundreds of chickens are kept in rows of cages. She said neither had a college education because of the Cultural Revolution, when students from the cities were forced to work on farms.

An only child, Cao said she never traveled outside Wuhu, 300 kilometers (185 miles) west of [Shanghai](#), until she was offered a place in [Peking University](#) in 1994 to study geology, a rare choice for a girl at the time. Eager "to see the outside world," she jumped at the chance.

"I liked the great outdoors," she said. "I never thought I would study economics."

Field Trips

During the next two years she stuck with geology, making field trips to the mountains around Qinhuangdao in [Hebei province](#), accompanied by a telescope and compass, "because I often got lost." It was one of these trips that sparked her interest in China's pollution.

"We stayed in a hotel downtown," she said. "I was reading by the window and I noticed that the pages would become covered in dust. I guessed it was from the coal. The pollution in Qinhuangdao was scary."

Since her visit, the city has become China's biggest coal port, delivering 235 million metric tons of the fuel last year, or about 40 percent of the nation's domestic seaborne supplies, according to China Coal Transport and Distribution Association.

In her third year, she was among a group of students given the option of joining a dual-degree program in economics, led by Justin Lin, who later became chief economist and senior vice president of the [World Bank](#). Her teachers included Wen Hai, now vice president of Peking University, and Yi Gang, now deputy governor of China's central bank.

Geology Telescope

Attending classes in the university's large lecture theaters, "I never succeeded in getting a seat in the front rows," Cao said. So she brought her geology telescope to read the small numbers in equations her professors scribbled on the blackboards.

After finishing the program in 1998, she combined her experience and pursued a career in environmental economics. In 2001 she went to Guiyang, capital of Guizhou province in southwest China, for her first field research in her new discipline. While in the city -- which has large steel, coal and chemical industries -- she noticed the buildings degraded much more quickly than those she'd seen in [Singapore](#).

"Twenty- or 30-year-old Singapore houses looked newer than 10-year-old Chinese houses," she said. "Not until then did I realize how serious acid rain was in China."

Cao said her challenge was to find a way to persuade a country pursuing short-term industrial growth also to address the long-term effects of [climate change](#).

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Energy Savings

"People talked about what would happen in 50 or 100 years," she said. To make the debate more immediate and practical for lawmakers, Cao decided to quantify the so-called co-benefits of pollution reduction, things like energy savings and lower medical costs that provide an immediate return.

Her case study on the public-health benefits of emission reduction and technology innovation in local [power plants](#), cement factories and steel plants helped her gain admission to a doctorate program at Harvard University's Kennedy School of Government in Cambridge, [Massachusetts](#), where she worked under the guidance of Professor Dale Jorgenson.

She expanded her analysis of carbon control after returning to Tsinghua, where she participated in a joint study by China's Ministry of Environmental Protection and the U.S. Environmental Protection Agency on the cost benefits in China's power industry from energy-saving and emission-reduction policies for 2006-2010.

Evaluation Tools

Cao's aim was to provide the Chinese government with tools it could use to evaluate the real costs of policies. A breakthrough came when the government published its 12th five-year plan for 2011-2015, which included a reference to the introduction of an environmental protection tax, Cao said.

Li Shuo, a Beijing-based analyst with environmental group Greenpeace, is skeptical about how quickly such a tax would be adopted, or whether it would come before a cap-and-trade market.

"We have been seeing the indication of a future carbon tax for a few years now -- most of the time with no meaningful elaboration or detailed implementing road map," Li wrote in an e-mail on Sept. 26. "We see quite some intellectual exercises here for sure, but none of them could be deemed as a concrete policy intention."

China has test programs in seven cities for cap-and-trade and could expand those to a national system, said Shobhakar Dhakal, former executive director of the [Global Carbon Project](#), an international scientific program hosted by the National Institute for Environmental Studies in [Japan](#).

Low Levy

Cao expects China will begin collecting carbon tax by 2015 at the earliest or within the next five-year plan. The levy initially will be low -- around 5 to 15 yuan per ton of carbon dioxide -- because the government likes gradual change, she said. The country also may roll out cap-and-trade measures for bigger companies later on, accompanied by an economy-wide carbon tax, she added.

"China is getting rich and our lifestyles are becoming westernized, which means the country will have higher emissions in the future due to our reliance on [fossil fuel](#)," Cao said. "The Chinese economy has developed fast, but we sacrificed so many things."

Chinese women also "sacrifice a lot," she said. "It's very difficult to strike a balance between career and family." Time is "a luxury for me; my family have breakfast, lunch and supper in canteens either in [Tsinghua University](#) or China Academy of Sciences," where her husband works as a researcher. While she splits the housework with him, she spends more time with their seven-year-old son.

Spicy Fish

She said she cooks on the weekend, including her son's favorite dishes: spicy fish with lots of chili. Otherwise, her free time is dedicated to helping him with schoolwork or taking him on trips to museums.

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"I haven't read a novel in ages," she said. "I used to like them in college but don't have time for them anymore."

Instead, part of Cao's time is taken up in lobbying for the adoption of environmental-tax measures.

"Economists like to talk about tax, but everybody hates tax," she said. To craft a proposal that would win support, she began to canvass opinions of ordinary people and work on a structure that would be acceptable to all sides.

"The biggest obstacles of climate policies are inertia and interest groups, just like other reforms in China," she said.

Those groups include powerful lobbies from big state-owned enterprises and electricity generators. To overcome this barrier, Cao suggests the carbon tax be integrated into an overhaul of the tax system that would limit the cost of new environmental measures.

"If everybody objects to your reform plan, then it's unrealistic," she said. "It must be both politically feasible and economically efficient. In economics, you often just make a bigger cake and let somebody else do the cutting. But we care about the size of this cake, as well as its fair distribution. We must make a real policy. We can't just tell a fairy tale."

--Sarah Chen and Hu Shen. With assistance from Feiwen Rong, [Kevin Hamlin](#) and [Henry Sanderson](#) in Beijing. Editors: Adam Majendie, Melinda Grenier

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dnjake 3 hours ago

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