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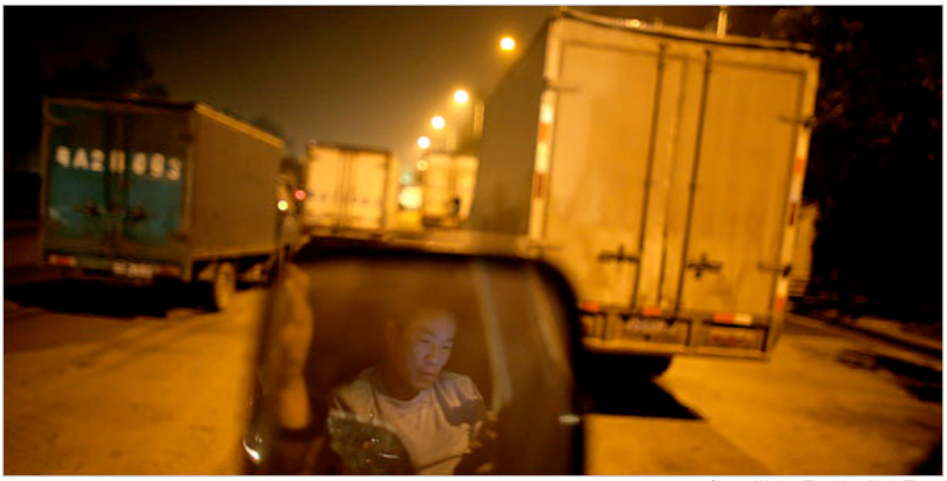
Trucks Power China's Economy, at a Suffocating Cost



Chang W. Lee/The New York Times

Because Chinese cities like Guangzhou limit truck traffic during daylight hours, many of the country's ten million trucks move by night.

By KEITH BRADSHER
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GUANGZHOU, China — Every night, columns of hulking blue and red freight trucks invade China's major cities with a reverberating roar of engines and dark clouds of diesel exhaust so thick it dims headlights.

By daybreak in this sprawling metropolis in southeastern China, residents near thoroughfares who leave their windows open overnight find their faces stiff with a dark layer of diesel soot.

After Mary Leung opens her tiny open-air shop along a major road soon after dawn, she must wipe the soot off her countertops and tables; the tiny yellow-and-olive bird that keeps her company is harder to clean.

Trucks are the mules of this country's spectacularly expanding economy — ubiquitous and essential, yet highly noxious.

Trucks here burn diesel fuel contaminated with more than 130 times the pollution-causing sulfur that the United

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States allows in most diesel. While car sales in China are now growing even faster than truck sales, trucks are by far the largest source of street-level pollution.

Tiny particles of sulfur-laden soot penetrate deep into residents' lungs, interfering with the absorption of oxygen. Nitrogen oxides from truck exhaust, which build all night because cities limit truck traffic by day, bind each morning with gasoline fumes from China's growing car fleet to form dense smog that inflames lungs and can cause severe coughing and asthma.

The 10 million trucks on Chinese roads, more than a quarter of all vehicles in this country, are a major reason that China accounts for half the world's annual increase in oil consumption. Sating their thirst helped push the price of oil to record levels this year, before a recent decline, and has propelled China past the United States as the world's largest emitter of global-warming gases.

Yet cleaning up truck pollution presents complex problems for China's leaders.

For instance, regulators have begun raising emissions standards for new trucks, but have left millions of older ones belching black smoke. Forcing businesses and farmers to buy more expensive vehicles could put a drag on the economy, which already faces inflationary pressure from rising food prices and other costs.

That fear of inflation — not to mention political and social unrest — has led Beijing to prevent the country's mostly state-owned oil companies from increasing diesel prices at the pump in pace with global oil prices. Raising fuel prices for farmers, whose incomes have lagged behind those of city dwellers and who need diesel for their tractors, is one concern. Restraining the cost of diesel also essentially subsidizes every manufacturer in China's elaborate export machine.

But price controls create a vicious circle. Oil giants like Sinopec, losing money on every gallon of diesel they refine because of the low sales cost, upgrade refineries slowly, if at all, and seek out cheap crude with high levels of sulfur to make diesel, negating the effects of higher emissions standards for new vehicles.

"Sinopec is trying our best to purchase low-quality crudes — much heavier and more sulfur content," said Evan Jia, a Sinopec spokesman. "We buy those kinds of crudes to lower the purchasing cost."

Low state-subsidized diesel prices frequently make trucks more cost-effective than trains, which pollute less. Nearly twice as many large freight trucks are being sold in China this year as in the United States. Demand for diesel at service stations is so great, and supplies are so tight, that rationing and shortages have become common. Truck drivers idle for hours only to be allowed to buy as little as 5 gallons, or less than 20 liters, of fuel.

China has stepped up rail services for hauling freight, but not fast enough to slow rapid growth in the truck fleet. Since 2000, sales of heavy-duty trucks have risen sixfold while car sales have risen eightfold.

This has created myriad problems, from gridlock that chokes China's cities to pollution that chokes its citizens, contributing each year to hundreds of thousands of premature

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deaths from heart and lung problems, according to the World Bank.

Ms. Leung, the shopkeeper, is a slender, tidy, 44-year-old woman with a cheery disposition. She used to keep her little bird in a wooden cage over the entrance to the two battered plastic tables where she serves soft drinks and fresh waffles for less than 40 cents each.

All day, trucks, buses and cars grind past. While large trucks are banned in Guangzhou from 7 a.m. to 9 p.m., some obtain special permits for daytime access. And many medium-size trucks with diesel engines are allowed in the city during the day if they carry local license plates.

"We had to put out bowls of water in the cage" so the bird could constantly wash itself, Ms. Leung said. She finally moved the bird, a Pekin robin, to her home on a quieter street, leaving the cage empty.

She tries not to think about what the exhaust is doing to her own health.

"My throat hurts all the time," she said. "I suck on throat lozenges for it. It's unbearable."

International experts say that hundreds of millions of Chinese are exposed every day to the potentially lethal mix of soot particles and smog.

California regulators have labeled diesel soot a carcinogen. A growing body of academic literature blames tiny airborne particles from diesel exhaust, coal-fired power plants and other sources for up to 90 percent of all deaths from outdoor air pollution, because the particles penetrate so deeply into lungs. The particles can float for hundreds of kilometers, but the greatest effects are on people near the source of the pollution.

Diesel engines also emit large quantities of nitrogen oxides, which react with gasoline fumes to produce photochemical smog when hit by sunlight.

Mainland Chinese atmospheric scientists concluded in an analysis this year in The Journal of Environmental Sciences that, here in Guangzhou, particles were the pollutant farthest out of line with air-quality norms 226 days a year. Sulfur dioxide, which comes mainly from burning coal, was the pollutant that exceeded norms by the widest margin 45 days a year, while nitrogen oxides were the most prominent pollutant 23 days a year.

The air was relatively clean on the remaining 71 days a year.

New tests by Chinese and American researchers in Tianjin in northeastern China found that diesel engines in trucks and buses accounted for 93 percent of all nitrogen oxides from vehicles in China and 97 percent of particles.

A separate academic study of diesel exhaust here in Guangzhou found that Chinese trucks put out particles in unusually large quantities and sizes, as engines with often inadequate or damaged emissions equipment were forced to pull overweight loads.

Ms. Leung said she had little choice but to stick it out.

She and her husband had a shop on a less-busy street, but the building was torn down and the local government gave her the current lease as a substitute. They are not allowed to sell the lease or apply for a different one, and the shop is their sole means of support for two daughters, the elder one the first in the family to go to college.

The only option, Ms. Leung said, is to hope her building will be condemned so the city

will issue her a lease in a more healthful location. "I'm dreaming of it," she said.

In the meantime, she keeps cleaning her tables and countertops below the empty bird cage. "I have to work in order to eat," she said.

In nearby Shenzhen, Chan Kin-fun also faces economic realities.

A salesman shows Mr. Chan, the operations manager of a Hong Kong trucking company, around the towering tractor cabs at a Sinotruk dealership. Even the most modern cabs have engines that emit at least three times the levels of nitrogen oxides of new American trucks and at least seven times the particles — even with clean, low-sulfur diesel.

Building a truck that meets top emissions standards is not just a question of spending a little extra on better pollution-control equipment. It usually requires radical engine redesigns, which can add thousands of dollars to a truck's price.

A truck meeting the European Union's existing Euro 4 pollution standard, which Beijing's municipal government will adopt in January, would have to be ordered specially from the factory, the salesman said. And it would cost $35,000, compared with $27,000 for a truck meeting the more lenient Euro 3 standard now in effect for Guangzhou and Shenzhen.

Trucks conforming to the Euro 2 standard, still legal to sell in much of China, would cost only $23,000, and a "special fee" of $950, the Sinotruk salesman said, to conceal the truck's origin in an area where only Euro 3 trucks are supposed to be sold.

But none of this helps Mr. Chan. Hong Kong already requires him to buy Euro 4 trucks, and this puts him at a disadvantage when competing with mainland trucking companies that use cheaper vehicles.

"I don't know how much longer I'll be able to stay in business," he said.

One reason China has severe air pollution is that officials have been slow to impose that extra cost. Trucks in the United States, which has by far the stiffest diesel emissions standards in the world, typically cost at least twice as much as a Euro 3 truck of similar power in China, partly because of higher labor costs, but also because their engines pollute less.

"Every time you increase the Euro standard, a lot of cost goes into it," said George Huo, the vice general manager of Beiqi Foton Motor Company, one of China's largest truck manufacturers.

The Chinese government has lagged about eight years behind the European Union in imposing new emissions standards. Only as air pollution has started to become a national issue is China beginning to accelerate the pace; Euro 4 standards will take effect nationwide in 2010, five years after they took effect in the European Union.

But the opportunities for further improvements in emissions per vehicle are limited by poor fuel quality.

The United States allows maximum sulfur concentrations of just 15 parts per million for most diesel fuels, while China allows up to 2,000 parts per million. The average sulfur in American gasoline is limited to 30 parts per million; China allows up to 800 parts per million.

Sulfur clogs emissions control equipment, and the more advanced the equipment, the more vulnerable it is to sulfur damage. And China lacks an effective inspection system to

enforce even the more lenient standards it sets.

The cleaner fuel available in cities like Guangzhou and Beijing helps limit car pollution. But truck drivers tend to fill up in rural areas with less expensive high-sulfur fuel.

Western oil companies pay extra to buy low-sulfur crude because removing sulfur through refining is difficult. But in a bid to control inflation, the Chinese government orders service stations to sell gasoline and diesel at prices so low they frequently fall below refiners' costs.

That gives refiners like Sinopec a strong incentive to buy the cheapest possible crude. Mr. Jia, the spokesman, said the company then refined the crude to meet China's standards. Low diesel prices also leave oil company refinery divisions with little money to invest in modernization.

The Chinese government raised regulated prices of gasoline and diesel by nearly 10 percent on Nov. 1, to the yuan equivalent of $2.65 a gallon. But that still roughly equals the wholesale price of diesel on international markets and is slightly higher than the wholesale price of gasoline, leaving nothing to cover the cost of distributing fuel to service stations, not to mention profit.

So refineries and service stations have been cutting back on sales, to the dismay of truckers.

After four years of coping with diesel shortages every few months, Zhang Yanchao, a 33-year-old trucker, thought he had become inured to lining up for fuel. But that was before he waited 10 hours on a recent night outside Guangzhou and was then allowed to buy just a quarter-tank of diesel.

"It's the worst I've ever seen," he said. "I couldn't get any sleep since I had to keep moving forward in the line of trucks all night long."

Two dozen truckers said in interviews here and in Shenzhen that fuel shortages had become chronic. The shortages also contribute to air pollution, with trucks idling for hours as they wait in line.

Rapid highway construction has reduced travel time in much of China. A half-dozen truckers who regularly drive from the Shandong Peninsula in the northeast to Guangzhou said that what had been a three-day trip five years ago took only two days last summer, thanks to the new expressways. But they said long waits for fuel had lengthened the trip to four days now.

The journeys are tough on drivers' health, as they breathe the exhaust of the trucks ahead of them.

"When a truck driver is not eating rice, he's eating diesel," said Mr. Zhang over a dinner of rice and vegetables at a grimy cafe here as his brakes were repaired.

Wearing blue jeans and a dark pullover and chain-smoking cigarettes, like many of the truck drivers here, Mr. Zhang was frank about both the problems truckers face and the problems their vehicles create.

Overweight trucks damage roads and emit extra pollution. But Mr. Zhang said he frequently exceeded weight limits on his blue five-month-old Chunlan truck.

"But of course I put more on it," he said. "Otherwise, how could I make a living?"

With his pay based on how much cargo he hauls, he estimated that he typically carries two to three times his truck's legal limit.

Time on the road is hard on relationships, too. Mr. Zhang has a wife and a year-old daughter. But he takes another woman with him on many of his trips as a second "wife," he said, insisting that his legal wife accepted the arrangement.

He acknowledged that the diesel exhaust was probably not good for him, and said many truck drivers developed coughs.

"Coughing comes with old age, but driving a truck makes it worse," he said. "But coughing can come from these cigarettes as well."

Oil industry experts suggest that China should raise diesel prices by at least 20 percent to eliminate subsidies and fuel lines and to foster refinery investment. Mr. Zhang, who pays the equivalent of $680 a month on his truck loan, vehemently opposes an increase in diesel prices; he is convinced that he would not be able to pass on the extra cost to the manufacturers who hire him.

"That would be too much for me," he said. "I would be put out of business. I might as well stay home."

One response to China's truck-pollution problem would be to ban older trucks. But the government has resisted such a radical step, fearing the costs not just to the economy, but to the truckers and to members of their extended families, who typically pool their savings to finance a truck.

Another obstacle to change may be the lack of public criticism of truck pollution. While environmental groups are rapidly multiplying in China, vehicle pollution has attracted little attention — and much resignation among truckers and residents alike.

Mr. Zhang typified that reaction when he said, surveying the dingy truck stop, "If you don't like pollution, go live in the mountains."

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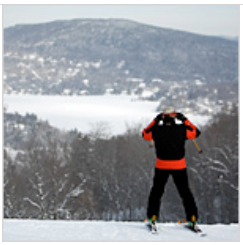

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