Pollution and Politics in the People's Republic of China: Big Oil, Big Auto, and the Battle for Beijing's Blue Skies

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10/18/13
It’s bad

http://www.theatlantic.com/infocus/2013/01/chinas-toxic-sky/100449/
http://www.foggybeijing.com/data/monthly/beijing
http://www.mep.gov.cn/gkml/hbb/bgg/201203/t20120302_224145.htm
http://epa.gov/air/criteria.html
It’s bad

http://www.china.org.cn/environment/2013-03/18/content_28277548.htm
Air Pollution Linked to 1.2 Million Premature Deaths in China

By EDWARD WONG

BEIJING — Outdoor air pollution contributed to 1.2 million premature deaths in China in 2010, nearly 40 percent of the global total, according to a new summary of data from a scientific study on leading causes of death worldwide.

Figured another way, the researchers said, China’s toll from pollution was the loss of 25 million healthy years of life from the population.
Where does it come from?

- power plants
- motor vehicles
- factories

http://www.theatlantic.com/infocus/2013/01/chinas-toxic-sky/100449/
Ok, can you be more specific?

But: There are lots of caveats to these data.
Are we trending in the right direction?

Answer: *Probably*. But air pollution levels are currently way too high, and progress is slow. Clearly much more must be done.

Source: BJEPB environmental annual reports, e.g. http://www bjepb.gov.cn/portal0/tab189/info10303.htm
Why are you so optimistic?

• *If you’re working on China’s environment and you are not an optimist, then you are in the wrong business.*

• Although it may not seem that way, China has made enormous progress in recent years:
  – Amazing growth in media/public awareness and participation
  – Big progress in monitoring and data transparency/quality
  – Strong recognition by the Chinese government of the challenges and willingness to accept international assistance
  – We have crossed a “tipping point”?

• We know how to solve this problem:
  – Regulatory and technology solutions that force deep emissions reductions from all sources
    • Sound too obvious or too easy? Let’s get more nuanced…
Deep Dive!
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Controlling the energy and environmental impacts of these hundreds of millions of motor vehicles is a key long-term challenge for China.
How to control motor vehicle emissions?

- Emissions = # of vehicles × VKT (km/year) × EF (g/km)
- # of vehicles and VKT are controlled through urban planning and/or TDM

**Confession**: the EF term is really all I work on (but this doesn’t mean the other two aren’t just as important…)

- Reducing fleet emission factors:
  - Technology-neutral (but technology-forcing…) emissions standards for new vehicles
  - “Systems approach” of controlling vehicles and fuels together
  - Compliance and enforcement
  - In-use vehicle emissions management

- Good news: Chinese regulators understand this and are making impressive progress in all areas
How to control motor vehicle emissions?

- Progressively stringent tailpipe emission standards are extremely effective at reducing emissions to near-zero levels.
Diesels are a key problem

Diesel trucks are just 5% of China's vehicle fleet but they emit 61% of all vehicular particulate matter.

Consistent progress by MEP, but challenges

- China’s Ministry of Environmental Protection has authority and responsibility to control pollutant emissions from motor vehicles.
- From 2000-2010, MEP made relatively consistent progress, implementing a new tailpipe emission standard every 3-4 years.
- As vehicle emission control technology gets more complex, however, vehicles require higher quality fuel to function properly (“catalyst poisoning”).
- In particular, there is a bottleneck at the “China IV” diesel truck emission standard; vehicles meeting this standard require a certain minimum fuel quality (sulfur content).
- But MEP does not have regulatory authority to set fuel quality standards.
- The “China IV” diesel truck standard, which would cut new vehicle PM emissions by 80% and NOx emissions by 30%, was delayed twice by MEP for a total of 2.5 years due to lack of adequate quality fuel. The standard finally went into effect on July 1, 2013 (even though diesel S level is still 350…)
- The political “battle” is over the vehicle/fuel mismatch, and how and when China will supply high quality diesel fuel to enable stringent control technologies for diesel vehicles.
Chinese gov’t structure – big picture

**National People’s Congress (NPC)**
- Highest legislative body; meets two weeks per year to approve legislation

**State Council**
- Highest executive body; chaired by Premier Li Keqiang

**27 Ministries and Commissions**
- (NDRC, MEP, MIIT, MOT, etc.)
- Includes some important functions not under authority of Ministries and Commissions (such as issuing standards), as well as influential research groups

**Organizations and Institutions Directly Under the State Council**
- Includes some important functions not under authority of Ministries and Commissions (such as issuing standards), as well as influential research groups

**State-Owned Enterprises (SOEs)**
- (Sinopec, PetroChina)
  - Institutionally administered by State-Owned Assets Supervision and Administration Commission (SASAC)

**Provincial Governments**
- Underneath provincial governments is parallel executive structure (provincial-level ministries and commissions, etc.)

**Municipal Governments**

**Chinese People’s Political Consultative Conference (CPPCC)**
- Legislative advisory body

Provincial and municipal government bodies take direction and work priorities from the corresponding national Ministry
Case study: influencing fuel quality
Airpocalypse!

Public debate swirls over China's fuel quality

Repeated bouts of smog this winter in China's central and eastern parts have given rise to public outcry over oil quality, which contributes to air pollution. Fu Chengyu, board chairman of Sinopec, said Thursday that oil refining companies were one of those directly responsible for the smog.

Politics of pollution: China's oil giants take a choke-hold on power

By Sui-Lee Wee and Hui Li

BEIJING (Reuters) - The search for culprits behind the rancid haze enveloping China's capital has turned a spotlight on the country's two largest oil companies and their resistance to tougher fuel standards.

Bureaucratic fighting between the environment ministry on the one hand and China National Petroleum Corp (CNPC) and Sinopec Group on the other has thwarted stricter emission standards for diesel trucks and buses -- a main cause of air pollution blanketing dozens of China's cities.
The State Council’s infrequent directives and pronouncements carry enormous weight.

In cases of inter-ministry fighting— or massive public or international pressure— State Council may step in to make a decision.

February, 2013: **Decision on Accelerating Fuel Quality Improvement** establishes nationwide timeline for reduce gasoline and diesel fuel sulfur levels to 10 ppm.

Just 7 sentences resolves years of conflict and uncertainty.
So are we done?

• Far from it.
  • The State Council ultra low sulfur fuel timeline announcement is huge, but it
    doesn’t take effect until the end of 2017, and it’s only 7 sentences – there are
    a LOT of details to work out.
  • New Chinese vehicles are at Euro 4/IV-equivalent levels, but China-specific
    modeling and international experience suggest that Euro 6/VI levels or
    beyond are required for long-term control.

• And don’t forget about:
  – Compliance and Enforcement
  – In-use (legacy) vehicle emission control

• This presentation has focused on the impacts of vehicles on air pollution. But
  don’t forget about these either:
  – Fuel consumption / GHG emissions (another whole presentation…)
  – Congestion

• China may have 1 billion vehicles by mid-century…
Lessons learned

• Bottom up, “working level” technical and regulatory development is a critical prerequisite to progress, but sometimes crossing the finish line requires top down attention.
• Media is increasing in influence in China.
• Understanding all the actors – and their motivations – is vital for making progress, especially on issues that cut across multiple government and SOE institutional authority.
• Politics is as important as technology potential.
• “Airpocalypses” can have silver linings.
• Sometimes optimism is justified.