From presentation discussions – Thursday, April 29, 2010

Why do environmental groups oppose mercury cap and trade schemes?

Do particles cool or warm the climate?

Haze and fires

Sulfur scrubbers

EPA's Mercury Rule: Bad Use of Cap-and-Trade

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A federal appeals court decided last week that a U.S. Environmental Protection Agency (EPA) rule exempting coal- and oil-fired power plants from cutting toxic mercury pollution violates the Clean Air Act and is unlawful. The court rebuked EPA for attempting to create an illegal loophole for the power generating industry rather than applying the toughest emission standards of the Clean Air Act (see full text of decision [PDF]).

The ruling invalidates the agency's so-called "Clean Air Mercury Rule," which allowed power plants that fail to meet emission targets to buy credits from plants that exceeded targets, rather than installing mercury emissions controls of their own. In other words, the EPA wanted to use a cap-and-trade system with mercury – a highly toxic substance.

Fourteen states, dozens of Native American tribes, public health and environmental groups (including Environmental Defense), and organizations representing registered nurses and physicians challenged the EPA's mercury rules. Are you surprised that Environmental Defense opposed a cap-and-trade system? It's because mercury is a toxin, and cap-and-trade doesn't work with toxins.

A cap-and-trade system is the best way to limit sulfur dioxide (acid rain) and greenhouse gases because they're ubiquitous and their negative impact is more global than local. With toxins like mercury, there can be hotspots of pollution, such as a particular lake or stream. The only way to handle a toxin is with an absolute cap – no trading. The power industry has had the technology for years now to dramatically reduce toxic mercury pollution, and it's way past time to put it to work.

Mercury is mostly emitted as air pollution that ends up in waterways and accumulates in fish. When people eat the fish, they ingest the mercury which can then cause nerve and brain damage, especially in young children and developing fetuses. EPA is well aware of how toxic mercury is. They have a whole Web site devoted to it.

- Approximately 1,100 coal-fired units at more than 450 existing power plants spew 48 tons of mercury into the air each year. Yet only 1/70th of a teaspoon of mercury is needed to contaminate a 25-acre lake to the point where fish are unsafe to eat. Over 40 states have warned their citizens to avoid consuming various fish species due to mercury contamination, with over half of those mercury advisories applying to all bodies of water in the state. Power plants also emit tens of thousands of tons of other air toxics, including hydrogen chloride, arsenic and lead.

- The EPA mercury rules generated controversy from the moment they were proposed in 2004. Key language was drafted by power industry attorneys who were employed by the same law firm from which EPA's political management hailed. EPA's internal auditor in the Office of Inspector General discovered that EPA senior political management had ordered staff to work backwards from a predetermined political outcome "instead of basing the standard on an unbiased determination of what the top performing [power plant] units were achieving in practice."

- We filed suit against the EPA mercury rules in 2005, and it took two years for the courts to strike it down – two years during which energy companies have continued to poison the planet with mercury.

- "The Bush administration cannot ignore its responsibilities to bring power plants' mercury pollution under control," said Earthjustice attorney James Pew, who represented Environmental Defense, the Sierra Club, and the National Wildlife Federation in the lawsuit. "We hope the administration will gain some new respect for the law in its last year and start working to protect Americans from pollution and stop working to shield polluters from their lawful cleanup obligations."

http://www.sciencedaily.com/releases/2009/06/090619125905.htm

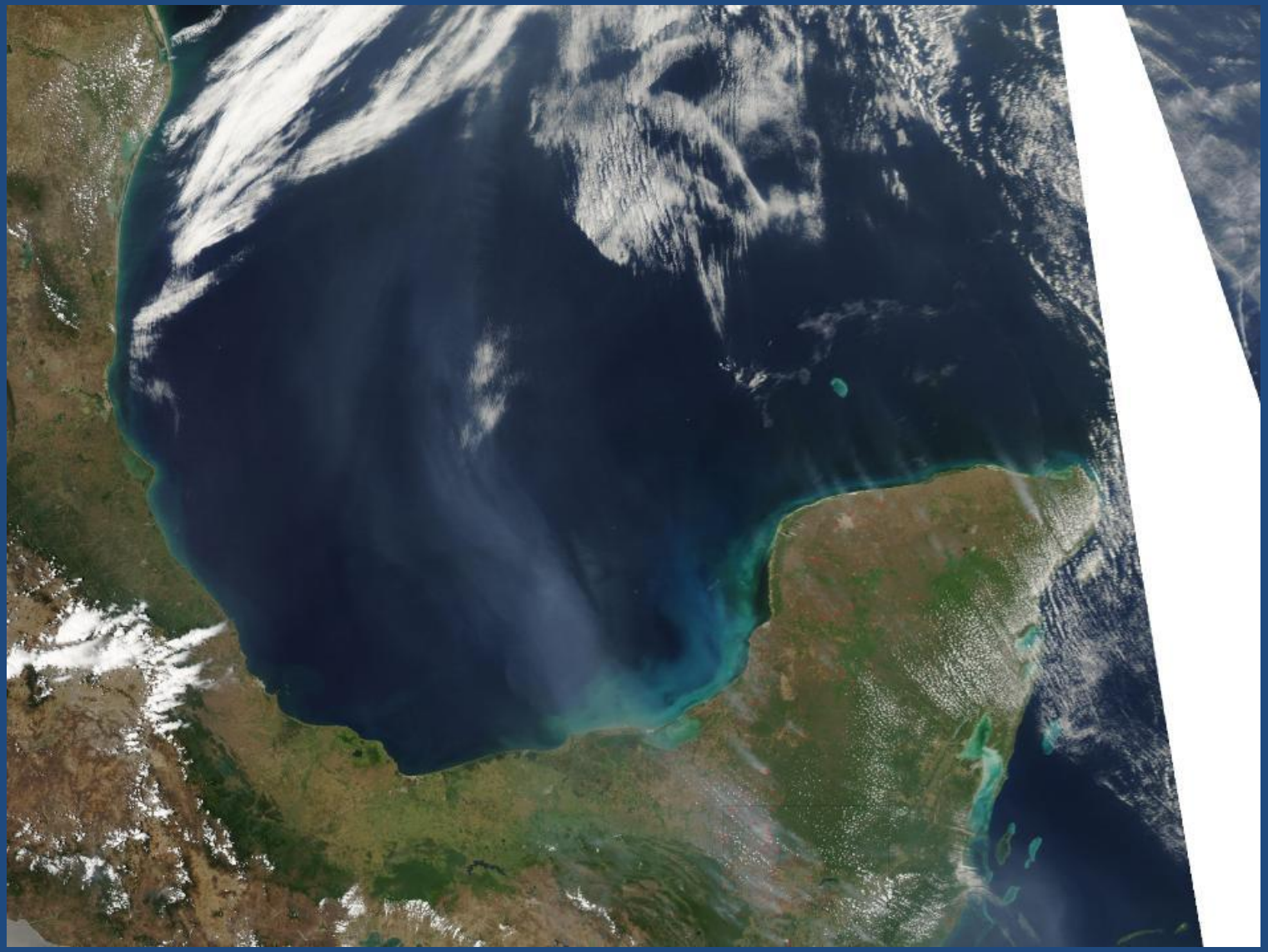
Some Particles Cool Climate, Others Add To Global Warming

ScienceDaily (July 9, 2009) — There is large scientific agreement that human made emissions of CO_2 and other gasses *[sic]* give global warming. But human activity doesn't just cause gas emissions. Burning of fossil fuels and biomass also causes emissions of the particle black carbon. Other kinds of particles are formed in the atmosphere as a cause of human made emissions.

Particles, also named aerosols *[sic]*, are today one of the main reasons for the uncertainty about how humans affect the global climate. Aerosols like sulfur, nitrate, and organic carbon are formed in the atmosphere and cause global cooling. Thereby they contribute to mask parts of the human induced global warming. On the other hand, black carbon absorbs radiation and thereby has a warming effect on the earth's climate

Note – it's "Gases" and aerosols are mixtures of particles and gases, not just particles!

Of course, a lot of haze is just pollution from photochemical smog, but here is an example of what I was talking about in class today. Note the plume of smoke and the individual fires.



From Wikipedia:

The capital, operating and maintenance costs per short ton of SO_2 removed (in 2001 US dollars) are:

For wet scrubbers larger than 400 MW, the cost is $200 to $500 per ton

For wet scrubbers smaller than 400 MW, the cost is $500 to $5,000 per ton
For spray dry scrubbers larger than 200 MW, the cost is $150 to $300 per ton

For spray dry scrubbers smaller than 200 MW, the cost is $500 to $4,000 per ton

Isn't clear who makes the money for scubbers – apparently Japan installed them before we ever did.