

3 Questions: Noelle Selin on curbing mercury

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Noelle Selin, an assistant professor of engineering systems in MIT's Engineering Systems Division. Photo: Patrick Gillooly

The first United Nations negotiating session for a global, legally binding mercury treaty begins today in Stockholm. Continuing through Friday, this is the first of five planned negotiating sessions that will address global controls on mercury, a toxin that causes neurological damage and impairs brain development in infants and children around the world.

The sessions are expected to result in a global treaty to be signed in late 2013 that will address the emissions and use of [mercury](#) in products, wastes and international trade. Noelle Selin, an assistant professor of engineering systems in MIT's Engineering Systems Division, with a joint appointment in [atmospheric chemistry](#) in the Department of Earth, Atmospheric and Planetary Sciences, studies the interactions between science and policy in international environmental negotiations. She sat down with MIT News to discuss the first negotiating session, and what

she considers to be the biggest hurdles to signing a global treaty, which is “not a given” for the U.S.

Q. What do you see as the biggest challenge in the effort to reduce [mercury emissions](#) worldwide?

A. I see two major intersecting challenges: addressing the global spread of mercury emissions from coal-fired power plants in the context of the increasing demand for energy, and dealing with local impacts of mercury contamination.

The single largest source of anthropogenic mercury emissions is power generation, particularly from coal-fired power plants. A growing, worldwide demand for energy is increasing the use of coal, and this trend will lead to more mercury emissions if not controlled. About half of current anthropogenic emissions come from Asia, mostly from China, which is dramatically increasing its use of coal. Much of the coal used in China is also relatively high in mercury content. Recent research shows that future emissions of mercury to the atmosphere significantly depend most on how energy-based industrial development proceeds in Asia.

Dealing simultaneously with both local issues and long-range transport of mercury will also be a critical challenge for an international agreement. Mercury emitted in elemental form travels worldwide. At the same time, some other forms of emitted mercury deposit close to emission sources. Local impact also comes from the use of mercury in processes and products. Mercury is used extensively in artisanal gold mining in developing countries where workers and local communities are exposed to some of the highest levels of [mercury contamination](#) in the world. Mercury also continues to be used in products, such as thermometers, thermostats, fluorescent light bulbs and a wide range of electronic equipment, including computer monitors and cell phones. Disposal of these products, particularly electronic waste (e-waste) in developing

countries, can expose local populations to mercury.

Q. Even if an international treaty is passed, how will it be implemented or enforced?

A. In general, implementation and enforcement of international environmental agreements are difficult. Some countries simply do not have the intention or political will to meet their obligations. Furthermore, many developing countries lack the financial resources and technical capacity to effectively implement international environmental regulations. For this reason, some environmental agreements include mechanisms for capacity building, as well as the provision of financial assistance. However, this is often one of the most contentious topics of negotiation, and the availability of necessary resources for implementation are often limited as many developing countries argue that industrialized countries do not provide enough support for capacity building.

Another implementation challenge will be coordinating an international mercury treaty with other environmental agreements that already partly cover mercury and other hazardous substances. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal controls the international trade and management of hazardous waste including waste containing mercury. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade sets out provisions for the import and export of hazardous chemicals, including mercury. Coordination with these two agreements will be important in addressing the entire life cycle of mercury, including mining and production, use, emission, disposal and cleanup.

Q. How would an international treaty affect developed countries like the U.S. that already regulate mercury emissions? How do current laws in

the U.S. regarding mercury emissions and use compare to other industrialized nations?

A. The U.S. regulates mercury emissions from municipal-waste combustion and medical-waste incineration, but does not currently regulate mercury emissions from coal-fired power plants, which are the largest domestic mercury emission source. This is an area where U.S. regulations should be strengthened; the EPA is currently developing power-plant emissions standards for mercury.

European countries also have stronger regulations than the U.S. on mercury in many products, including a large number of common electronic goods. Sweden, for example, has banned mercury in almost all products, but there are some exceptions, including the use of mercury in compact fluorescent light bulbs. In the U.S., many efforts to phase out mercury in products are voluntary, although some states have more stringent regulations. In fact, California has largely copied European Union regulation on mercury and other hazardous substances in electronics, going beyond federal requirements.

For the U.S., any treaty ratification requires the advice and consent of the Senate, and must be approved by two-thirds of all senators. Over the past few decades, this has been an obstacle for U.S. participation in many multilateral environmental agreements. As a result, the U.S. has not ratified several important environmental treaties, including the Basel and Rotterdam conventions. Domestic politics is likely to be a continuing challenge for U.S. implementation of environmental regulations and international cooperation on mercury, and it is not a given that the U.S. would become a party to a mercury treaty.

Provided by Massachusetts Institute of Technology

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