

**Q: How can cost-effective economic policy and mitigation measures affect SLCPs and other air pollutants?**

**A:** A well-designed regulation will see benefits to society that exceed the economic costs associated with compliance. Further, in some cases, environmental regulations not only provide net benefits, but also reduce direct costs to consumers. For example, in the far north of Canada, wood stoves are common for space heating, although most homes still have a secondary heating device using diesel, gas, or diesel powered electricity. Both traditional wood fires, as well as incomplete diesel combustion, emit black carbon, with particular consequences for climate warming in the north. In Canada, electricity and home heating costs are significantly higher in the north compared to southern Canada since all fuel must be imported over long distances, usually by marine tanker.

The Canadian National Energy Board estimates that electricity costs in some communities are over 10 times higher than the Canadian average on a per kilowatt-hour basis; and due to the climate, per capita energy use is almost twice the Canadian average<sup>1</sup>. Thus any policy that results in better building efficiency (in terms of lowering the required fuel for heating) would have the double benefit of lowering SLCPs as well as lowering energy costs for local residents. In many cases, future energy savings would more than offset the initial investments required, over relatively short time horizons.

Taking a specific existing regulatory example, the Canadian 2011 *Off-road Compression-Ignition Engine Emission Regulations* for diesel engines (e.g. tractors, excavators, log skidders and bulldozers) reduce emissions of fine particulate matter (PM<sub>2.5</sub>) of which black carbon is a component. Under these regulations, it is estimated that the present value of all costs is \$88.7 million, including about \$84.3 million to importers of off-road diesel machines and about \$4.4 million to government. The *Regulatory Impact Assessment Statement* (RIAS), or cost-benefit analysis, found that the benefit of the new regulation simply in terms of monetized health benefits and environment benefits (not including climate change benefits), were 1.2 to 2.5 times greater than the costs of the regulation<sup>2</sup>. The benefits of the amended regulation were therefore estimated to exceed the costs over a broad range of scenarios. Similarly, a 2011 analysis by the US Environmental Protection Agency indicates that the 2010 benefits of the Clean Air Act Amendments of 1990 have exceeded costs by roughly a factor of 25, with these benefits resulting primarily from health benefits of PM<sub>2.5</sub> reductions.

In another specific existing example, reducing toxic air pollutants and short lived climate pollutants, can have significant health benefits related to avoiding respiratory and cardiovascular illnesses associated with air pollutants, with

---

<sup>1</sup> [National Energy Board](#).

<sup>2</sup> Canadian Environmental Protection Act, [Regulations Amending the Off-Road Compression-Ignition Engine Emission Regulations](#).

quantifiable associated economic benefits, such as avoided health-care costs. Thailand's complete phase-out of leaded gasoline in 1996 is a case in point. A recent study found that since the early 1990s, there has been a statistically significant decrease in blood lead levels in school children and traffic police, two groups that face the highest risk of lead exposure. It has been reported that blood lead levels in both groups decreased dramatically since 1998. The study also calculated the monetary value of health benefits is 7,000 million Baht (around 213.3 million U.S. dollars) while costs of phasing lead out of gasoline is 200 million Baht (around 6.1 million U.S. dollars)<sup>3</sup>. Thus, the leaded gasoline phase out policy yielded health benefits to the population in Thailand, and the benefits far outweigh the costs of compliance.

As shown in the 2011 UNEP report *Near-term Climate Protection and Clean Air Benefits: Actions for Controlling Short-Lived Climate Forcers*, many of the measures to reduce SLCP emissions have low or even negative costs, making them particularly likely to provide societal benefits that exceed the costs of implementation.

---

<sup>3</sup> Pollution Control Department (PCD) of Thailand, *Unleaded Gasoline Policy: Health Benefits for School Children and Traffic Policemen in Bangkok Metropolitan Administration*, February 2002.