Methane, Black Carbon, Ozone and Technology Forcing: Synergistic Strategies for Clean Air and Climate

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Summary of Key Points

1. *Need for Increased Policy Focus on Methane, Black Carbon and Ozone*

   - Methane, black carbon and ozone are all significant contributors to global warming – by some analyses they have a greater combined impact, than all CO2 emitted to date.
   - In addition to their effect on global average temperature, emissions of these climate forcing agents also have nontrivial regional climate impacts. These include the potential role of black carbon deposition in darkening Arctic ice, resulting in earlier melting and thus extending the melt season, and the effect of black carbon aerosols on precipitation.
   - These agents also have significant human health and other non-climate environment effects. Preliminary analysis commissioned by CATF from the Geophysical Fluid Dynamics Laboratory suggests that methane's contribution to global background levels of tropospheric ozone is responsible for tens of thousands of premature deaths annually. Black carbon emissions from diesel engines, cook stoves, and industrial boilers also constitute a subset of the world's particulate matter inventory.
   - The advantage of dealing with these non-CO2 pollutants is that, unlike CO2, they have a relatively short life in the atmosphere; therefore reductions made today will have a cooling effect within weeks to a decade, not centuries from now.
   - These pollutants are also, unlike CO2, typically amenable to lower cost end-of-pipe or equipment fixes; diesel particulate filters, coal mine methane removal, and lower emission cook stoves, for example, are well understood and readily deployable technologies.

2. *What Would a Sensible Policy Approach Look Like?*

   - Methane policy could be developed through state and multilateral commitments to directly regulate methane sources such as coal mines and agricultural operations. These regulations could be supplemented with a global "buy down" fund especially for non-OECD sources.
   - Black carbon policy could also focus on direct state and multilateral regulation of key black carbon sources such as legacy diesel engines,

residential cook stoves, some targeted industrial boilers and, perhaps, agricultural burning.

- In view of concerns over the Arctic ice melt "tipping point," accelerated research efforts would target and, where necessary, better identify black carbon sources that reach Arctic atmosphere and surfaces. In parallel, multilateral commitments for rapid reductions would be made by countries whose emissions are found to affect the Arctic .

3. *The Continued Importance of Technology Forcing to Spur Low Emission Technology for Climate and Clean Air*

Related to, but separate from, the points above, the focus on a CO2 cap and trade policy should not mean the abandonment of direct technology-forcing source regulation. Carbon market price signals are unlikely to achieve the size and stability in the next decade necessary to spur serious "step change" technology that will be necessary to achieve 50+% carbon reductions in this century. Moreover, as the trading system is designed to do, and as experience with the US sulfur dioxide trading system demonstrates, investments under a CO2 cap and trade scheme will tend to migrate to lowest-cost solutions (such as inexpensive global offsets targeting low tech solutions) rather than local technological innovation.

Examples of continued productive technology forcing policy include:

- British Columbia/EC proposal to mandate carbon capture and storage for all new coal plants by 2015-2020.
- Recent Australia proposal to ban sale of incandescent light bulbs.
- EU and US state CO2 car tailpipe requirements.
- US proposals to require coal gasification as BACT (for clean air as well as climate).