

Some Reflections Moving From Science to Mitigation

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LLGHG and SLCF are Different Problems

- Climate change has been framed, by the science and policy communities, as a long term problem (e.g. 100 yr GWP, stabilization scenarios).
 - SLCFs were first highlighted as a way to “buy time” to deal with this long term problem.
- Near term climate change (the rate of change and the path that we follow) has important impacts that are not captured by this long term framing.
- Both LLGHG and SLCF require urgent attention.
- We need to separate the issues, create new metrics, and new ways of discussing the various dimensions of climate change.
- *We don't have a single metric (objective) for dealing with air pollution, water pollution, or even risks of toxic chemicals. Why should we for climate change?*

Air Quality Policy Decisions have Important Implications for SLCF

- Air quality policies will have both positive and negative effects on SLCF.
- It is important to understand the multiple benefits and tradeoffs of emission control policies as we seek to achieve multiple public policy goals.
 - Adding SLCF considerations may change the decision framework and the benefits of action
- There are compelling health (and ecosystem) reasons to decrease emissions that contribute to SLCF.

It's the Mix, Stupid

- Mitigation measures change the mix of emissions of multiple pollutants simultaneously, with synergistic impacts on SLCF.
- The impacts of these changes must be considered together, on a measure by measure basis, as opposed to a pollutant by pollutant basis.
 - Sector by sector may be an adequate approximation, depending on the measure (or technology).

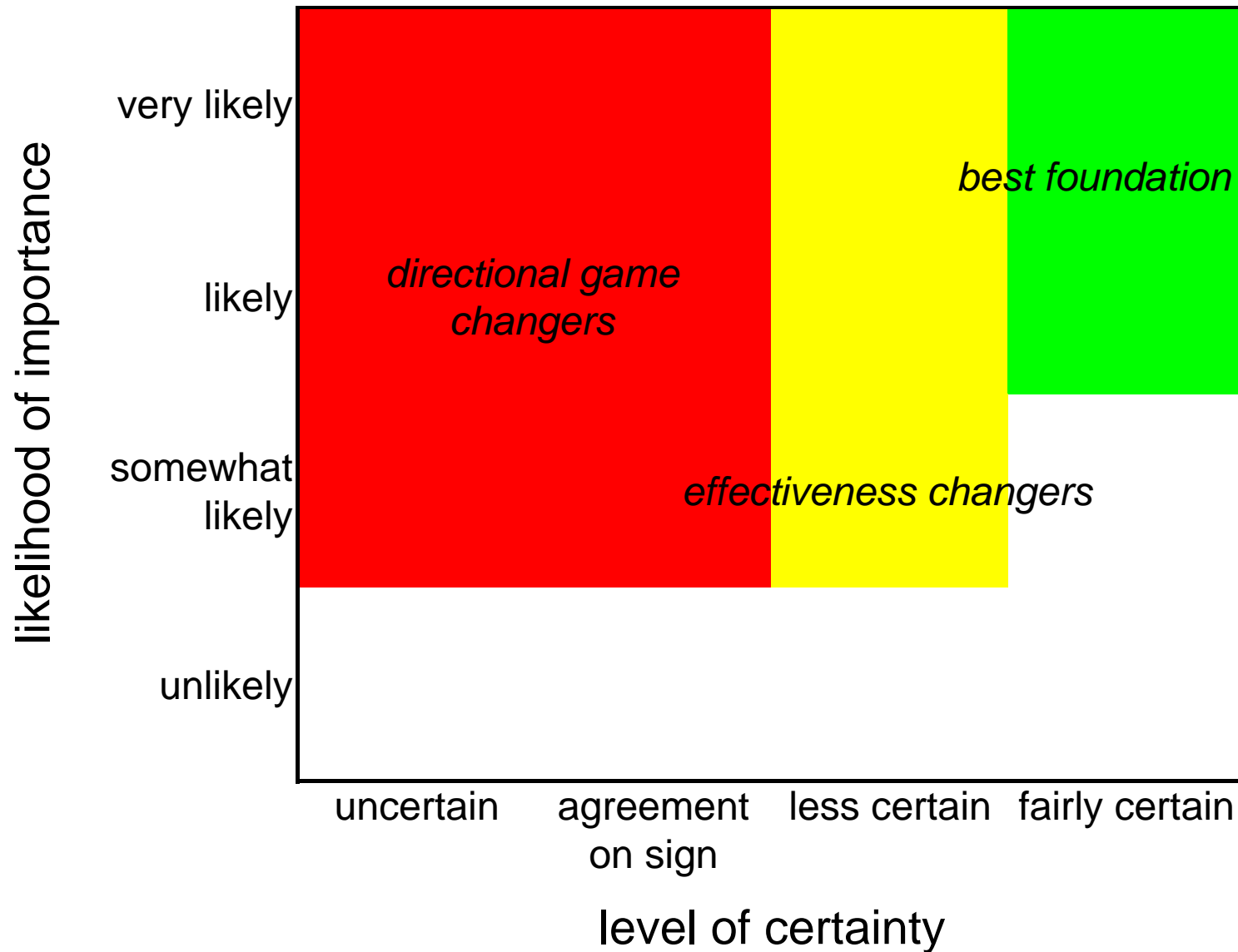
Location Matters

- Emissions of BC (and O₃ precursors) are not all equal.
- Sources, emissions, mitigation options available, and the health and climate impacts of the mitigation options all vary by location (and timing).
- Our further discussions today should address how mitigation opportunities, their potential impacts, and the key uncertainties vary by region of the world (region of U.S.?).

Uncertainties Remain Significant

- Key questions
 - Can we point policies in the right direction?
 - Can we predict the effectiveness of policies?
- Need to put bounds on the uncertainties where ever we can.

Pinder Diagram: Characterizing Uncertainty



Uncertainties Remain Significant

- Directional Game Changers:
 - Aerosol Indirect Effect: Need size-resolved particle number distribution for emissions, into models, and compared to observations.
 - Brown Carbon: Need more characterization of sources, ambient observations, and model chemistry improvements
- Best Foundation:
 - More confident of ozone precursor impacts on SLCF than for BC impacts.
 - The greater the BC fraction of PM, the more likely it is that emission mitigation will have a cooling influence.
- Likely to be able to point in right direction, relative effectiveness of policies is less certain.

Revisiting the Workshop Objective

- Help inform EPA's work
 - BC Report to Congress
 - Climate Policy Development
 - O3 and PM NAAQS Policy Development
 - Intramural and Extramural Research
- Help inform and coordinate other efforts
 - UNEP BC and O3
 - AC&C Bounding BC Analysis
 - LRTAP: TF HTAP, Expert Group on BC, Protocol Revisions
 - Arctic Council: TF SLCF, AMAP Expert Group on Climate, Mitigation Fund

BC Report to Congress Structure

- BC Definition and Measurement Techniques
- Inventory of BC Sources and Emissions
 - Global
 - Domestic
- Impacts of BC on Climate
 - Global
 - Regional (U.S.)
 - Arctic
- Metrics & Approaches for Quantifying BC Effects & Comparing to LLGHGs
- Cost-Effective BC Mitigation Approaches
 - Mobile
 - Stationary Sources
 - Residential Heating/Cooking
 - Biomass Burning
 - Analytic Synthesis
- Impact of Mitigation Options
 - Climate
 - Public Health & Environment

How can EPA facilitate the Community's progress?

- Resources
- Provision of Data
- Development of Standards/Conventions
- Mechanisms for Communication/Collaboration
 - Periodic Workshops
 - Shared Data Repositories
 - Wiki for Emissions Data, Model Metadata, Observations, Cataloging ongoing research, New Publications/Analyses?
 - Listserves, Newsletters