

Global Atmospheric Pollution Forum



Progress in Developing a Framework for Integrated Co-benefits Strategies in the Global Atmospheric Pollution Forum

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Seminar on a Co-Benefits Approach: Emerging Trends and Needs

Bangkok, March 2010

Introducing the Forum

Global Atmospheric Pollution Forum: Partnership of international organizations and regional air pollution networks

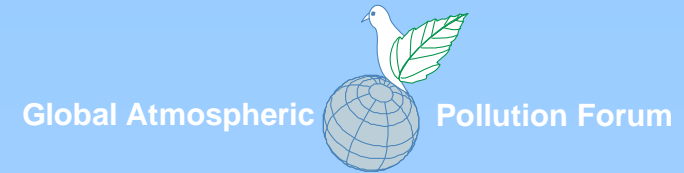
- United Nations Environment Programme (UNEP)
- UNEP-RRC-AP representing EANET and Malé Declaration
- UN Economic Commission for Europe, Convention on (UNECE) Long-range Transboundary Air Pollution (LRTAP)
- Air Pollution Information Network for Africa (APINA)
- Inter-American Network for Atmospheric and Biospheric Studies (IANABIS)
- Clean Air Initiative (CAI) – Asian Cities; Latin America
- Sahara and Sahel Observatory (OSS)
- Institute for Global Environmental Strategies (IGES)
- International Union of Air Pollution Prevention Associations (IUAPPA)
- Stockholm Environment Institute (SEI)

Global Forum Stockholm Conference

‘Air Pollution and Climate Change: Developing a Framework for Integrated Co-benefits Strategies’



Global Forum Stockholm Conference



Major Conclusions:

- i. Integrated air pollution - climate strategies can substantially reduce costs of delivering air pollution and climate objectives**
- ii. Failure to integrate strategies can lead to major policy conflicts and failures**
- iii. Focussing on early reduction of black carbon, ozone and methane can deliver relatively rapid climate benefits**
- iv. Policy focus in UN ECE Countries mainly climate change; in many Asian countries, current priority is poverty eradication and sustained economic development**
- v. Integrated strategies have potential for introduction relatively easily in countries just embarking on air quality management**

Key messages from the Conference

- Increasing recognition of the depth of the interactions
- Ideas about co-benefits not new, but still not implemented
- Focus on interactions between air pollutant impacts and radiative forcing
 - SO₄ will go down – warming will be realised;
 - Focus on Black Carbon, Ground-level Ozone and Methane
- Science and policy related to air pollution and climate change still largely separated



Effects of emission control measures on emissions (Amman, 2009)

	Reduced emissions	Increased emissions
Structural Measures		
Energy savings, efficiency improvements, banning of activities	All pollutants	
Increased use of natural gas	CO ₂ , SO ₂ , VOC, NO ₂ , PM	CH ₄
Biomass	CO ₂	VOC, PM, CH ₄ , N ₂ O
Stationary Sources		
Fluidised bed combustion	SO ₂ , NO _x	N ₂ O
Combined heat and power	All pollutants	
Selective and non-selective catalytic reduction	NO _x , CO	NH ₃ , N ₂ O
Mobile Sources		
EURO Emission standards	NO _x , VOC, PM, CO	NH ₃ , N ₂ O

Disproportionate Emphasis of Climate Change Co-benefits on Criteria Pollutants to Date

Odd, since “other desired outcomes” include:

- More & better jobs
- Better health
- Greater security
- Higher reliability
- Lower risks
- More water availability
- Better water quality
- Habitat protection
- Better crop / forest growth
- Greater mobility
- Greater sense of community
- Better balance of payments
- Less costly infrastructure
- Higher quality of life
- Favorable feedback loops
- Etc., etc.

... and less adaptation!



Focus on Major Short-term Forcing Agents

Positive (warming)

Black Carbon (BC)

Tropospheric Ozone (O₃)

Methane (CH₄)

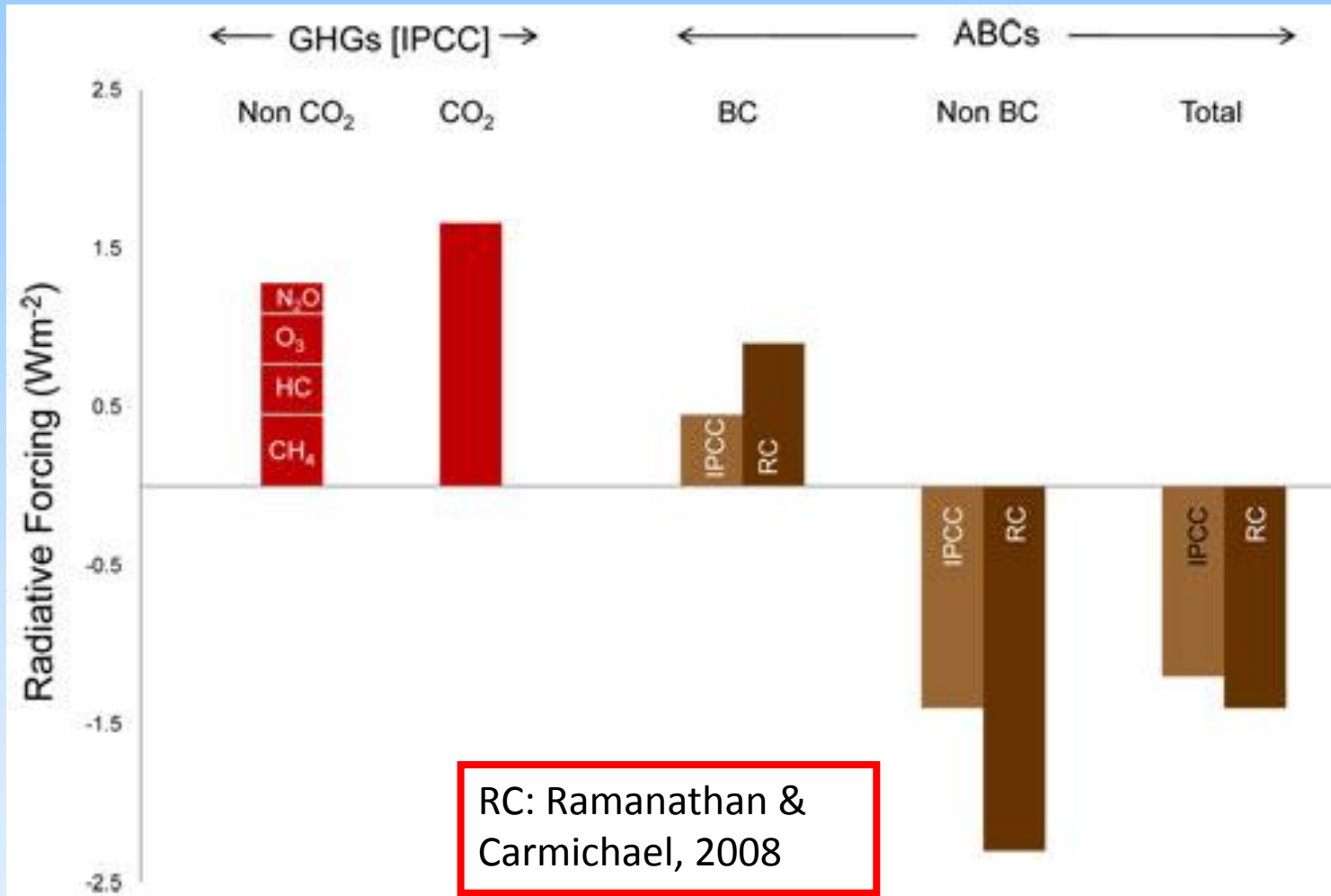
Negative (cooling)

Sulphate (SO₄²⁻)

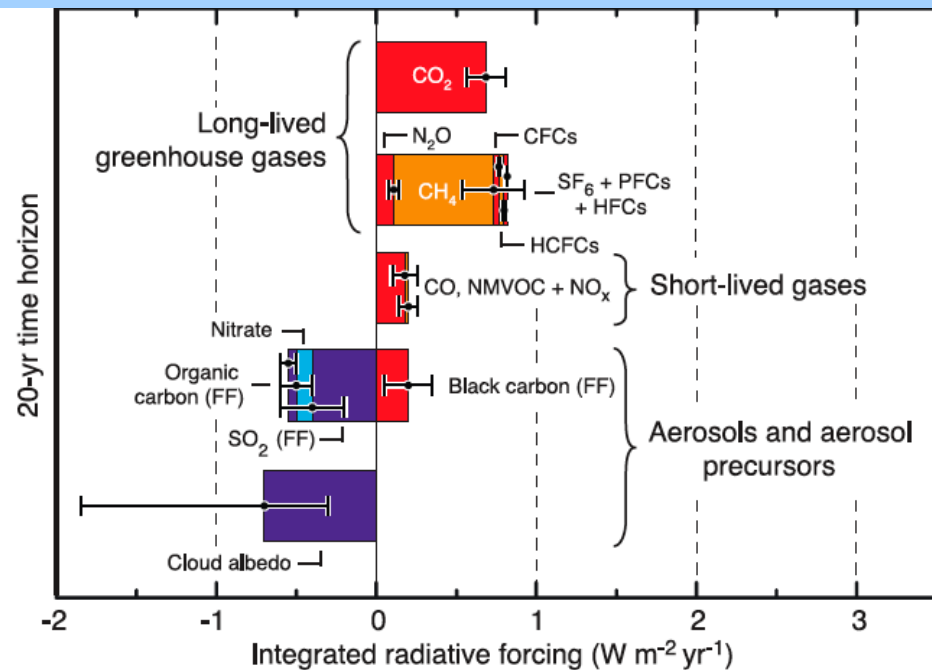
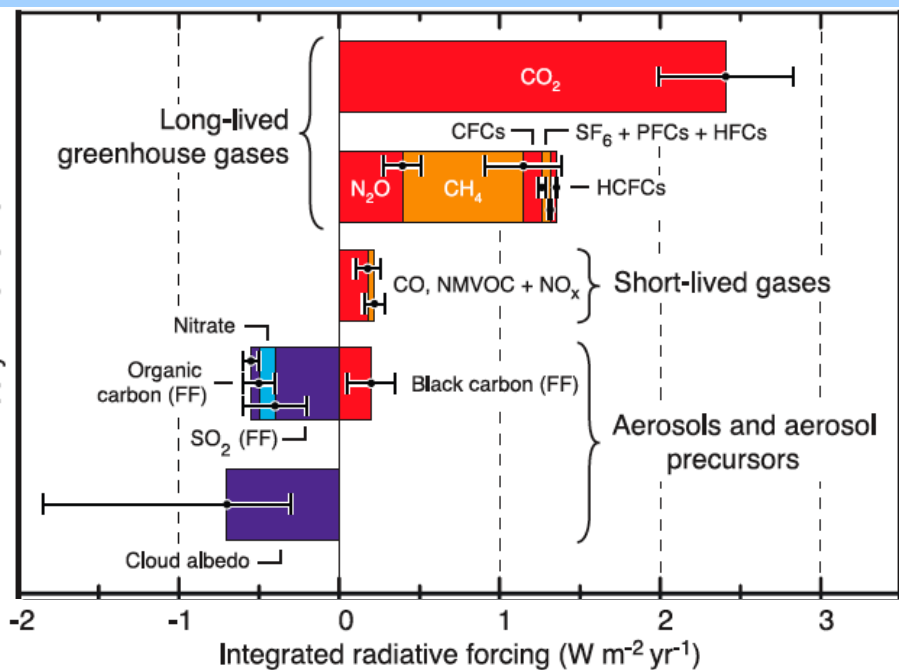
Organic carbon (OC)

Global Radiative Forcing due to GHGs & ABCs

Ramanathan and Feng, 2008



Integrated radiative forcing for year 2000 global emissions

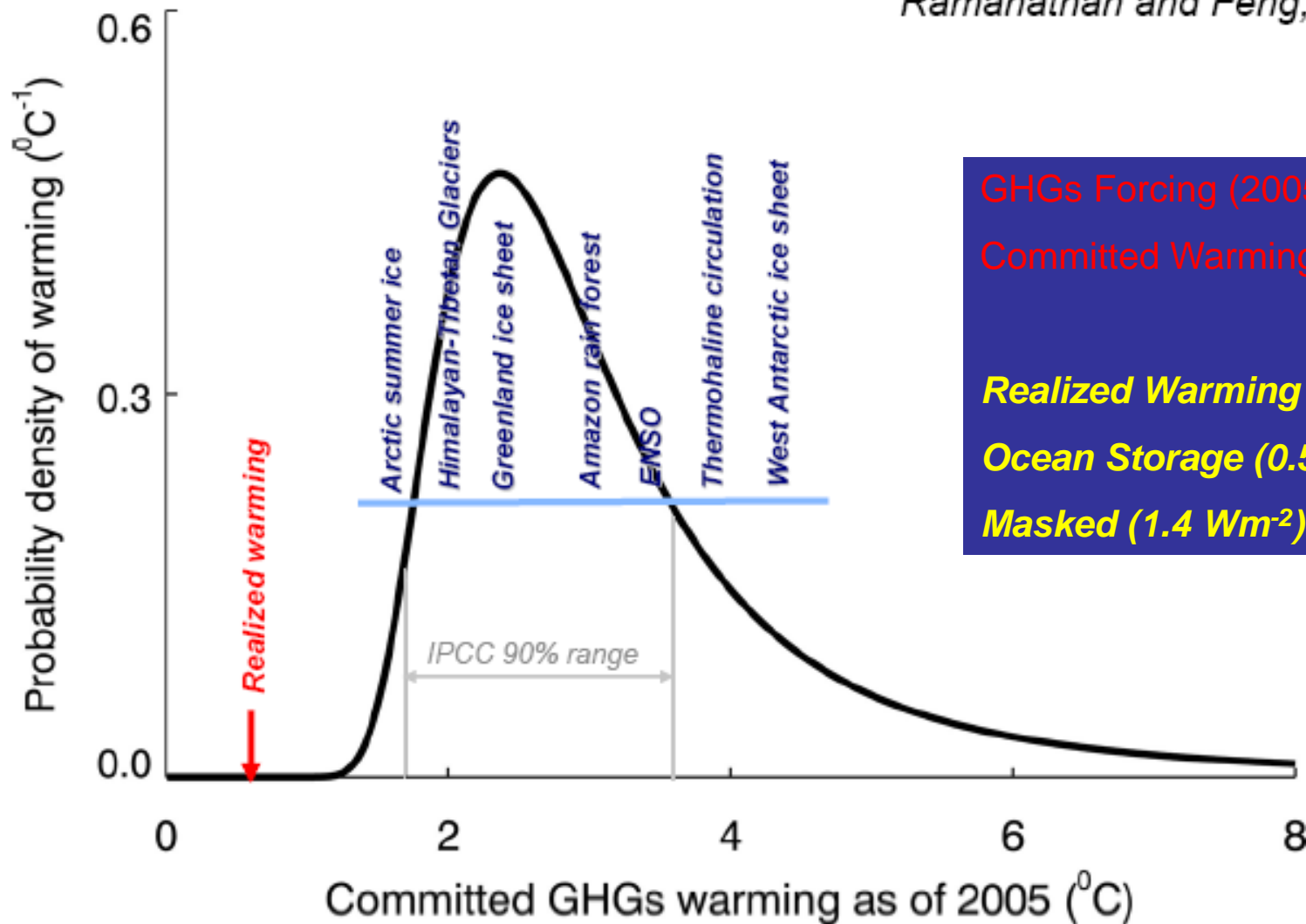


100-yr integrated radiative forcing

20-yr integrated radiative forcing

Committed Warming as of 2005

Ramanathan and Feng, 2008



GHGs Forcing (2005) = 3 Wm^{-2}

Committed Warming = 2.4 C

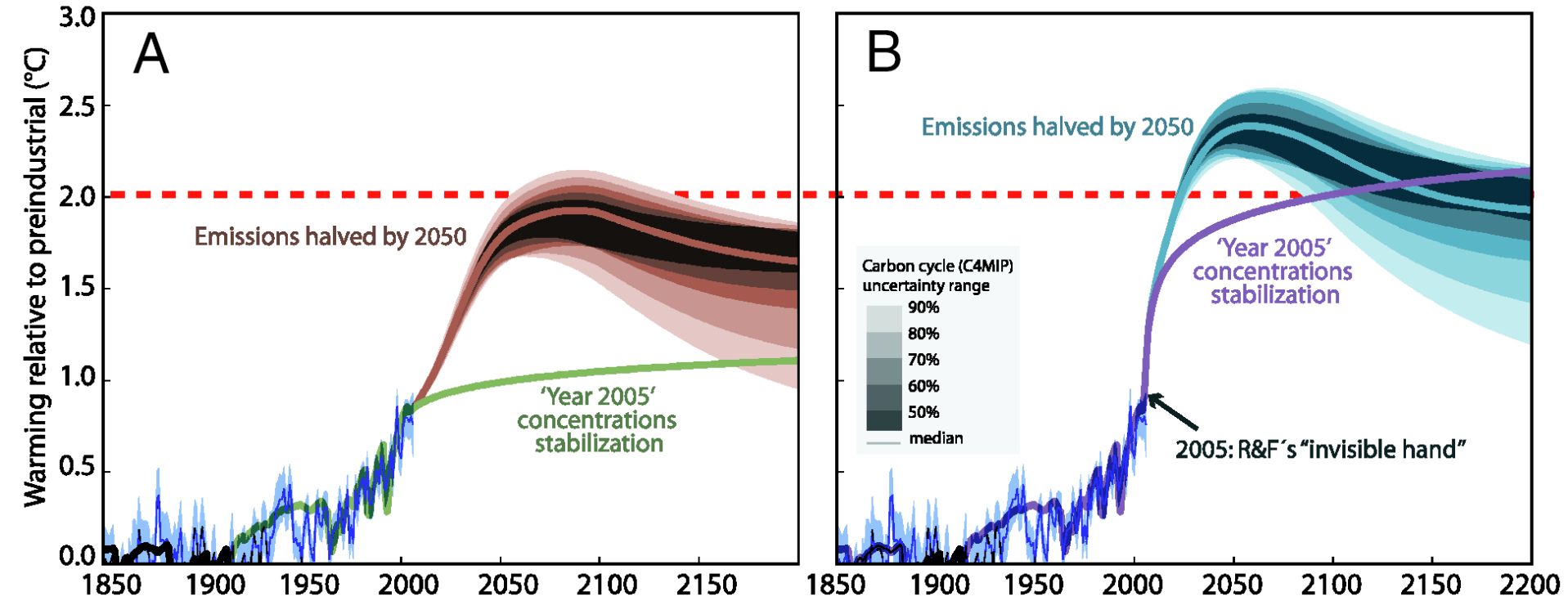
Realized Warming = 0.6 C

Ocean Storage (0.5 Wm^{-2}) = 0.5 C

Masked (1.4 Wm^{-2}) = 1.2 C

Committed warming derived from IPCC Forcing & IPCC climate sensitivity

Committed warming derived from IPCC Forcing & IPCC climate sensitivity

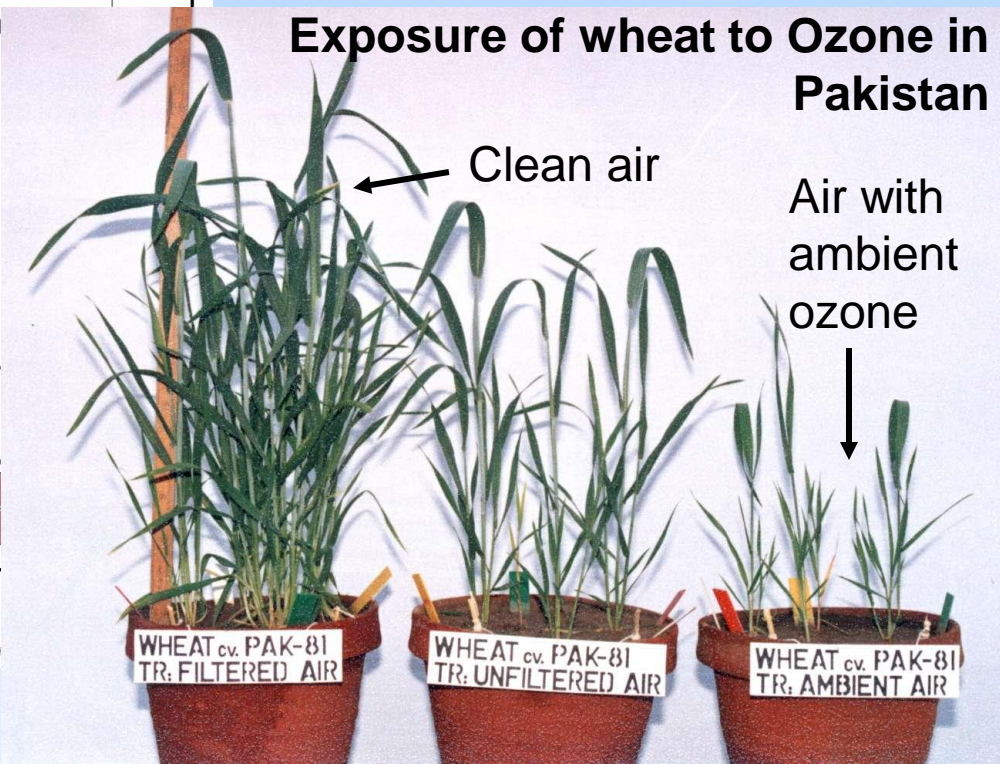
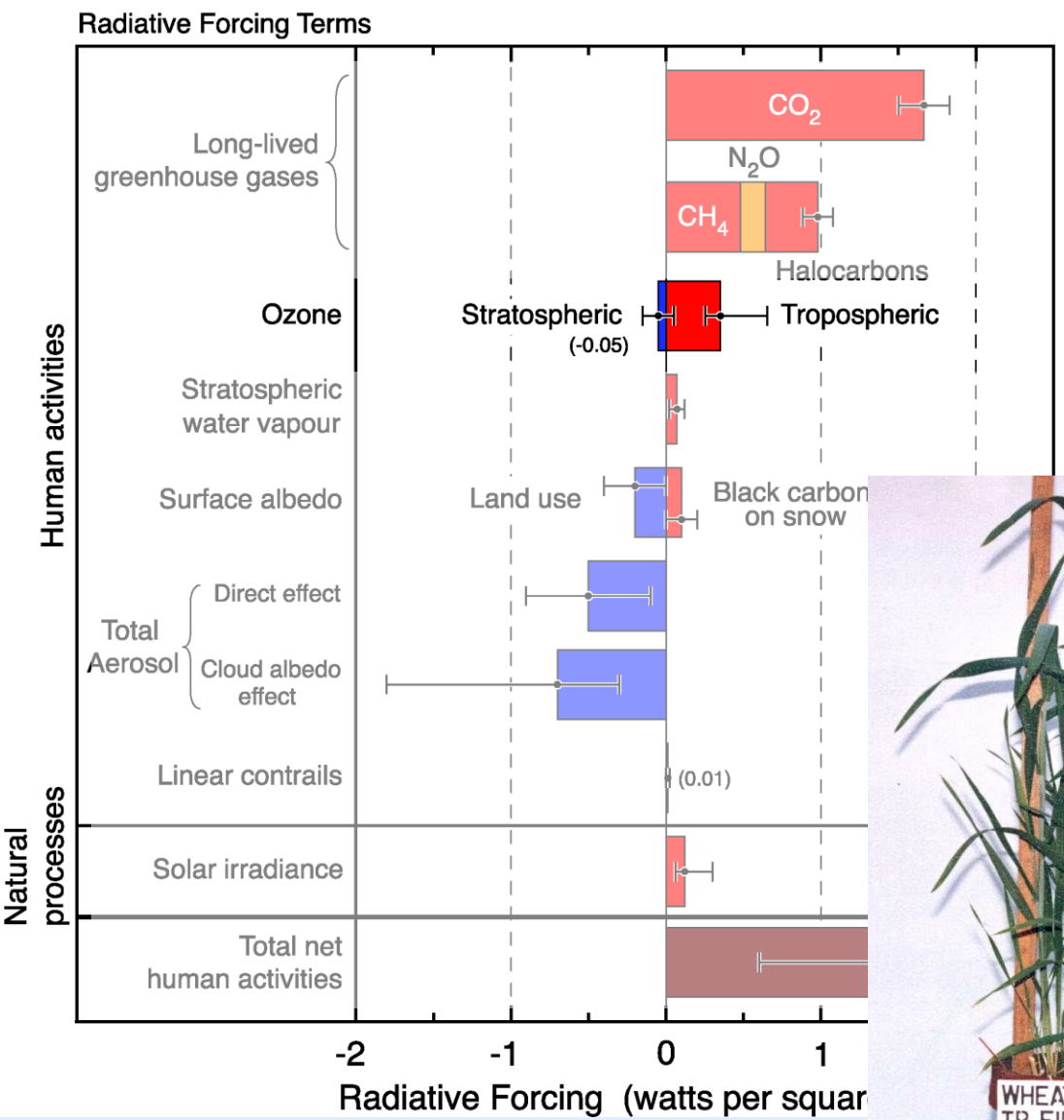


Global warming: stop worrying start panicking? Shellhuber PNAS Sep 08

Multiple benefit of reducing ground-level / tropospheric ozone

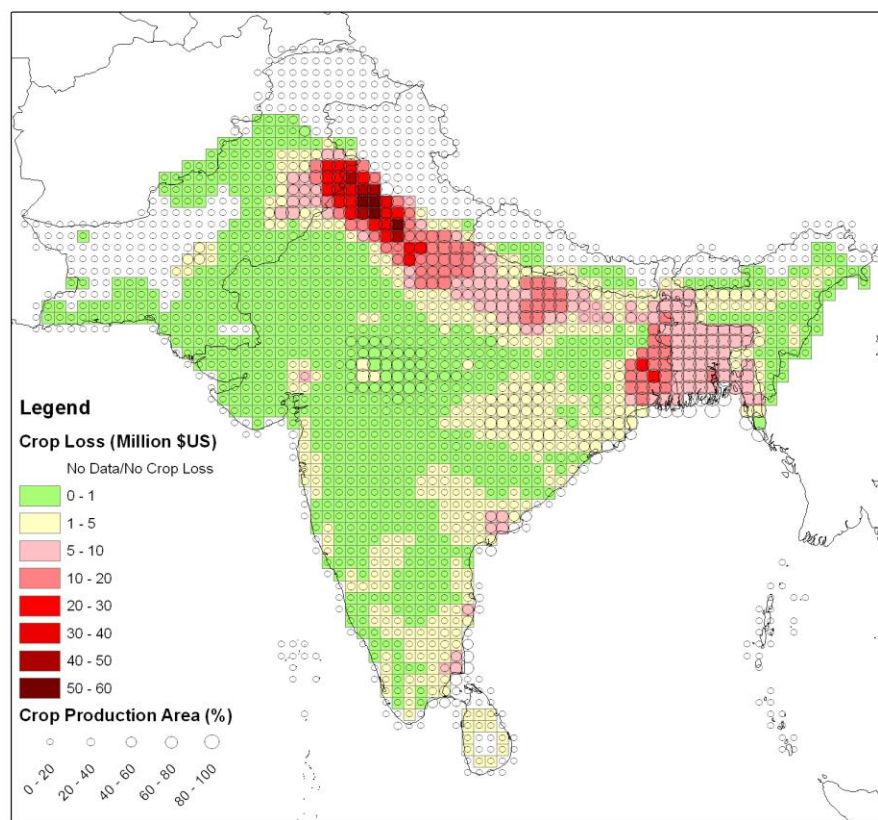
i. Ozone – an important GHG;
short residence time – immediate climate benefits from reductions

ii. Ozone – reduces crop yields in Asia by up to 40%



Source: IPCC 2007

Provisional economic loss estimates for crops in South Asia



Wheat, Rice, Soybean, Potato

European AOT40 dose-response relationships

FAO crop production, distribution and producer price data for 2000

MATCH modelled O_3 concentrations for 2000

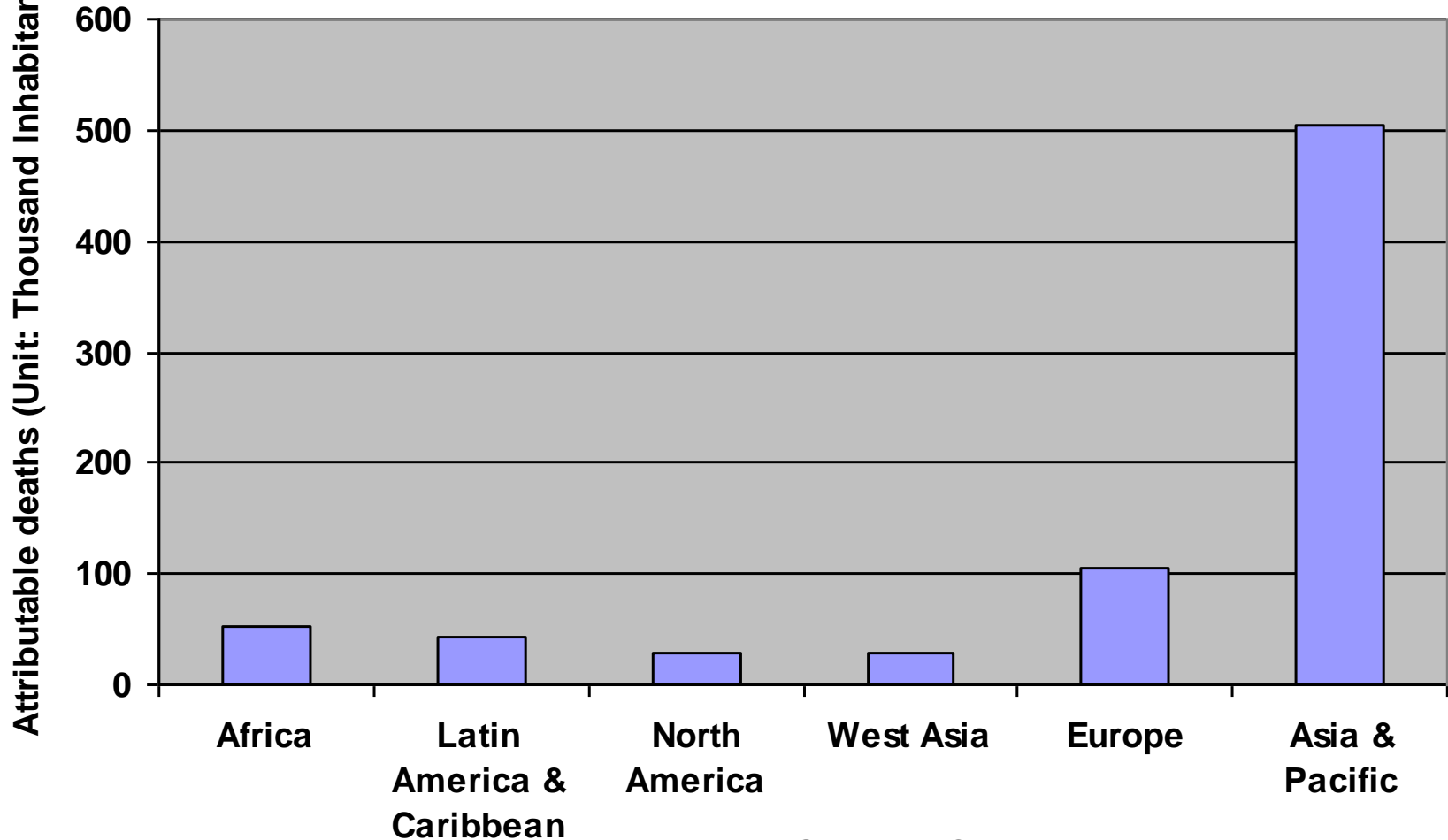
Loss estimated at **US\$ 3.9 Billion**

India (US\$ 3.1), Pakistan (US\$ 0.35) and Bangladesh (US\$ 0.4)

Impacts on Himalayan-Tibetan Glaciers, Arctic and Health

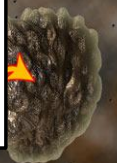
Black carbon is emerging as a major driver for glacier retreat and decrease in the Indian summer monsoon

Premature deaths due to outdoor air pollution (PM, including BC)

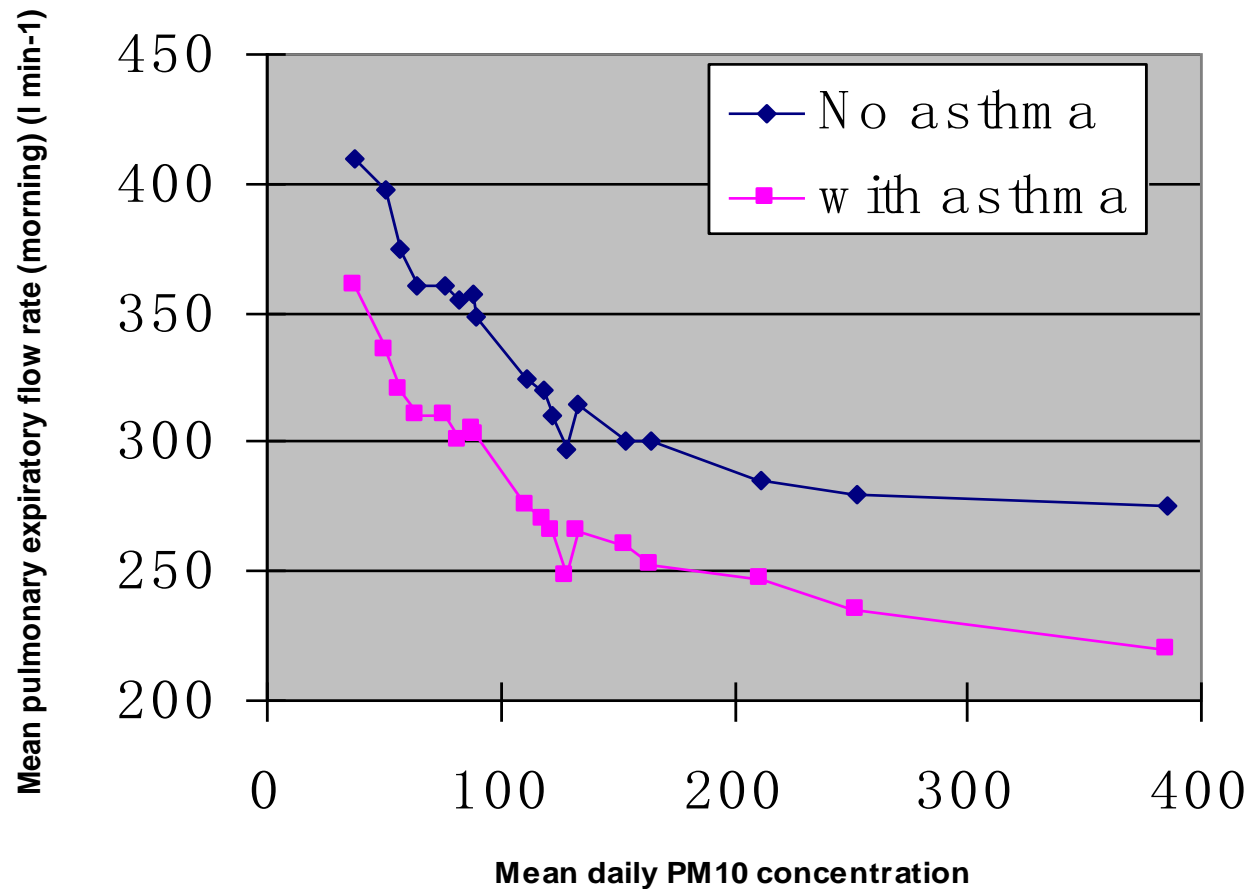


Source: Cohen et al, 2004, WHO

CLES IN
LOUDS



Health Study Dhaka – the influence of PM on lung function



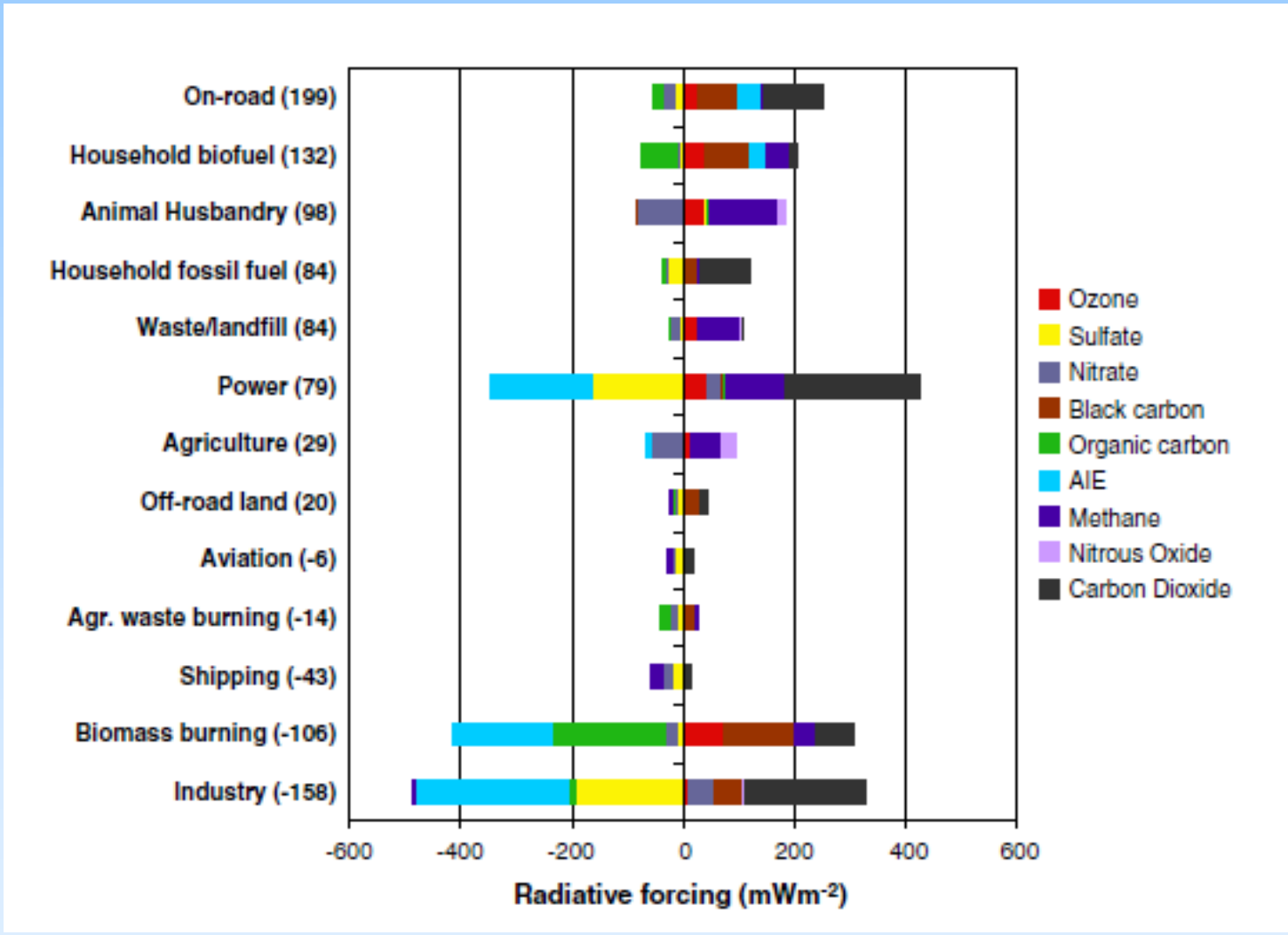
UNEP Integrated Assessment of Black Carbon and Tropospheric, and its Precursors

- One of a number of assessments on black carbon, but has a wider remit and stronger policy focus
- Report (~150 pages) and summary for decision makers by end 2010
- provide credible overview science of and policies that can reduce emissions and impacts in a manner that is policy relevant
- Concentrate equally on radiative forcing and air pollution impacts, but with an entry point related to urgency from climate perspective

Interim insights

- **Bounding BC:** likely that BC has a positive forcing, but uncertainty is large
- **Ozone is an important GHG,** but the strategy for reducing precursors will have very different impacts on radiative forcing

Radiative forcing by sector by 2020



Need for an Integrated Approach

Win- win solutions:

- Efficiency gains will affect all emissions (win-win) – but only if these are not offset by greater overall consumption
- Tackling BC, O₃ and Methane will have multiple benefits,

Win-lose:

- Some measures reduce sulphate but leave BC – worst possible result for climate

Further Development of the Forum Co-Benefit Strategy

- **Developing effective strategic policy systems at regional and national levels to integrate AP and climate and deliver co-benefits**
- **Intellectual challenge of developing governance systems to integrate issues**
- **IUAPPA study – how to change existing corpus of legislation in EU to achieve an integrated approach and develop administrative systems**
- **Initiating comparison of national and regional strategies for implementation of integrated co-benefit strategies in Asian, African and L American regions, and comparing it with US and Europe**
- **Collaborating with and summarising the science of co-benefits**
- **Support inclusion of integrated co-benefits approach in future work programmes of emerging regional air pollution networks and LRTAP**
- **The Forum members can provide advice on implementation systems and tailoring them to different scales, political systems and stage of development**

Thank you

Further Development of the Forum Co-Benefit Strategy – UNEP Integrated Assessment

- **UNEP has asked the Forum (through SEI) to act as secretariat for an integrated assessment of black carbon and tropospheric ozone**
- **UNEP assessment will have science to policy focus and harmonize with the many other emerging initiatives;**
- **Results will feed into existing international initiatives and Conventions and UNEP will consider need for further mechanisms to promote the implementation of implemented co-benefit strategies**

Development of the Forum Co-Benefit Strategy – Actions after Stockholm Conference

- i. LRTAP EB submitted conference report to UNFCCC**
- ii. Continued promotion of scientific debate at regional meetings**
- iii. Report submitted to other inter-governmental bodies e.g. UNEP**
- iv. Focus on short term forcers – UNEP Integrated Assessment**
- v. Support for the Gothenburg AP and CC meeting**
- vi. Support for side events on co-benefits at Copenhagen**
- vii. Promote fuller consideration of air pollution/ climate interaction in climate negotiations post-Copenhagen**