Addressing Arctic Climate Change: Actions on Short-lived Climate Forcers

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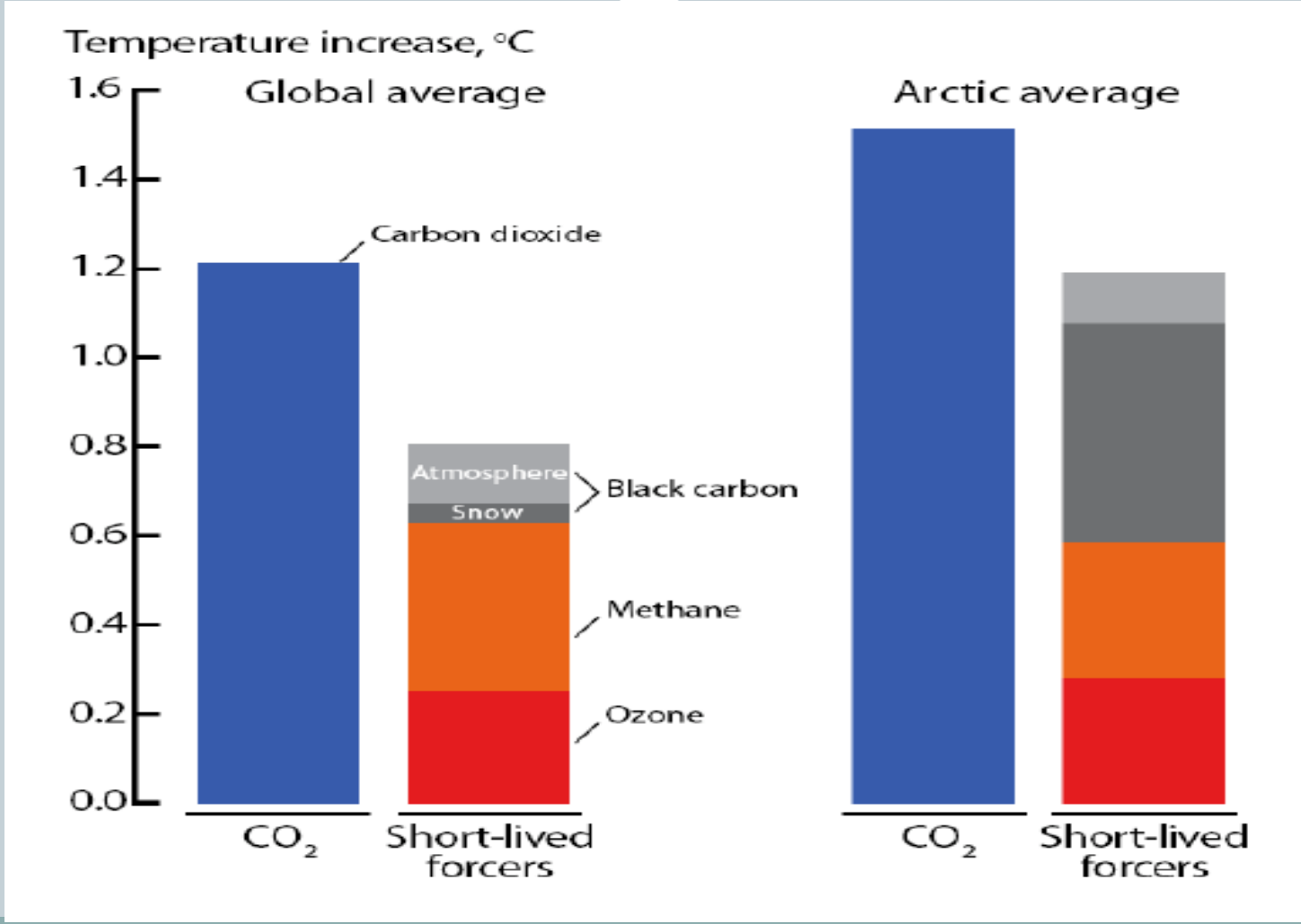
SLCFs: An overview

Short Lived Climate Forcers

Compound	*Lifetime*	*GWP* 100 yr	*GWP* 20 yr
• **Black Carbon-soot** Regional and local	1-2 weeks	210-1500	690-4700
• **Troposperic Ozone** Regional and global Regulated under ECE-LRTAP	appr. 1 month	20% of methane	
• **Methane** Regulated under KP. Global	12 yrs	25[1] (31)	72 (104)

1) AR 4

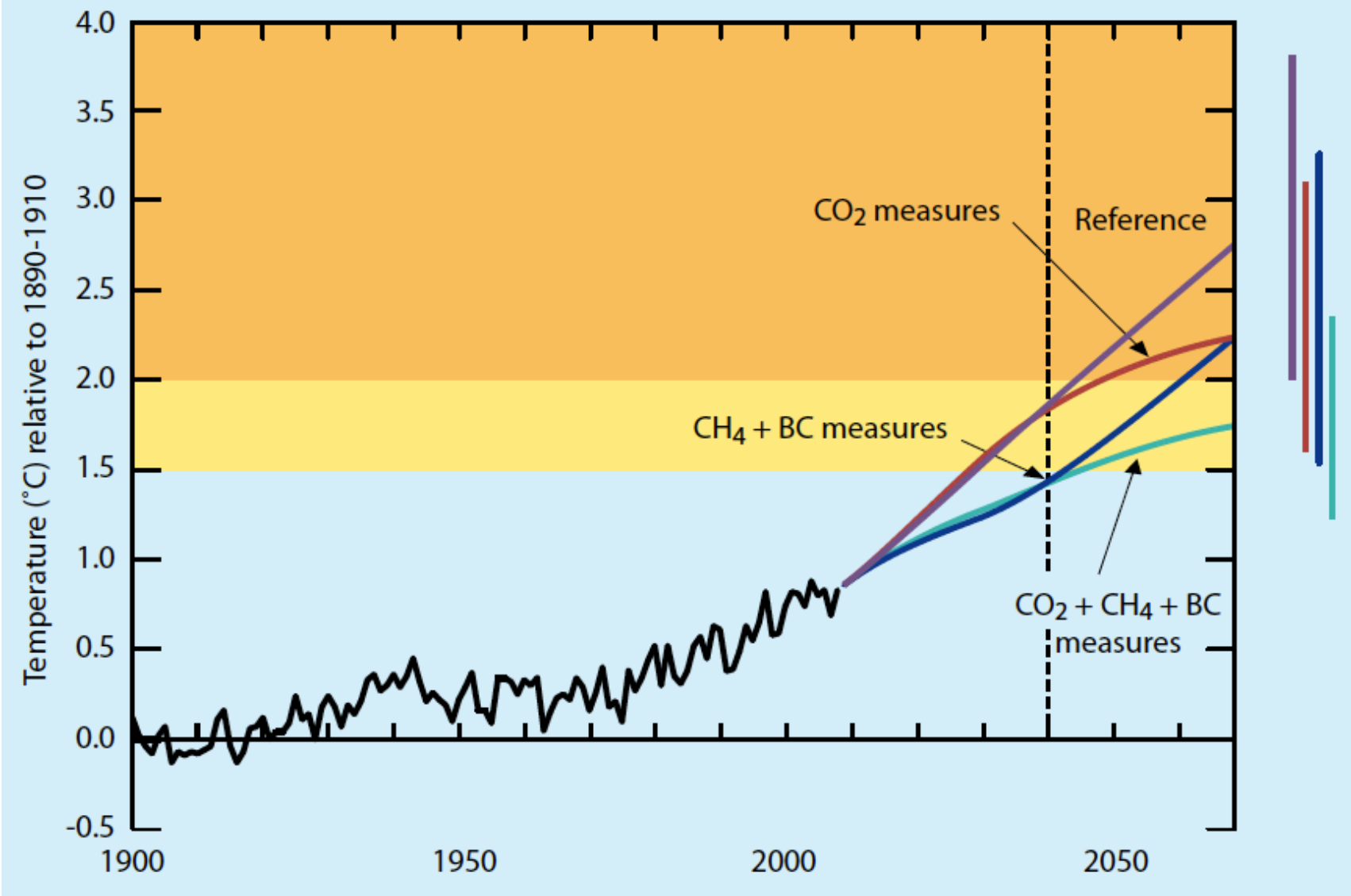
Contribution to global and regional warming



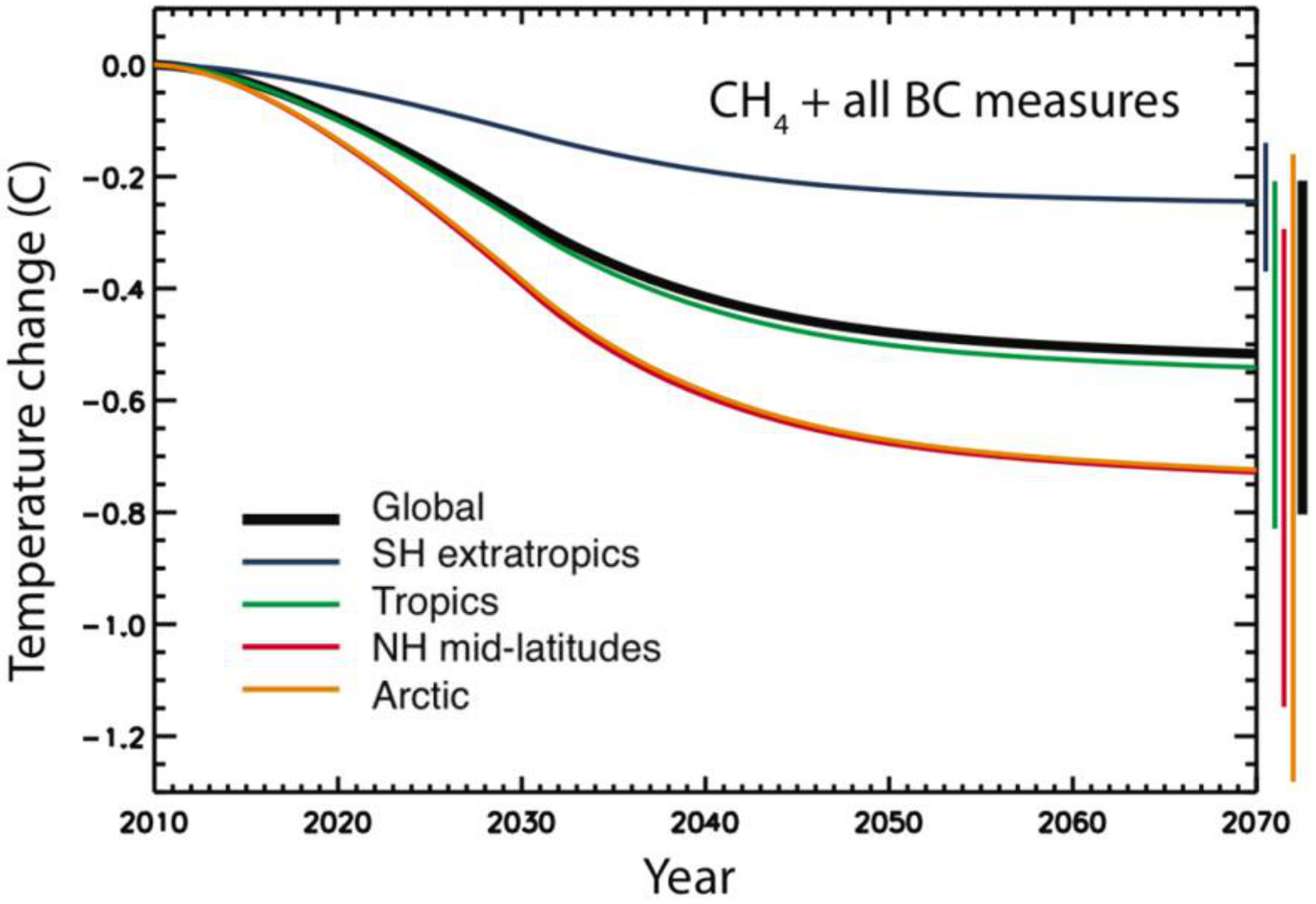
UNEP/WMO Integrated Assessment

- UNEP/WMO Integrated Assessment on Black Carbon and Tropospheric Ozone launched on June 14, 2011.
- UNEP released a ”SLCF Action Plan” on 25 November 2011 that will presented in Durban on Thursday 8 December 11:30-13:00 in Apies River
- The UNEP reports - a key source for discussing SLCF action
- Integrated Assessment: http://www.unep.org/dewa/Portals/67/pdf/Black_Carbon.pdf

Result for Global Temperature Change from the combined results from NASA-GISS and ECHAM models (JRC)



Temperature change in latitutinal bands



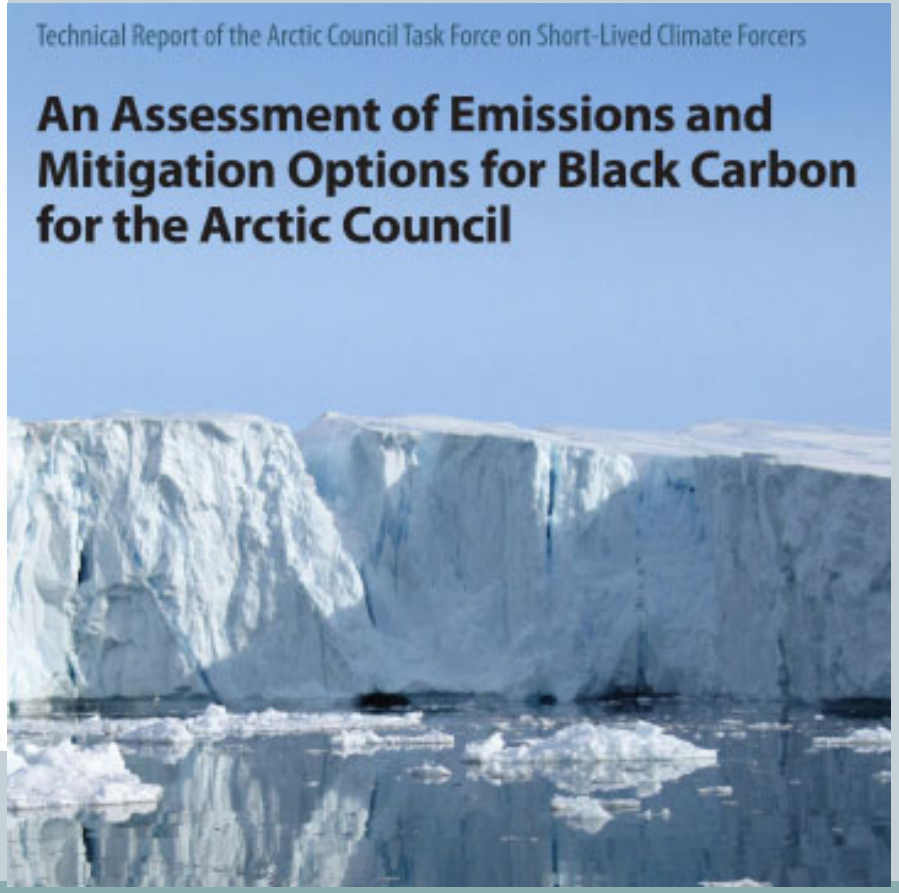
The Arctic and the Global Climate

- Climate change is severely affecting the Arctic, its ecosystems, society, economy and people
- Exploitation of Arctic natural resources, facilitated by climate change impacts, may contribute to additional destruction of valuable Arctic habitats and accelerate climate change
- Many feedbacks in the Arctic may accelerate global climate change: snow cover, sea ice melting and methane releases from the tundra and the Arctic seas
- Changes in the Arctic have worldwide repercussions: sea level rise (0.9-1.6 m) affecting 100s of millions of people.

The Arctic Council and SLCFs

- The Arctic Council formed in 1996, 8 nations
- SLCFs started to be discussed informally in 2007
- Two ”Chatham rules” informal workshops
- AMAP workshop in 2008 – Recommendations to SAOs to take action on SLCFs
- Tromsø Declaration in April 2009
- First meeting of the SLCF Task Force February 2010
- Report – both recommendations (and technical report) considered by Ministers in Nuuk in April 2011, with renewed mandate to 2013

Important Arctic Council reports



BC - Summary findings

- Reductions in the emissions of CO_2 are the backbone of any meaningful effort to mitigate climate change.

- BC deposited to Arctic snow and ice results in a positive radiative forcing.

- *Global direct atmospheric forcing* due to BC leads to Arctic warming.

- BC emitted near or within the Arctic will have the greatest impact on Arctic climate and especially on surface temperatures, in fact more than 50 % of BC impacting the Arctic comes from the Arctic Countries

Transport

- **On-road and off-road diesel engines**
  - Regulations that target particulate matter for new vehicles, if fully implemented, are projected to reduce black carbon from new vehicles to near-zero
  - Additional early measures could accelerate this decline by:
    - more retrofitting of older vehicles
    - enhancing current controls on existing vehicles and equipment
    - improving inspection and maintenance programs
    - accelerating the timeline or broadening the scope of existing regulations for new engines.

Residential Burning

- **Residential burning (wood, coal) for heat**
  - Major source of emissions that actually reach the Arctic
  - Significant for all Arctic Council nations
  - Projected to remain essentially unchanged or increase by 2030 without new and additional measures:
    - Improved technology
    - Additional BC standards
    - Change-out programs (e.g., pellet stoves)

Open Burning

- **Agricultural burning and wildfires**
  - Significant source reaching the Arctic. Russia and Ukraine account for 75-80% of emissions
  - Some Council nations already ban agricultural burning; others control when and where burning may occur; others rely solely on local regulation. Russia ad hoc local regulation. Large improvements possible at low or negative cost (Russia, North America; also Ukraine)
  - Potential measures include no-burn and no-till methods. Major co-benefit is the prevention of wildfires – most wildfires human in origin
  - Strong health, environment and public safety co-benefits

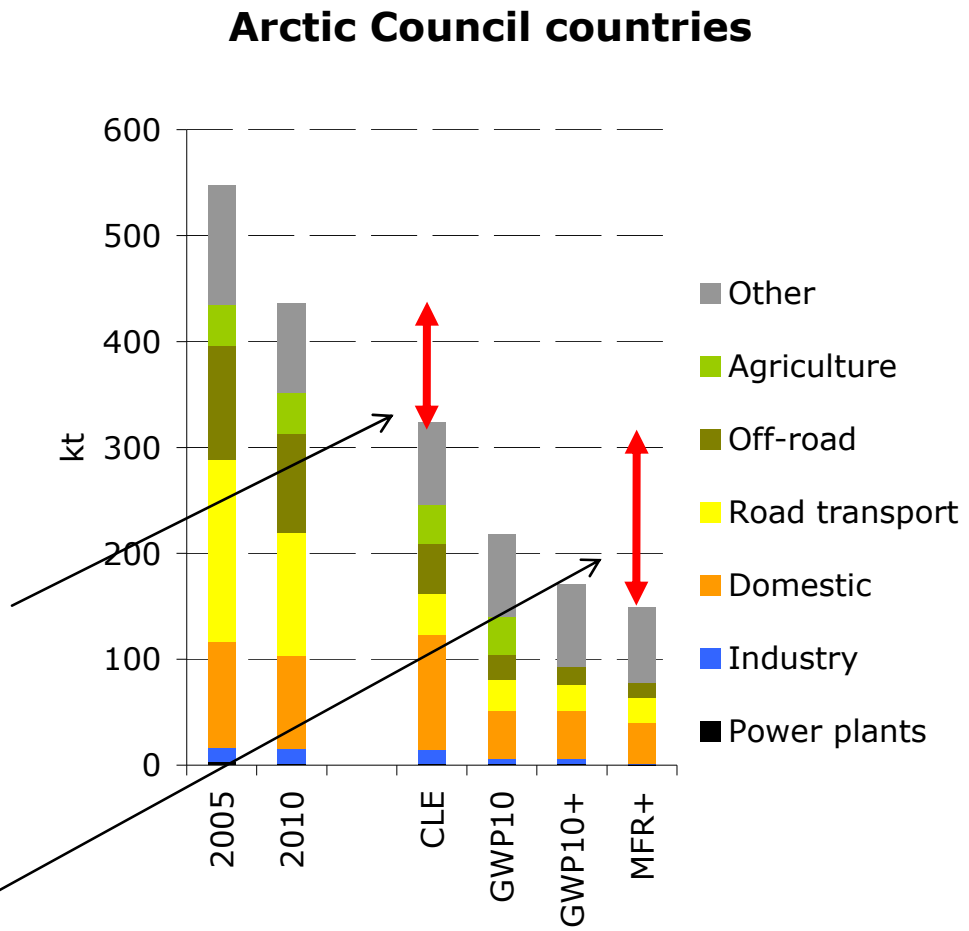
Shipping and Gas Flaring

- **Shipping**
  - Currently small source but potential high impact
  - Potential increase in traffic and impact with melting sea ice
  - Council nations comprise 90% of current shipping activities in Arctic, so within-Council action has good opportunity to impact problem
  - Measures should continue to include broader engagement with IMO

- **Gas flaring**
  - Remains a large unknown, but **potentially highly significant** source of black carbon emissions, especially as oil and gas activities expand
  - Premature to identify measures. Improved emission estimates, private sector engagement and in-field measurements are needed

Summary Message on Black Carbon Emissions

- Emissions that reach the Arctic and deposit on snow most important – closer sources have much greater per-unit impact
- Highest Arctic-impact sources can be identified: Arctic Council majority, OECD nations 80-90%
- Reductions from anticipated transport regulations account for almost all projected decline by 2030; other sources will remain unchanged or grow without additional measures
- Additional reduction opportunities in transportation, residential and agricultural/forestry sectors



Source: draft analyses by IIASA GAINS model, 2010

Future work

- The Arctic countries are highly motivated to take action to slow down warming by means of reducing SLCF
- The Task Force will now look at implementing recommended actions in the Arctic Countries as well as move forward to also include actions on methane
- There are also discussions starting on a possible Arctic Black Carbon treaty
- The Swedish Presidency will push the SLCF in the coming one and a half year.

Thank you!