



**KING'S**  
*College*  
**LONDON**

University of London

# The Impact of Transboundary Air Pollution on European Air Quality

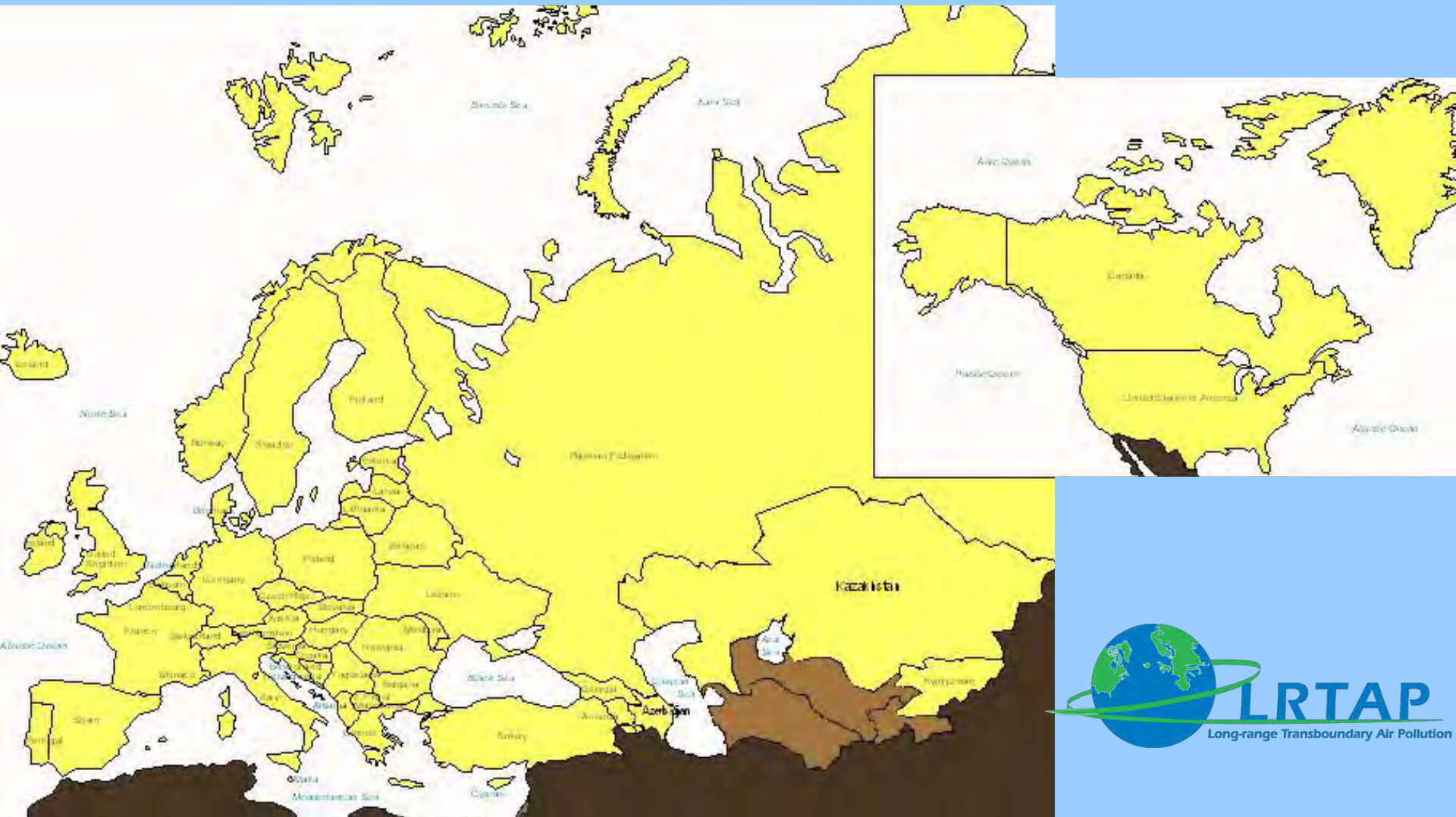
**Prof. Martin Williams**

**King's College London, Chair CLRTAP Executive  
Body**

**9<sup>th</sup> CONCAWE Symposium, 14-15 March 2011, Brussels**

# CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

51 Parties in Europe, North America and Central Asia

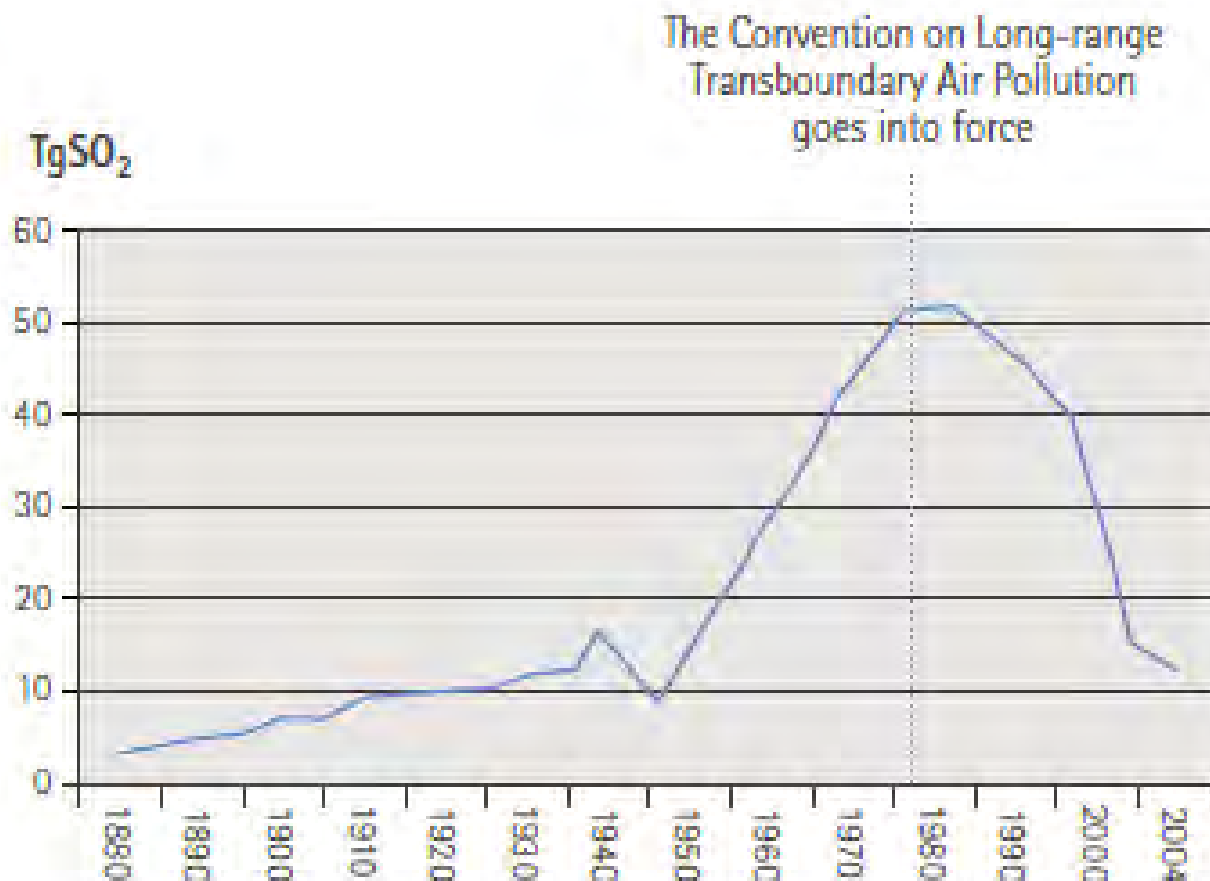


# CLRTAP Protocols

- 1984 EMEP Protocol
- 1985 and 1994 Sulphur Protocols
- 1988 NO<sub>x</sub> Protocol
- 1991 VOC Protocol
- 1998 Heavy Metals Protocol*
- 1998 POP Protocol*
- 1999 Gothenburg Protocol*
  - to abate Acidification, Eutrophication and Ground level Ozone*

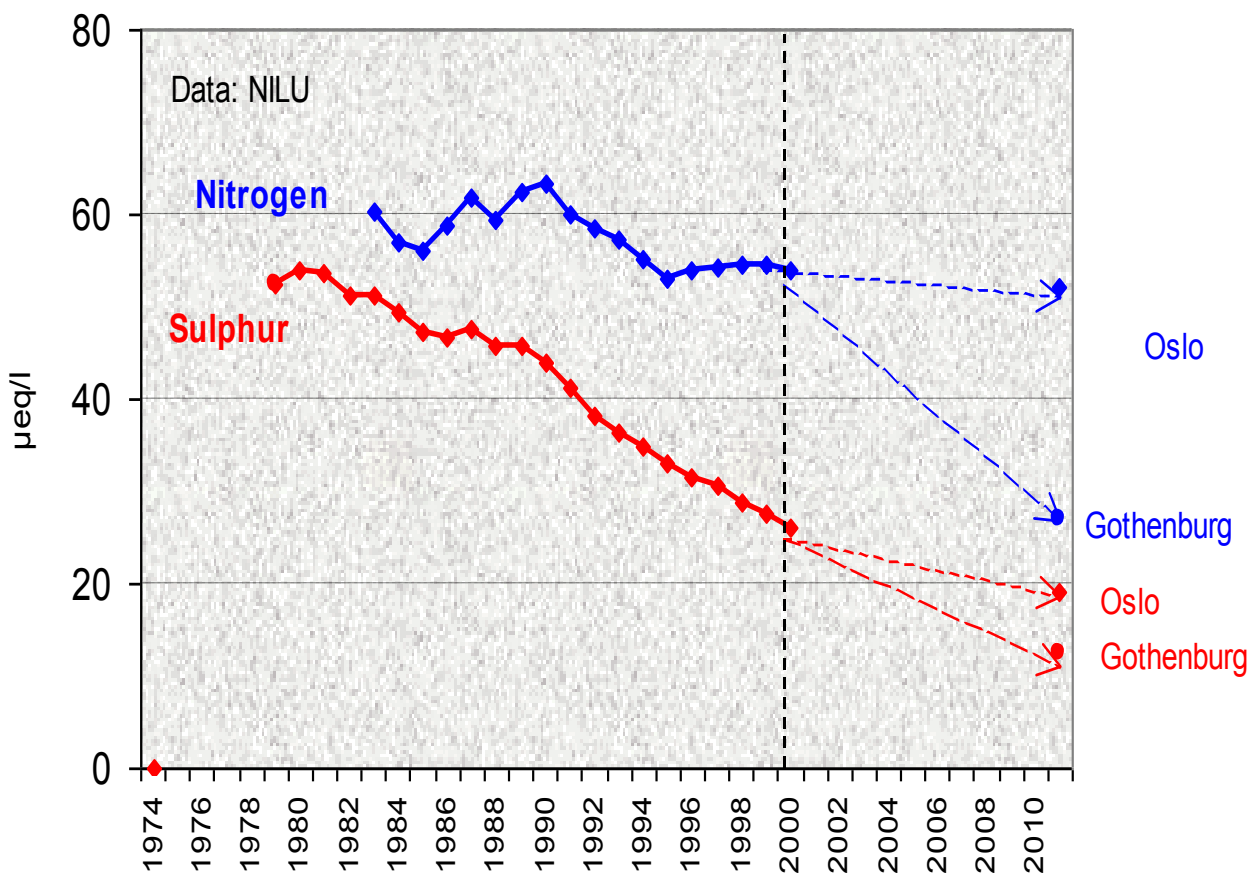
**CLRTAP  
has  
reduced  
emissions.**

.....



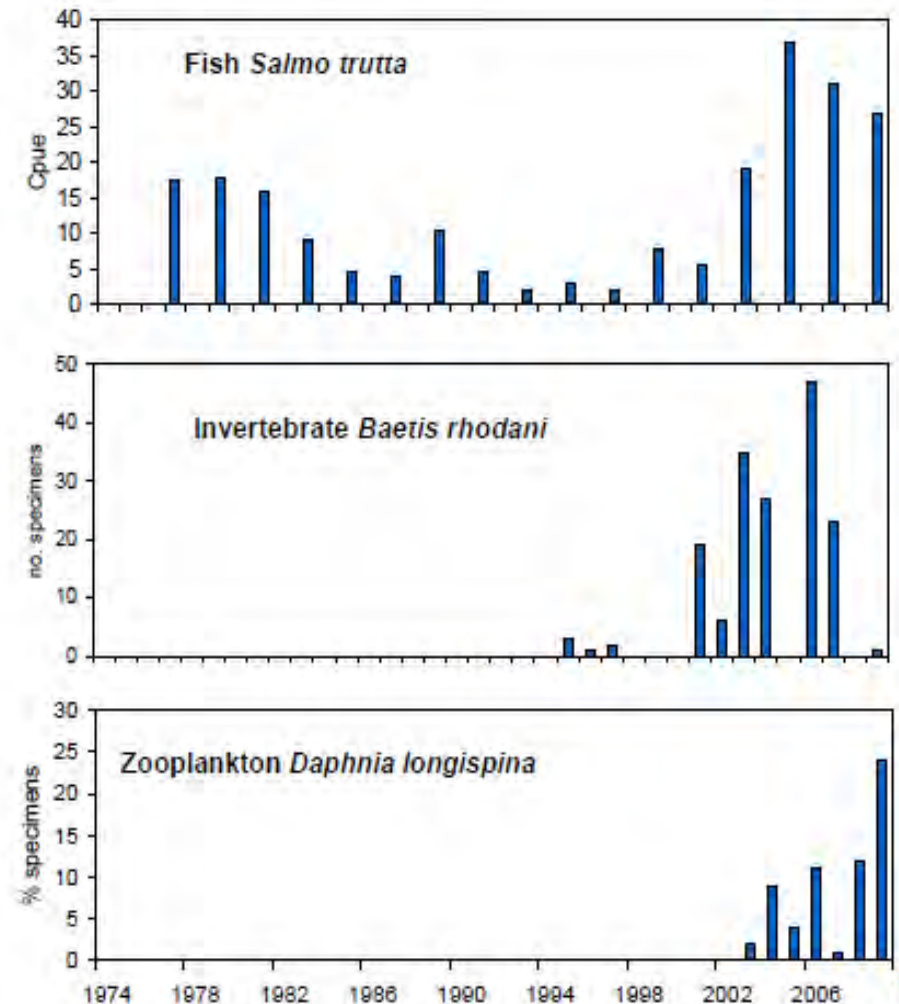
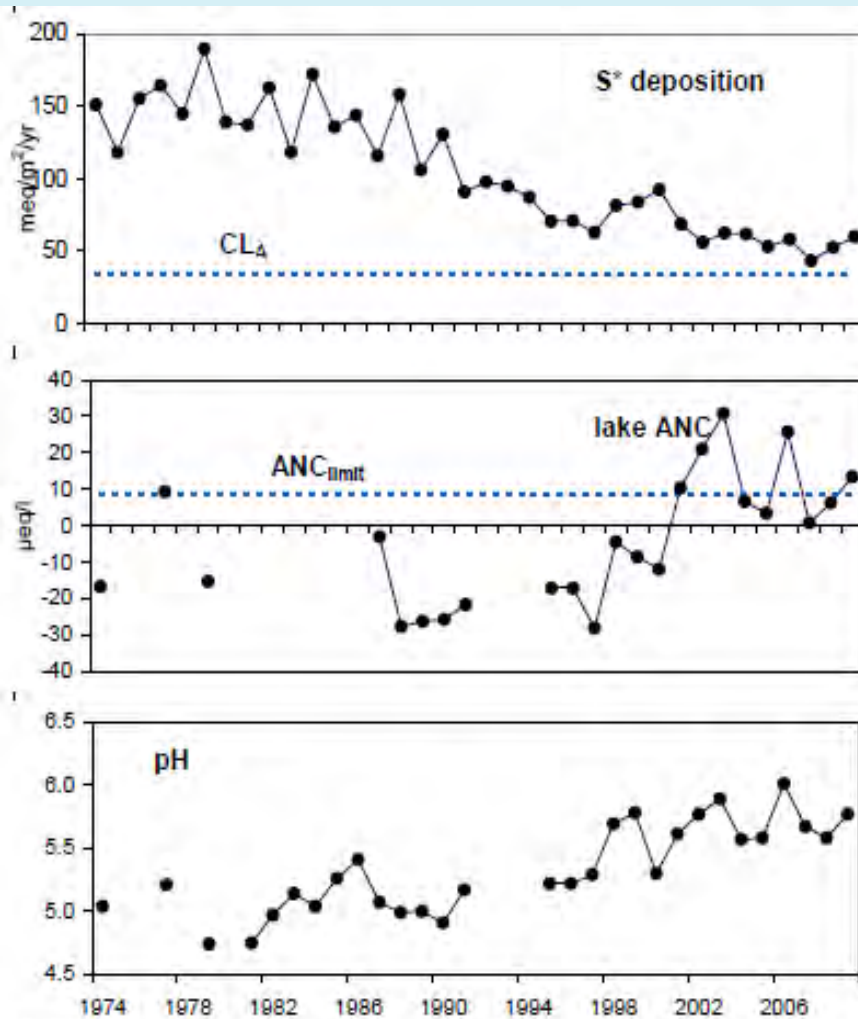
Emissions of sulphur dioxide in Europe over the period 1880-2004  
Source: Verstreng et al. *Atmospheric Chemistry and Physics* 2007

Average deposition for 7 stations in southern Norway



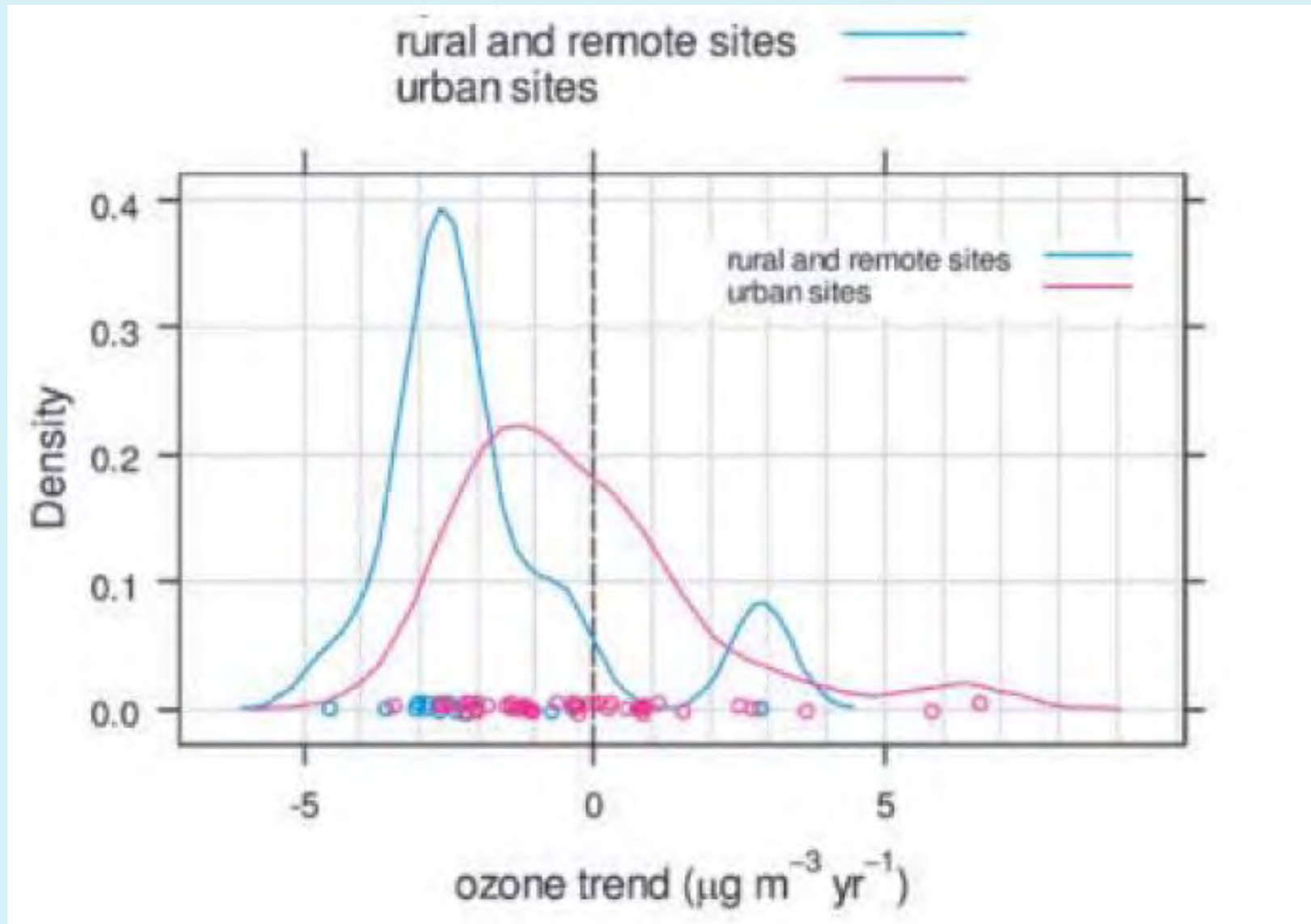
**.....and will continue to reduce emissions as the Gothenburg Protocol improves on the earlier Protocols**

# Chemical and Biological recovery is happening

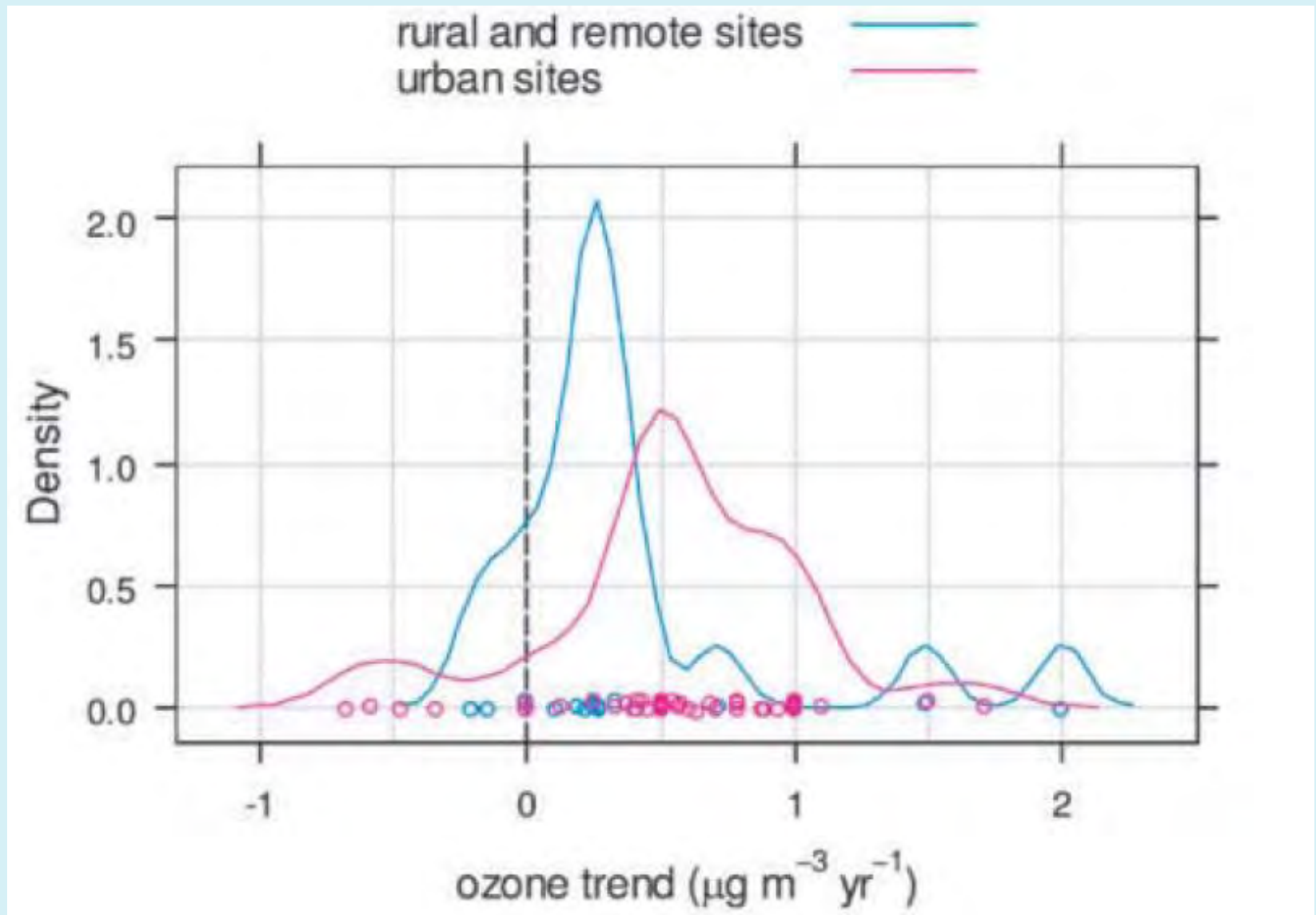


Institut Scientifique de l'Environnement  
pour un développement durable

# Trend in 99.9%ile of hourly ozone values in the UK 1990-2005



# Trend in Annual Mean ozone in the UK 1990-2005

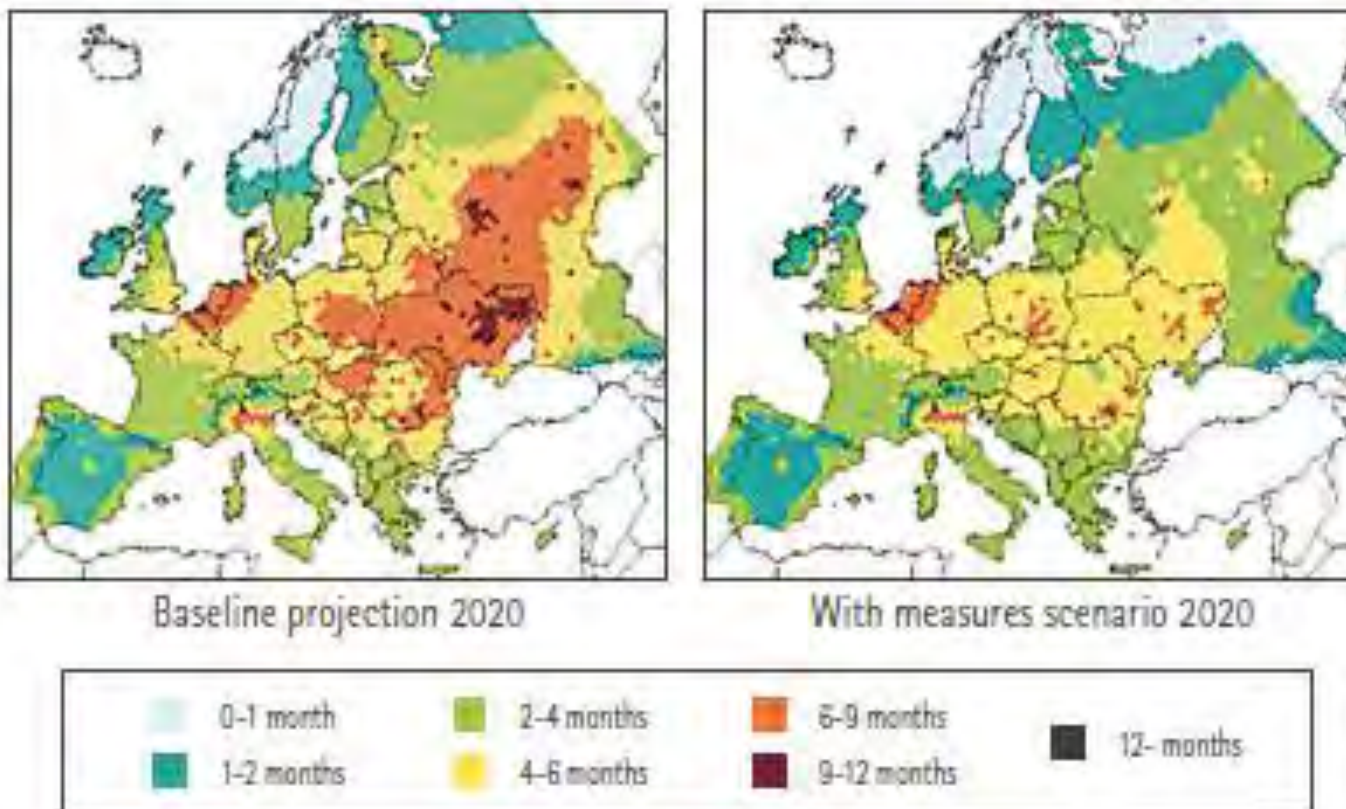




# But the job is not finished!

- Problems remain with the 'classical' pollutants especially on Health and on Eutrophication
- And new problems are emerging – on intercontinental transport and on the interactions with climate change

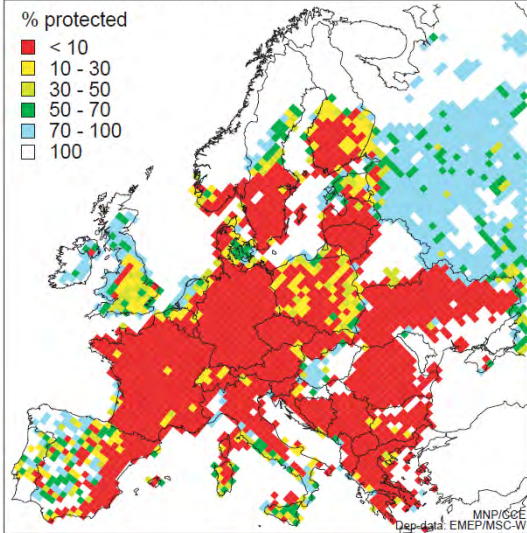
# Problems remain on public health:



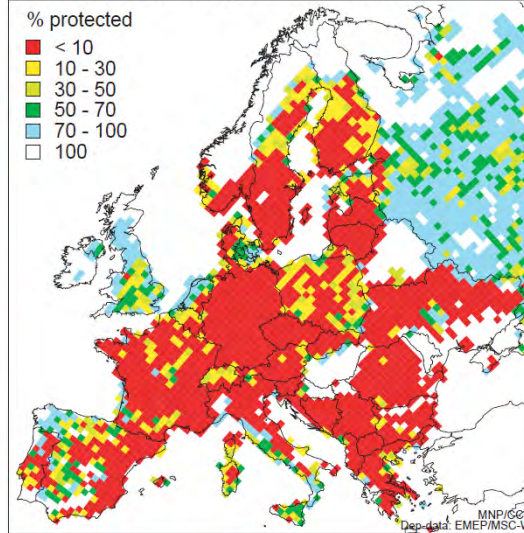
Loss in statistical life expectancy due to anthropogenic PM<sub>2.5</sub>

Source: Convention's Centre for Integrated Assessment Modelling, 2009

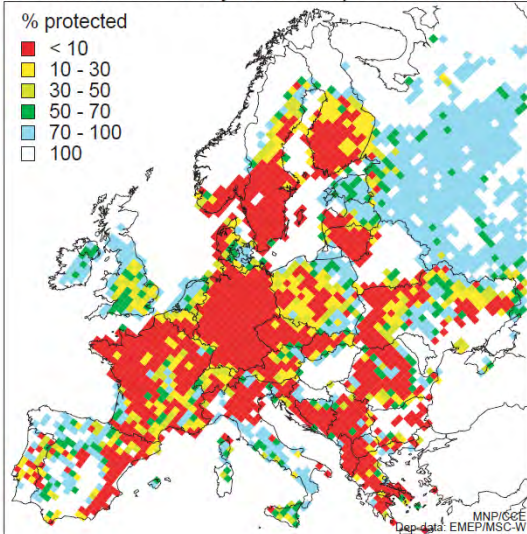
Nutrient N CLs: Ecosystem area protected 1980



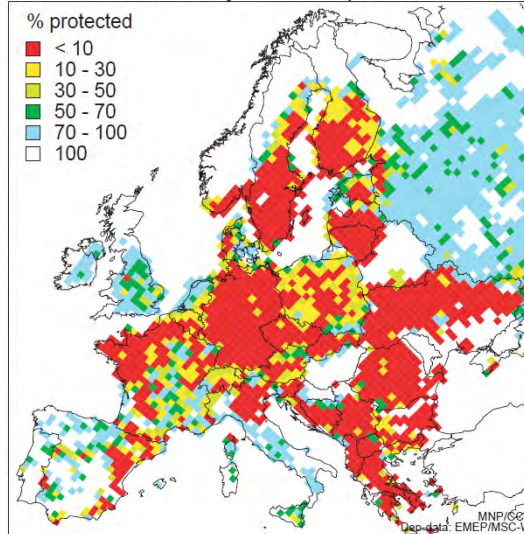
Nutrient N CLs: Ecosystem area protected 1990



Nutrient N CLs: Ecosystem area protected 2000

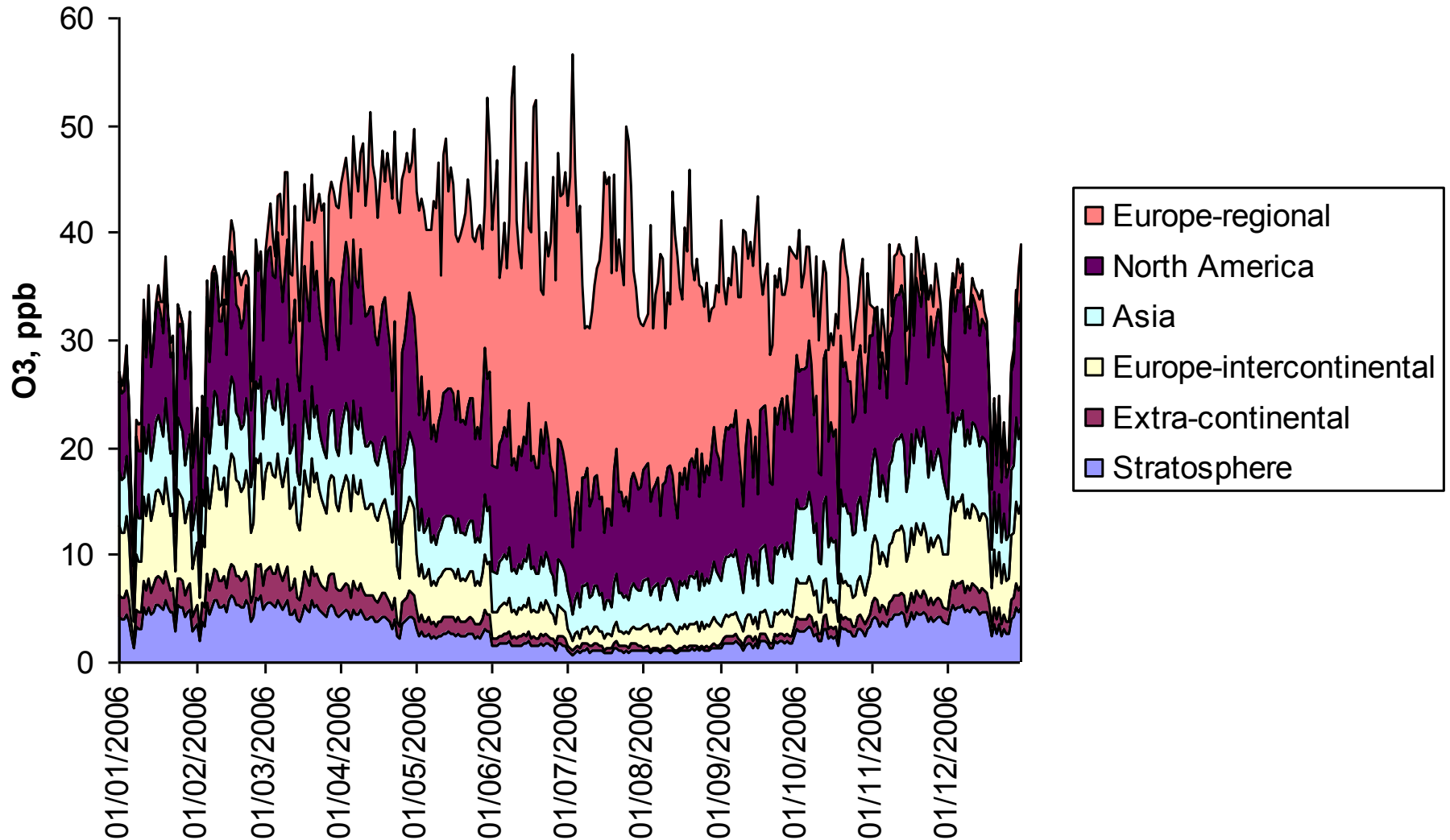


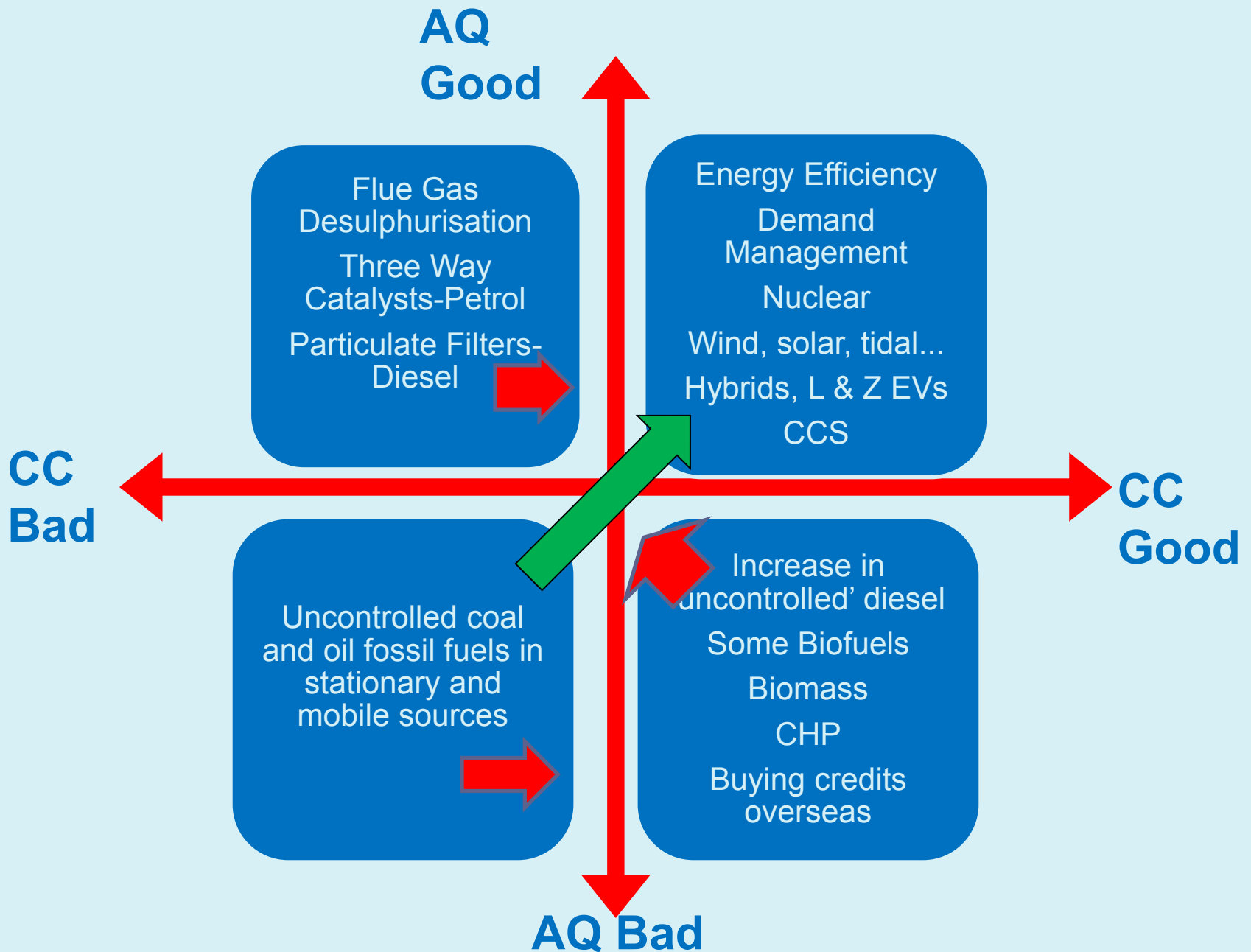
Nutrient N CLs: Ecosystem area protected 2010



**...and in the wider environment where there are still significant problems with nutrient nitrogen (red shows areas NOT protected)**

# Ozone is a global problem - world-wide Sources of UK Ozone (Derwent, Atm. Env, 2008)

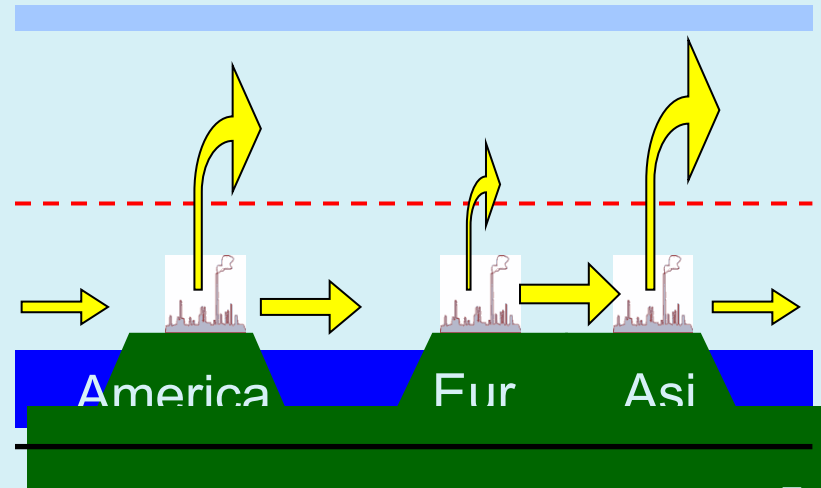






**New issues are emerging and CLRTAP has been dynamic and flexible in responding**

- **Established Task Force on Hemispheric Transport of Air Pollution**



- **In 2009 established Expert Group on Black Carbon to make first *institutional* links between Climate Change and Air Pollution**





# Strategic Priorities for CLRTAP

- Participation of EECCA and South-Eastern European countries is *important* - in Heavy Metals, POPs and Gothenburg Protocols
- Science will remain at the heart of the Convention
- Concentrate on 'core expertise' of CLRTAP, recognising that global instruments exist or are being developed on POPs and Mercury
- Revision of Gothenburg to reduce existing problems – health (PM and ozone), environment (Nitrogen and ozone)
- Links to Climate Change and the SLCFs – BC in Gothenburg II ? Methane in Gothenburg III ?
- 'Outreach' to the rest of the world – CLRTAP as an example of how to solve problems
- A first step to global co-operation on air pollution?



# Integrated Assessment of Black Carbon and Tropospheric Ozone

Summary for Decision Makers





# Main policy messages of the UNEP/WMO Assessment

- There are important public health and food security benefits from tackling SLCFs as well as for climate
- SLCF abatement is complementary to measures on GHGs-both are needed
- Swift action is beneficial
- Abatement of SLCFs is feasible with existing technologies and policies
- ...BUT international governance is lacking

# Three groups of promising mitigation measures identified

## CH<sub>4</sub> measures

1. Recovery of coal mine gas
2. Production of crude oil and natural gas
3. Gas leakages at pipelines and distribution nets
4. Waste recycling
5. Wastewater treatment
6. Farm-scale anaerobic digestion
7. Aeration of rice paddies

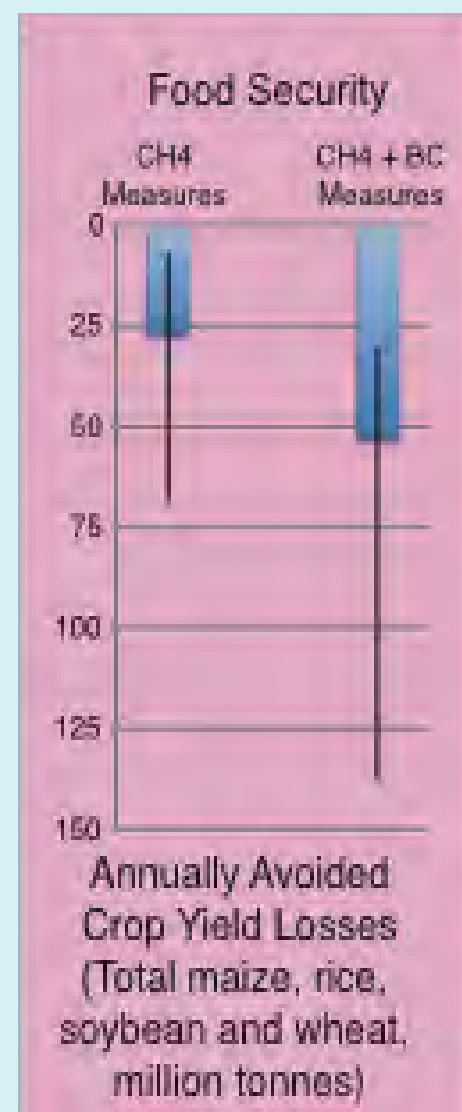
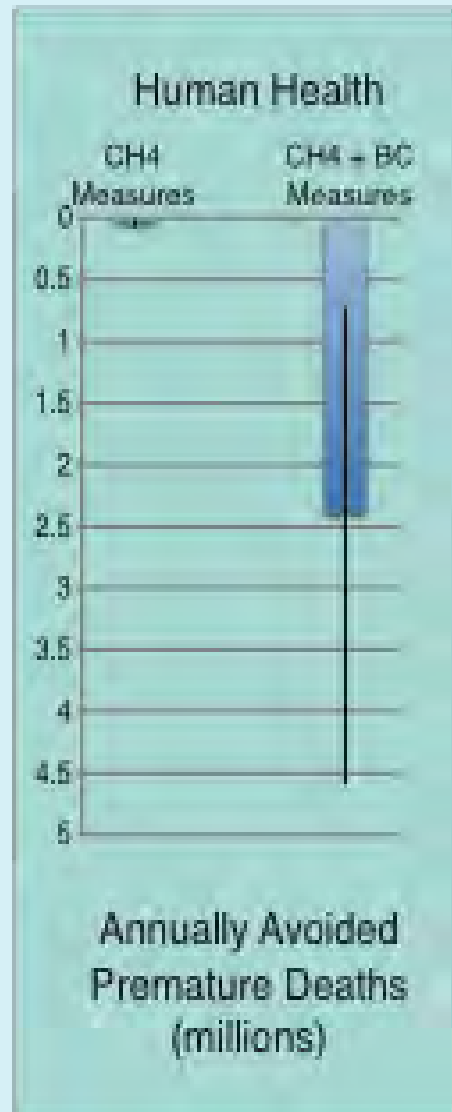
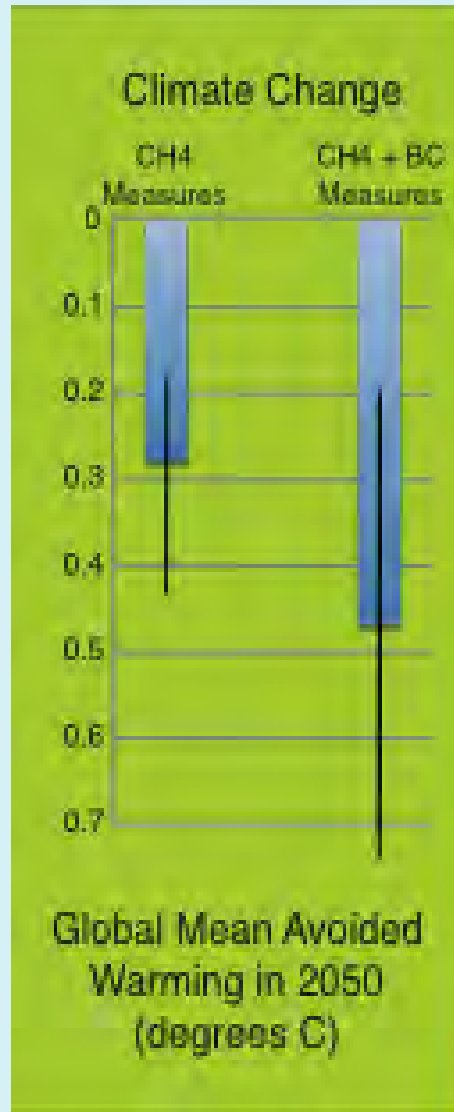
## Technical BC measures

1. Modern coke ovens
2. Modern brick kilns
3. Diesel particle filters
4. Briquettes instead of coal for heating
5. Improved biomass cook stoves
6. Pellets stoves and boilers (in industrialized countries)

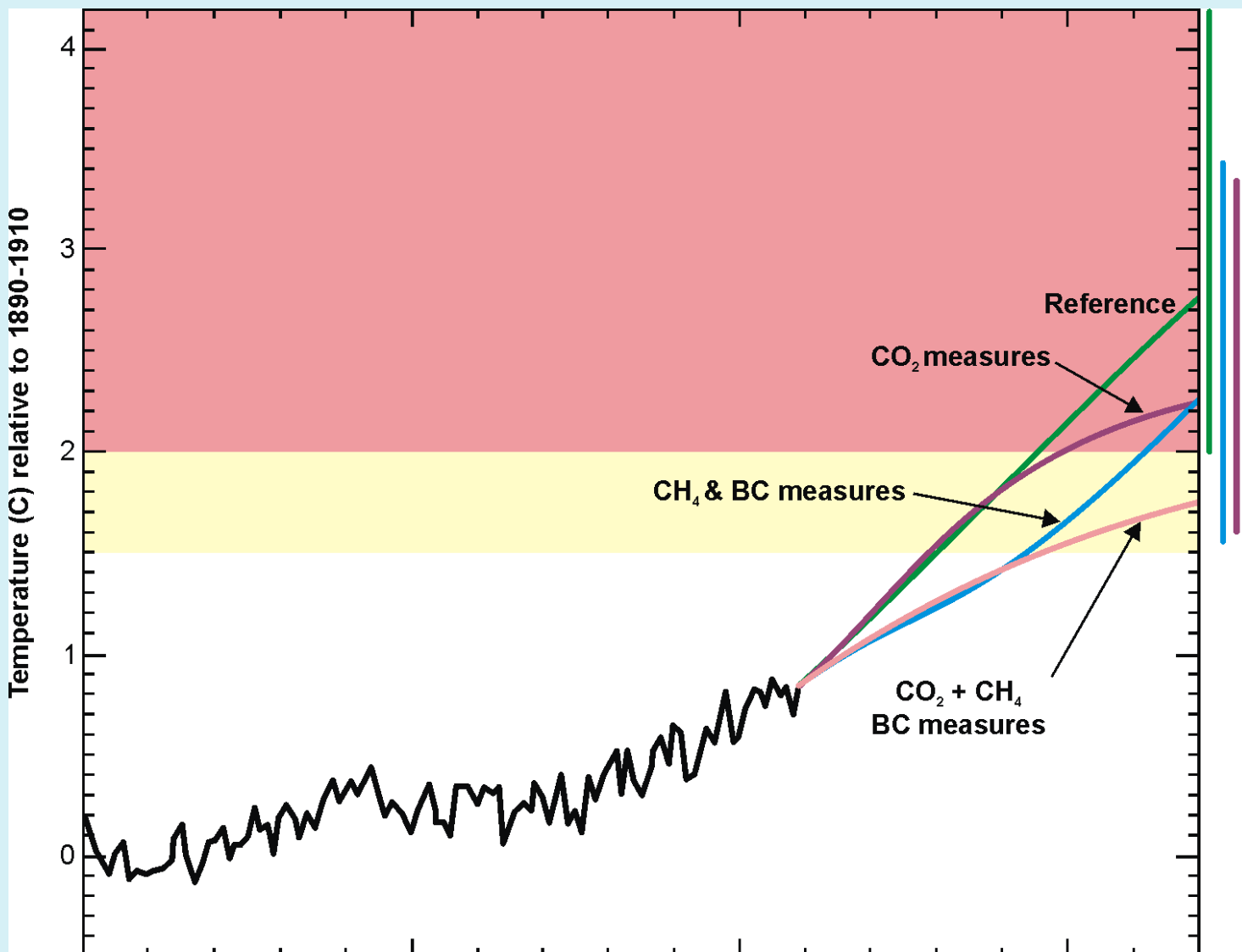
## Non-technical measures

1. Ban of high-emitting vehicles
2. Ban of open burning of agricultural waste
3. Elimination of biomass cook stoves

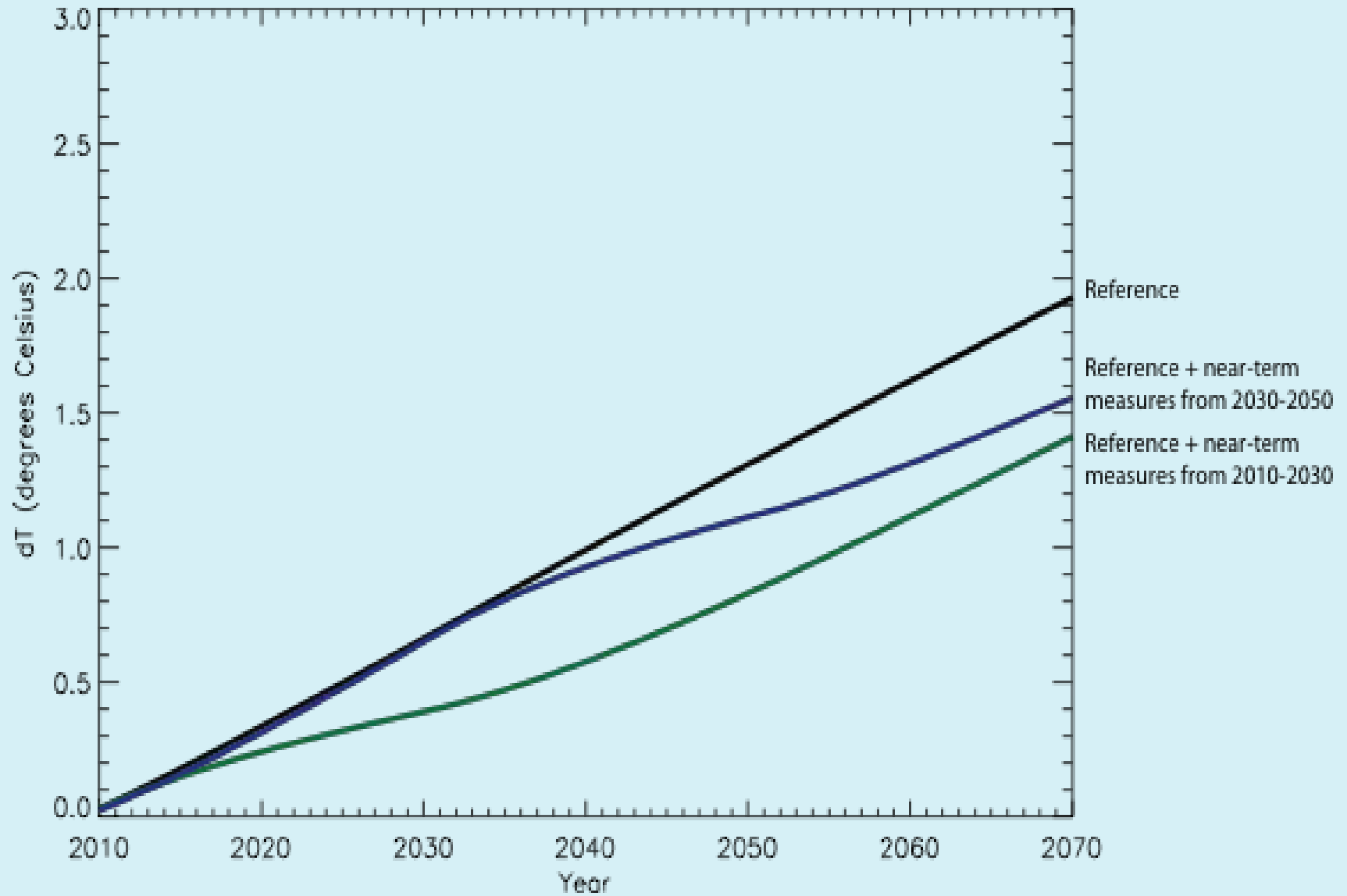
# As well as climate benefits there are also major benefits for health and food security



# SLCF and CO<sub>2</sub> measures are complementary not mutually exclusive



# Swift action is beneficial



# Possible models for managing SLCFs (1)

- ***Incorporate in UNFCCC?***

**Pros:** Single forum for all climate agents

**Cons:** Added complexity

- How compare GHGs and SLCFs – GWPs?

- Takes pressure off GHGs?

- Less emphasis on air quality damage

- AQ more a priority for developing countries

- Global climate mitigation policies heavily reliant on trading – not appropriate for SLCFs

# Possible models for managing SLCFs (2)

- *New global air quality treaty?*

**Pros:** Offers forum for shared experiences, common standards on technology, products

**Cons:** Issues are local and regional so why establish global treaty? What would Parties commit to do that was substantive?

# Possible models for managing SLCFs (3)

- *Build on existing regional air quality agreements?*

**Pros:** Politically more feasible?

Co-benefits of air quality abatement are large

Uses existing structures

Solutions/targets can be 'customised' locally

Could link targets with climate policies

Platforms exist and could be used as exemplars – CLRTAP

Science is already being 'globalised' HTAP

**Cons:** Suspicion of negotiating climate 'by the back door'



# How to translate this into action?

- UNEP Assessment cites many examples of successful implementation of the measures – but not on a sufficiently wide scale
- International governance and funding on SLCFs is lacking
- CLRTAP has taken a lead by incorporating Black Carbon into the revision of the Gothenburg Protocol
- UNEP will address the SLCF Assessment at the Governing Council in late February 2011
- Where next?

# CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

Internet site:

[www.unece.org/env/lrtap](http://www.unece.org/env/lrtap)

