EXCELLENCE IN SCIENCE

THE ROYAL SOCIETY

SATELLITE MEETING ON

What would a global policy to regulate human use of fixed nitrogen look like?

Organised by Professor David Fowler CBE FRS, Professor John A Pyle FRS, Professor John A Raven FRS and Professor Mark A Sutton

Wednesday 7 – Thursday 8 December 2011

The Kavli Royal Society International Centre, Chicheley Hall, Buckinghamshire

The natural global cycling of nitrogen through terrestrial and marine ecosystems with important transfers to and from the atmosphere is vital for the Earth's life support systems. Over the last century human activities have taken control of the source terms in the nitrogen cycle, so that two thirds of the fixed nitrogen circulating globally results directly from human activity through combustion and industrial nitrogen fixation.

Approximately half of the global human population relies on fertilizer nitrogen for food, yet fixed nitrogen in the atmosphere and in terrestrial and marine ecosystems represents a threat to human health, biodiversity and climate. The atmosphere transfers fixed nitrogen efficiently across international borders, and many of the effects occur far from the source. There are controls over specific components of the nitrogen cycle in some countries, but these are not integrated in a meaningful way and the time will come when a global strategy to manage the benefits and risks effectively may be necessary. This meeting brings together scientists and environmental policy makers to discuss the issues.

The meeting will follow immediately a discussion of the Global Nitrogen Cycle at the Royal Society 8-9 Carlton House Terrace London 5th and 6th December. At the Discussion meeting the major terms in the Global Nitrogen cycle will be re-evaluated to show current understanding of the sources and sinks of reactive nitrogen in the environment at global scales, the way the global cycling of nitrogen has changed over the last 200 years and prospects for the 21st Century. At the Discussion meeting the state of scientific understanding of the global nitrogen cycle and the magnitude of human influence on the fluxes and their effects on ecosystems, climate and human health will have been presented. It is clear that the global biogeochemical cycling of nitrogen has been perturbed greatly by human activity, and effects are clear at local regional and global scales. Control measures have been introduced at local and regional scales to regulate emissions of fixed nitrogen to soils, water and the atmosphere but there is no control at the global scale.

Objectives

The objectives of the meeting are to discuss the Policy implications of human modification of the global nitrogen cycle and the merits and risks of a policy initiative to regulate the human use of fixed nitrogen at global and/or regional scales. The specific product of the meeting will be a brief document outlining the possible ways forward and the consequences of not taking action.

Structure

The discussion needs to set out the issues:

- What is the problem?
- Why do we need a global policy?
- What will happen if there is no agreement?
- How could a policy be implemented?

The Meeting will begin on Wednesday 7 December with plenary presentations and discussion of the case. After lunch breakout sessions in four groups will address each of the above questions for a specific issue, the four being:

- Threats (N and Air quality, water quality, climate and Biodiversity)
- Agriculture -Reduced N. (What measures could be taken, equity issues and sustainability)
- Combustion – Oxidized N (Measures to date and prospects, equity issues regionally)
- Consumption (Benefits of reduced animal protein consumption, energy and other products consumed)

Output

The arguments will be briefly summarised in a document which addresses the four numbered issues above, and published as a Policy Statement by the Royal Society.

Wednesday 7 December 2011

08.30 Registration & coffee

09.00 Welcome by Professor Sir Peter Knight, FRS, Principal, The Kavli Royal Society Centre
Welcome by Professor David Fowler CBE FRS

09:20 Existing policies and regulations and the likely profile of human Nitrogen fixation during the 21st Century
Dr Markus Amann, International Institute for Applied Systems Analysis (IIASA), Austria

09:45 Discussion

10:00 Nitrogen and the oceans
Dr Maren Voss, Leibniz-Institut fur Ostseeforschung Warnemuende, Germany

10:25 Discussion

10:40 Coffee break

11:00 Nitrogen and Air Quality
Professor Paul Monks, University of Leicester/NERC, UK

11:25 Discussion

11:40 Nitrogen and Biodiversity
Dr Kevin Hicks , University of York, UK

12:05 Discussion

12:20 Nitrogen and climate

12:45 Discussion

13:00 Lunch

14:00 Nitrogen and Global trade
Professor James Galloway, University of Virginia, USA

14:25 Discussion

14:40 – Breakout session
17:00 Introduction to the four groups and tasks

17.00 CLOSE OF DAY

18.15 Pre-dinner drinks

18.30 Dinner

Thursday 8 December 2011

09.00 Plenary Feedback from each of the breakout groups

10:30 Discussion of the conclusions and outline for preparation of the Policy Statement.

12:30 Lunch and depart.