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Japan – UK Joint Research Project
Developing visions for a Low Carbon Society through sustainable development

MoE, Japan / Defra, UK

1. Outline

The Ministry of the Environment of Japan (MoEJ) and the Department for Environment, Food and Rural Affairs in the UK (DEFRA) are jointly promoting a scientific research project: Developing visions for a Low Carbon Society through sustainable development. They will promote studies toward achieving a Low Carbon Society (LCS) by 2050 in collaboration, encourage other countries to engage in LCS studies, and jointly hold series of international workshops. The first workshop will be held in 2006 in Tokyo.

2. Objectives

The objectives of the joint research project are to:

(1) Understand the necessity for drastic reduction of greenhouse gas (GHG) emissions in order to achieve a LCS based on scientific findings, and to and disseminate this understanding;
(2) Review country-level studies on GHG emissions scenarios;
(3) Investigate pathways to achieve a LCS at country level in a globally harmonized manner, which are composed of concrete actions and innovations including both legal/social/ behavioral systems and technological solutions;
(4) Identify bottle-necks, barriers and opportunities for achieving a LCS;
(5) Contribute to the development of international cooperation between researchers working towards a LCS; and
(6) Share the images of a Low Carbon Society.

3. Scientific Background

The emission reductions we make, or do not make, in the next few years, critically affect our ability to meet environmental goals for long-term climate protection. Because of past and current greenhouse gas emissions, a certain increase in global temperature is unavoidable. Such increases in temperature carry profound risks. Even a small increase in temperature is likely to have significant impacts on ecosystems and species, might lead to increased drought and extreme rainfalls, with severe consequences for our society. The Third Assessment Report (TAR) of

the Intergovernmental Panel on Climate Change (IPCC) and other, more recent, studies have indicated the following:

① An increase of even 1℃ in global average surface temperature compared to pre-industrial levels is likely to have significant impacts on fragile ecosystems including coral reefs

② Negative impacts on agriculture, water resources, and human health would appear on a global scale for a temperature increase between 2 and 3℃

③ Serious risk of large scale, irreversible system disruption, such as reversal of the land carbon sink and destabilisation of the Antarctic ice sheets, is more likely above 3℃. Such levels are well within the range of climate change projections for the century.

It is vital to consider how the current upward trend in greenhouse gas emissions can be halted. The ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC) is "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".

The European Union has a target to limit the increase in global average temperature to 2℃ above pre-industrial levels. When this target was adopted in 1990, it was thought that this equated to atmospheric carbon dioxide levels below approximately 550 parts per million (ppm), but in 2001 the IPCC suggested that a limit closer to 450ppm might be more appropriate. Since pre-industrial times we have already seen atmospheric carbon dioxide concentration rise from 270 to 380ppm. So we are already approaching the lower limit of 450ppm, which re-emphasizes the need for urgent action.

In Japan, the Sub-Committee for International Climate Change Strategy under the Central Environment Council recommended in its second Interim Report that "taking all this scientific knowledge into account, we think starting point for studying long-term targets should for now be the approach that would limit the temperature increase to 2℃".

The joint research project will use the same premise of a 2℃ limit, with some flexibility, for each participating study; this corresponds to a reduction of global anthropogenic GHG emissions by more than half of the existing levels over the period 2050 to 2100 in order to stabilize atmospheric GHG concentrations between 2100 and 2150.

4. Project Format

(1) Organizations leading on the research

Japan: National Institute of Environmental Studies (NIES)

UK : UK Energy Research Centre (UKERC) and Tyndall Centre for Climate Change Research

(2) International Workshops

The first international workshop will be held in Japan from June 14 to 16, 2006, involving researchers and governmental officials from about 20 countries, and international organizations. Prior to the workshop, a public symposium will be held in Tokyo on June 13, 2006. A second workshop will be held in 2007.

5. Scope and characteristics of the research

The joint research project will use a top-down or "back-casting" approach to identify what is required over the long term to realize stabilization of global temperatures. The vision of a Low Carbon Society will be described along with the scale of cuts required in GHG emissions compared to current levels. The project intends to identify what can be done now and in the future by summing up concrete actions and innovations needed, in terms of legal/social systems, technologies, and life-styles. It is intended to cover studies on the requirements of people living in the 2050 world, as well as studies on various aspects of LCS including energy supply, structure of industry, structure of cities and countryside, and transportation systems.