

## 4. Socio-Economic Development Scenarios and Climate Change Initiatives

This section describes the discussions about the socio-economic development scenarios closely related with mid- to long-term climate initiatives.

- The future paths and volumes of GHG emissions will greatly differ depending on what kind of socio-economic development takes place. Thus, socio-economic development processes that internalize GHG emission regulation need to be sought as soon as possible.
- The kind of socio-economic development processes each country or region needs to follow should be considered as well, with reference also to the unique circumstances of each country or region.

### <The IPCC Socio-economic Development Scenarios>

- In considering future measures and in establishing mid- and long-term goals, it is necessary to examine the kind of social vision to be envisaged. Because the amounts and paths of CO<sub>2</sub> emissions will depend on how the socio-economic system develops, specific scenarios for socio-economic development need to be considered.
- The IPCC initially describes several future socio-economic scenarios in which a variety of factors including environmental considerations are taken into account, but which assume that measures to cope with climate change have not been taken. Two axes are described; one contrasts priority being given to economic growth with aiming for harmony between the environment and the economy, and the other contrasts aiming for a globalized system with aiming for locally-based systems. The results include four scenarios: the (A1) scenario describes very rapid economic growth, (A2) describes a very heterogeneous world, (B1) describes a cycling-oriented society and (B2) a world society with a local/regional emphasis. (See Table 4.1)

### <Extent of Climate Change Measures Differ Depending on the Development Scenario>

- According to the IPCC, significantly different levels of GHG emissions and temperature increases will accompany each scenario. Its studies show significant differences in the amount of GHG emission reductions needed to achieve stabilization at each GHG stabilization level (see Fig. 4.1).

## <Possible Socio-Economic Development Processes>

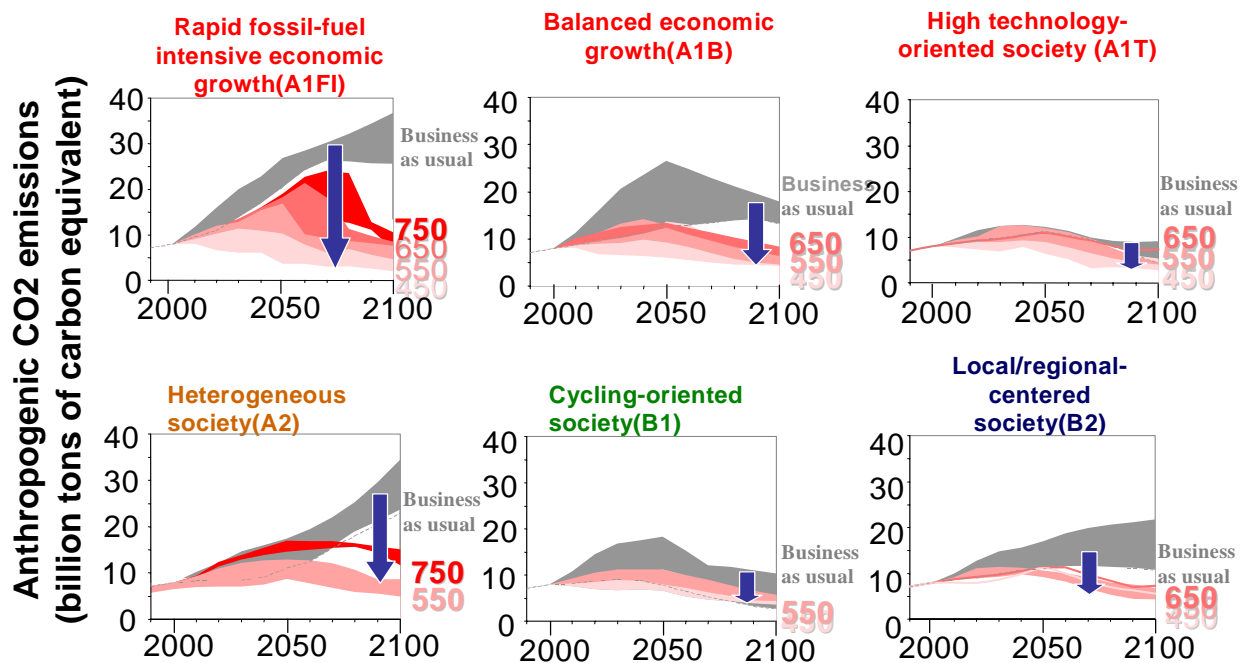
- Depending on the scenario, the necessity could arise in future for extremely large emission reductions, moreover in a very short space of time, though the possibility that this could actually be achieved must be seen as low. This leads to an understanding that we must not stop at taking measures to cope with climate change, but we must also reform the entire socio-economic structure if we wish to avoid an intolerable situation. That is, socio-economic development processes that incorporate GHG emission limitations need to be sought as soon as possible.

Table 4.1 Types of Future Socio-economic Scenarios

	Outline
A1 Scenario	A low-population growth/very rapid economic growth scenario. Barriers among global regions minimized and inter-regional society built, with per capita income and other factors tending towards convergence. It is divided into 3 sub-sets distinguished by types of technological change in the energy system; A1B (Balanced energy consumption), A1F1(Fossil fuel intensive), and A1T(High -efficiency energy technology).
A2 Scenario	This scenario describes a heterogeneous world. Regions form blocks, and indigenous traditional cultural patterns remain largely intact. Rapid economic growth based on free trade is not highly valued. Thus, world population at its maximum reaches about 15 billion. Dependence on regional energy sources is relatively high and progress in technology relatively low, one result being that regions with rich coal sources in Asia and elsewhere will not decrease their dependence on coal, raising GHG emissions to a high level.
B1 Scenario	As in A1, low population growth and very rapid economic growth, but in which technology choices place importance on sustainability, favoring low resource consumption, development and application of green energy sources, etc. Thus, levels of economic activity are lower than in A1. Regionalism will encourage regional value systems, resulting in GHG emissions in 2100 that are lower than the 1990 level. Because the society itself will place importance on the environment, special effort will not be required in taking climate initiatives, and costs of accelerating such measures will be low. However, realization of this kind of society will require a drastic shift from present reality.
B2 Scenario	Regionalism will be relatively strong, and economic, social and environmental sustainability will be sought within regional limits. Thus, much of the world's diversity will remain. However, due to awareness of the need to protect the environment, a situation as extreme as in the A2 scenario will not result. Population will reach mid-levels of UN predictions. Though it is somewhat conservative, it might be called the middle-path scenario.

Source: IPCC/SRES Report (2001)

Figure 4.1 Emission reduction needed for stabilization of [GHG] concentrations



Source: IPCC Third Assessment Report (2001)

### <Construction of a Global System Based on a Regionally Diverse Development Scenario>

- The analyses in the IPCC development scenarios are presently premised on the assumption that all countries of the world will develop in line with each scenario. However, in our present world, diverse development patterns are followed in each country and region, and it is difficult to imagine a single socio-economic development pattern being adopted globally.
- Therefore, it would be more realistic in future to think about the kind of development process each country and region might follow in view of their varying circumstances, taking as a pre-condition consideration of a global-scale system for dealing with climate change that involves the whole world. From the point of view of global sustainable development, it is also important to consider how climate change-related efforts are to be integrated with other issues of concern to the international community, e.g. poverty.

### **About a Research Project - Japanese Climate Scenarios Toward 2050**

In order to provide scientific support for global environmental protection policy, Japan's Ministry of the Environment is promoting research through the Global Environmental Research Fund (GERF). The Japanese Climate Scenarios Toward 2050 Project (full name: Comprehensive Research Project for Diverse and Comprehensive Evaluation, Forecasting and Planning for Mid- to Long-term Policy Options Aimed at Creating a Low Carbon Emitting Economy) is being carried out under the auspices of this funding program.

The project leader for the Japanese Climate Scenarios Toward 2050 Project is Dr. Nishioka Shuzo, chairman of the sub-committee and executive director of the National Institute for Environmental Studies (NIES). The project aims to build a mid- to long-term scenario for dealing with climate change in Japan based on the latest scientific knowledge. Its specific research themes are itemized below:

1. Long-term scenario research aimed at evaluation methods for climate initiatives,
2. Research on establishing multi-lateral evaluation criteria for climate initiatives,
3. Evaluation of the efficiency of mid- to long-term CO<sub>2</sub> emission reduction measures taken for urban areas,
4. Research on comprehensive technological, life style and social system measures for coping with climate change,
5. Research on a mid- to long-term strategy for CO<sub>2</sub> reduction in the transport sector with careful consideration of technological innovation and changes in demand

The time 5 year time period for the Japanese Climate Scenarios Toward 2050 project is divided into Phase I (2004 – 2006) and Phase II (2007 – 2008).