

*For the 5th Tripartite Presidents Meeting in November 2008 (Hokkaido)*

**Research Developments:**

**Implementing the Second Five-Year Plan (2006-2010) at the**

**National Institute for Environmental Studies (Japan)**



Yoshifumi YASUOKA  
Executive Director  
NIES, JAPAN



# NIES Research Facilities



**Cape Hedo**  
(Transboundary air)



**NIES (main campus)**

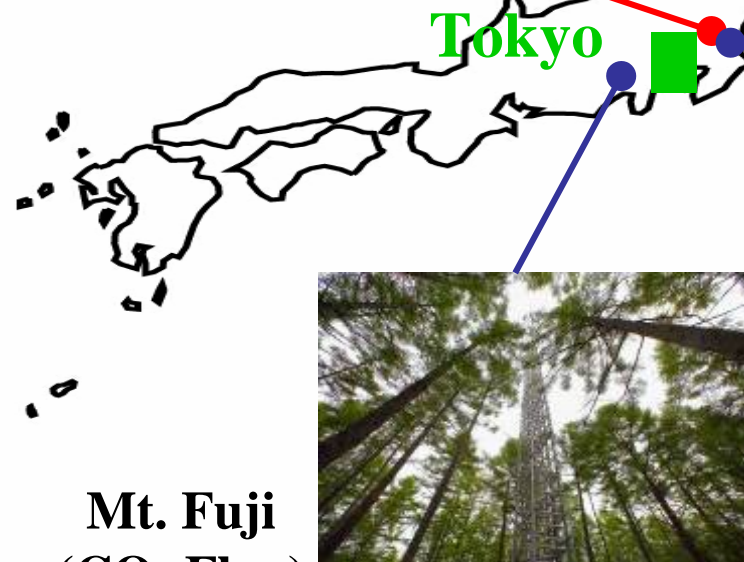


**Teshio**  
(CO<sub>2</sub> Flux)

**Cape Ochi-Ishi**  
(GHGs)



**Hateruma**  
(GHGs)



**Mt. Fuji**  
(CO<sub>2</sub> Flux)



**Lake Kasumigaura**  
(lake environment)



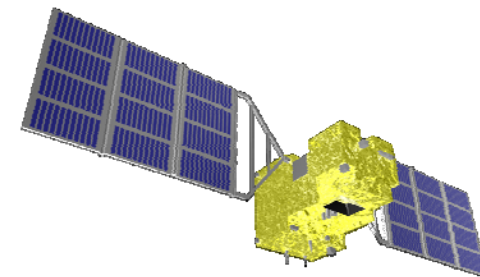
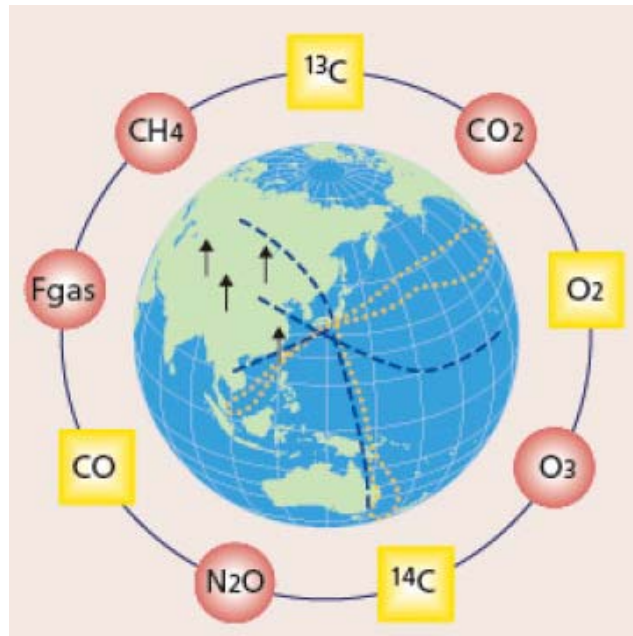
# GHG Monitoring Facilities



**Commercial Ocean Liner  
(Southern Cross)**



**Commercial Air Liner  
(JAL)**

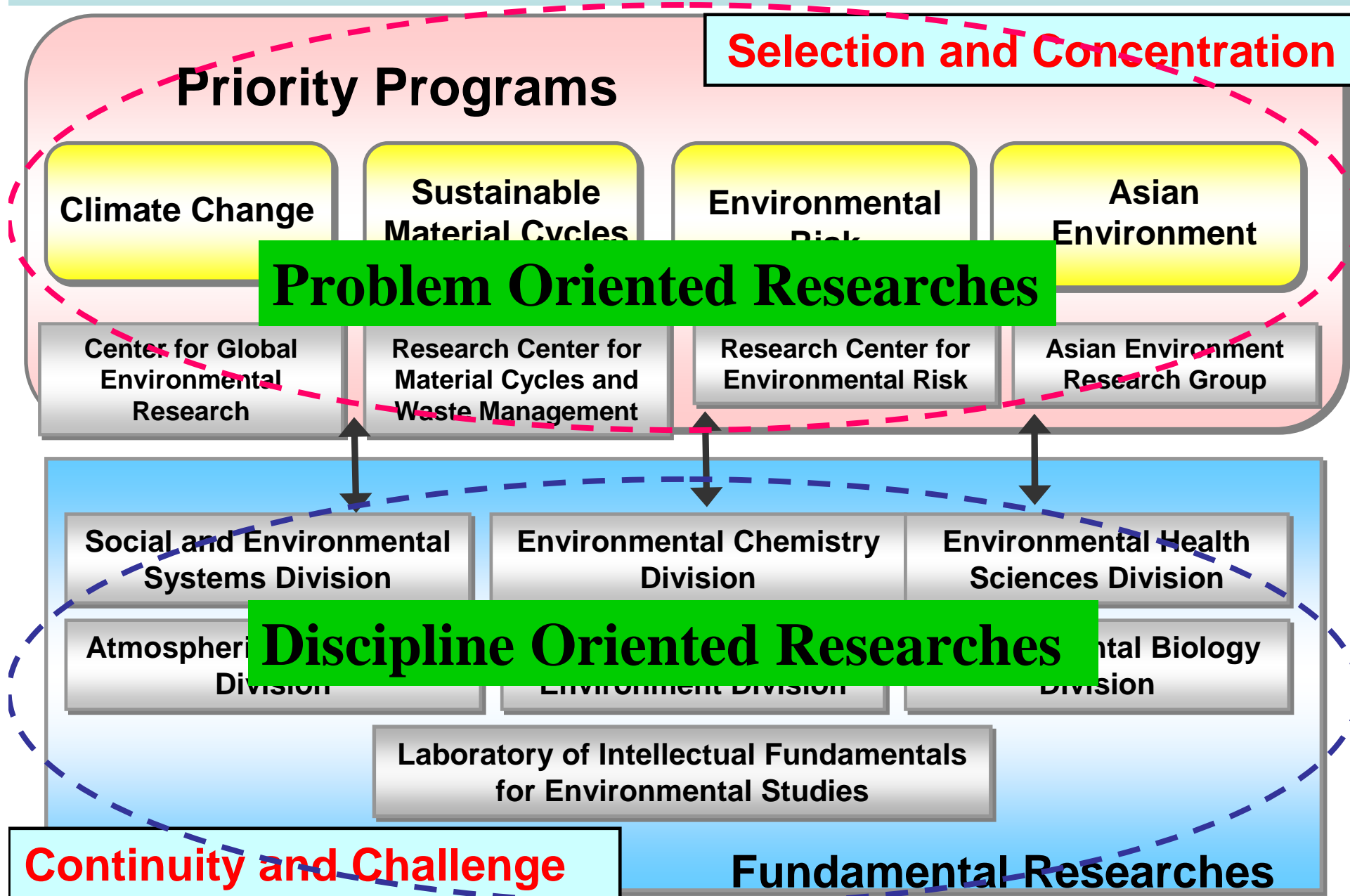


**GOSAT**

**(to be launched on Jan. 21, 2009)**

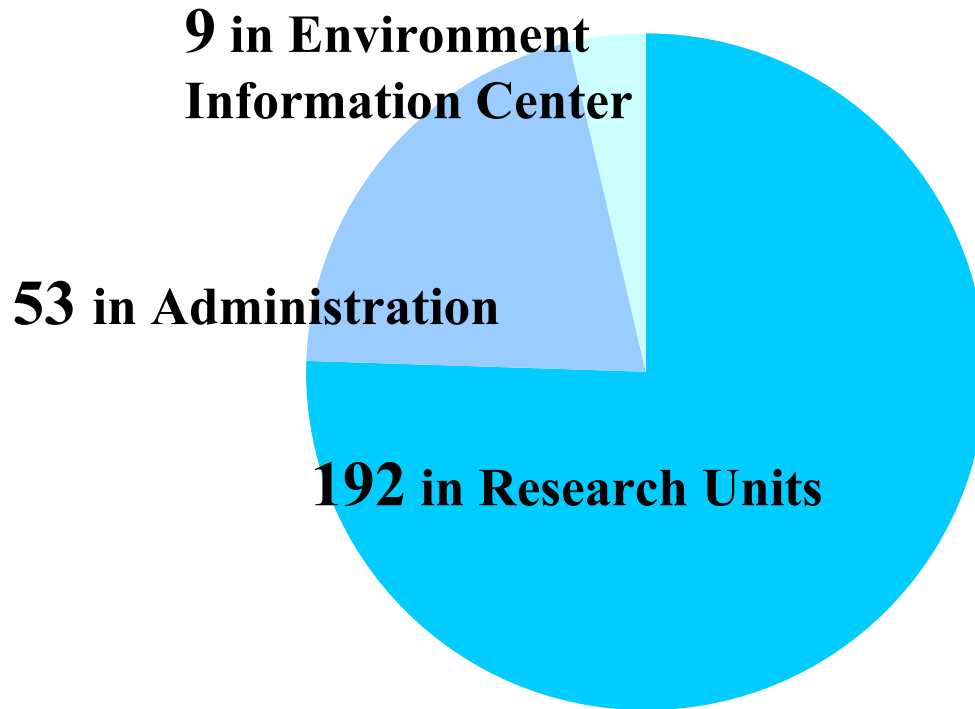
**Monitoring Network over Ocean, Land and Atmosphere**

# Research Framework for the Second Term (2006-10)



# Human Resources

## 254 Permanent Staff



## 603 Other Researchers



**Half of researchers is involved in priority programs**

**As of April 2008**

# Budget

## Revenues

**Category**

**Fiscal 2008**

**Operating grant**                      **9,675,000**

**Subsidy for facilities**              **499,000**

**Commissioned work**                **4,055,000**

**Total**

**14,229,000**

(unit: thousand yen)

**140 Million USD**

## Expenditure

**Category**

**Fiscal 2008**

**Project costs**                        **6,119,000**

**Facility Improvements**            **499,000**

**Expenses for Commissioned work**  
**4,055,000**

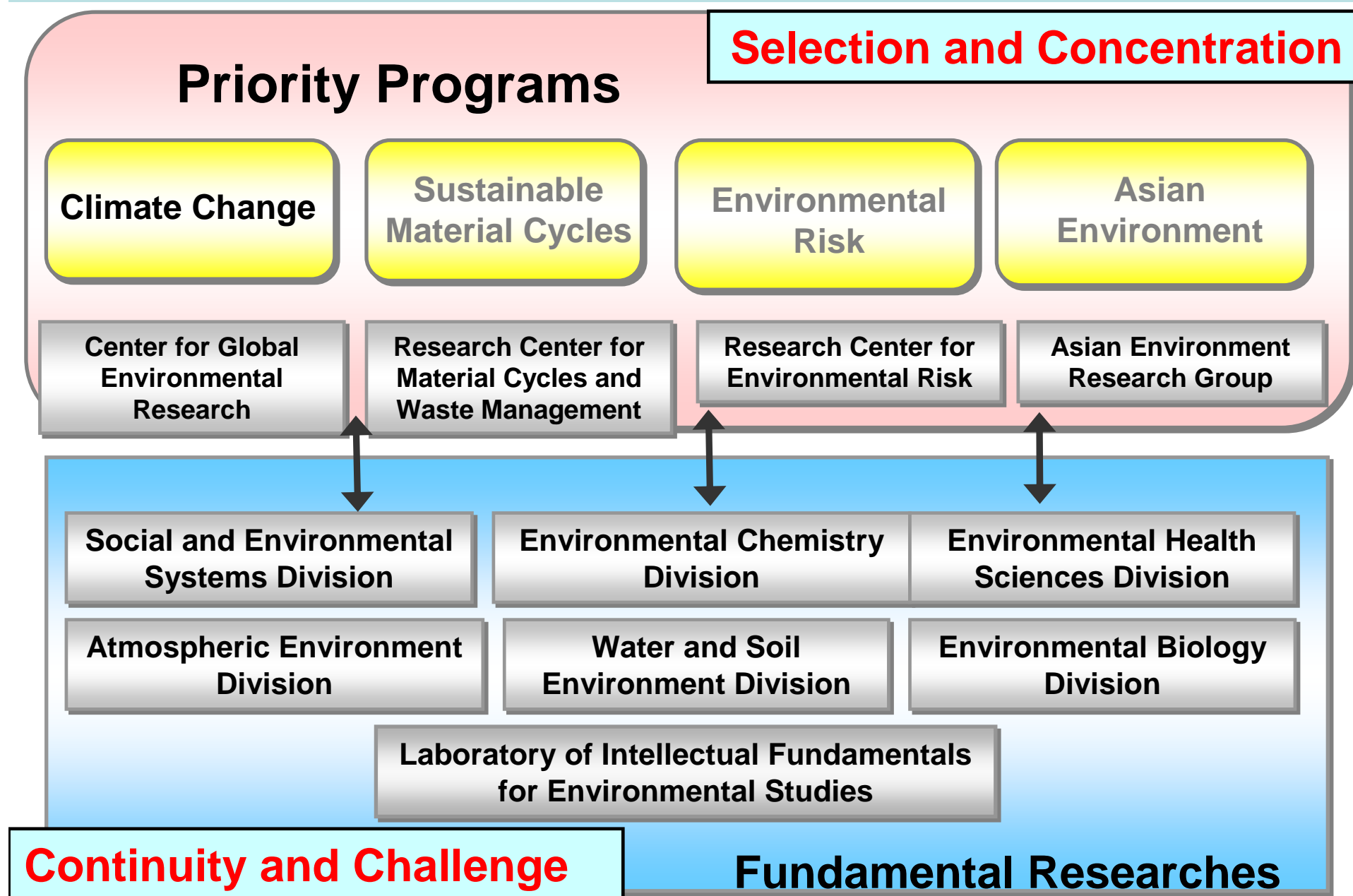
**Personnel expenses**                **3,042,000**

**General administrative expenses**  
**514,000**

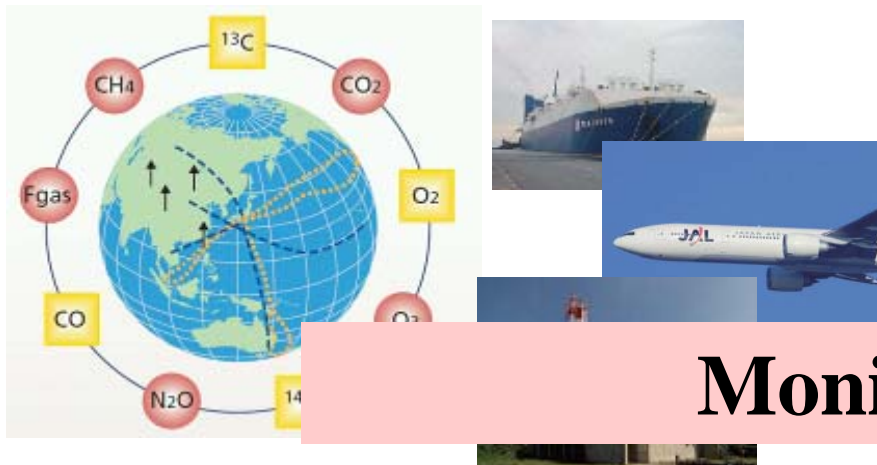
**Total**

**14,229,000**

# Research Framework for Second Five-Year Plan (2006-10)



# Climate Change



## Monitoring

**PJ1: Long-Term GHG Monitoring and Process Studies**



**PJ2: GHG Observation by Satellite (GOSAT)**

## Model Prediction & Assessment



**PJ3: Integrated Assessment of Climate Change Impact & Risk**



## Realization of LCS

**PJ4: Research on Long-Term Vision Toward Low-Carbon Society (LCS)**

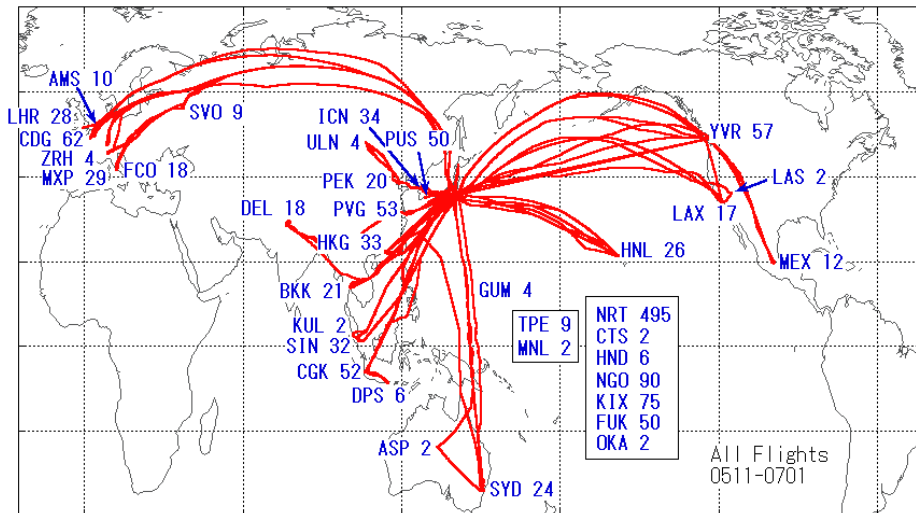


# PJ1: GHGs Monitoring with JAL Aircrafts

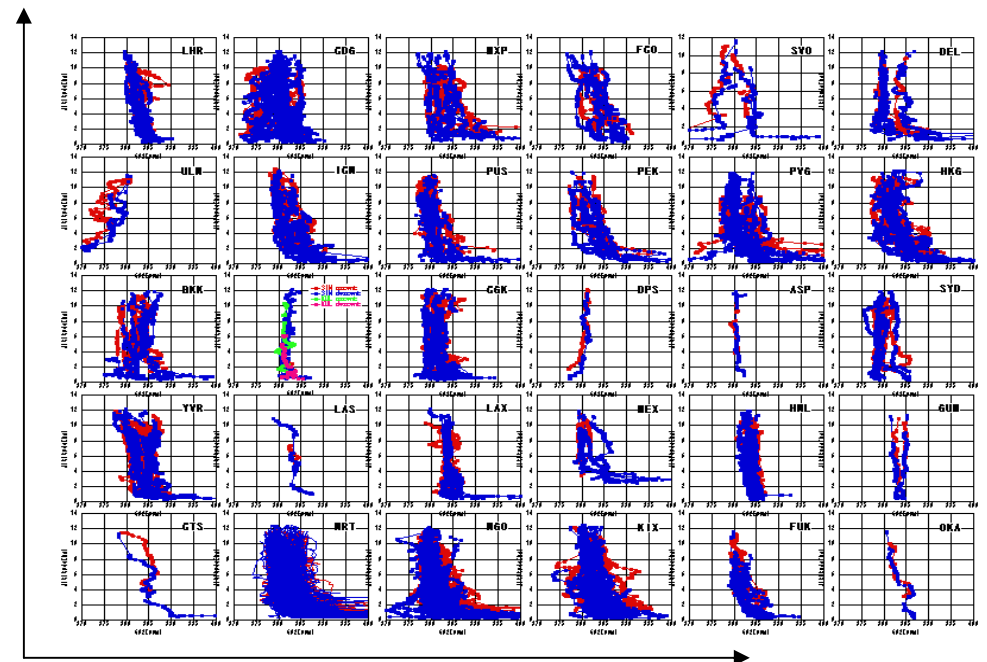


Continental scale observation of GHGs along flight courses and at airports

Height (Feet)



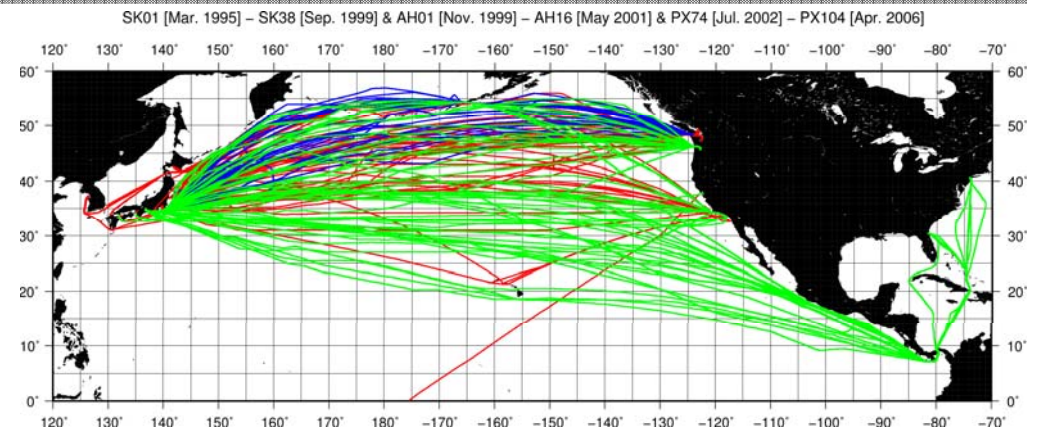
Flight courses



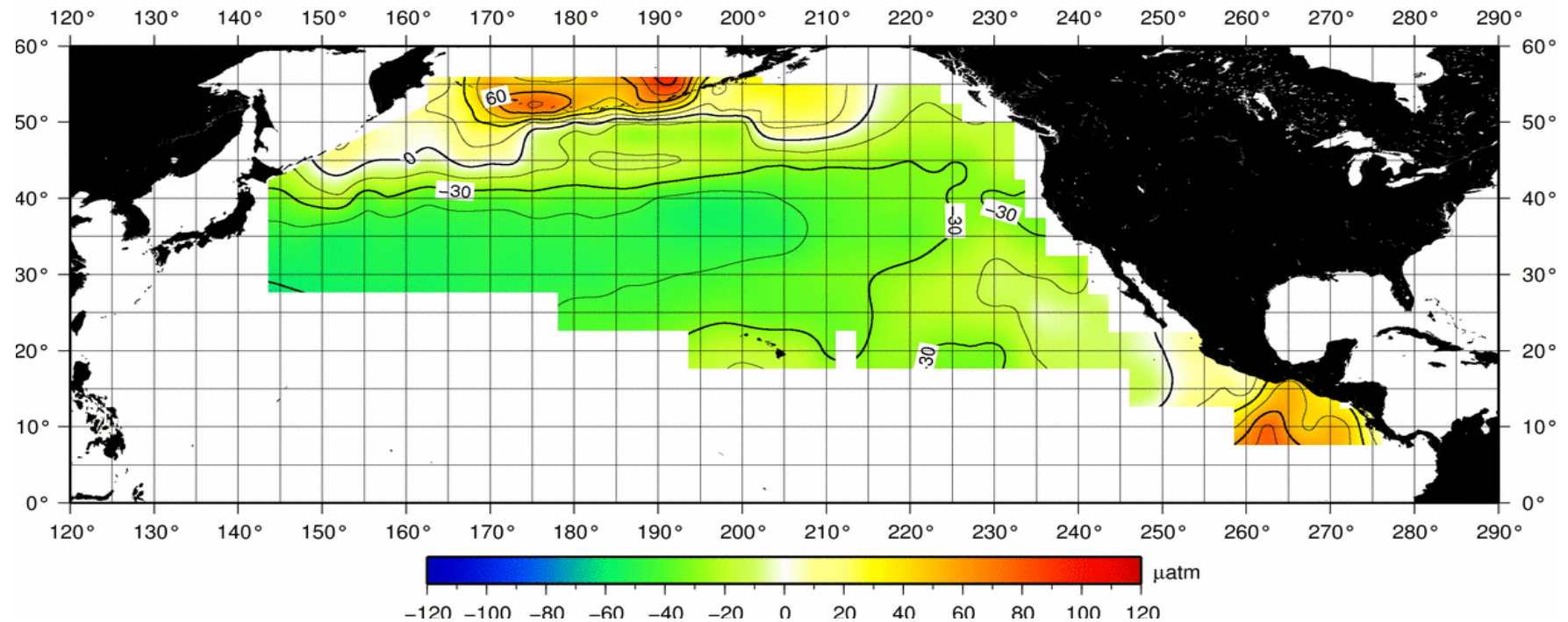
CO2 density (ppm)  
at each airport

Data from 2005/11 to 2007/01 by 5 aircraft

# PJ1: pCO<sub>2</sub> Observation over Ocean (M/S Transfuture 5)

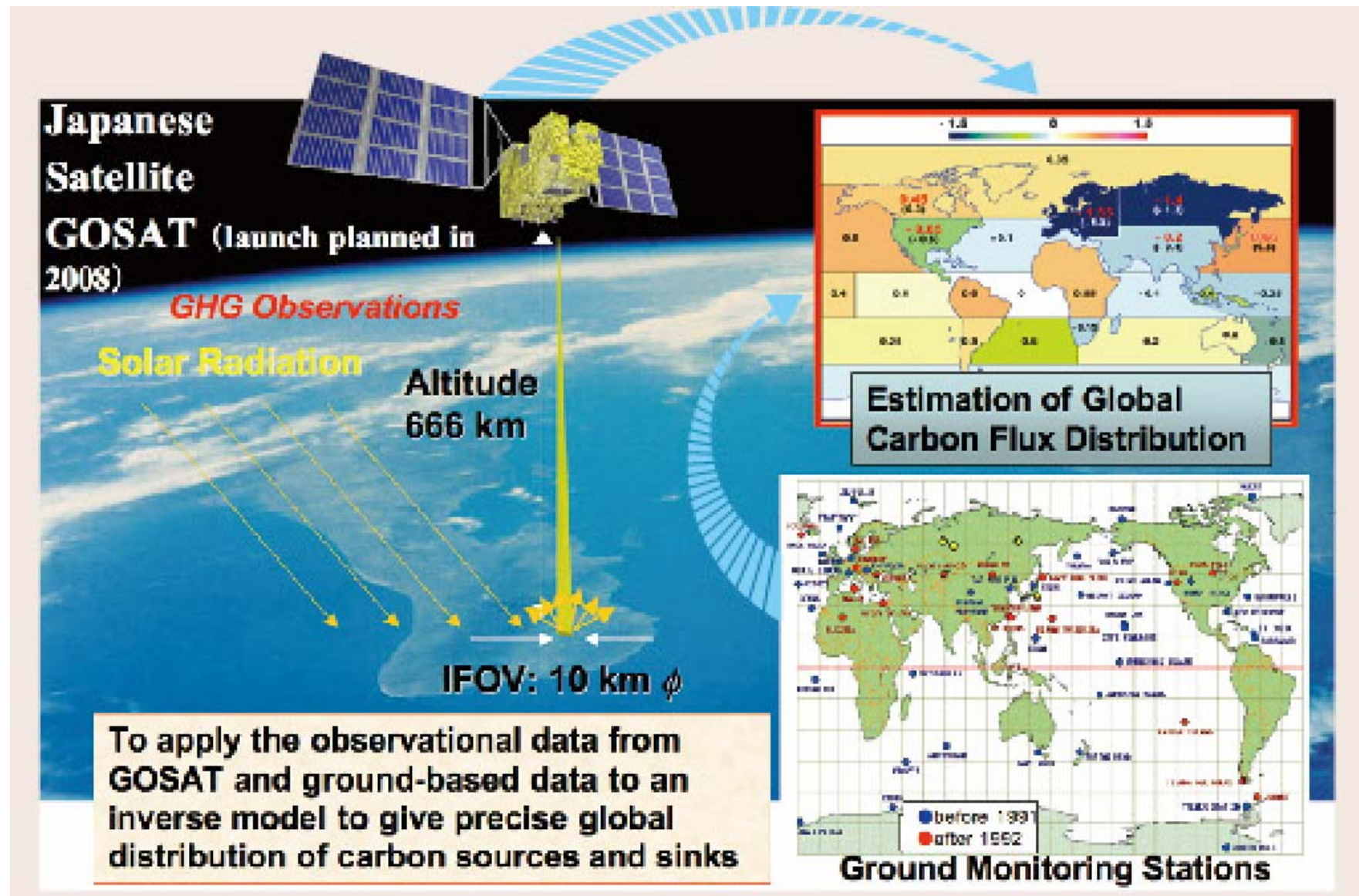


January

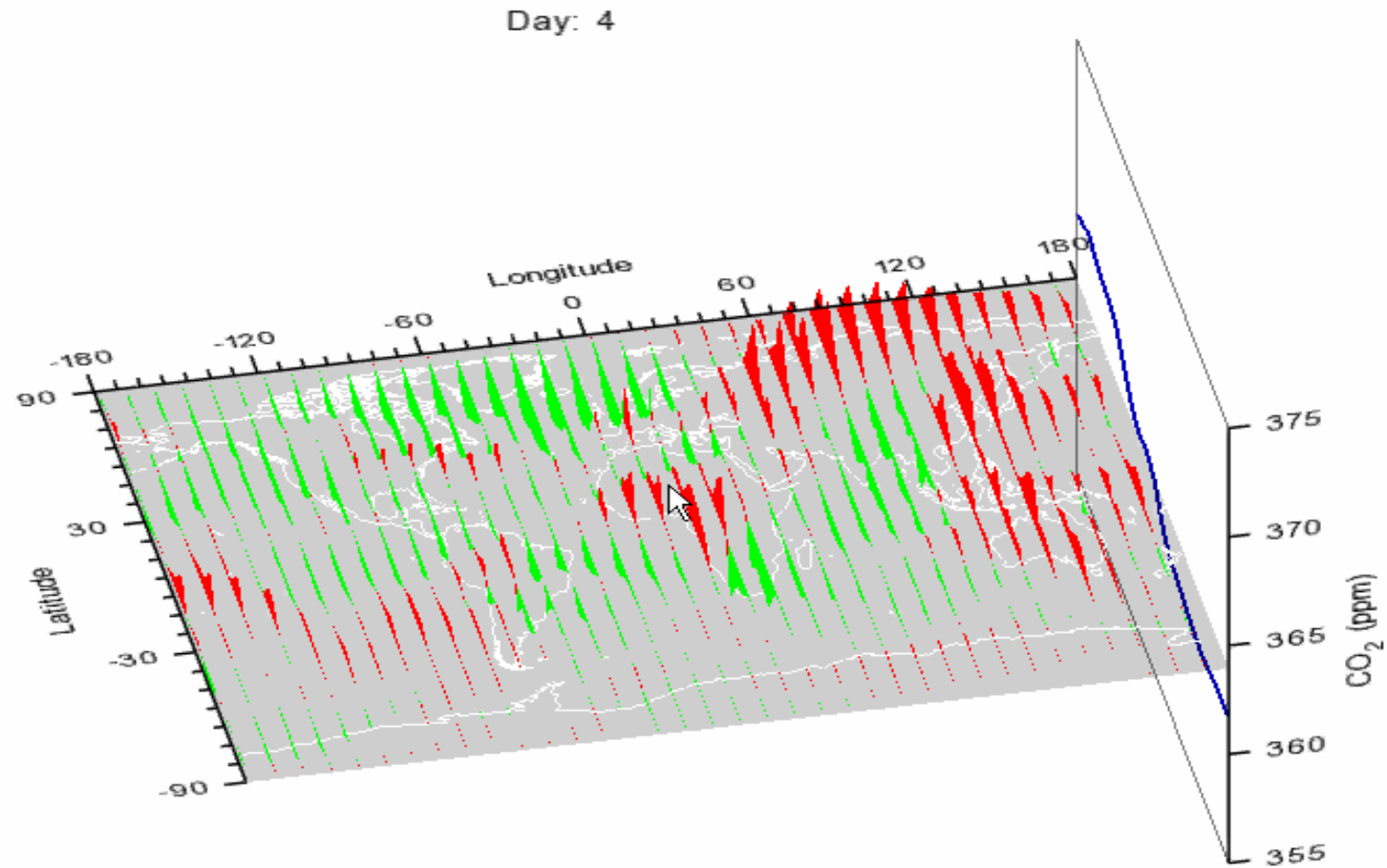




## PJ2: Greenhouse gas observation from space (GOSAT; to be launched on Jan. 21, 2009)



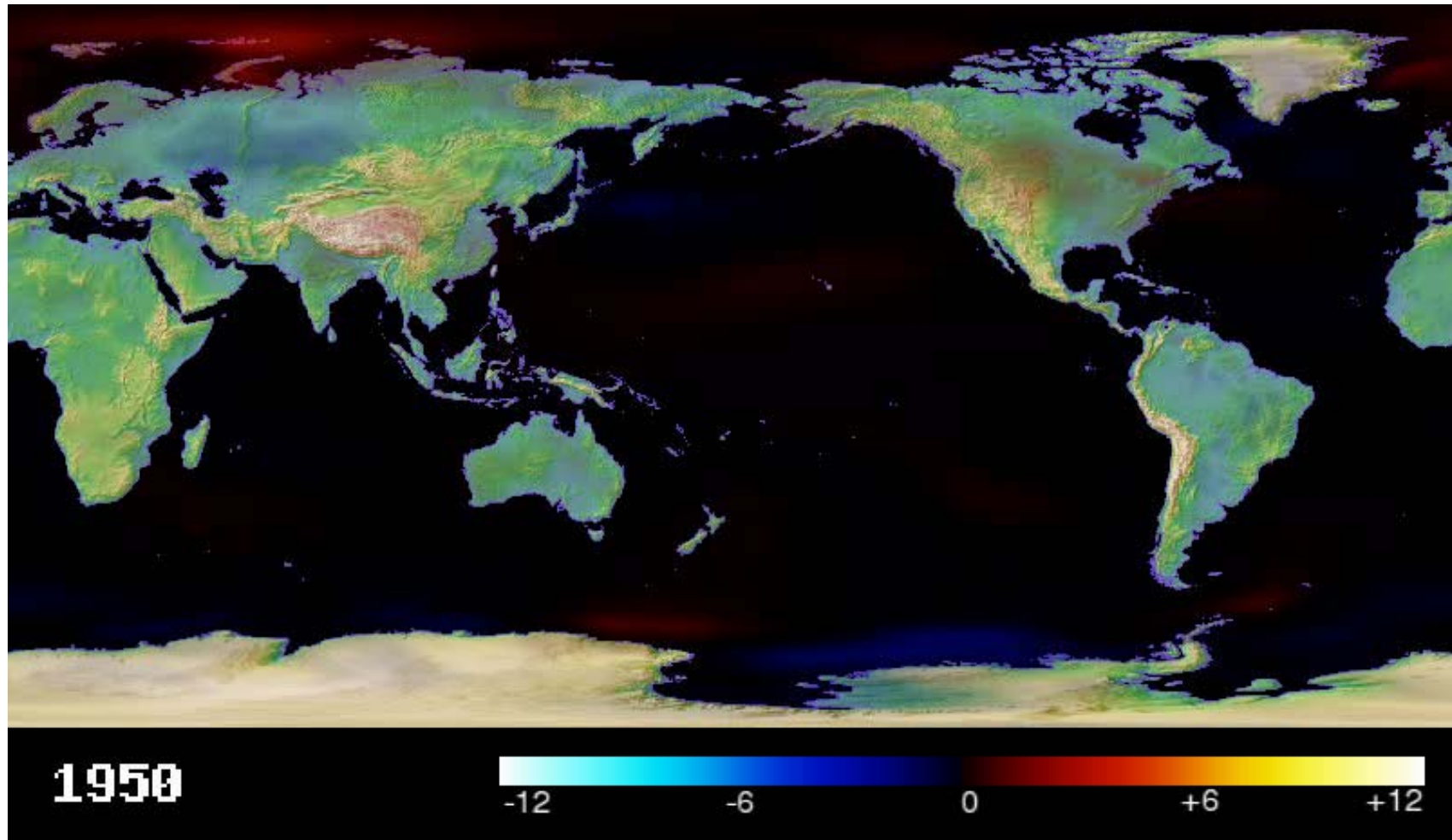
# GOSAT



**Simulated Global CO<sub>2</sub> Distribution for GOSAT**



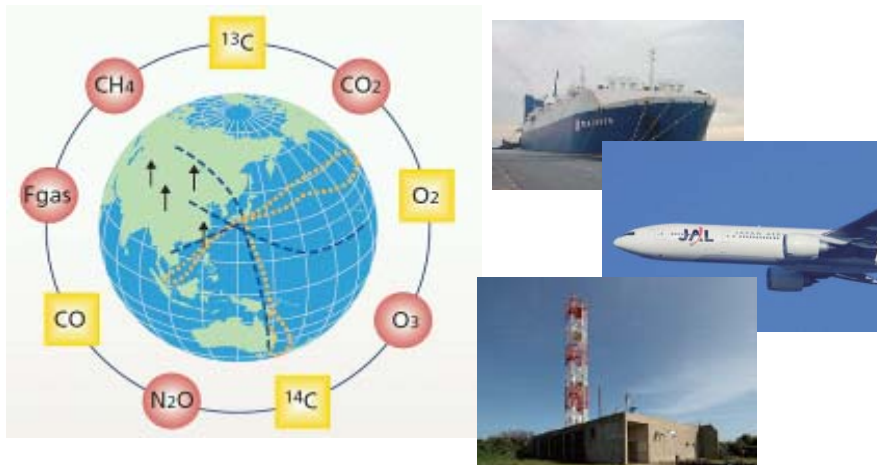
## PJ3: Prediction and Assessment of Climate Change (NIES-CCSR-FRCGC GCM Model)



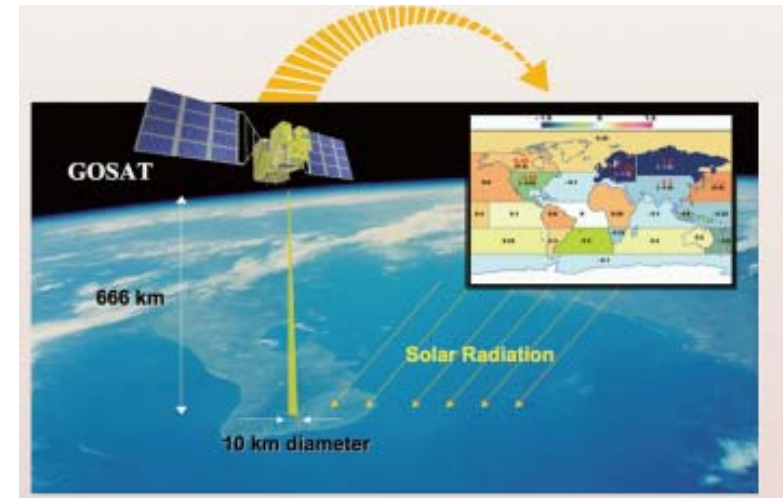
Prediction of Temperature up to 2100 with Earth Simulator  
(RR2002 Project sponsored by MEXT; contributed to IPCC AR4)

Red heat hell

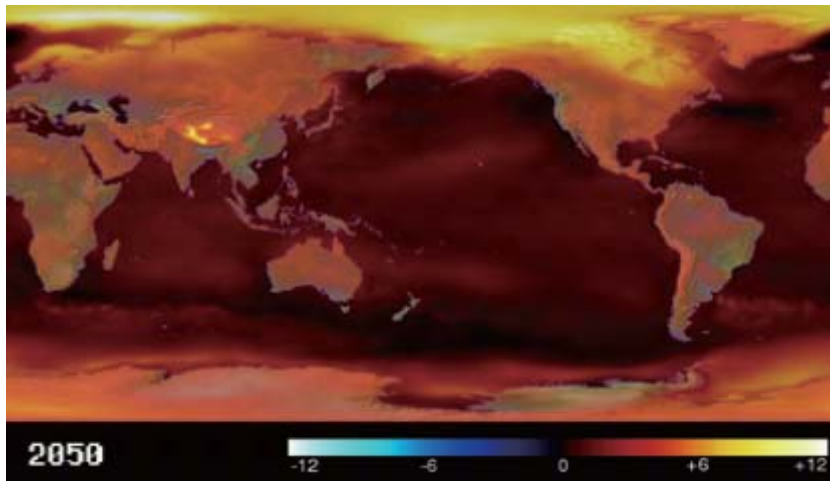
# Climate Change



**PJ1: Long-Term GHG Monitoring and Process Studies**



**PJ2: GHG Observation by Satellite (GOSAT)**



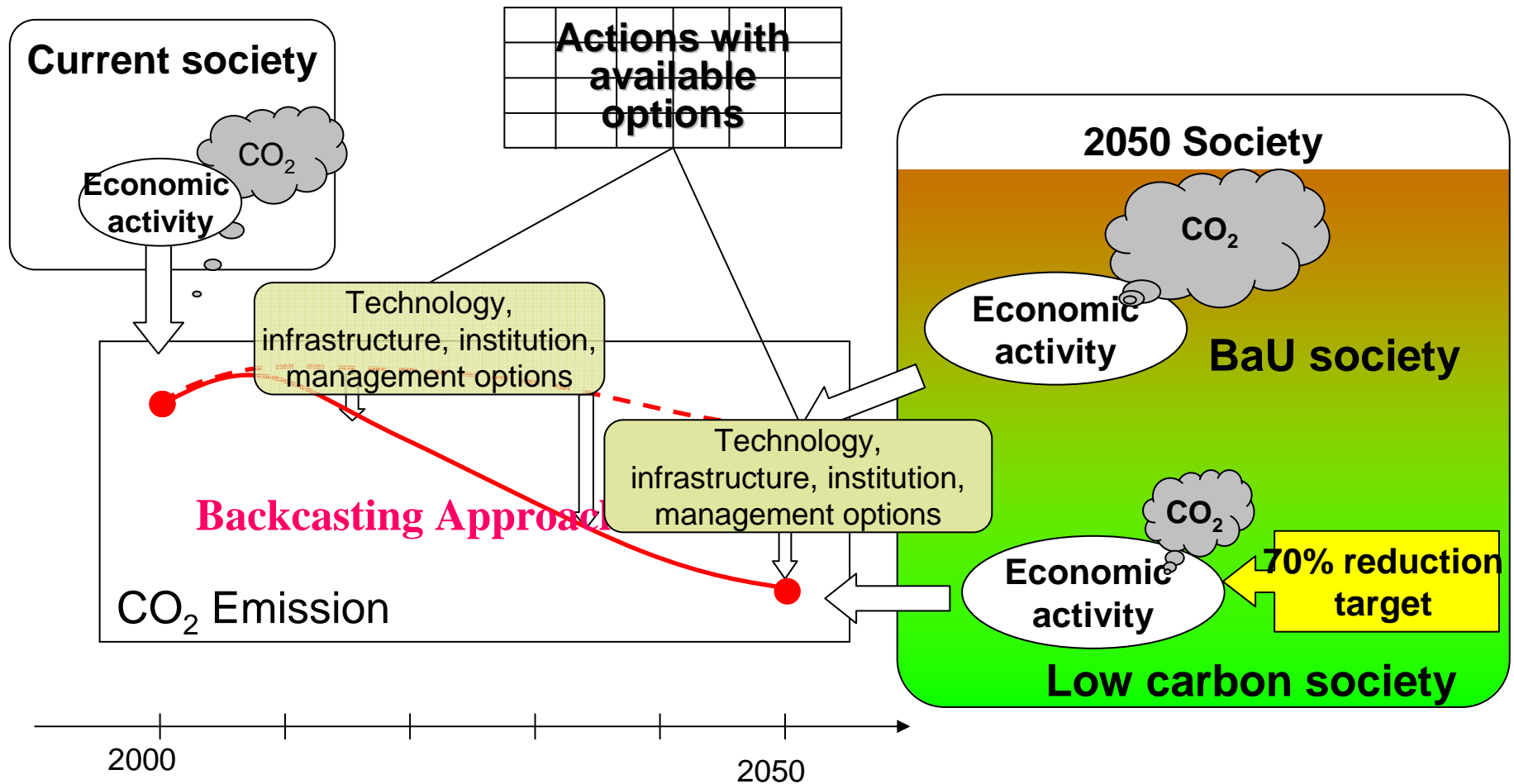
**PJ3: Integrated Assessment of Climate Change Impact & Risk**

## Realization of LCS



**PJ4: Research on Long-Term Vision Toward Low-Carbon Society (LCS)**

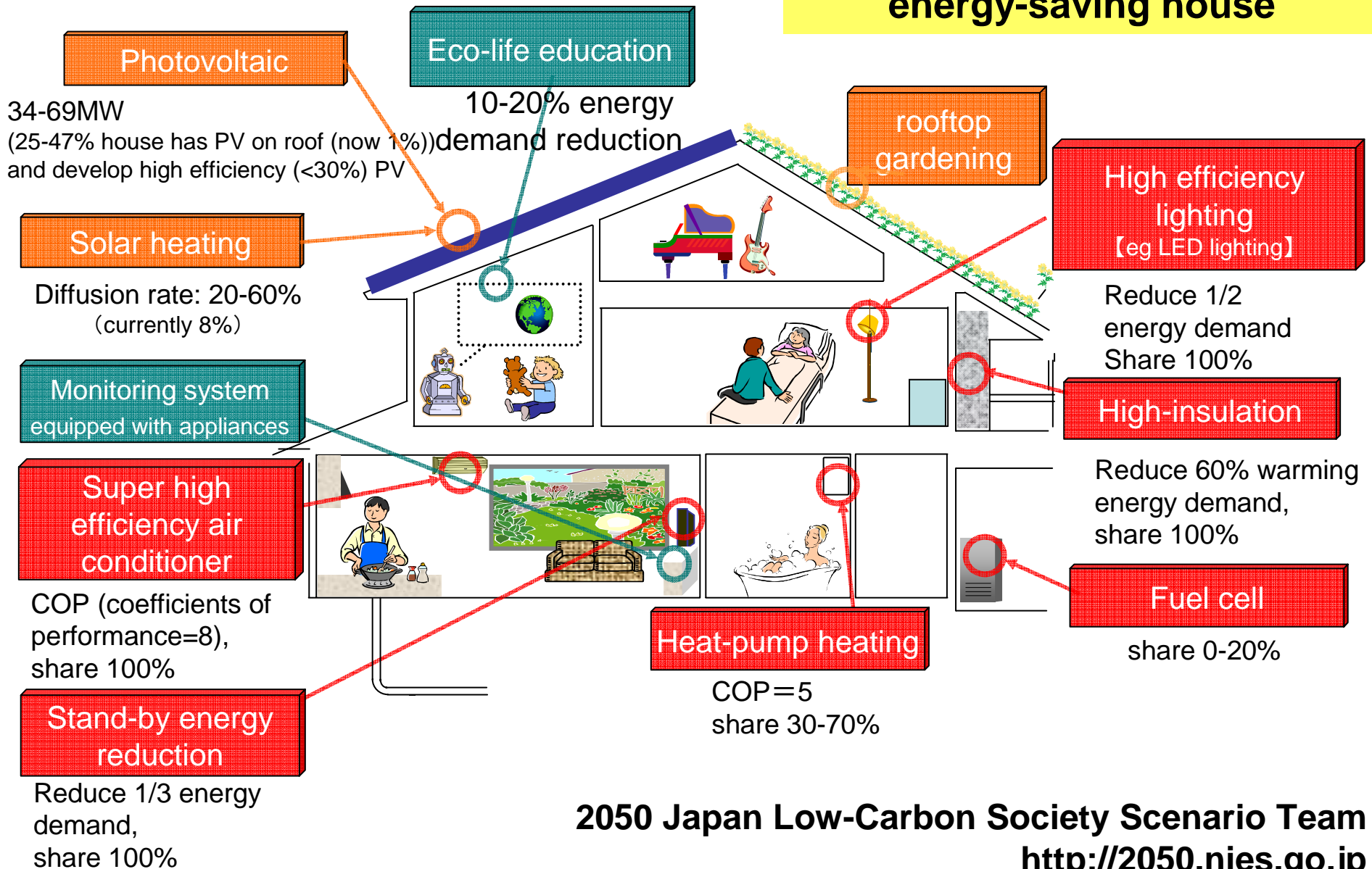
# PJ4: Developing Visions for a Low Carbon Society (LCS) and Integrated Analysis of Climate Policies



**Backcasting Approach for CO<sub>2</sub> Reduction by 70 % up to 2050**

# LCS house in 2050

## Comfortable and energy-saving house





# Intergovernmental Panel on Climate Change, IPCC awarded 2007 Nobel Peace Prize



Several NIES researchers were Lead Authors of the IPCC Fourth Assessment Report

Significant contributions were made to producing the report and providing scientific data on climate change



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



PRESENTED TO

**MIKIKO KAINUMA**

FOR CONTRIBUTING TO THE AWARD OF THE

**NOBEL PEACE PRIZE**

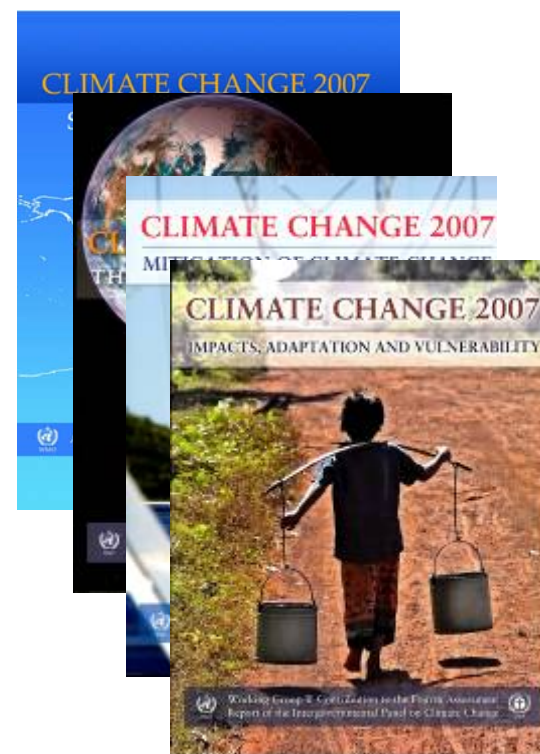
FOR 2007 TO THE IPCC

*R. K. Pachauri*

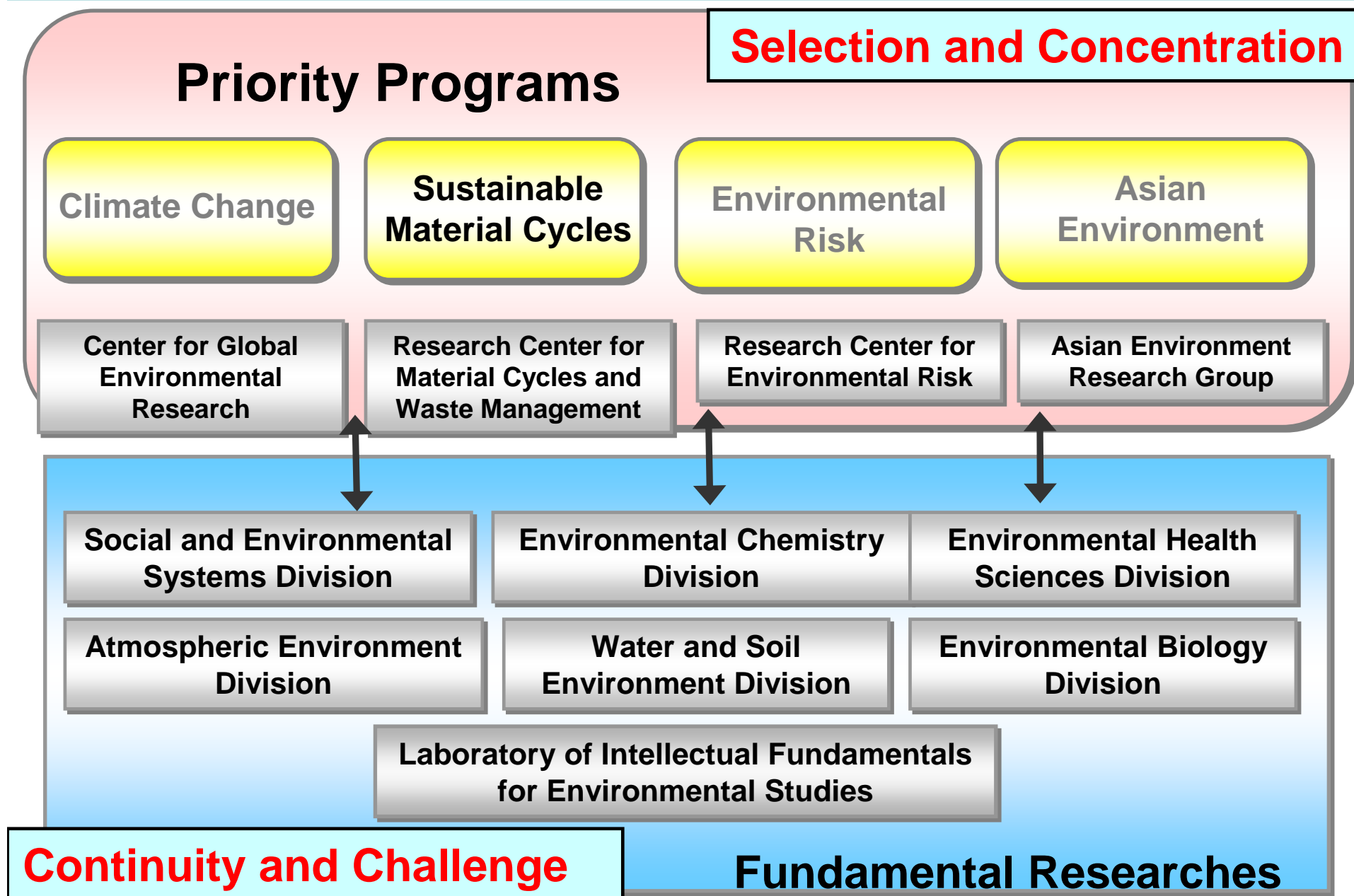
R. K. Pachauri  
IPCC Chairman

*R. Christ*

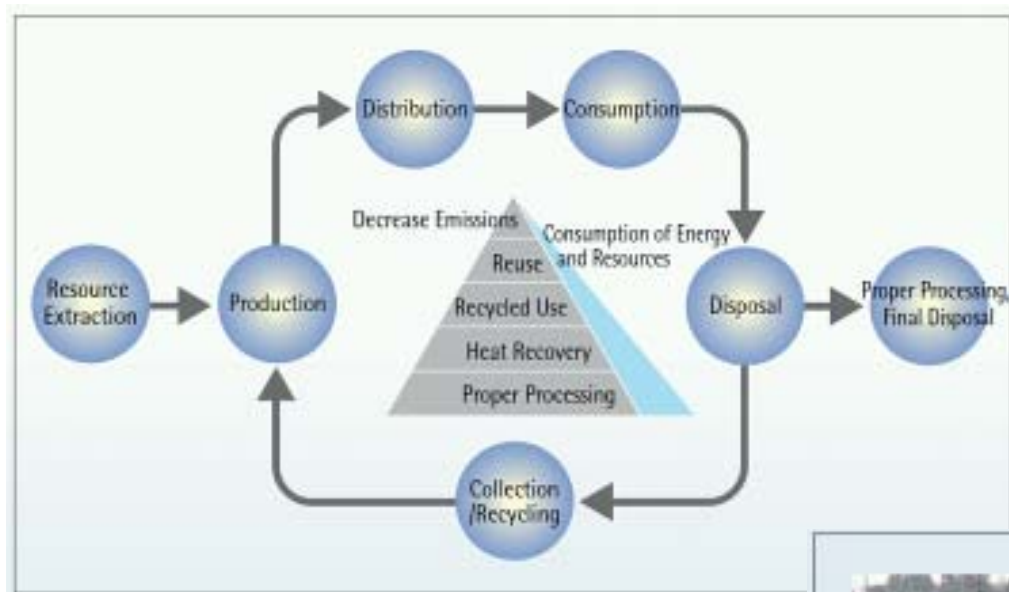
R. Christ  
IPCC Secretary



# Research Framework for Second Five-Year Plan (2006-10)



# Sustainable Material Cycles (1)



PJ1:

Assessment Method for  
Managing **Material Cycle**  
**Systems**

PJ2:

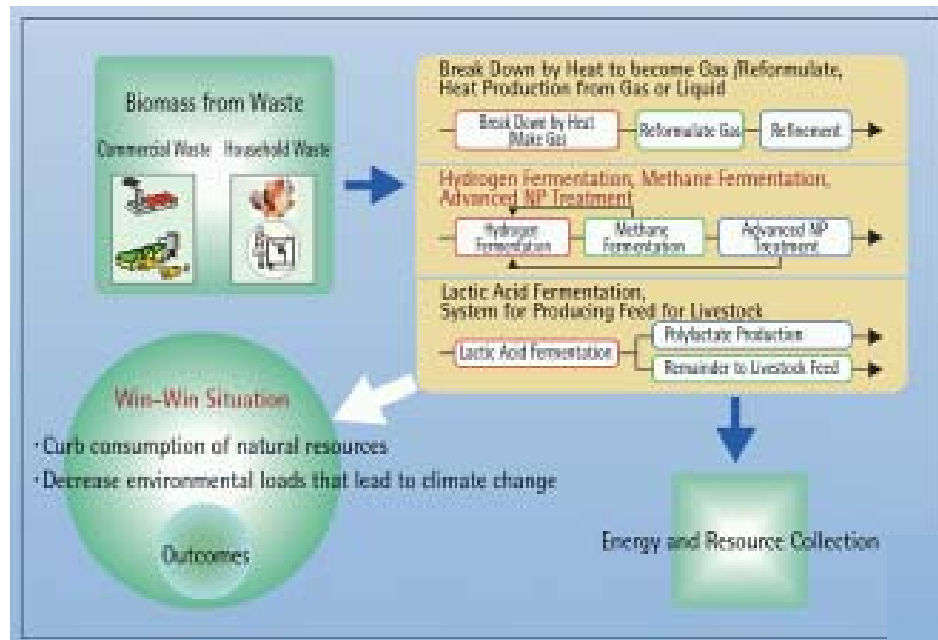
Management Method for  
**Hazardous and/or Recyclable**  
**Materials**



# Sustainable Material Cycles (2)

PJ3:

Strategic Material Cycle **Technology Development for Waste Biomass**



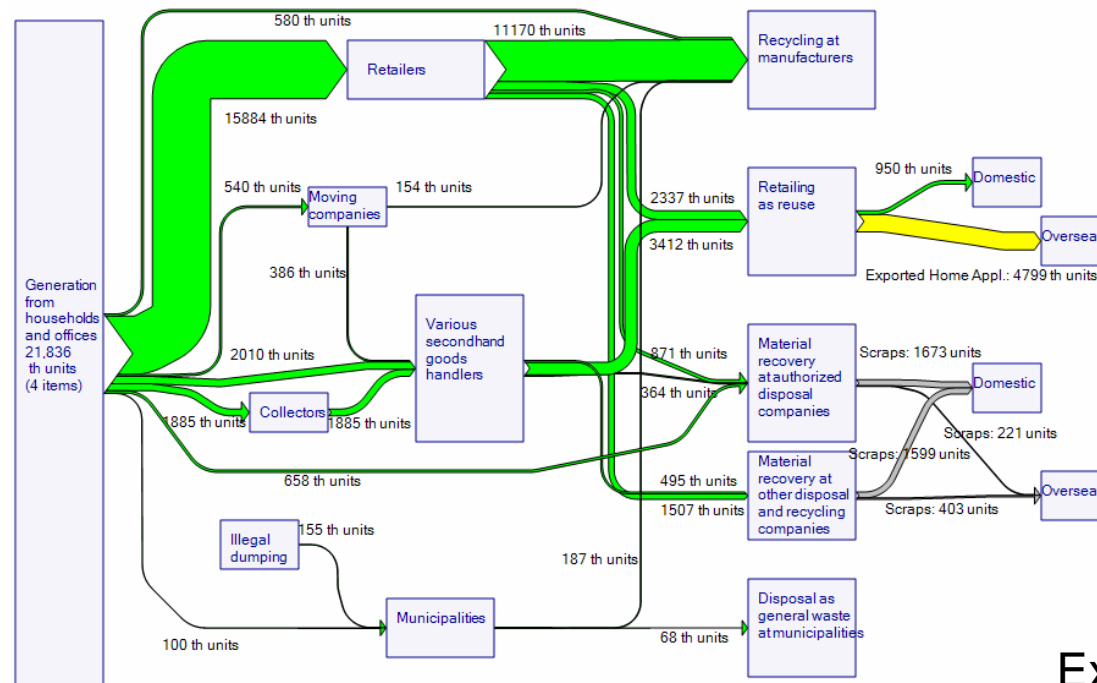
PJ4:

Development of Network for Managing **International Material Cycles**





# PJ4: Establishing appropriate management networks and technological systems to support **sound international material cycles**



**Estimation of domestic material flow**

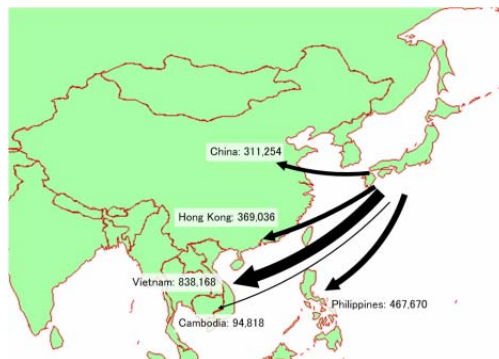
**Secondhand exports**

**"Invisible flow"**

**Scrap metal exports**



Export number is estimated to be 4.8 million in FY2007.

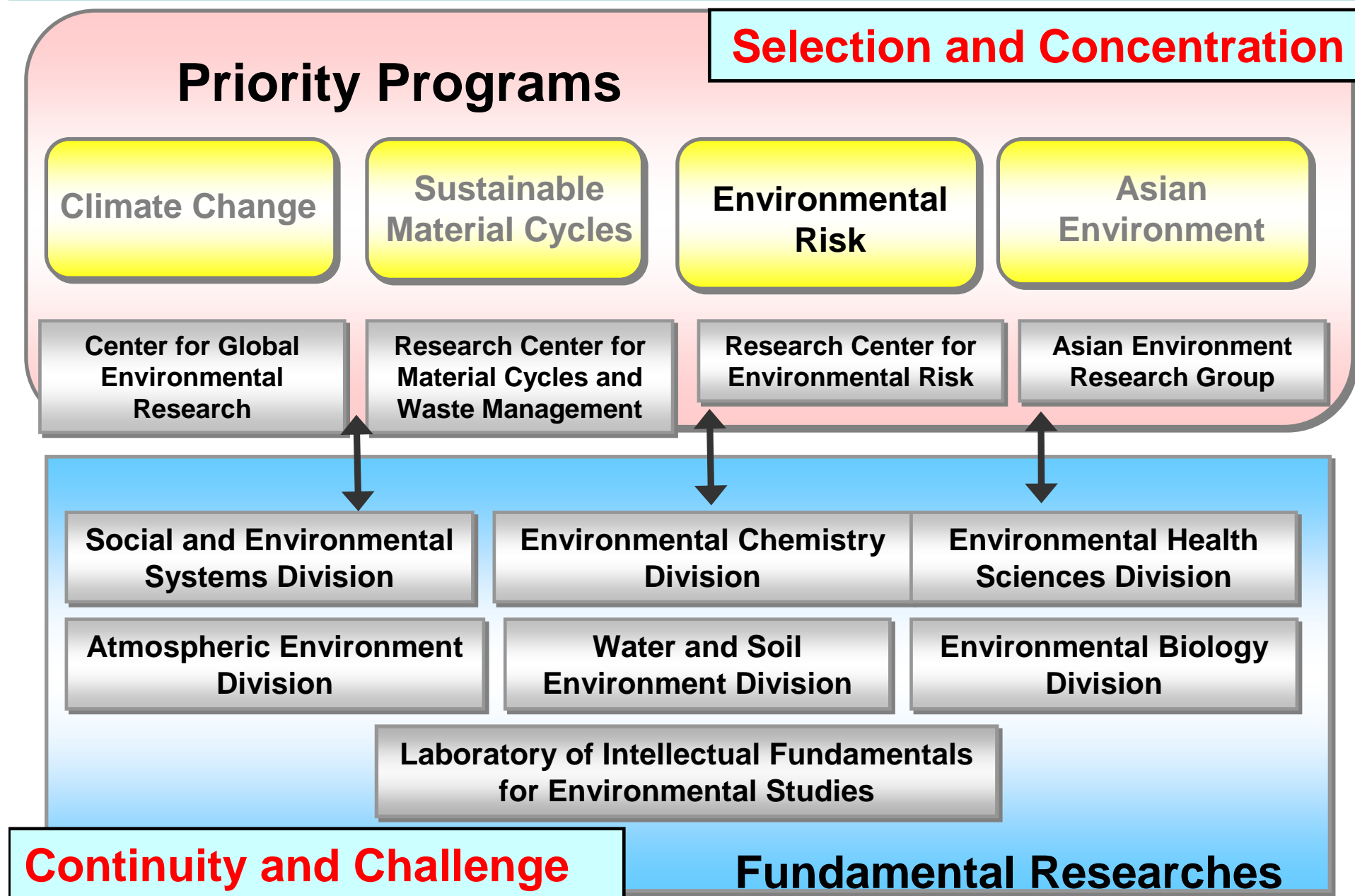


Mixed metal scrap was analyzed and many air conditioners are found.

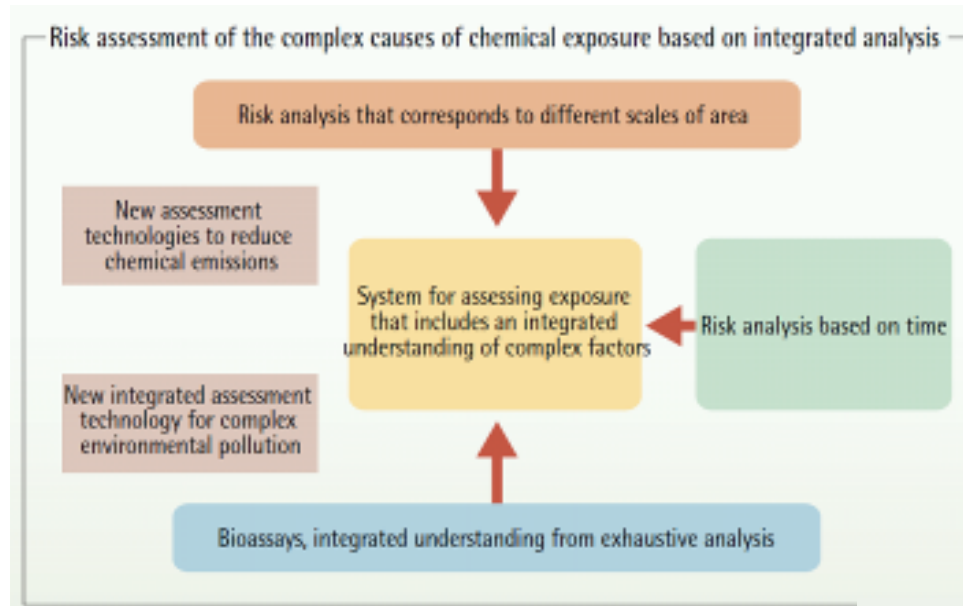


**Flow of secondhand CRT TVs (2007)**

# Research Framework for Second Five-Year Plan (2006-10)



# Environmental Risk (1)

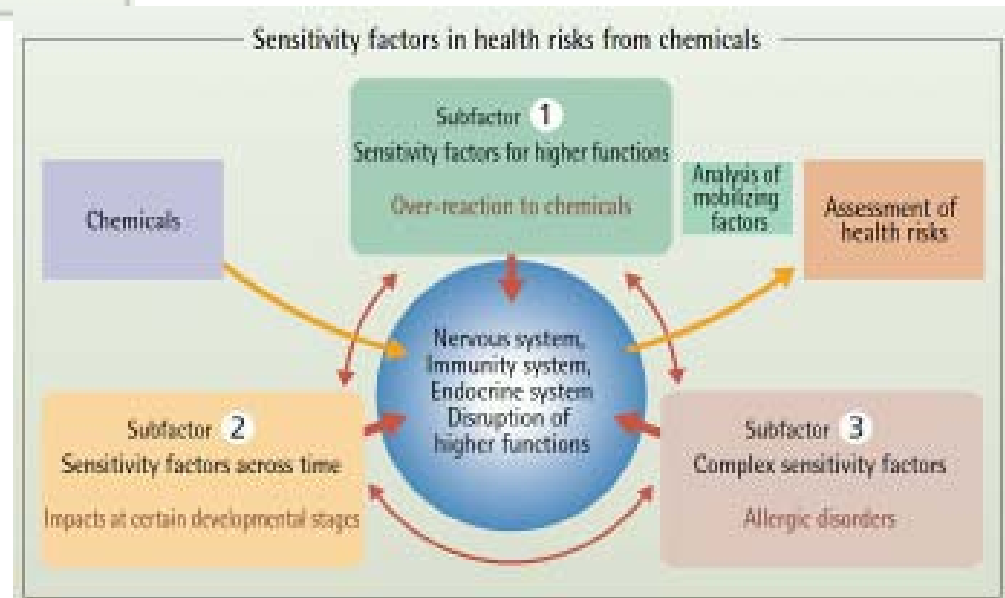


PJ1:

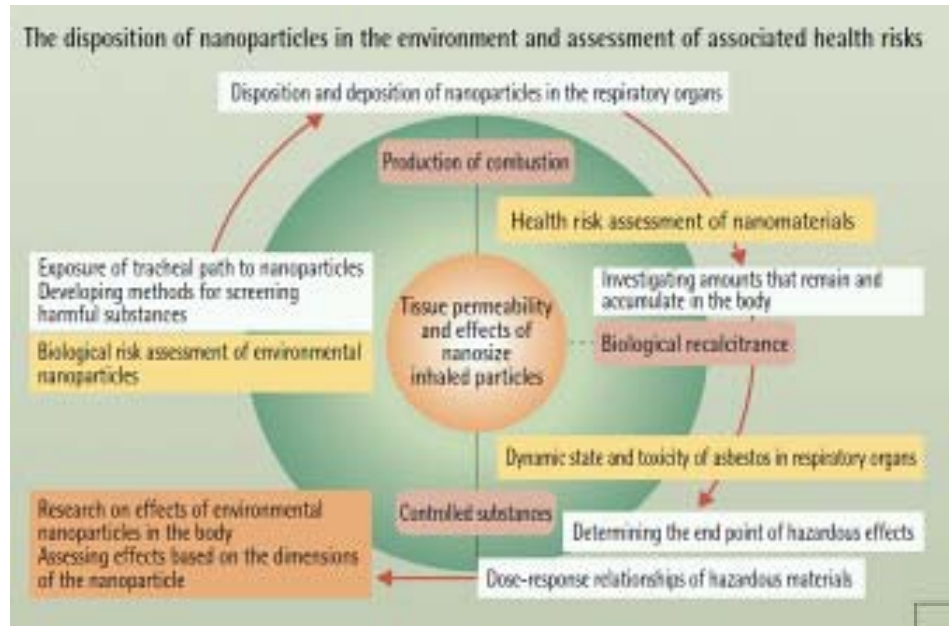
**Cumulative Effect Assessment for Exposure to Various Chemicals**

PJ2:

**Environmental Health Impact Assessment for Personal Sensitivity Difference**



# Environmental Risk (2)

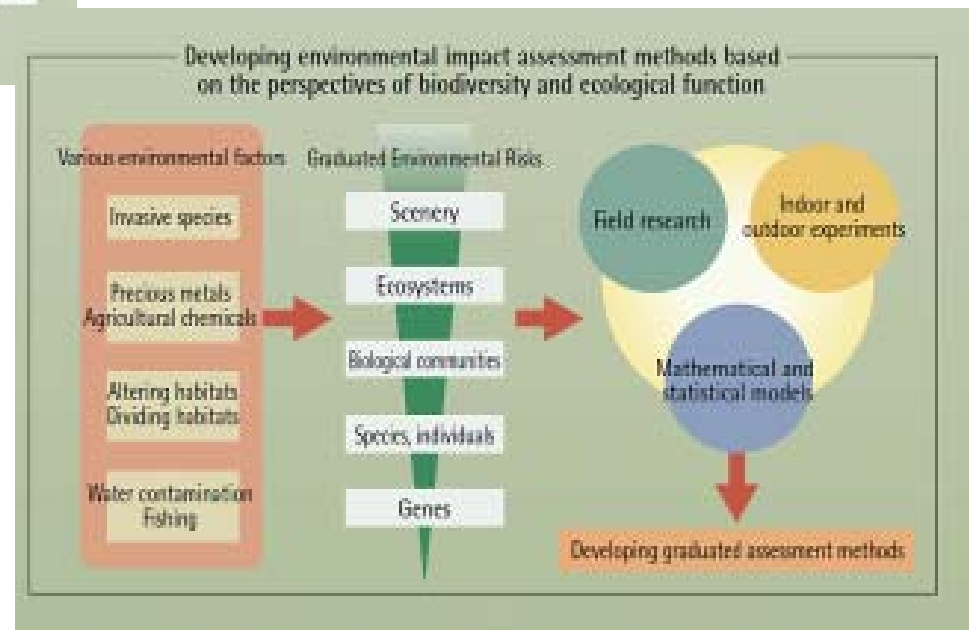


PJ3:

## Environmental Fate of Nano-Particulates and Environmental Impact Assessment

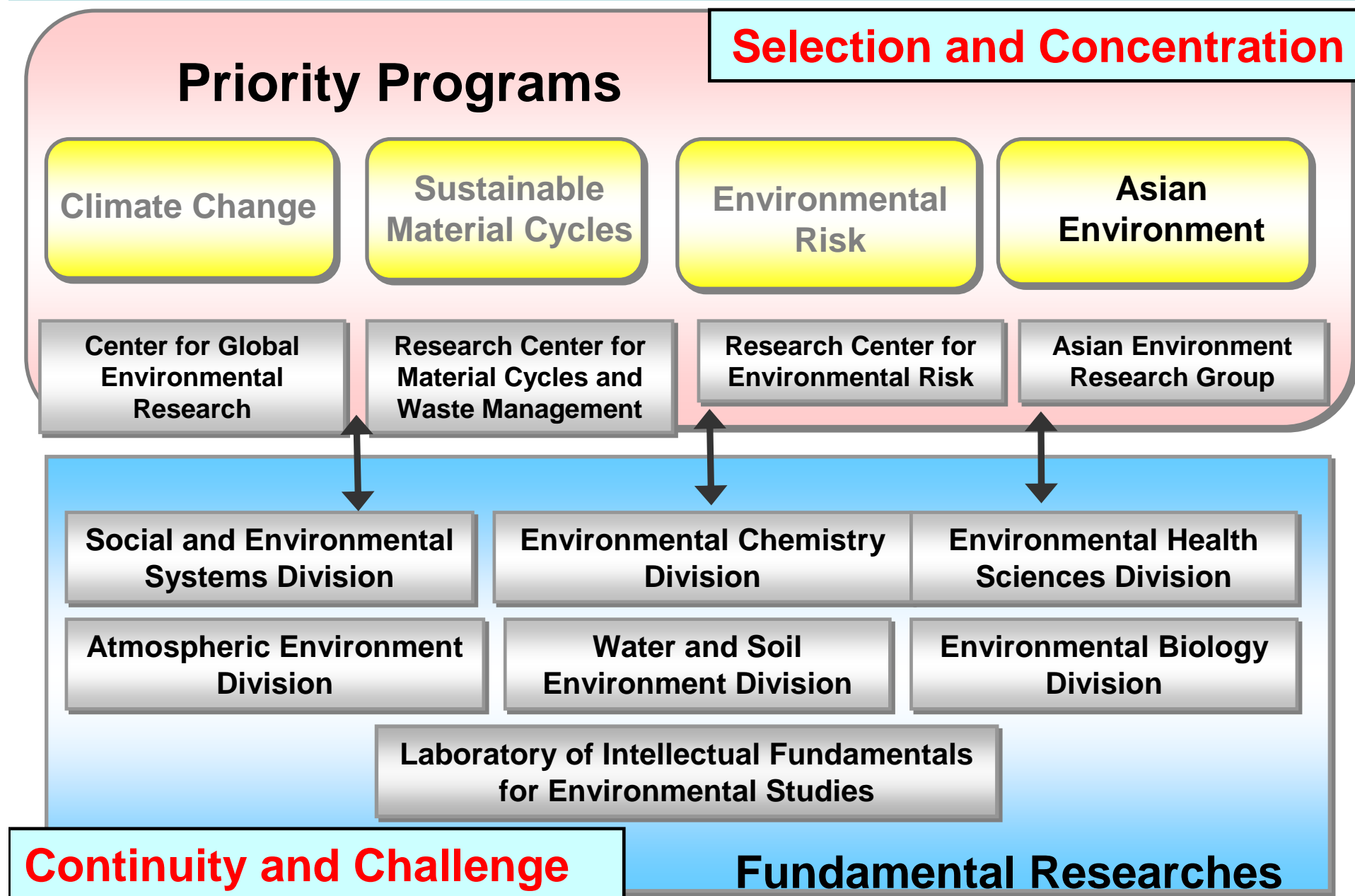
PJ4:

## Biodiversity & Ecological Environmental Impact Assessment





# Research Framework for Second Five-Year Plan (2006-10)



# Asian Environment (1)



**PJ1:**

**Development of Assessment  
Method for Asian  
Atmospheric Environment**

**PJ2:**

**Development of Water-Circulation &  
Natural Material Cycles Assessment  
Method in East Asia**



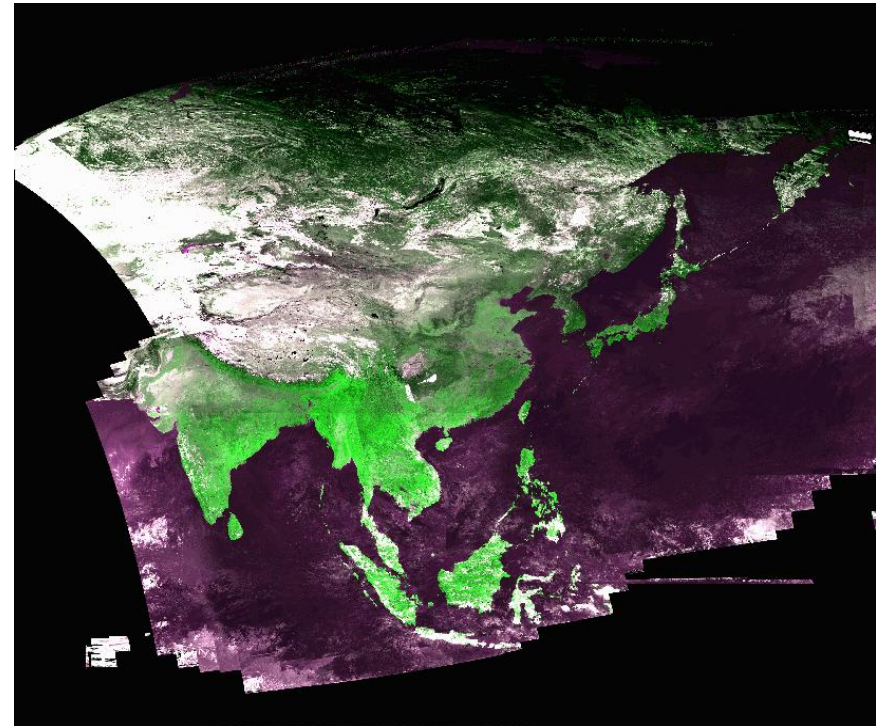
## Asian Environment (2)



**Observation of Land Surface Parameters  
from Satellite (NOAA/AVHRR, MODIS)**

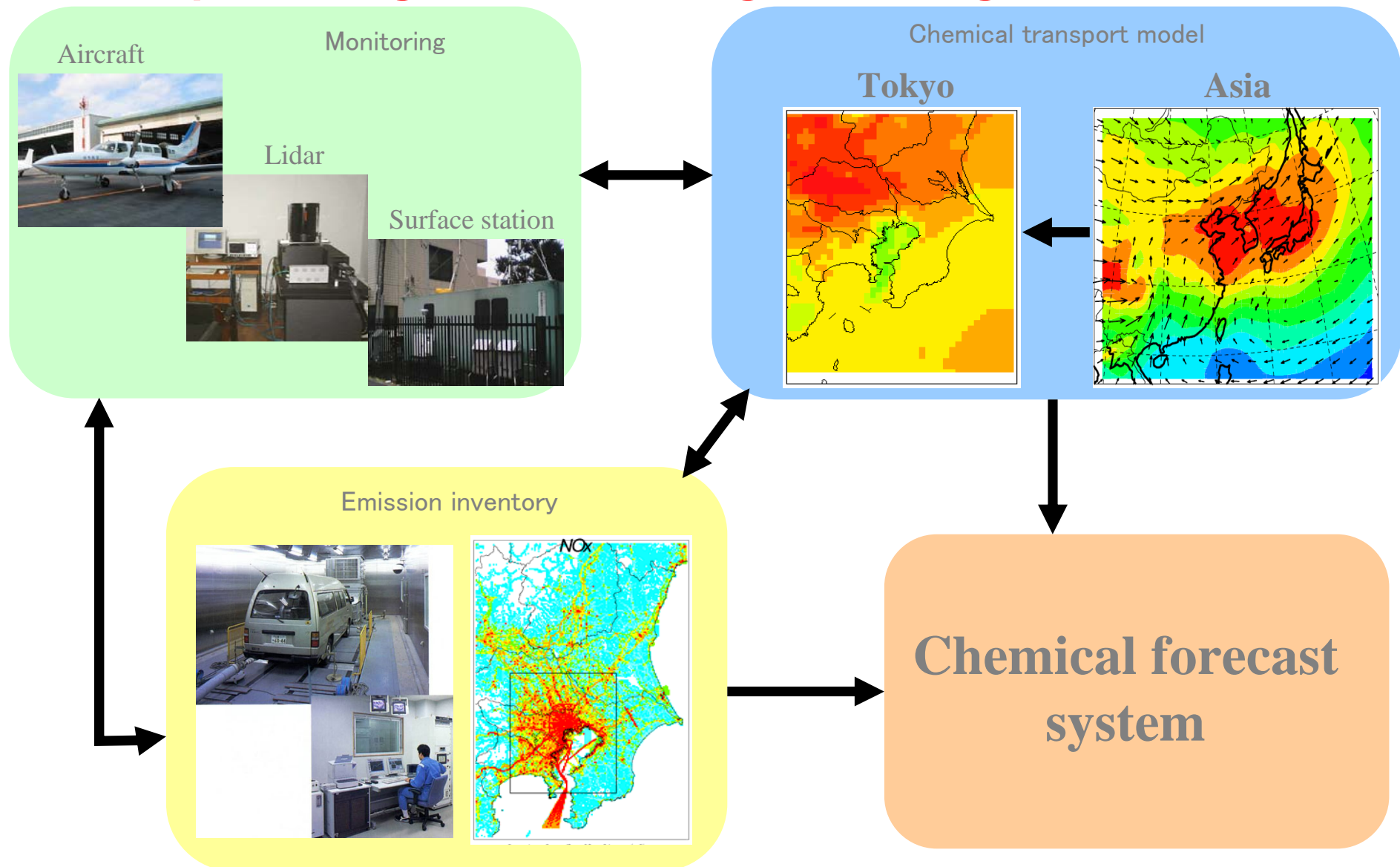
**PJ3:**

**Environmental Impact  
Assessment Method for  
Watershed Ecosystems**



# PJ1: Development of Assessment Method for Asian Atmospheric Environment

**Concept: Linkage of monitoring, modeling and inventories**





# Forecast System

**【Region】** East Asia, Japan, Tokyo

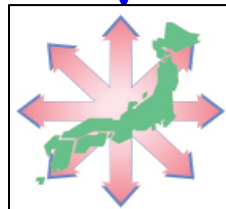
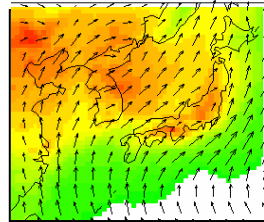
**【Period】** two days forecast

**【Pollutants】** O<sub>3</sub>, NO<sub>2</sub>, PM<sub>2.5</sub> etc.

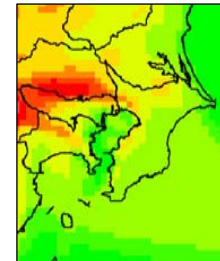
Weather forecast  
(JMA)

Emission inventory  
(REAS/EAGRID)

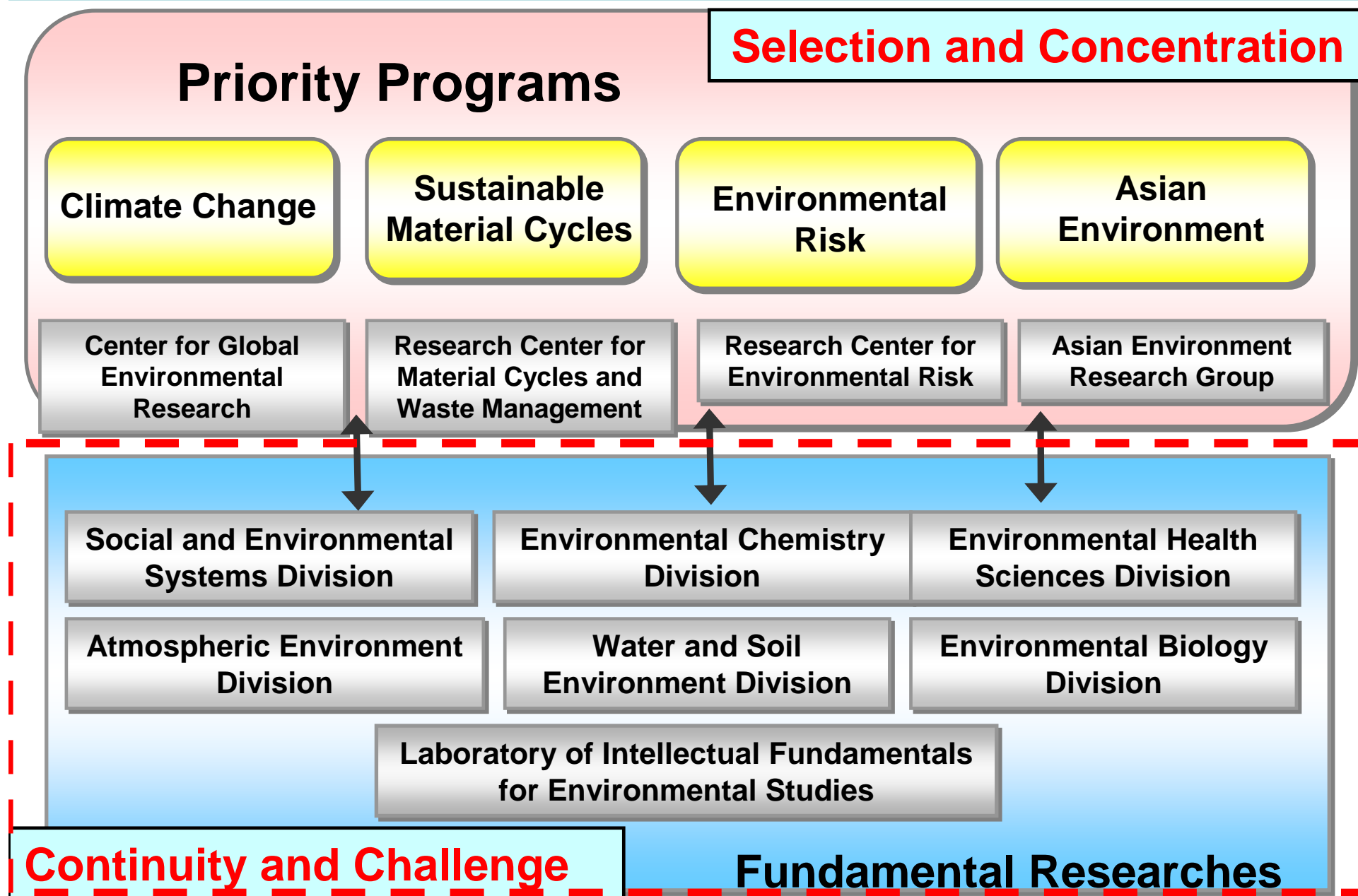
Met. model (RAMS4.4) + CTM (CMAQ4.4)  
< Three nested grid system >



Web page



# Research Framework for Second Five-Year Plan (2006-10)



# Toward Sustainable World

