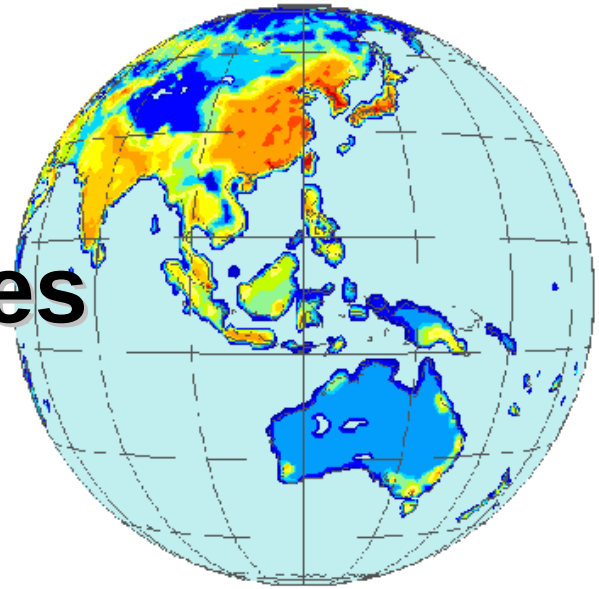
Quantification of Storylines



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The 10th AIM International Workshop

Ohyama Memorial Hall, NIES

11 March, 2005

Aim of quantification

- Provision of consistent base scenarios to other teams
  - production in each sector, energy supply, ...
- Consistency check of countermeasures proposed by other teams, and evaluation of their effectiveness
  - CO2 reduction, economic impact, ...

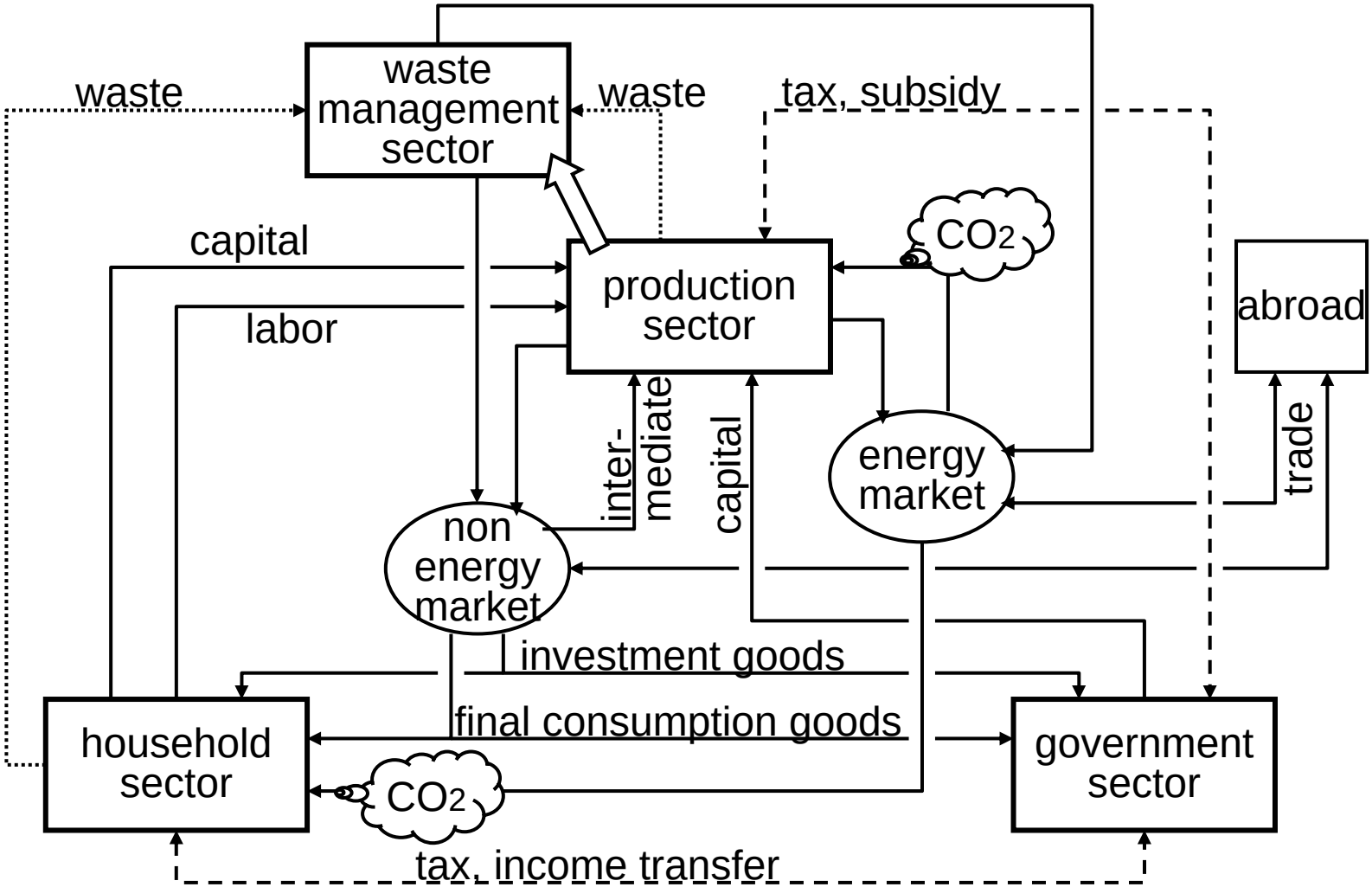
- Consistent long term carbon emission scenarios with/without countermeasures will be drawn.

Model

Revised AIM/Material model

- Computable general equilibrium model with recursive dynamics
  - Time period: 2000, 2001, ..., 2020, ..., 2050
  - Activity: 107 sectors & 113 commodities
- Economic balance and material balance
  - Elasticity of substitution among commodities in the same category: 0 or ∞
  - Update of input share in capital accumulation process
- Energy demand
  - Short term (each year): no substitution among energies
  - Long term: substitution by technology change

Model structure



Main input data

- Some input data are uniform among scenarios
  - Population
  - Potential economic growth
  - Technology change
    - up to 2012: use results of AIM/Enduse model
    - 2013 onward: assume to keep trend
  - Preference change
  - Energy supply
    - Constrain supply of renewable, nuclear, ...
  - International relationship
    - international price and import share
      - up to 2002: use observed data
      - 2003 onward: assume to keep situation in 2002

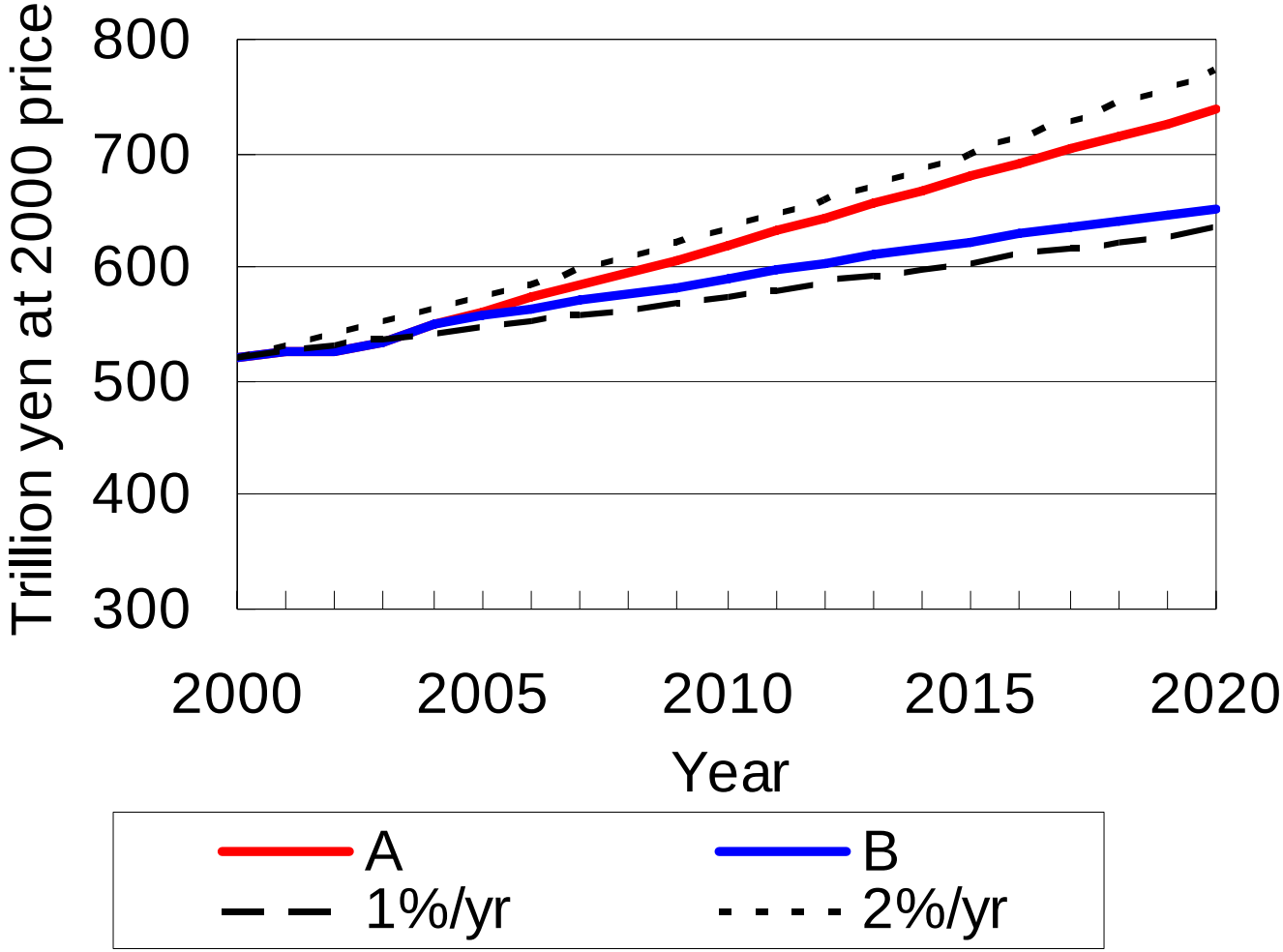
Output

- Scenario A: economic oriented scenario
- Scenario B: moderate scenario

- GDP
- Total production by sector
- CO2 emission
- Energy supply and demand
- ...

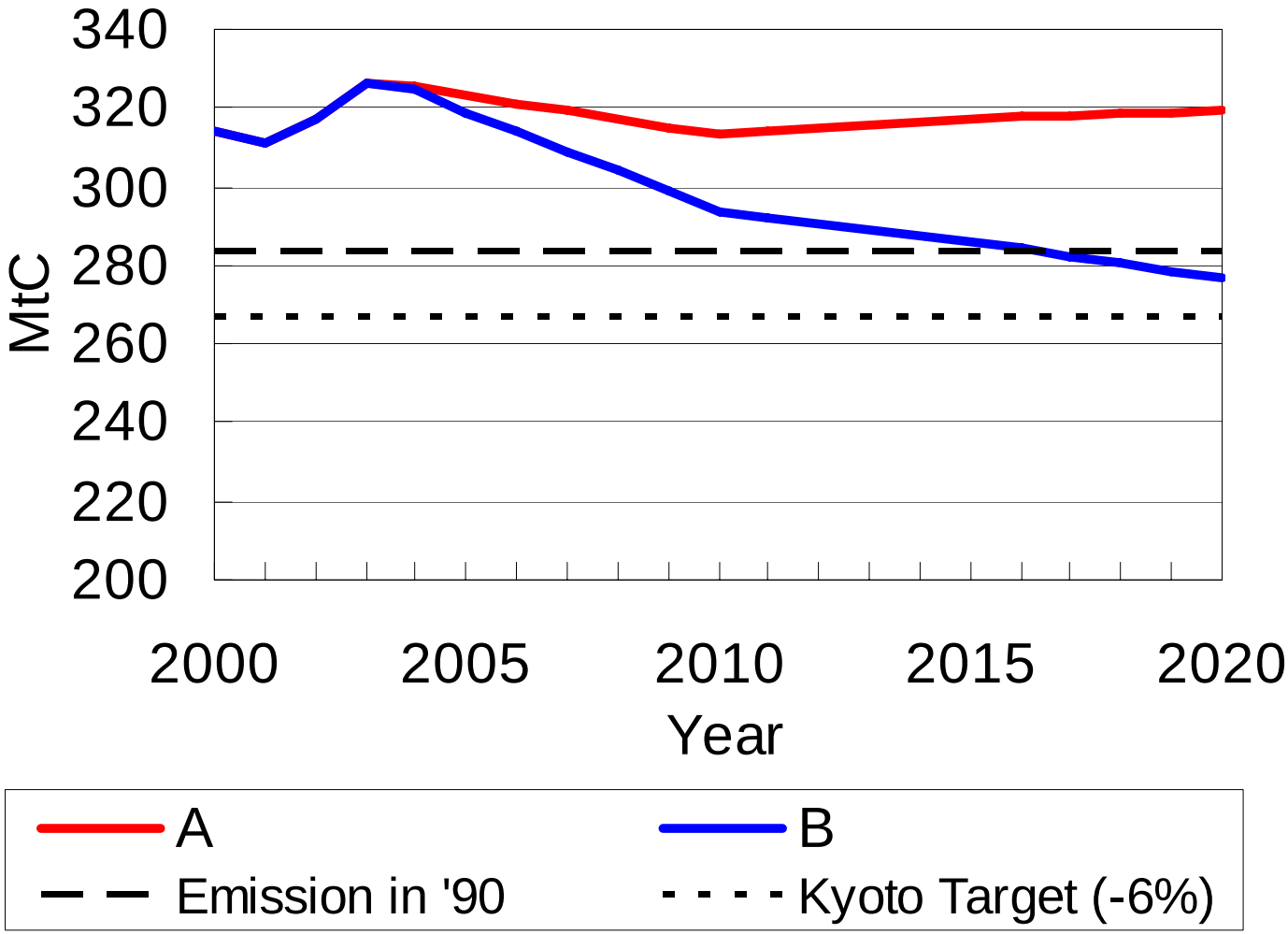
Preliminary results until 2020

GDP



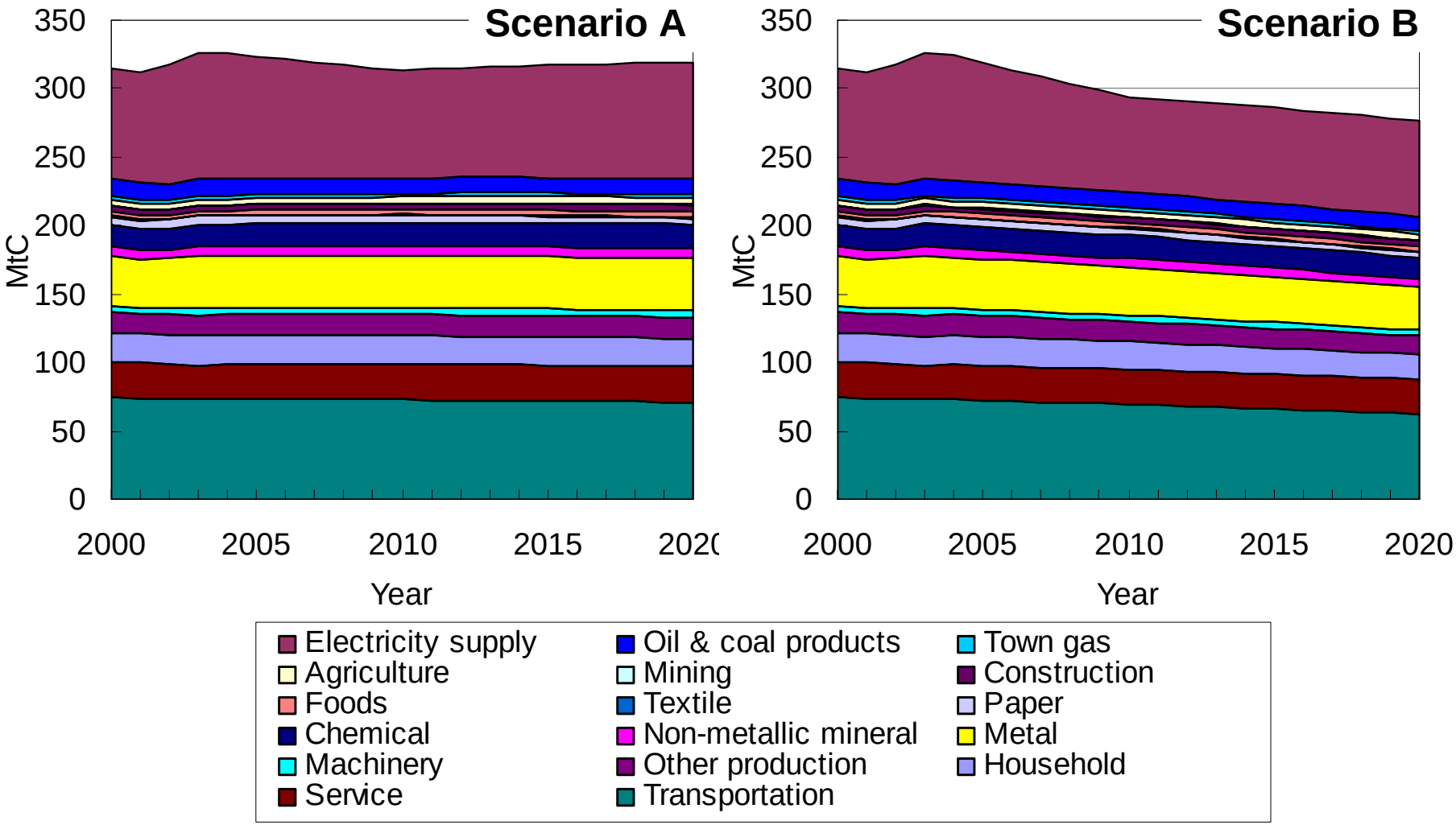
Preliminary results until 2020

CO2 emissions



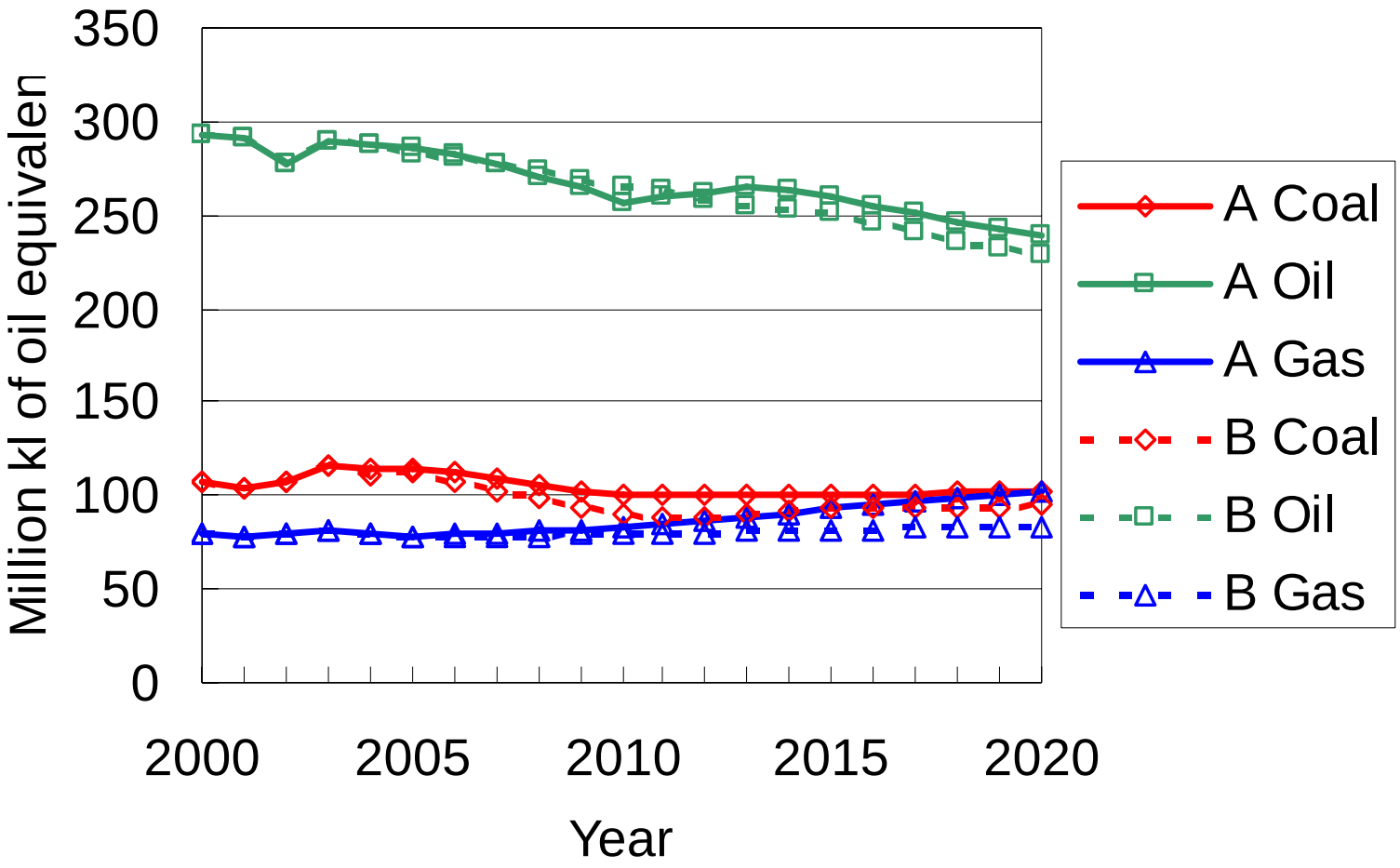
Preliminary results until 2020

CO2 emissions by sectors



Preliminary results until 2020

Fuel supply



Preliminary results until 2020

Electricity supply

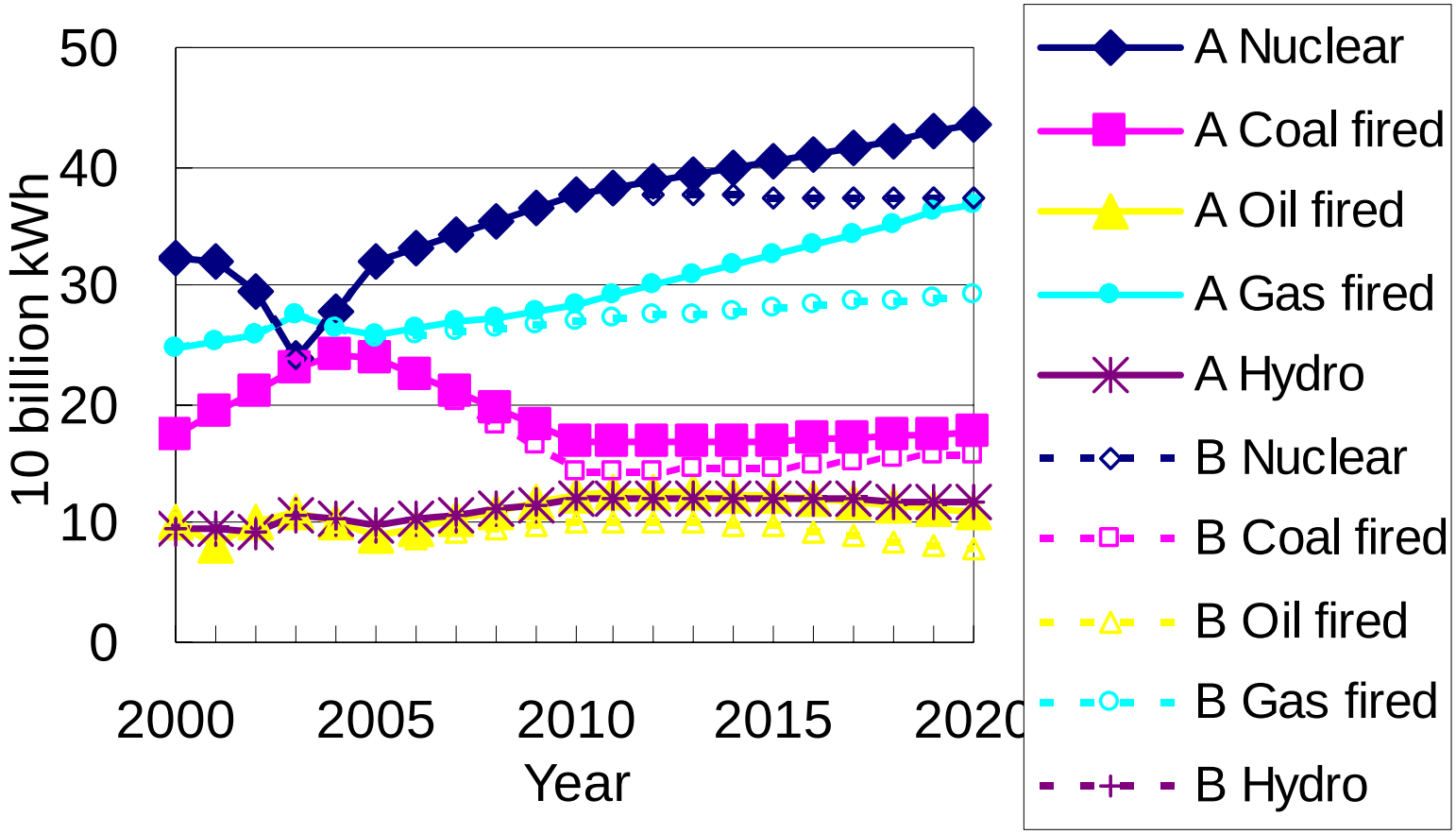
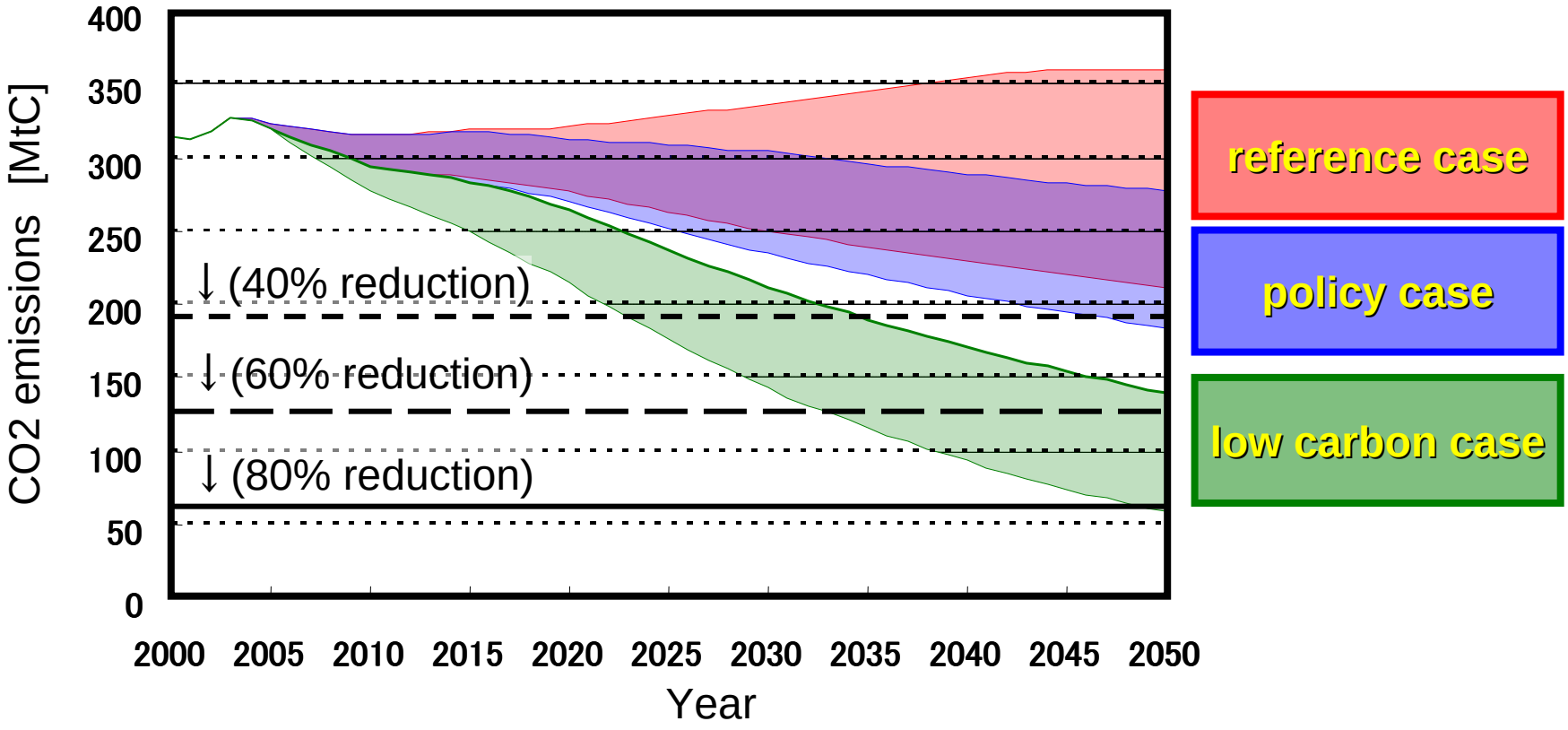
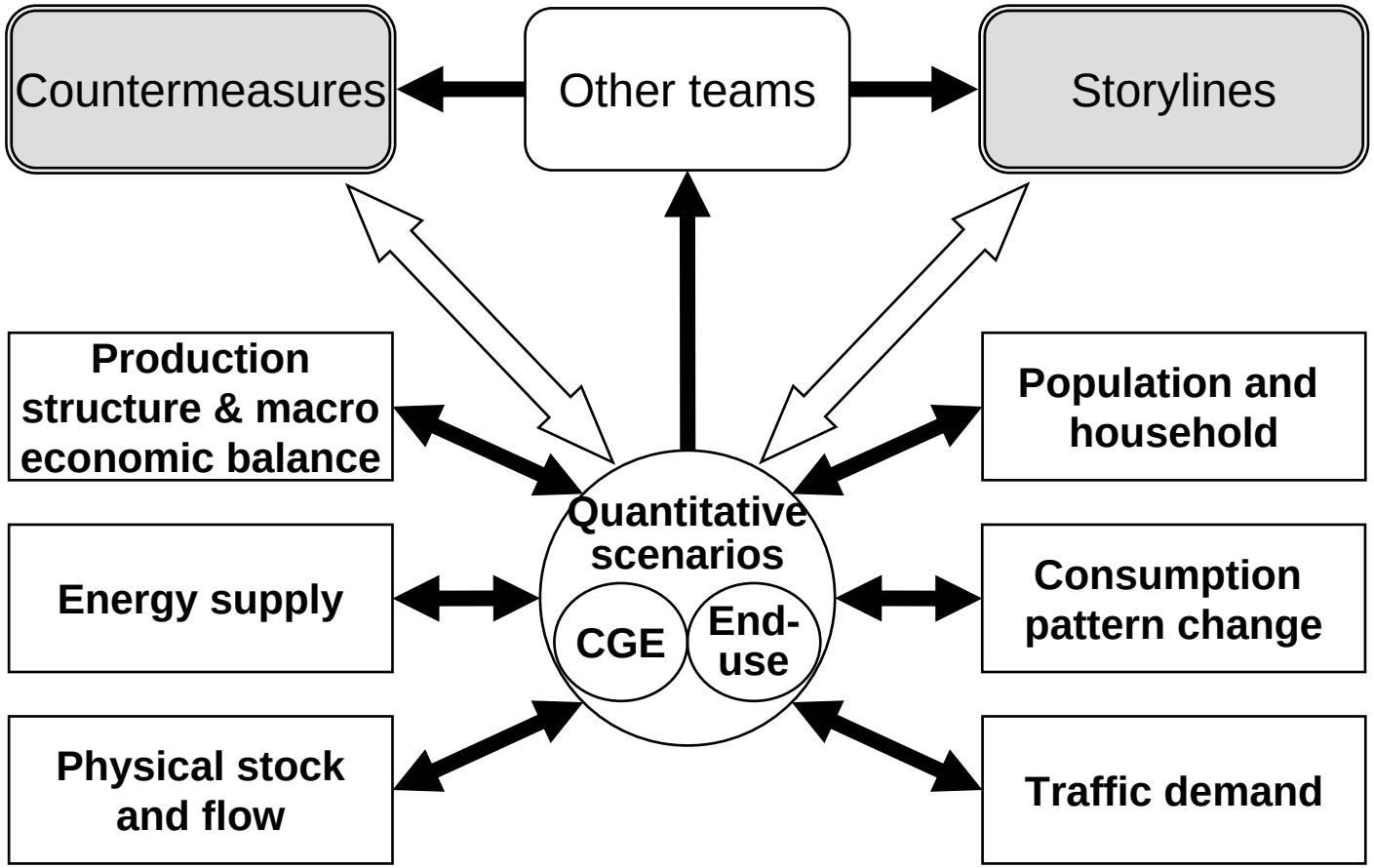


Image of results until 2050

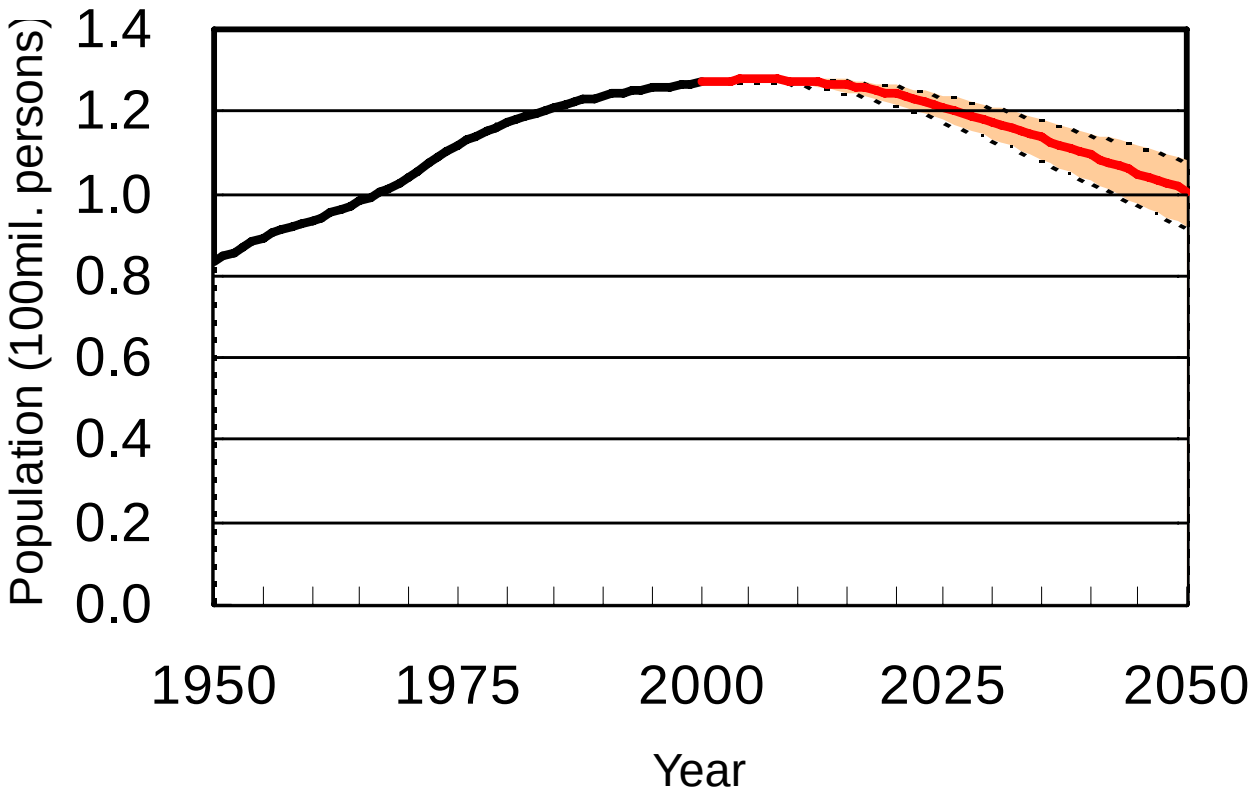


Quantification for 2050
constructing sub-models



- Quantification of input data
- Keeping consistency among inputs.

Main input data
population

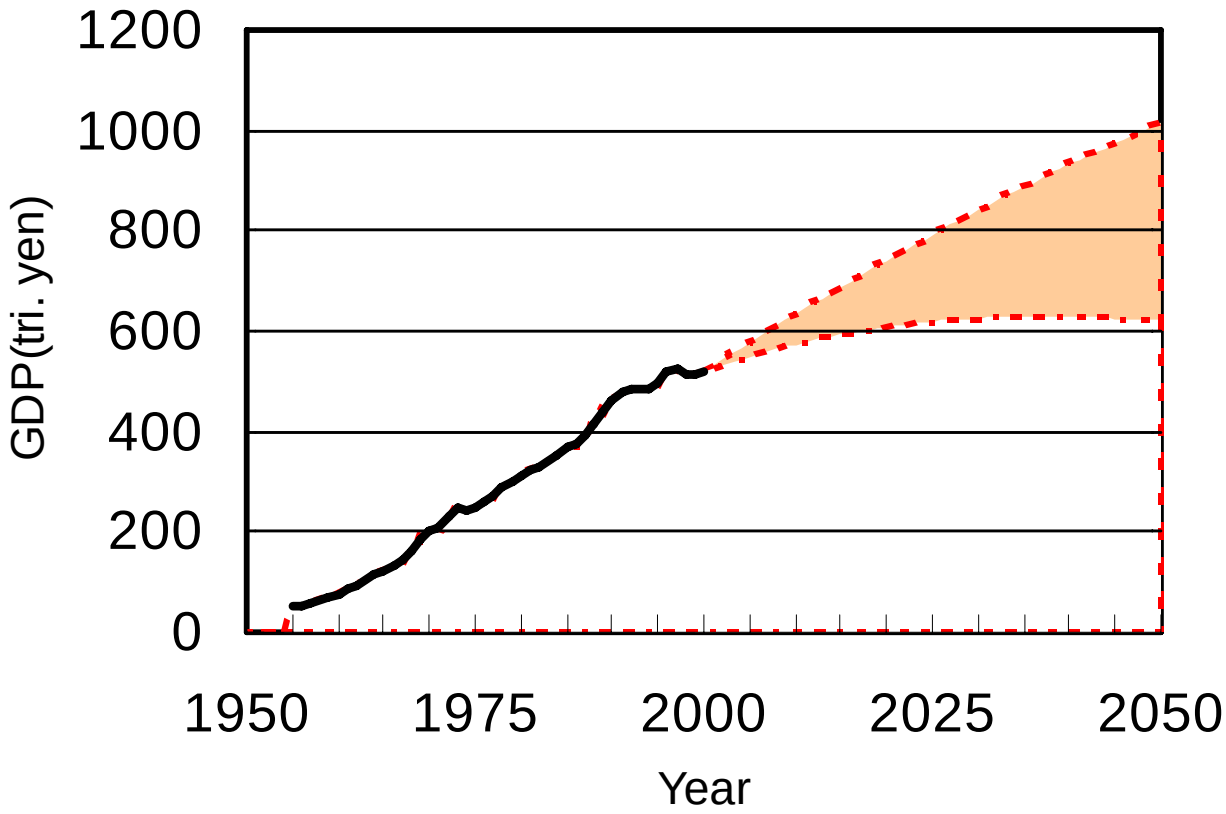


Medium variant: 127 mil ('00) ➜ 101 mil ('50)

Source: Population Projections for Japan:2001-2050
by National Institute of Population and Social Security Research (2002)

Main input data

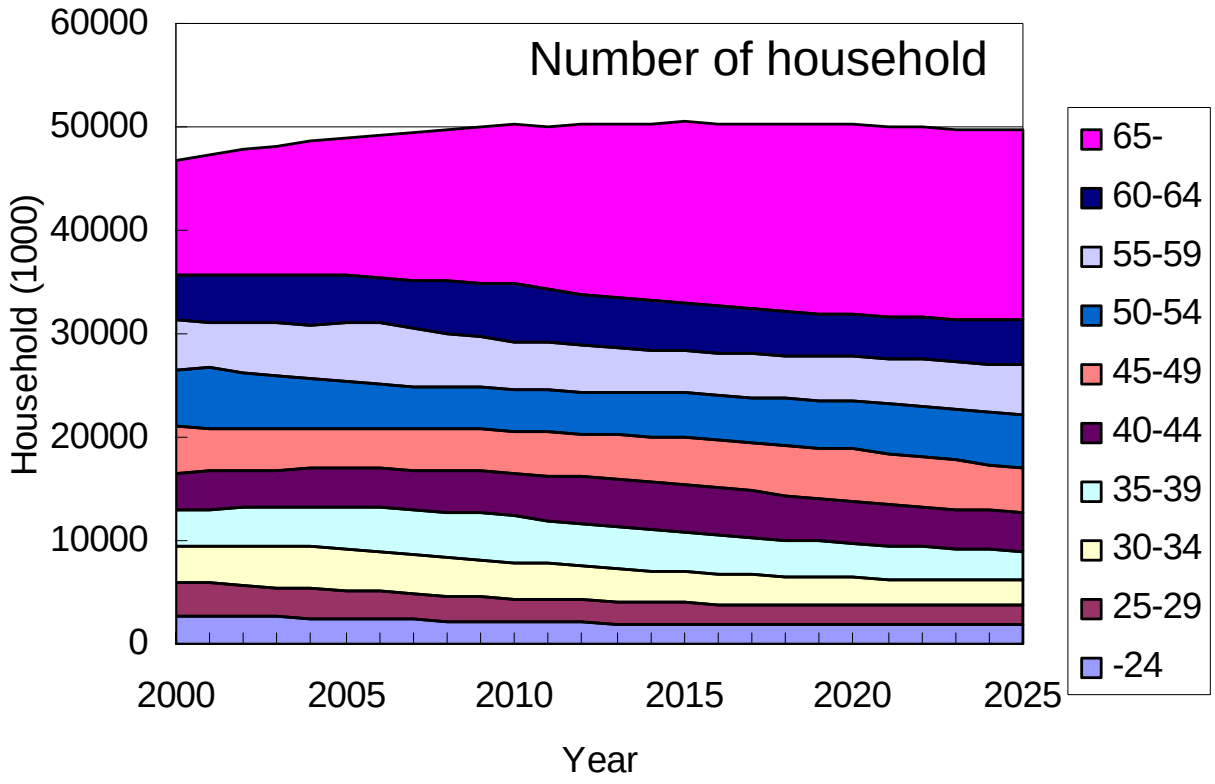
Potential economic growth



Assumption:
Annual growth rate of GDP per capita: 1%/yr – 2%/yr

Main input data
preference change

Number of household by age of house-holder: See below
Preference in each household: keeping observation (1988-2002)



Source: Household Projections for Japan:2000-2025
by National Institute of Population and Social Security Research (2003)