

The AIM Training Workshop 2007

A Long-term quantitative design methodology for moving towards a low carbon economy -A case study in Shiga Prefecture Japan-

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23 October 2007

- Propose a method to envisage a future low carbon society
- Develop a set of tool to estimate a quantitative and consistent socio-economic future and its consequence
- Apply the tool to Shiga Prefecture in Japan



Estimation Process

·Area ·Year ·GHG emission goal ·Sector

·scenario ·key words · qualitative narration · representative indicators

·database: effect, limit, cost...

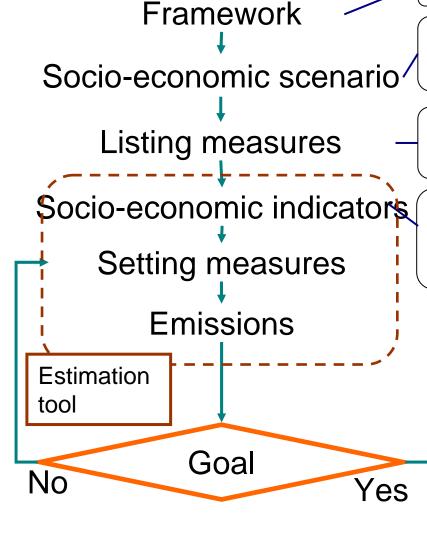
·combining method ·measure's trend

 population, household, time, production, final demand

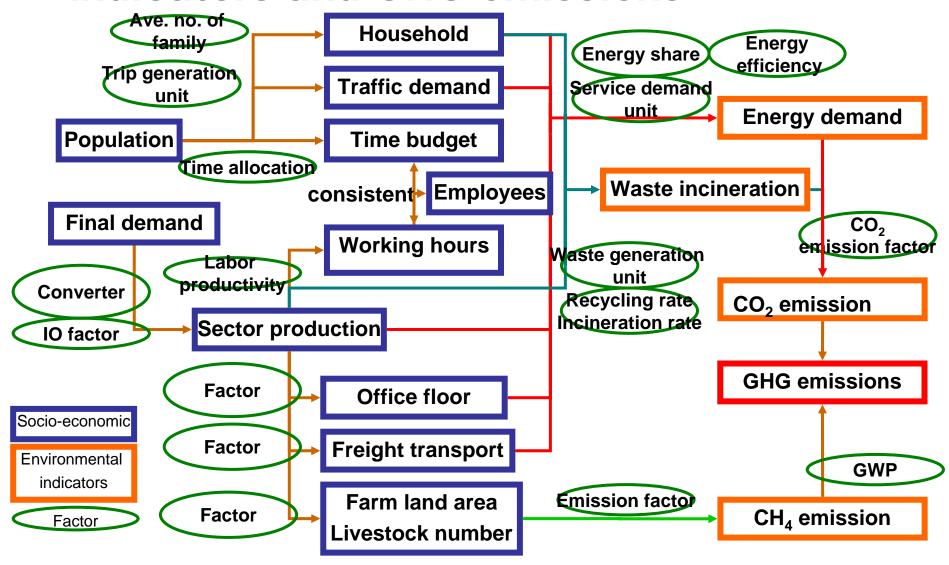
·sector production ·transport demand, etc

Delineate a future vision Formulate a set of action list Propose a policy priority

A possible low carbon society



Estimation flow: socio-economic indicators and GHG emissions





- Area : Shiga Prefecture
 - Population : approx. 1.38 million (2006)1% of Japan
 - Area : approx. 4000km² 1% of Japan
 - Lake Biwa: approx. 670 km²1/6 of Shiga
- Target Year : 2030
 - Target year of next prefecture long-term plan







Overview of Shiga Prefecture

Area: 4,017 km²

- Lake Biwa: 670 km² (17%)

Population: 1,387,475('06)

- Only one pref. where the population would increase until 2030

Households: 499,716 ('06)

Share of Secondary Ind. (GDP): 46.7% ('02)

- Largest share in Japan.





Environmental Goal in 2030

■ GHG(CO₂, CH₄) : -50% from 1990 level

- Considering the necessity of 60~80% reduction from 1990 level by 2050 in Japan (G8 summit)





Socioeconomic assumption in 2030

<Assumption>

Population: 1.38 million (same as the 2005 level)

Household No.: 520 thousand (470 thousand in 2005)

<Macroeconomic indicators estimated>

Real gross regional production: 7,677 billion yen (+0.95%/year)

GRP per capita: 5,560 thousand yen (+0.90%/year)

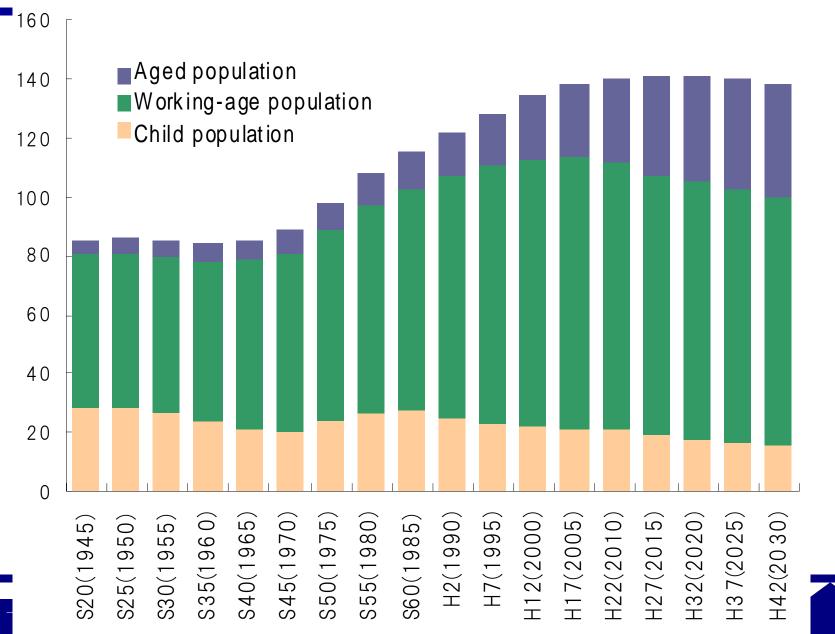
Primary industry: 564 billion yen (4.2% in total GRP)

Secondary industry: 6,470 billion yen (48.2%)

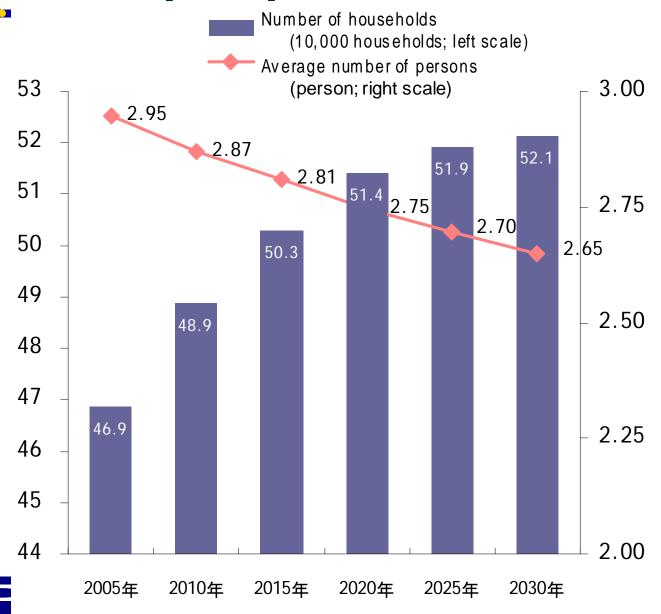
Tertiary industry: 6,401 billion yen (47.6%)



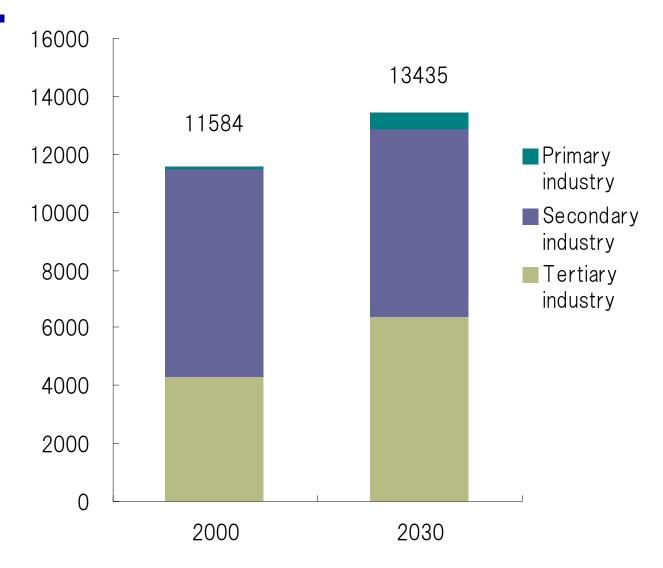
Population trend of three age groups



Household prospect toward 2030



Production by industry (billion yen)

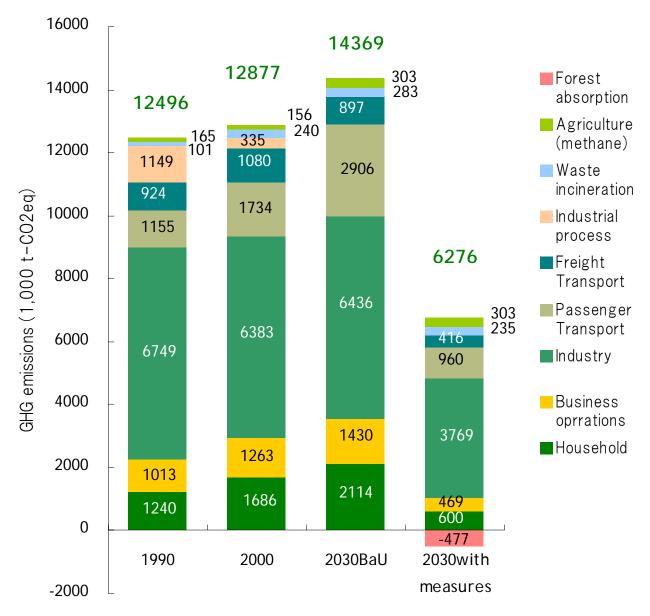




Mitigation measures

Residential and Service	Energy efficiency improvement Fuel switch including renewable
	Lifestyle change
Industrial	Energy efficiency improvement Fuel switch
Transport	Energy efficiency improvement Traffic modal shift: public transport, bicycle Fuel switch to bio-fuel Compact city, Logistic efficiency
Other	Recycling rate improvement Forest management

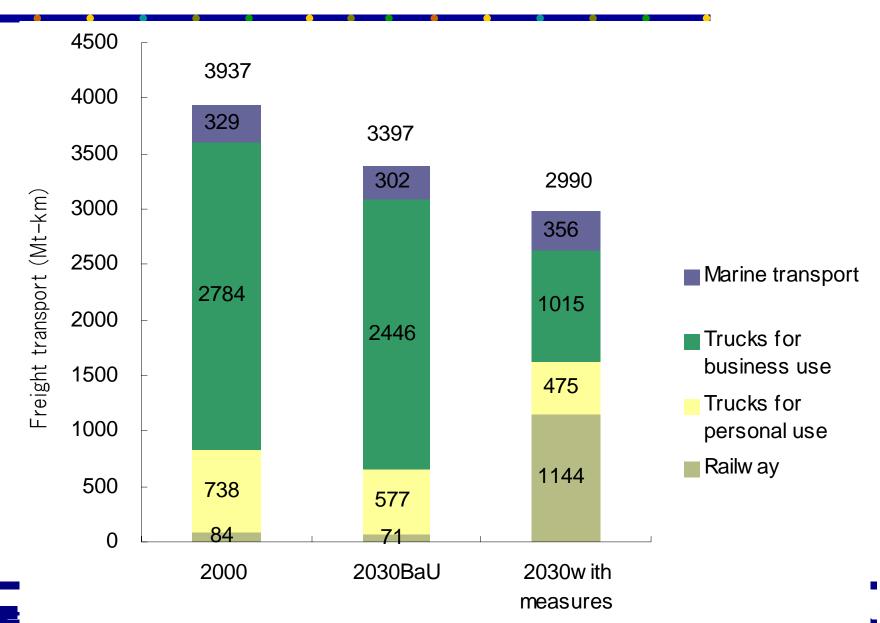
GHG emissions by sector





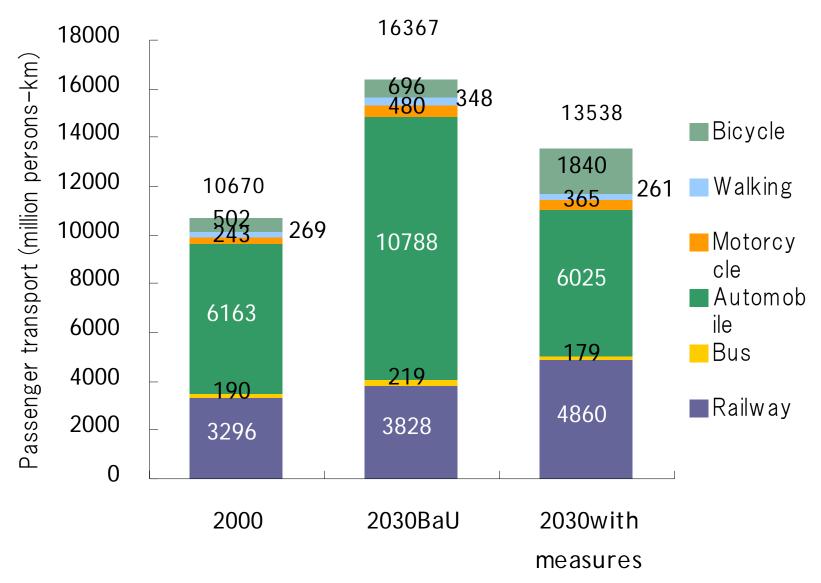


Freight transport by mode



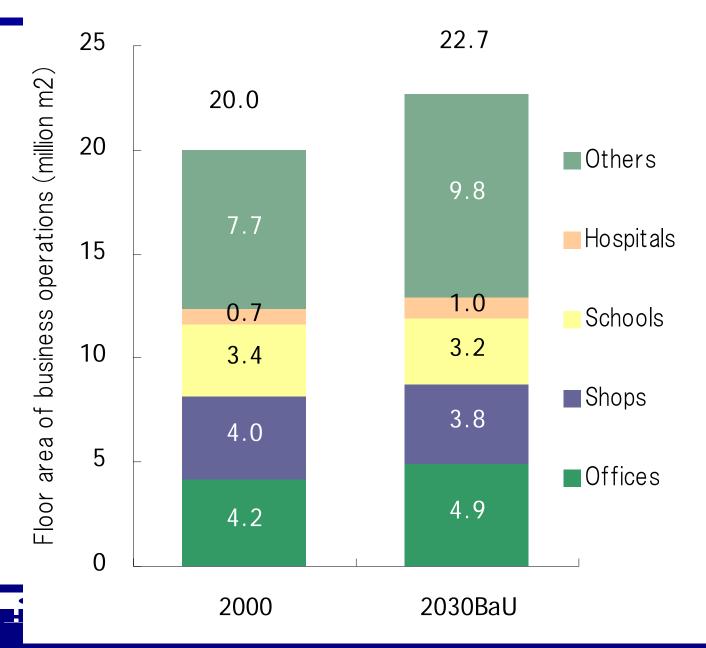


Passenger transport by mode

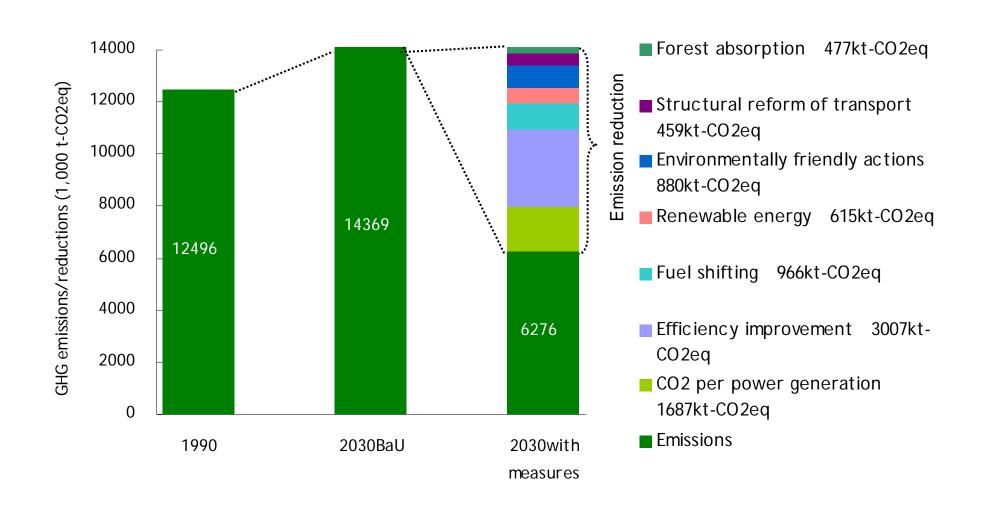




Floor area of business & service

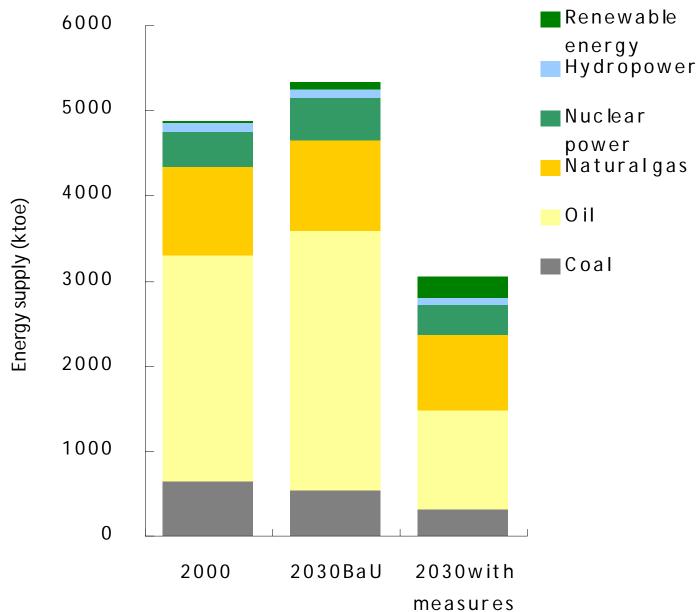


Emission reductions by measure





Primary energy supply by source









Sustainable policy package



Citizen

Household

introduction of eco-appliance insulation, PV system tree-planting to roof/wall rain water use separation and recycling of waste eco-friendly behavior from product possession to service utilization

Infrastructure

efficient waste treatment public transport system bicycle and pedestrian lane permeable pavement rain water storage tank treatment of non-point source pollutants vegetation along lakeside

compact city and protected

Administration

Land use control

Sustainability data analysis/dispatch

Building performance certificate

Sustainable finance

low interest loan
eco-project finance
interest rates according to
environmental risk
eco-fund

low interest loan to ESCO

<u>Sustainable service</u> rental, car-sharing, ESCO

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Sustainable taxation

charge to emissions industrial waste tax forest and water tax automobile tax immovable tax charge to household waste tax to golf course tax to lake area leisure

Manufacture

eco-friendly production fuel switch reduce/reuse/recycling supply of eco-products efficient logistics

Private

Energy supply

renewable energy co-generation bio fuel

Green logistics

connection to rail/ship

Eco-friendly agriculture

reduction of fertilizer
supply of organic resource
water resource cultivation
& CO₂ sink

Environmental loan credit

Environmental depreciation and tax deduction

Public

Enforcement of sustainable taxation

----> Policy effect

Money flow

- Developed a tool to estimate socio-economic indicators and GHG emissions
- Applied it to Shiga prefecture based on a socioeconomic scenarios
- Evaluated the effects of measures
- Being used for the policy discussion in Shiga Prefecture
- Future task: cost estimation, back-casting etc.

