

Survey of 2050 Scenarios in EU Countries and Narrative Storylines for Japan 2020/2050 scenarios

Junichi Fujino (NIES)

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National Institute for Environmental Studies, Tsukuba, Japan

Selected List of Country Level Studies and Research trip during 5/17-5/25, 2005

Country	Organizations	Projects/Models	Target year	GHG reduction goals [Projection]
UK	Dept.of Trade and Industry	Energy White Paper (2003); MARKAL	2050	CO ₂ : 550ppm; +2°C -58%(CO ₂)=64MtC in UK
Germany	Study Commission on Sustainable Energy	Enquete Commission on Sustainable Energy Supply (2000)	2020 2030 2050	-80% by 2050 (GHGs) (-40% by 2020; -50% by 2030)
Netherlands	RIVM et. al.	The Climate OptiOns for the Long-term (COOL) (1999-2001); Participatory IA	2050	CO ₂ : 450ppm;GHGs: 550ppm -15~-25% globally; -50~-80% in Industrialized Countries; -80%(GHGs) in Netherlands
France	Interministerial Task Force on Climate Change (MIES)	Reducing CO ₂ emission fourfold in France (2004)	2050	-75% by 2050; 450 ppmv (CO ₂); 0.5 tC/capita by 2050
Canada	Natural Resources Canada	Energy Technology Futures (2000)	2050	Kyoto trend line: 2%/year reduction →248Mt(GHG) (approx. -60% from 1990)
Finland	National Technology Agency	Climtech Programme (1999-2002); EFOM	2030	-20% compared to the Kyoto target (GHGs)
Sweden	The Climate Committee	Swedish Climate Strategy (2000)	2050	-50% by 2050 (GHGs) in Sweden; 4-4.5 tCO ₂ eq/capita by 2050; CO ₂ ; 550ppm
Japan	WWF Japan	Power Switch (2003) AIM/Enduse (Japan)	2020	[24% by 2020 (CO ₂)]
USA	DOE, National Laboratories	Scenario for a clean energy future(2000); NEMS	2020 2050	[Moderate: 29.5% more CO ₂ in 2020 than 1990; Advanced: Same level in 2020 as 1990]
	Argonne NL/EPA/GPN	Engines of Growth (2004)	2050	[Tech.drives market:46% by 2050 from 2000]

Visitors: Shuzo Nishioka, Yasushi Ninomiya (IGES), Reina Kawase, and Junichi Fujino

Stabilization target and country-level reduction target setting

- Target year: 2050
- Country-level reduction target: more than 50%
- Stabilization target: CO₂ concentration around 450ppmv to 550ppmv, or 2 degree C (based on EU initial target in 1996, 2 degree C temperature target and 550ppm CO₂ concentration.)
Current research shows more strict relationship between concentration and temperature.
- Burden sharing: mainly C&C (Convergence and Contraction), and intensity target, multi-stage, others
Controversial issue

Plan, Implication, Evaluation of 2050 project

- Energy saving and development of renewable energy: first priority
CCS (Carbon Capture and Storage) : important option
Nuclear energy: keep in France, decreasing in other EU countries
Hydrogen: problem of energy sources to produce hydrogen
Infrastructure (energy, transportation, building): set the direction considering its long lead time
- UK has advantage for policy implications with the leadership of prime minister. Germany is also eager but it seems to be polarized between Environment and Industry. France has the inter-ministry on climate change but still rough sketch of 2050.
- Though UK 2050 project shows less economic impacts with 60% reduction, it's not an outcome from economic modeling. There is no detailed model study on this issue.

Cross-cutting outcomes of this research trip in EU (3)

Qualification of 2050 project

- UK: MARKAL, Germany: Simulation models (Wuppertal institute), France and Netherlands: snapshots of 2050
- MARKAL is the only optimization model for the above simulations. They had several meeting on parameter setting of technology data. But still it has difficulty to deal with economic loss and drastically structure change.
- Simulation models covers energy supply, transportation, building, etc. But it only shows the relationship between key elements in each sector and there is no optimization scheme.

The Features of Japan 2050 Low Carbon Society Research Project

1. Research project involving about 60 researchers on long-term scenario development, CC policy regime, urban system, IT, transportation system, industrial structure change and others.
2. Applying economic model and technology model for consistent scenario development. Collecting a large amount of environmental options regarding technology, institution, behavior and so on.
3. Covering not only energy supply but also service demand change.

Forthcoming Open Symposium “Low-Carbon Society Scenario toward 2050: Scenario Development and its Implication for Policy Measures” on March 24th, 2005 in Tokyo

Tentative Agenda on March 24 (Thu.), 2005

- 10:00-10:15 Opening Remarks: Mr. Toshiro Kojima, MOEJ
- Session 1** **Overview of Low Carbon Society Scenario Development**
- 10:15-10:30 Purpose and Objective of this Symposium: Prof. Shuzo Nishioka, NIES
- 10:30-11:00 Long-term climate policy in EU: Dr. Artur Runge-Metzger, Environment DG, European Commission
- Session 2** **Long-term GHG reduction target**
- 11:00-11:10 Overview and discussion points: Dr. Norichika Kanie, TITech
- 11:10-11:30 Policy perspective of Long-term GHG reduction target setting: Dr. Martin Weiss, Germany's Federal Environment Agency (Germany)
- 11:30-11:50 Stakeholder perspective of Long-term target: Dr. Marleen van de Kerkhof, Institute for Environmental Studies (Netherlands)
- 11:50-12:30 Discussion:
Discussant: Dr. Joop Oude Lohuis, RIVM (Netherlands)
Dr. Srinivasan Ancha, IGES
- Session 3** **Development of low carbon society scenarios toward 2050 and their policy impacts**
- 13:30-13:40 Overview and discussion points: Dr. Junichi Fujino, NIES
- 13:40-14:20 UK scenarios toward 2050: Mr. Stephen Green, DTI (UK)
- 14:20-14:50 Germany scenarios toward 2050: Dr. Manfred Fishedick, Wuppertal Institute (Germany)
- 14:50-15:20 France scenarios toward 2050: Mr. Michel Colombier, IDDRI (France)
- 15:20-15:40 Coffee Break
- 15:40-16:10 Netherlands scenarios toward 2050: Dr. Remko Ybema, ECN (Netherlands)
- 16:10-16:30 Japan scenarios toward 2050: Dr. Junichi Fujino, NIES
- 16:30-17:20 Panel Discussion
- 17:20-17:30 Final Remarks

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The issues to be discussed during this symposium are;

- 1) Why EU countries need to structure the low carbon economy ?
- 2) How to decide country-level GHG (Greenhouse gases) reduction targets?
- 3) How to develop the scenario and road map to achieve the society with such targets? How to consider economic impacts, technology innovation, social infrastructure change, lifestyle change, etc?
- 4) How seriously the concept of low carbon economy are taken into current policy making process and realized as concrete policy measures?
- 5) What are the common / different stances between EU countries and Japan in achieving low carbon economy? What are the messages of the low carbon economy to future global governance?

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2nd Open symposium on this issue with
EU, USA, China, India, Japan,
and others will be held
in Sep or the beginning of Oct, 2005

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Develop 2020 BaU and Intervention scenarios

1) Develop narrative storylines

2) Develop quantitative BaU scenarios

- Identify scenario driving forces and
- Model (AIM/Material[Japan]) calculation

3) Develop 2020 Intervention scenarios

- Collect environmental options (EDB)
- Assume diffusion rate of each env. Options
- Model (AIM/Enduse[Japan]) calculation

Features of narrative storylines for Japan 2050 project

These are similar to SRES B1/B2 scenarios...

- 1) Develop scenario concept considering the society which will allow intervention toward low carbon society**
- 2) Focused on Japan. More detailed descriptions are required (industry structure change, consumption pattern, etc)**

Concept of Two Narrative Storylines

Scenario A:

Centralized economy, Urban style

Hard working

Mass prod., cons., recycling

Intensive leisure

**Value with quantitative indicators
and more...**



Scenario B:

Decentralized economy

Work sharing

Less prod., cons., recycling

Take time leisure

**Value with qualitative indicators
and more...**



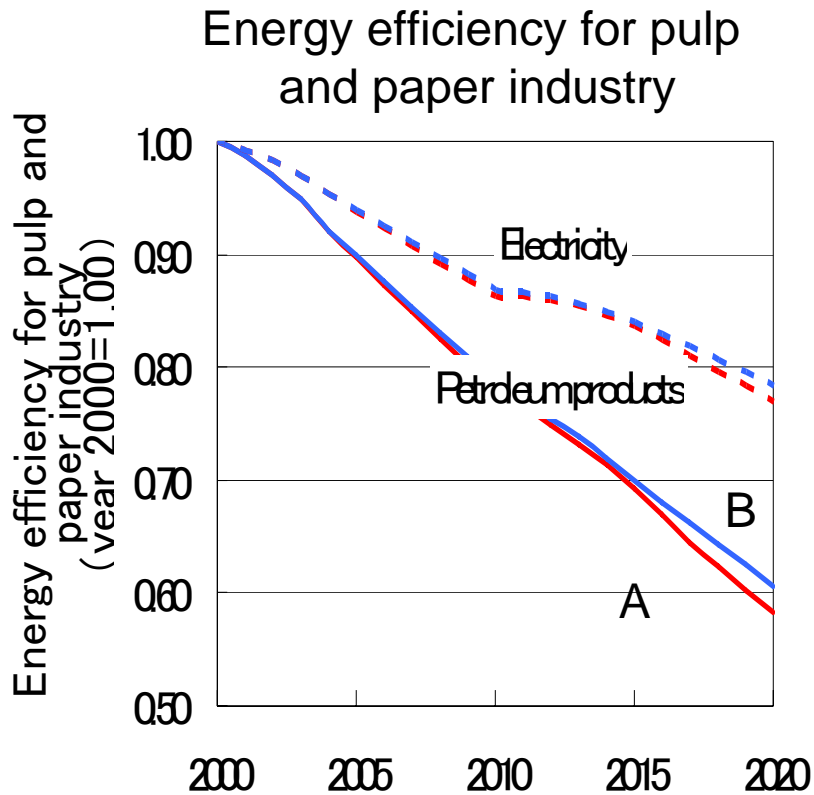
Develop Storyline of BaU scenario

Driving forces	BaU A	BaU B
Lifestyle	Much consumption	Less consumption
Population	Slightly decrease	Slightly decrease
GDP growth	Rather high	Rather low
Productivity factor improvement	High improvement	Keep current situation
Industry structure	High value-added industry	Service industry
Land use	Urban centralized	Decentralized
IT society	Enhance convenience	Tele-communication
Energy supply	Fossil fuel driven + Nuclear energy	Less energy demand, less nuclear energy
GHG emission	Large	Middle

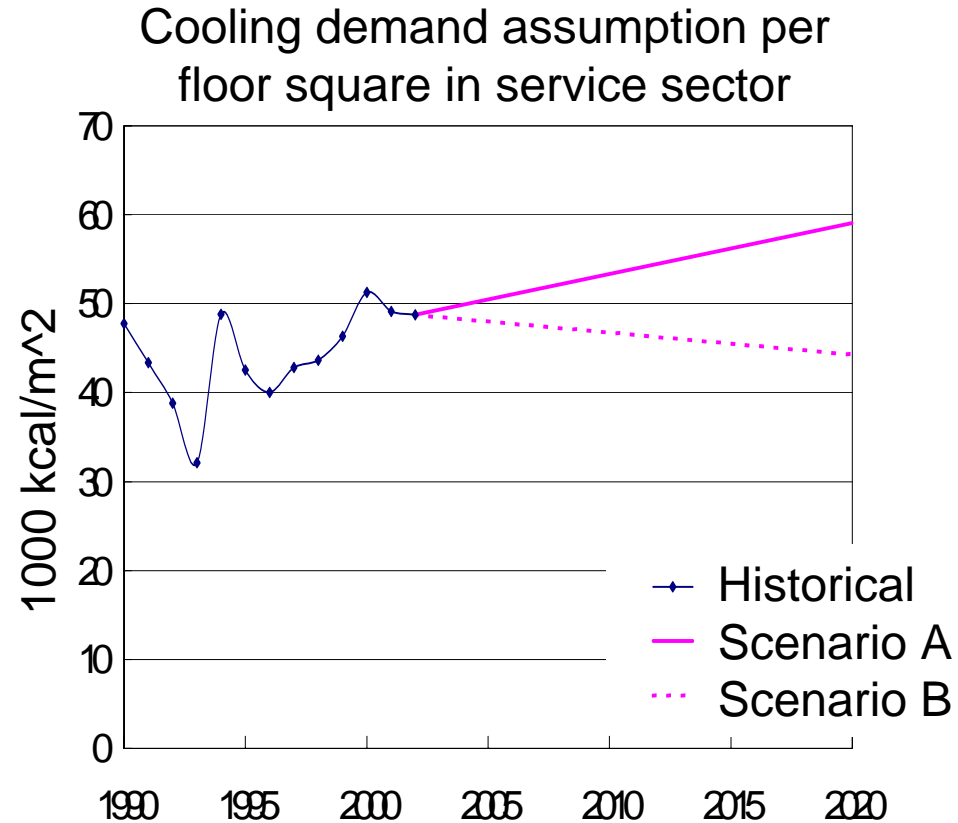
Translate into quantitative scenarios

- 1) Select Main Driving forces (population, GDP growth assumption, productivity factor improvement, etc)**
- 2) Model calculation (AIM/Material, AIM/Enduse)**
- 3) Detailed description of sector-wise demand (cooling, warming, lighting demand, etc)**

Quantitative parameters



Results from AIM/Enduse model

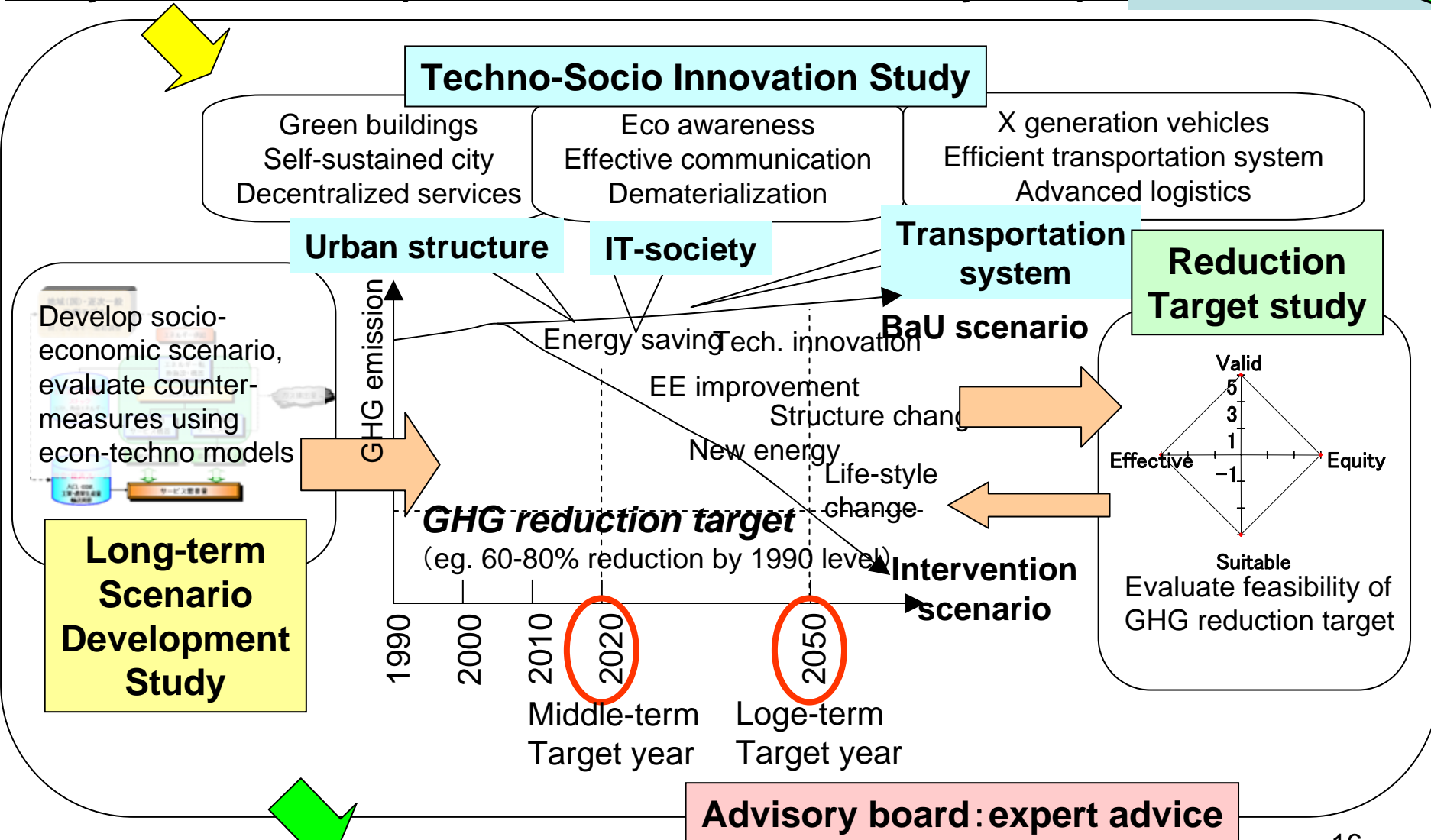


Trend assumption

Japan Low Carbon Society Scenarios toward 2050

Japan
de-CO₂
2050

Study environmental options toward low carbon society in Japan



Propose the direction for long-term global warming policy