

Japan's Actions Towards the Creation of Low-Carbon Cities

Message to Asian Cities

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1. Creating Low-Carbon Cities: Background

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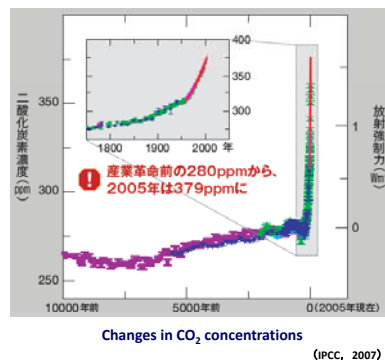
Concentrations of CO₂ keep rising

CO₂ concentration has been on the rise since the Industrial Revolution

Since the Industrial Revolution of 1750s, man has used large amounts of fossil fuels

Resulting in a rapid increase of CO₂ emissions from human activity...

Increases in CO₂ concentrations in the atmosphere



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Impacts from Climate Change

Rapid global warming and natural disasters

⇒ Fear of irreversible impacts on our children and grandchildren

- ◆ Glacial retreat
- ◆ Frequent abnormal weather (storms, droughts, heat waves)
- ◆ Rise of 17cm in average sea levels in 20th century

1000+ perish in Bangladesh from two large-scale floods in 2007 (JICA study)



House destroyed by high waves (Bangladesh) (Credit: JICA)

Fears of countries being submerged due to rising sea levels



Children walking on flooded roads (Tuvalu) (Credit: Prof. Hajime Kayane, Univ. of Tokyo)



Melting permafrost (Coast of the Arctic Ocean) (Credit: Prof. Gen Inoue, RHN)

Polar bears affected by receding polar ice are declared in endangered species by U.S. government in May 2008.



Receding polar ice at feeding areas (Credit: Asahi Shimbun)

Glacier melt in Himalayas L: 1978, R: 1998

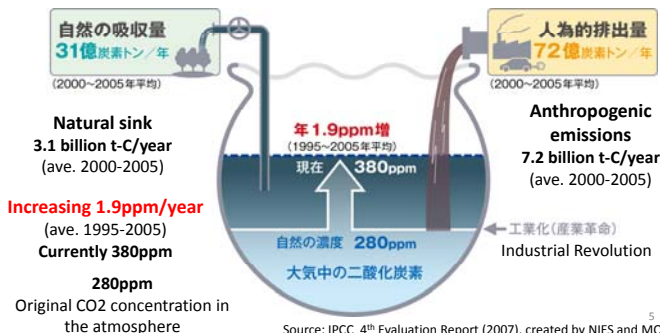


(Credit: Cryosphere Change Lab, Grad. School of Env. Studies, Nagoya Univ.)

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Worldwide Greenhouse Gas Emissions

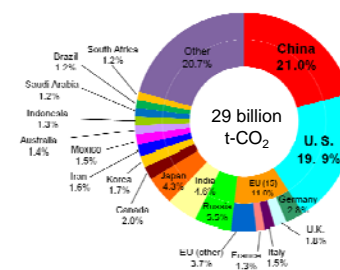
- ◆ In order to stabilise GHG concentrations in the atmosphere, anthropogenic emissions must be reduced to equal levels of natural sinks.
- ◆ Anthropogenic emissions are currently twice (or more) that of natural sinks.
- ◆ The degree of impacts from global warming is controlled by the timing of stabilisation and the concentration in stabilization.



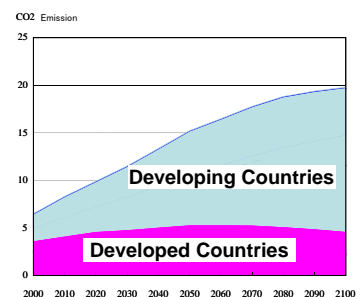
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Global CO₂ Emission Trends

CO₂ Emissions (2007)

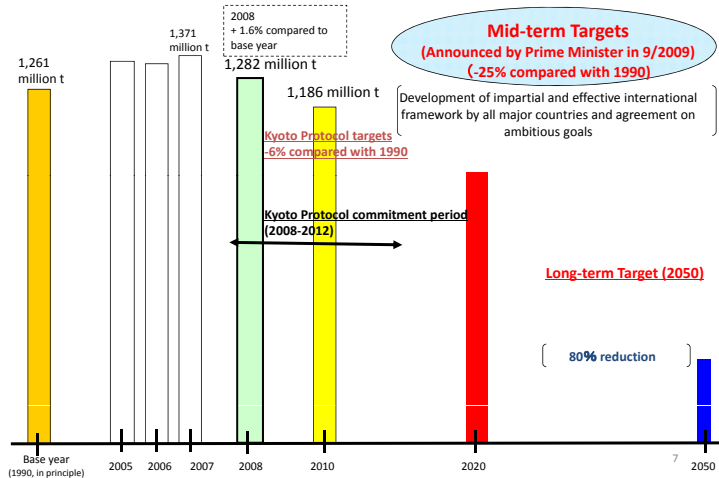


CO₂ Emissions (projection)



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GHG Emissions in Japan & Mid- & Long-Term Targets

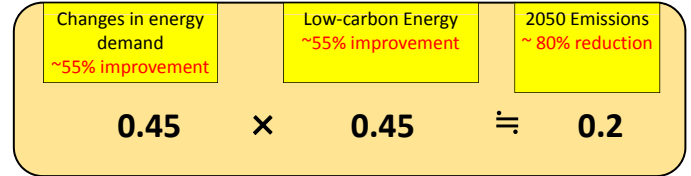


Reduction of CO₂ Emissions through Synergistic Effects



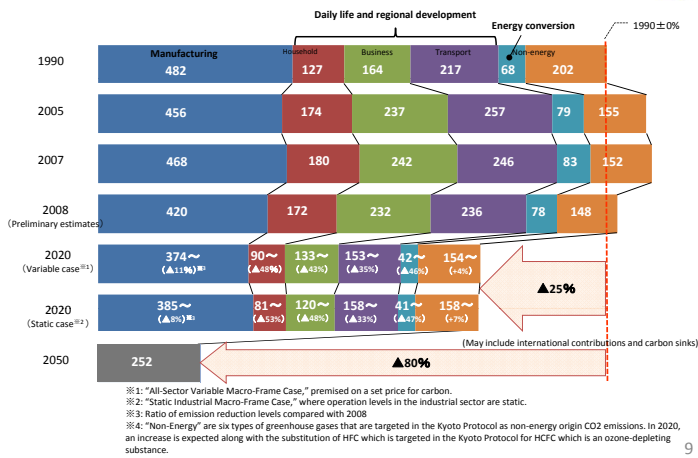
To achieve an 80% reduction in 2050 compared to 1990 levels,

A synergistic effect is expected due to CO₂ reductions from cooperation



Due to gradual increases in marginal abatement costs, in case that there is cooperation, the same amount of reductions, large reductions can be achieved in discounted cost and same cost where larger reduction.

Shape of GHG Emissions by Sector in 2020 and 2050 (Unit: 1 million t-CO₂)



2. Policies for the Creation of a Low-Carbon Society

All Families Living in Zero-Emission Houses



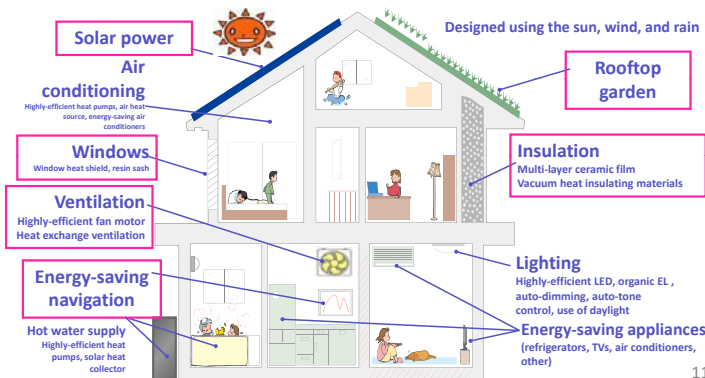
Zero-emission houses are homes in which CO₂ emissions are zero or minus with the following functions:

① Well-sealed and highly insulated shelters (building frame) to reduce potential energy demand

② Producing energy by sunlight and solar heat within the house itself

③ Highly efficient energy-consuming equipment/items, such as refrigerators and lights

※ Houses that have minus-emissions, including for CO₂ during the design and construction stage are referred to as Lifecycle Carbon Minus housing (LCCM houses).



Housing Eco-Point Project

100 Billion Yen (in 2009 Fiscal year)



Targets for issuing eco-points

Houses that have, in principle, been constructed after 28 Jan 2010 and purchased

① Eco-reform (Construction started Jan. 1-Dec. 31, 2010)

- Insulation retrofit in windows (double sash), glass replacement (double-glazed)
- Outside walls, ceilings or floors constructed with heat insulation
- ※ When combined with barrier-free renovations, the number of points increases

② Newly constructed eco-houses (Construction Dec. 8, 2009 – Dec. 31, 2010)

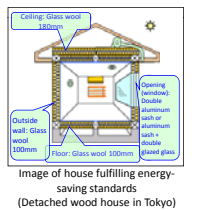
- Houses that correspond to "Top-Runner" standards in Energy-Saving Law (energy-saving standards + α (highly-efficient boilers, etc.))
- Wooden houses (limited to houses that fulfill energy-saving standards)

Using eco-points

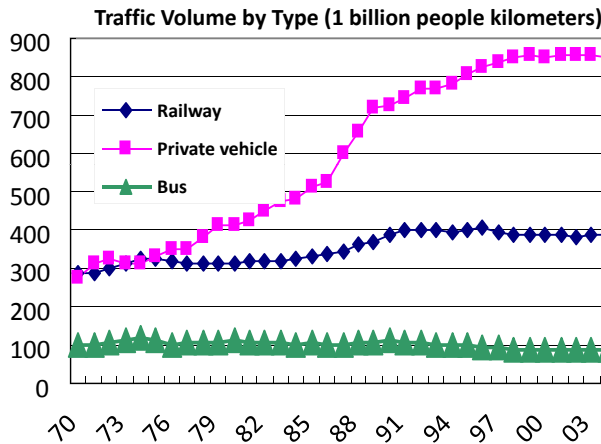
- Gift coupons, pre-paid cards (donation for environmental activities, public transport cards)
- Supporting local economy (local coupons and goods)
- Energy-efficient and environment-friendly goods
- Additional energy-saving measures for newly-built housing and eco-reformulation

Application and issuance of points (as of Apr. 2010)

- No. of applications: 20,083 houses (newly constructed: 2,270, renovated: 17,813)
- Points issued: 3,171 houses, approximately 230 million points



Changes in Traffic Volume by Type



Potential for CO₂ Reduction in Compact Cities

Large reductions of automobile mileage are possible in compact cities that utilise public transportation mainly. Even in the same local city, the amount of CO₂ emissions of automobiles per person in the consolidated cities with trams is half of the one in the city fully dependant on automobiles

Automobile mileage

Efficiency (CO₂ basic unit)

Vehicular CO₂ emissions

[Notes on automobile usage reduction targets]

- The necessity to use electricity and fuel that emit CO₂ arises when the vehicle use exceeds this capacity of low-carbon power origins, such as sunlight and wind, as well as bio-fuel which are not limitless.
- Therefore, the automobile mileage targets should be set around the level which makes to achieve the target of efficiency so that the amount of low-carbon power and bio-fuels exceed these capacities when it becomes impossible to achieve fuel cost targets (basic unit of CO₂) and vehicle use exceeds the usage quantity of low-carbon power and bio-fuels, it is necessary to set a level that will allow

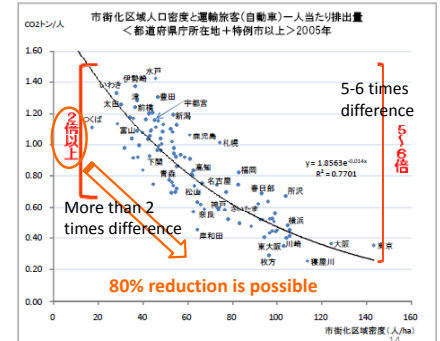
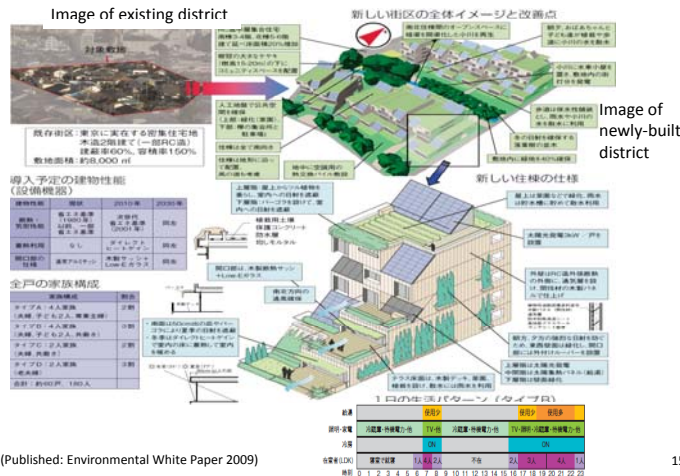


図 4-3-2 国立環境研究所・環境省資料、都市計画年報より作成

Example of City Designed on the Premise of Using Natural Energy



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3. Towards the Creation of Low-Carbon Cities

Images of the Future Cities

Walkable living area and city centre are connected by LRT (Light Rail Transit) and public transportation

- Concentrating the residences and business in the city centre around the stations and promote the consumption
- Install and maintain bicycle lanes throughout the city by converting the car roads
- Improve financial management and service quality of public transport system including LRT, BRT (Bus Rapid Transit) and buses

Targets for mid-/long-term roadmap

- Double the use of public transport in local cities by 2020
- 1,500km LRT-BRT lines by 2030 (currently 200km)
- 30-40% reduction of automobile mileage by 2050

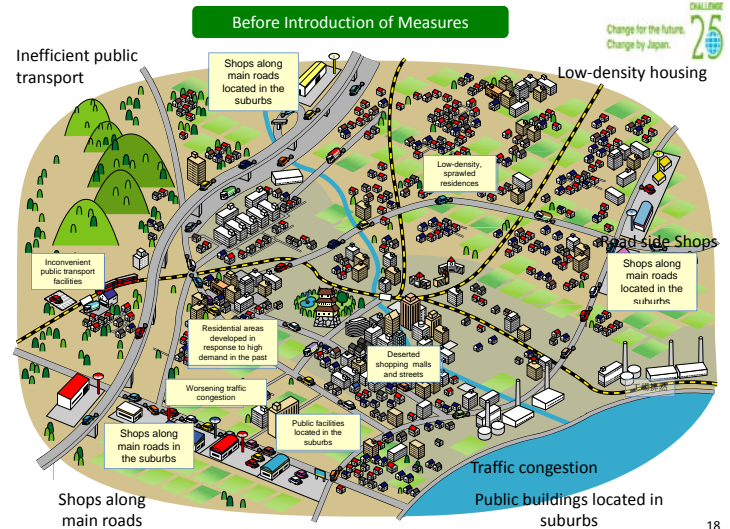
“Research on Environmental Improvement by Reviewing the Common Transportation Means”
NIES Special Research Report SR-79-2008
Source: Local Government Action Plans against Global Warming (Section of Area Policy)
Formulation Manual (Ver. 1) June 2009 MOEJ

Local natural assets are utilised through “heat path”, “wind path” and “water path”

- Spreading zero-emission buildings and housings
- Full-use of locally available natural energy
- Removing heat from the city centre through allocating green and water-surface areas and buildings considering the wind path
- Energy management at a district level through introducing a district heating and cooling system and using heat from incinerators



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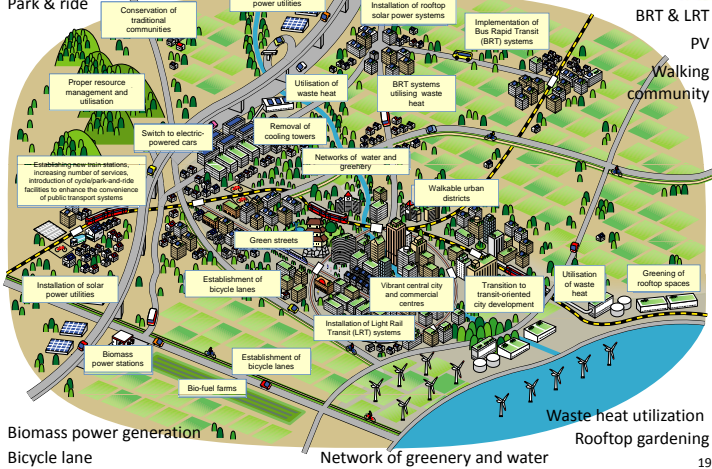


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Traditional community lives

EV

Park & ride



Improvement of Legal Frameworks



Revision of Law for the Promotion of Measures Global Warming (2007)
Declare the use of urban policies to reduce CO₂ emissions

- A) Defined that local governments can govern energy policies
- B) Defined that CO₂ reduction plan can be incorporated in the city planning and regional agricultural promotion planning and their implementation

Action Plan of Local Government

Required large and specially-designated cities to set up CO₂ reduction plan and implement it

→ Promotion of usage of renewable energy, energy efficient measures, public transport, greenery management and resource efficiency

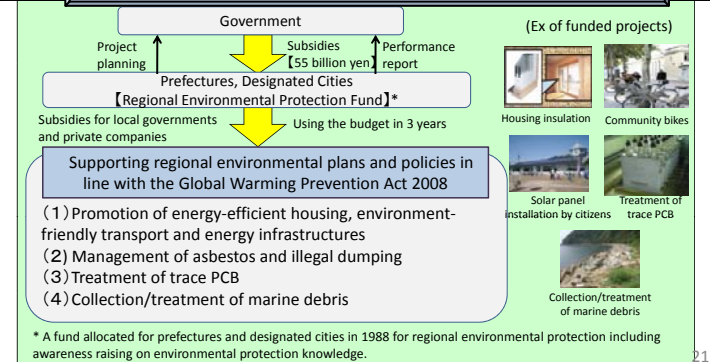
→ Local governments to implement energy management policies

→ CO₂ reduction policies to be incorporated in city planning and agricultural promotion planning

Regional Green New Deal Fund

- Formulation of regional CO₂ reduction plan should be done in each home in Amended Global Warming Prevention Act, June 2008
- Local governments to implement more pro-environmental policies even under the severe fiscal condition
- Supporting through expansion of Regional Environmental Protection Fund in each prefecture

Promotion of "regional revitalization" and "low-carbon / low-ecology"



Policies for the Creation of a Low-Carbon City

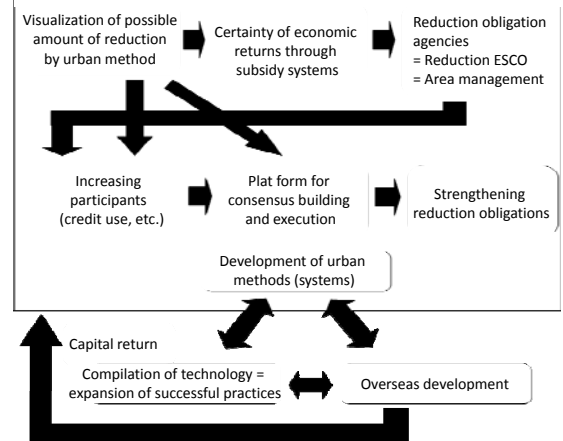


Figure: Hikaru Kobayashi 22



Thank you for your attention !

<http://www.env.go.jp>

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