

# Japan's emission trend and its reduction potential

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## Analysis of emission/energy data

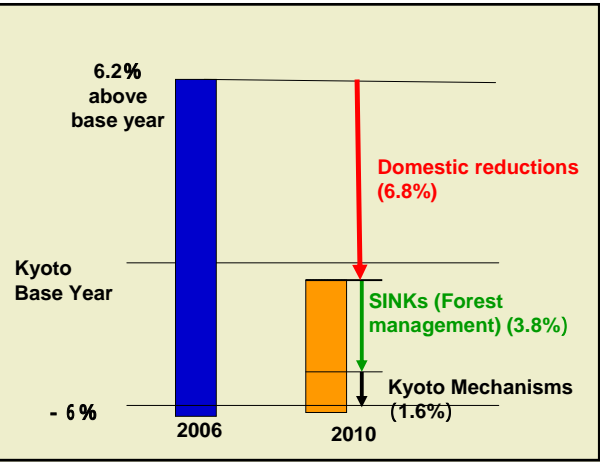
- Inventory Data
- Fuel and electricity Data of large facilities :  
Requested data (2000,2003,2005) from Kiko Network. The data are collected by mandatory periodical reporting requirements for large facilities under the Law Concerning the Rational Use of Energy (jurisdiction of the Ministry of Economy, Trade and Industry),  
[Lawsuit continues on some facilities not disclosed the data.]
- GHG data of large facilities:  
First data released in this March under the Mandatory Accounting/Reporting/Disclosure System under the Law concerning the protection of the Measures to Cope with Global Warming (Jurisdiction of the Ministry of Environment)

## Japan's GHG emissions trend (fiscal 90-06)

GHG emissions: 1.34 bil. t-CO2 (4<sup>th</sup> largest emitters in the world)



6.2% above the base year / 12.2% gap to the Kyoto Protocol target



## "Indirect" emissions and "Direct" emissions

### ■ Indirect emissions:

'indirect emissions' are calculated by allocating emissions associated with the generated electricity to the final consumption sectors, such as factories, offices, and households.

### ■ Direct emissions:

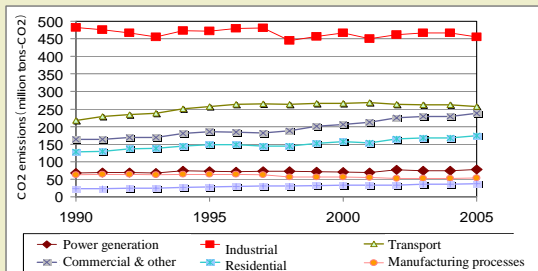
'direct emissions' are calculated as the CO<sub>2</sub> emissions of the power industry for electricity generated at power stations,

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## CO<sub>2</sub> emissions by sector (indirect emission)

- Industry is the biggest emitter, but its trend is stable since 1990.

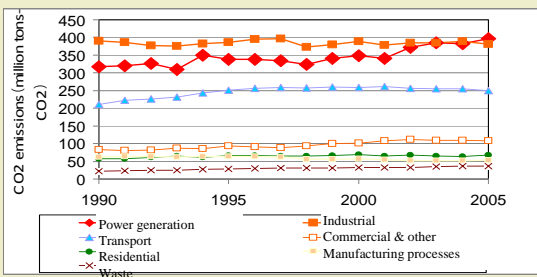
- Emissions from commercial and residential sector has increased since 1990.



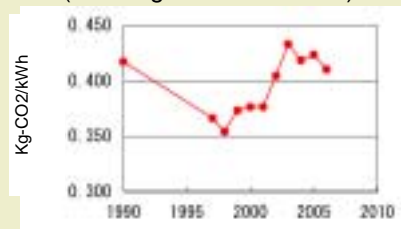
## CO<sub>2</sub> emissions by sector (direct emission)

- Power sector trend shows dramatic increase from 1990 level

- Reason: 1) increase of electricity consumption in commercial and residential sectors, 2) deterioration of emission factor.



## CO<sub>2</sub> emission factor (Power generation sector)



Source: Submission of Federation of Electric Power Companies of Japan to Central Environmental Council and Industrial Structure Council of Japan.

- CO<sub>2</sub> emission factor improved from 1990-1998, but after 1998, it has been deteriorated.

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## CO2 emissions from coal increases 3 times from 1990

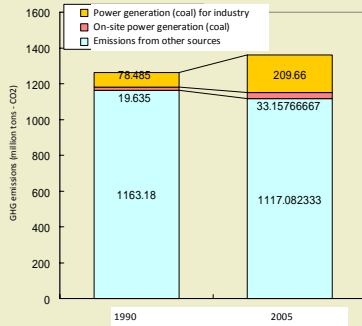
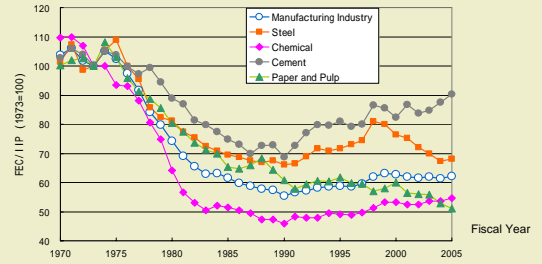


Figure 5. Trend in CO<sub>2</sub> emissions from coal  
 Source: Prepared from reporting data submitted to Central Environment Council and Industrial Structure Council, and from energy balance sheet of the Resources and Energy Agency.

- Main reason in emission factor deterioration is dramatic increase of emissions from coal-fired power plants. It increased 3 times from 1990.

## Manufacturing industry's efficiency worsened since 1990

< Changes in energy intensity based on IIP (Indices of industrial production) (1970-2005) >

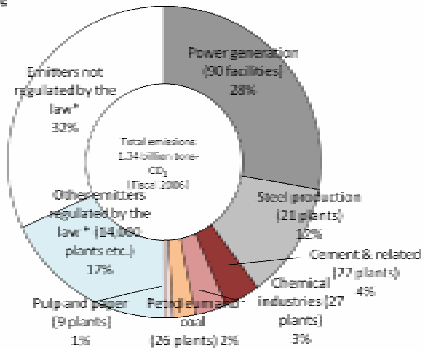


- Following the oil shock, energy efficiency improved
- After 1990 it has stagnated (and somewhat worsened)

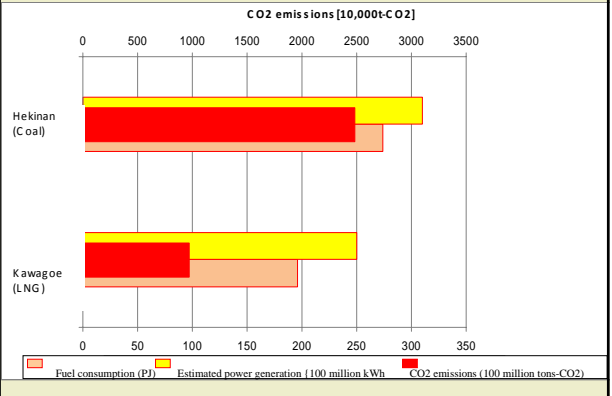
Source: IEEJ (2007) Handbook of Energy and Economic Statistics in Japan (2007 edition). Energy Conservation Center, Japan.

## 200 facilities account for half of Japan's total GHG emissions

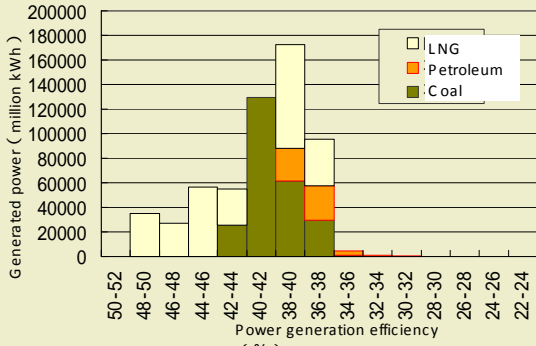
\*The law concerning the production of the Measures to Cope with Global Warming



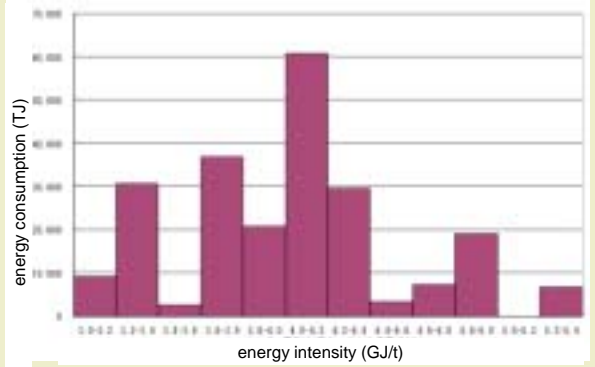
## CO2 emissions from power plant differs from fuel source



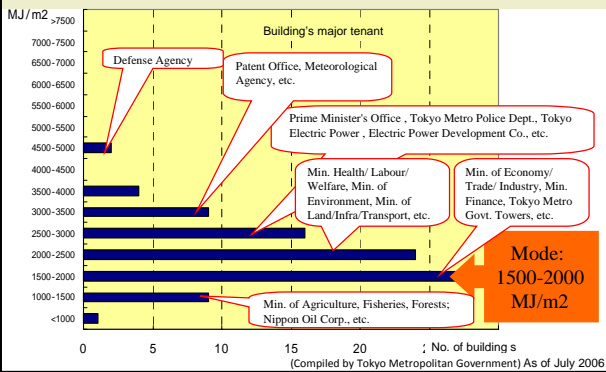
### Power generation efficiency of power plants



### Efficiency of cement facilities



### Efficiency of office buildings in Tokyo



### Steel sector?

... UNKNOWN...



Steel sector rejected to disclose CO<sub>2</sub> data and energy data. The core promoter of Japan's sectoral approach. Sectoral approach without data???

## Conclusion(1)

- Japan's emission is not yet declining.
- Major reason is increase in emissions of coal-fired power plants.
- Manufacturing industry's energy efficiency is worsened since 1990.
- 200 facilities (90 power, 21 steel, 89 others) accounts for 50% of Japan's emission. Those are highly responsible to Japan's emission reduction.
- But industry's actions including big emitters are left to "voluntary action."
- Detailed data shows efficiency varies site by site in each sector. Reduction in industry sector is no way like squeezing "dry towel", but there are even low cost reduction potentials.

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## Conclusion(2)

- Key for Japan to move forward is:
  - Information disclosure from industry and ensure public access to reliable data
  - Introduction of effective PaMS, trading/tax, with the data
- Having these, Japan still can meet Kyoto target mainly through domestic action, and accept further reduction target in the range of 25-40% in 2020 compared to 1990.

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