



25th world gas conference
"Gas: Sustaining Future Global Growth"

Natural Gas in Japan's Post-Fukushima Energy System and its CO₂ Emissions Reduction Potential

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Venue: Kuala Lumpur Convention Centre



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The Great East Japan Earthquake

Earthquakes (Main shock)

Magnitude : 9.0 (Mar. 11th 2011)

Casualties

Dead : over 15,800

Missing: over 3,200

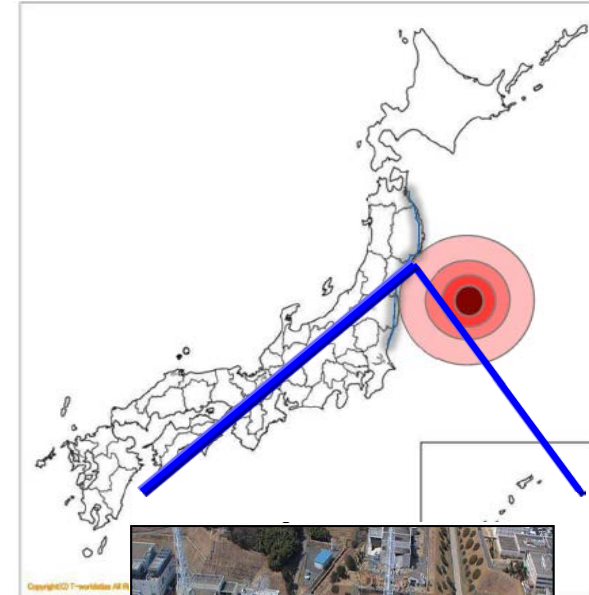
Injured: over 6,000 (As of Feb 21st 2012)

Evacuees

Over 342,000 (As of Feb 9th 2012)

Tremendous support from the international community

- 163 countries and regions
- 43 international organizations



Air Photo Service Inc (Myoko, Niigata Japan)



US Navy/US Pacific Command
(Operation Tomodachi)



Ministry of Defence

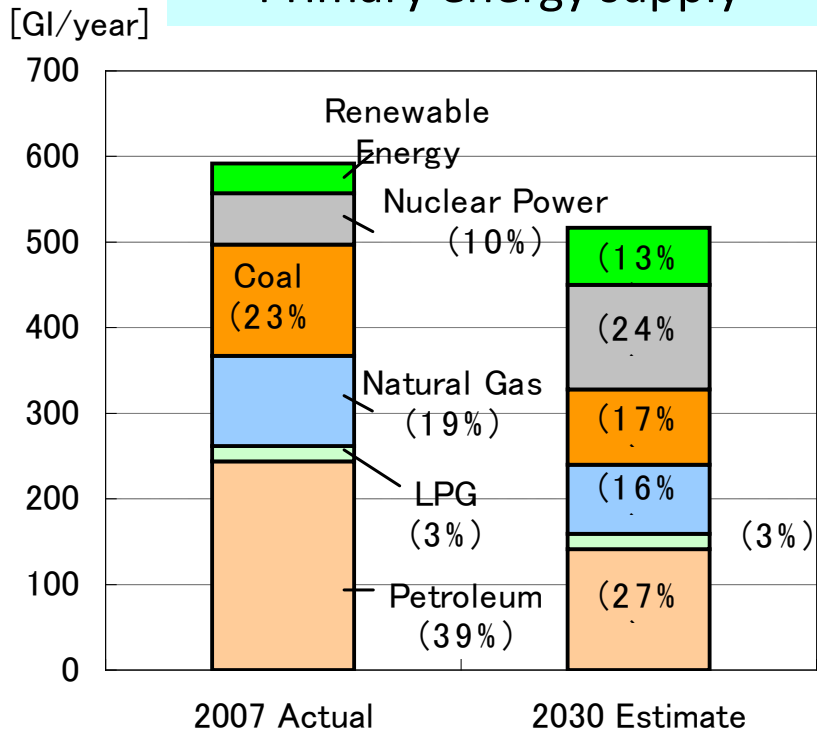
Fukushima Dai-ichi NPS after the Earthquake and Tsunamis

The Basic Energy Plan prior to earthquake

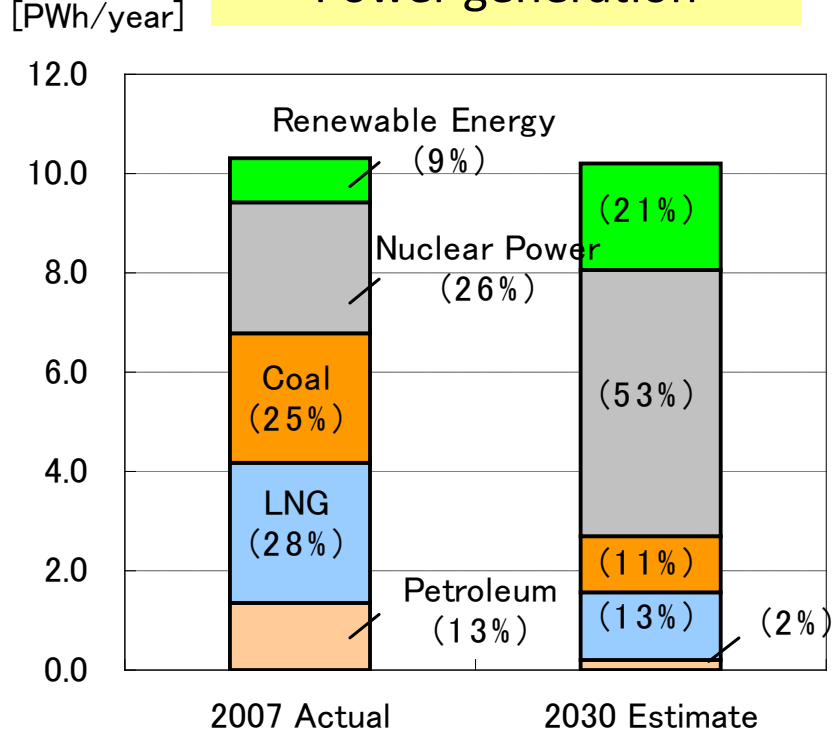
The Basic Energy Plan based on its efforts to promote nuclear power

- Construction of new nuclear power plants : a minimum of 14
- Facilities utilization rate : approximately 90%
- The plan aimed to achieve a reduction in CO₂ emissions by approximately 30% from 1990 levels

Primary energy supply



Power generation

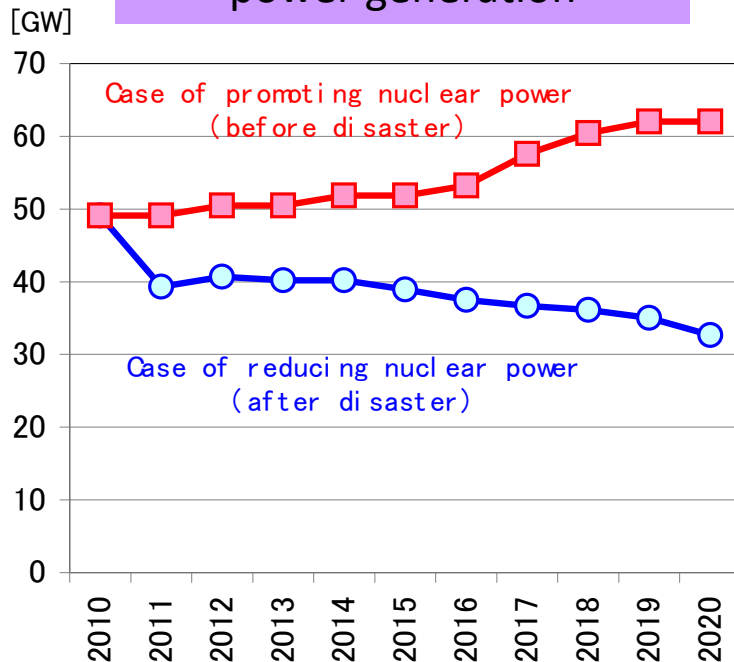


The shift in nuclear power policy following the disaster

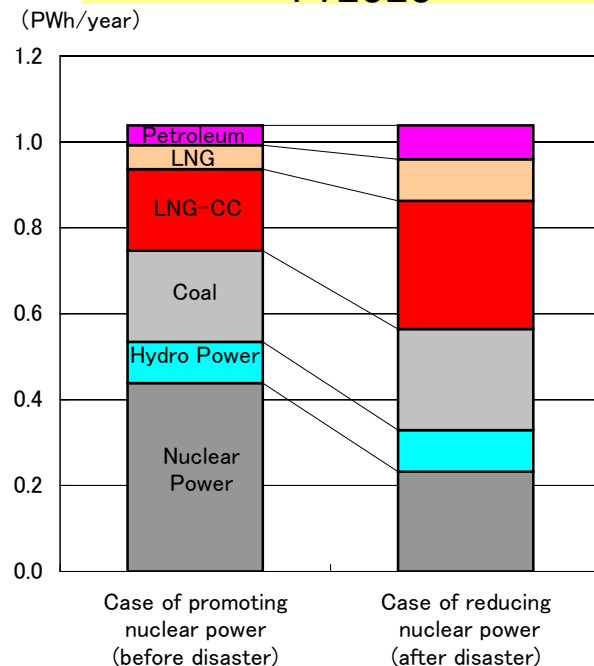
The scenario to reduce the country's dependency on nuclear power generation
 Estimation result in FY2020

- The capacity of nuclear power generation : Decrease by 30 GW
- The power generation of nuclear power generation : Decrease by 220 TWh/year
- CO₂ emissions : Increase by 110 Mt-CO₂/year

The capacity of nuclear power generation



The power generation in FY2020



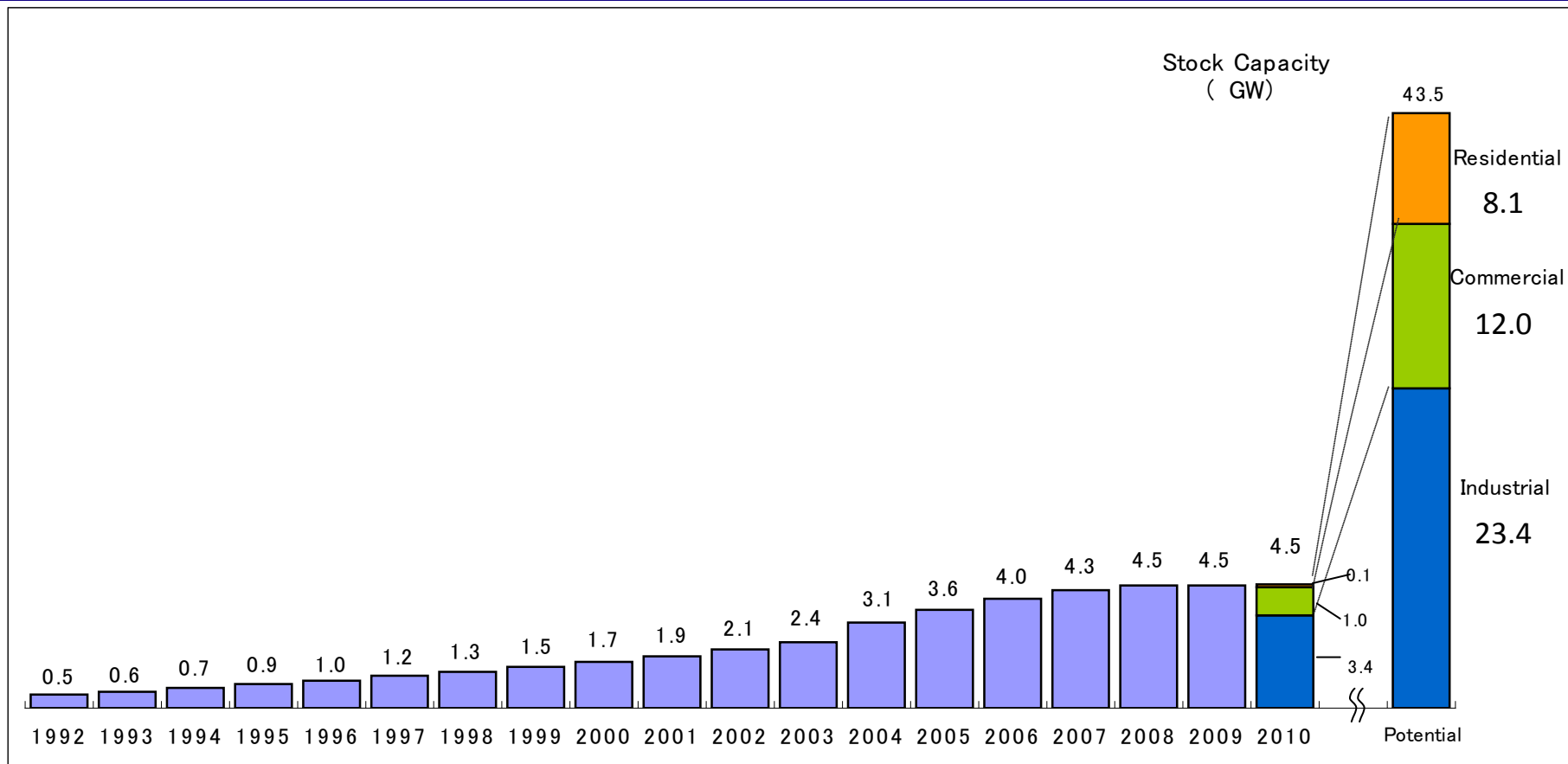
The potential for introduction of natural gas co-generation

Estimation result of the potential for the maximum introduction of natural gas co-generation

Industrial : 20 GW, Commercial : 11 GW, Residential : 8 GW

Increase of the consumption of natural gas : 30 billion m³/year

The potential to reduce CO₂ emissions : 70 Mt-CO₂/year



The potential for the shift in fuel usage

Increase of the consumption of natural gas : 48 billion m³/year
 The potential to reduce CO₂ emissions : 35 Mt-CO₂/year

Energy consumption data in latest year
 (Sector*Usage*Type of fuel)

Social factors

the trend of energy saving



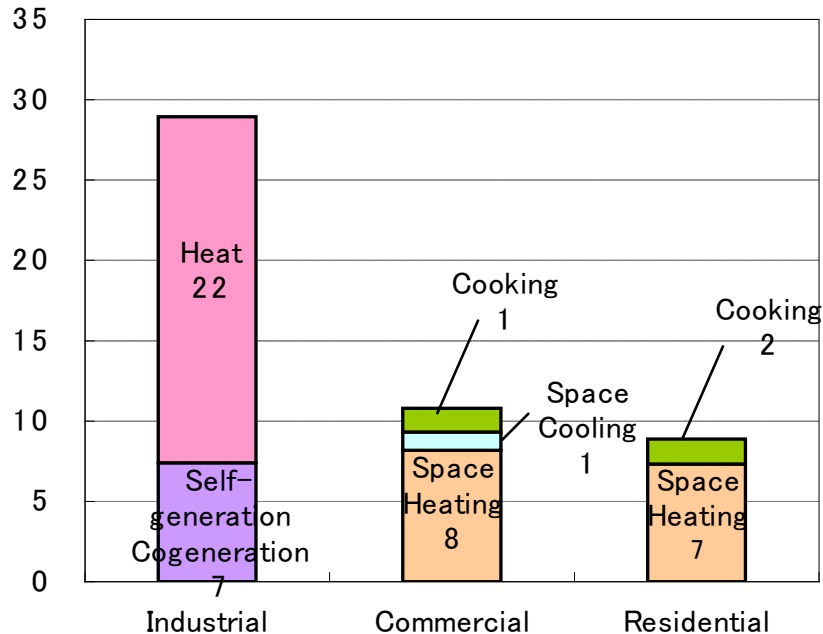
Energy consumption estimates in FY 2020
 (Sector*Usage*Type of fuel)

- heat use, cogeneration, and self-generation in the industrial sector
- cooking and space heating in the commercial and residential sectors



The potential for the maximum shift in fuel usage

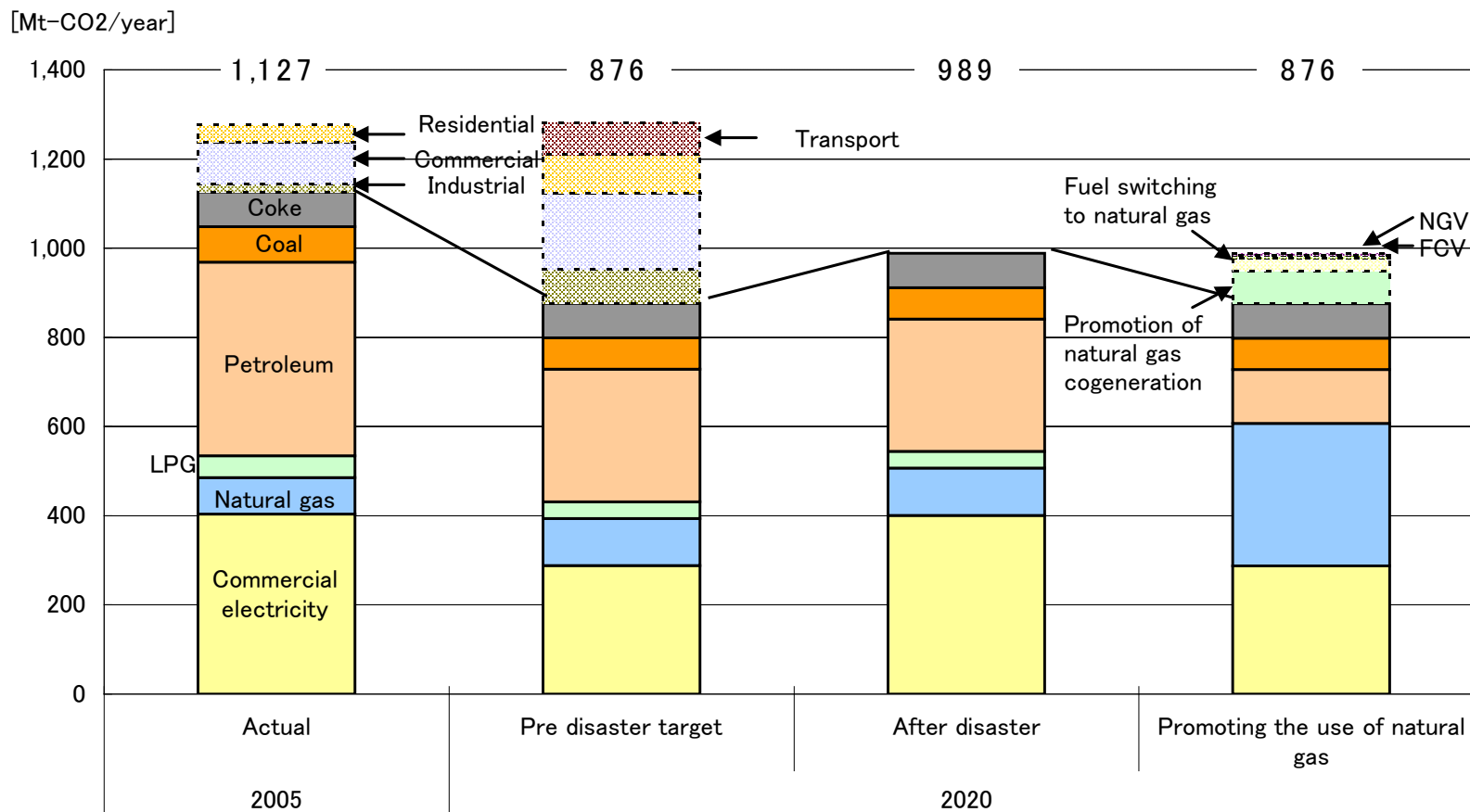
[billion m³/year]



The findings

- All sectors -

- CO₂ emissions from all four sectors were to be reduced 876Mt-CO₂/year
- The turnaround of nuclear energy policy would cause to increase 110 Mt-CO₂/year
- The total CO₂ reduction by promoting the effective use of natural gas could offset the increase in CO₂ emissions resulting from the turnaround in nuclear energy policy



Implications and further consideration

- The analysis indicated the importance of the role that natural gas played in Japan's energy system following the disaster.
- The results from this analysis suggest that Japan now requires an energy policy based on the promotion of advanced utilization of natural gas.
- Request in order to promote the utilization of natural gas
 - ✓ The expansion of domestic natural gas pipe line network
 - ✓ City gas companies take the lead in technological development
 - ✓ City gas companies make further efforts in their sales
 - ✓ Policy support, the understanding of natural gas utilization among policy makers