International Days of the Chair Modeling for Sustainable Development

Japan’s Energy/Climate Policy “After FUKUSHIMA”

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3号機では使用済み燃料保管プールの水蒸発か

福島第一原発情報

1号機
建屋で水素爆発

2号機
圧力抑制室破損

3号機
建屋で水素爆発

4号機
使用済み核燃料保管プールで火災
(東京電力提供)
Relative distribution of emitted radioactive particles:

- Konzentration wenig verdünnt / concentration slightly diluted
- Konzentration deutlich verdünnt / concentration considerably diluted
- Konzentration stark verdünnt / concentration strongly diluted

Important note: The illustration does not allow conclusions on the real concentration of radioactive particles in the air, because the strength of the source is unknown. It is only shown how effective emission is distributed at the moment and diluted depending on current weather conditions.
Myths (unquestioned-beliefs) about nuclear power were broken

• Myth #1 “Credible (stable)”: Many small/big accidents

• Myth #2 “Cheap”: Subsidy (13 trillion JPY for 54 plants) + Compensation (more than several trillion JPY) + Damage on Industry (more than several trillion JPY) + $\alpha$

• Myth #3 “Safe”: It was just not
Example of the damage cost

• (Complete or partial) import ban or request for a certificate to “made in Japan food” (almost all countries)

• Decrease of foreign visitors: 2.2 million (April-June, 2010) → 1.1 million (April-June, 2011) = Loss of 650 billion JPY per year

• Tremendous costs for decontamination: Several hundreds of trillion JPY (?)
NOTICE!!

Certification of Radiation Safety
Results were NEGATIVE for:
BELL PEPPERS (Miyagi Pref.)
Energy conservation we achieved last summer

- 15% **compulsory** electricity consumption reduction requirement to the heavy consuming facilities in Tokyo and Tohoku area
- Voluntary reduction requirement for general household
- Results: -16% compared to last year (July and August, Tokyo metropolitan area)
Survey conducted by IGES:
Do you support nuclear power to meet the demand of Japan?

Japanese (N=432)

- Agree: 10.4%
- Somewhat Agree: 36.8%
- Somewhat disagree: 24.1%
- Disagree: 28.7%

Non Japanese (N=275)

- Agree: 30.5%
- Somewhat disagree: 30.5%
- Disagree: 17.1%
- Somewhat agree: 21.8%
Survey conducted by Asahi newspaper (Mar. 10, 2013)

Do you support nuclear power plants to start operation again after (periodical) inspection?

Disagree: 57%
Agree: 27%
Survey conducted by Asahi newspaper (Mar. 10, 2013)
Do you trust the safety measures by the Japanese government?

Not at all: 52%
Not so much: 28%
2. Energy/Climate policy
“Less-dependent on nuclear power” is a consensus in Japan, but...

• **When?** : Immediately, 20 years, 40 years....

• **How?** : Renewable? fossil fuel?

• **How much?** : Cost re-calculation

• **CO$_2$ implication?** : Difficult to say something definite at this moment

• **Defense policy implication?** : role of nuclear power as a deterrent force
Renewables are IN, but..

• Exact FIT tariff prices, terms and amount of introduction, etc. are not yet decided
• Re-examining assumptions on cost calculation are still under-going
• Many regulation and local stake-holders objections are big barriers
Renewables are cheaper in the long run, but...

Results of the TIMES Japan model simulation by IGES
NPV of total energy system cost (2005-2100, 10% discount rate)
Energy conservation potential exists

• For example, If we change all electric bulbs and fluorescent lights in Japan to LED, we can save 99.2 billion kWh which corresponds to 13 nuclear power plant generation per year

• Anyway, we need to explore more energy conservation potential on the demand side (so far, little incentives for power companies)
Socio-economic impacts are high

• Challenges to the existing oligo-politicized, fragmented power supply/transmission system

• Revision of the price setting methodology of electricity price (VERY IMPORTANT!)

• Political influence of power companies on Japan’s industries and policy-makers will change

• Asia super-grid?
Japan’s climate policy: anti-multilateralism?
(my personal observation)

Generally speaking, Japan’s traditional multilateralism seems to have somewhat faded away due to:

1) loss of election for the UN security council member in 2005
2) China’s economic/political surge and Japan’s relative decline
3) FUKUSHIMA accident
3. Conclusion
Challenges and Opportunities

• Japan’s energy policy will definitely change after FUKUSHIMA

• Impacts on climate policy would be negative in the short term but positive in the medium and long term

• In short, everything depends on the restructuring of political decision making system in Japan!
Last word

Nuclear is neither safe nor cheap!
Thank you and let’s keep fingers crossed for everything!