

2021.03.01

Foreign Press Center Japan
Press Briefing (Streaming)

Carbon Neutral in 2050: The Current State of and Challenges for Japan's Energy Policy

Dr. Takeo KIKKAWA

Professor, Graduate School of International Management,
International University of Japan

Professor Emeritus, University of Tokyo

Professor Emeritus, Hitotsubashi University

Member, the Advisory Committee
for Natural Resources and Energy

kikkawa09@gmail.com

New Landscape: Carbon Neutral

■ October 26: PM Suga policy speech “Carbon neutral in 2050”

←October 13: JERA “2050 zero emissions” by ammonia

■ METI Minister Koriyama’s “Determination”

* July 3: Support the fade-out of inefficient coal-fired power with non-firm power transmission (renewable energy).

←Chiba-style TEPCO power grid

* Stance of Energy Basic Policy Subcommittee: Contrasts with former METI Minister Seko

* Framing the debate of “50 years⇒30 years”

:Contrasts with when the 5th Basic Energy Plan was made

■ 2050 energy source mix [Reference values] (December 21: Agency for Natural Resources and Energy)

* Renewable energy: 50 to 60%

* Hydrogen/Ammonia:10%

* Other carbon free power (including carbon capture, utilization and storage (CCUS)) + nuclear power: 30 to 40%

The Path to Carbon Neutrality

■ Electricity: Non-fossil fuel energy sources

- * Renewable energy, nuclear power
- * Carbon-free power (hydrogen, ammonia, CCUS)

■ Non-Electricity: Use for heat, etc. Electrification rate 38%

- * Electrification
- * Hydrogen (hydrogen reduction ironmaking, fuel cell vehicles, etc.)
- * Methanation, synthetic fuel (e-fuel)
- * Biomass

■ Carbon removal: Offset final CO₂ emissions

- * Planting trees
- * Direct Air Capture with Carbon Storage (DACCS), etc.

Renewable Energy

■ **The reason for the rapid global growth of renewable energy is the **economy**.**

- * Japan is alone in thinking “renewable energy is expensive”
- * The situation will change significantly even in Japan when the cost targets of industrial solar power for 7 yen/kWh in 2025, onshore wind power for 8 or 9 yen/kWh in 2030, and offshore wind power for 8 or 9 yen/kWh between 2030 and 2035.

■ **The issue of power lines is **solvable****

- * Use excess lines (lines for 21 decommissioned nuclear plants, non-firm connections)
- * Build lines (Optimal for ESG investing, the overall cost system remains in the power transmission sector)
- * Don't use lines (smart communities, hydrogen, cogeneration)

■ **Instead of aiming to make renewable the main power source, aim to make it **primary energy**.**

- * Lower costs by using renewable energy not just for electricity, but for heat as well.

Nuclear Power Plants

■ Renewable energy as the main power source = nuclear energy as a secondary power source

■ Suga administration will avoid replacement, same as the Abe administration.

- * Many advocates of nuclear power are optimistic, but they might have the rug pulled out from under them.
- * With the KEPCO bribery scandal, what was effectively the only route for replacement has vanished.
- * Even extending every plants (33) lifespan to 60 years, there will be 18 in 2050, 5 in 2060, and 0 in 2069.
⇒ Not a valid option for decarbonization.
- * How the Biden administration will handle the Japan-US agreement on nuclear energy is also a point of interest.

■ “A real and positive method to end nuclear power” as an option

- * Fired power shift + decommissioning business (job creation) + mid-term onsite storage costs

■ 5th Basic Energy Plan goal of “20 to 22% nuclear power in 2030” will be extremely difficult

- * Having 30 plants operating at 80% is nearly impossible.
- * Restarted plants: 9, Certified but not operating: 7, Under inspection: 11, Not applied for inspection: 9, Decommissioned: 21

Coal-Fired Power Plants (1)

■ The fadeout of inefficient coal power is **not a policy change**.

- Clearly stated in the 5th Basic Energy Plan
- Essentially, a declaration that “we will continue to use high-efficiency coal power (USC/IGCC)”
- June 30: Takehara New Unit No. 1 (600,000 kW), July 1: Kagoshima Unit No. 2 (645,000 kW) began operation
- 114 inefficient plants with low output, 26 high-efficiency plants with high output
- The rush to build new high-efficiency plants will cover 20% of electricity demand
- Stricter export criteria is also a kind of tautology

■ However, in some areas there are potential significant operating risks from two directions.

- Local energy companies not operating (or unable to continue operating) nuclear power plants
Major impact: Okinawa, Hokkaido, J-Power, Chugoku, Tohoku, Hokuriku
- Chemical, paper, and steel manufacturers which use private coal power to remain competitive
- In the end, with TEPCO, KEPCO, and JERA having shifted, inefficient coal power will fade out.

Coal-Fired Power Plants (2)

■ The reduction of coal power shifting not to nuclear, but to renewable energy is a change in policy.

- * Digging deeper into the “Japanese version of Connect & Manage” mentioned in the 5th Basic Energy Plan.
- * Greater focus on horizontal expansion of non-firm connections.
- * How much of a crack will we be able to make in the rule of “first come, first served?”

■ Another weakness of coal power=inability to adjust output

(not just an environmental issue, but economic as well)

- * With growth in the ratio of adjustable renewable energy, value will shift from kWh (baseload power sources) to Δ kW (adjustable power sources)
- * Output adjustability for one minute:
Hekinan (coal) 2%, Nishi Nagoya (LNG) 8%,
Osaki Coolgen (IGCC) 15%

Energy Source Mix

■ 2050 (Government)

- * Renewable 50 to 60%, hydrogen/ammonia 10%
- Carbon-free other than hydrogen/ammonia + nuclear power 30 to 40%

■ 2050 (Proposal)

- * Renewable 50% (60%), nuclear 10% (0%)
- Fired power 40% (hydrogen/ammonia/CCUS=zero emissions)

■ 2030 (Government)

- * Renewable 22 to 24%, nuclear 20 to 22%
- liquid natural gas 27%, coal 26%, oil 3%

■ 2030 (Proposal): Changing the government forecast is meaningful.

- * Renewable 30%, nuclear 15%
- LNG 33%, coal 20%, oil 2%

■ Relatively heavy **carbon pricing** (regulation) is the key