Global Environmental Policy Making on Technology

Class Work

3rd December 2019

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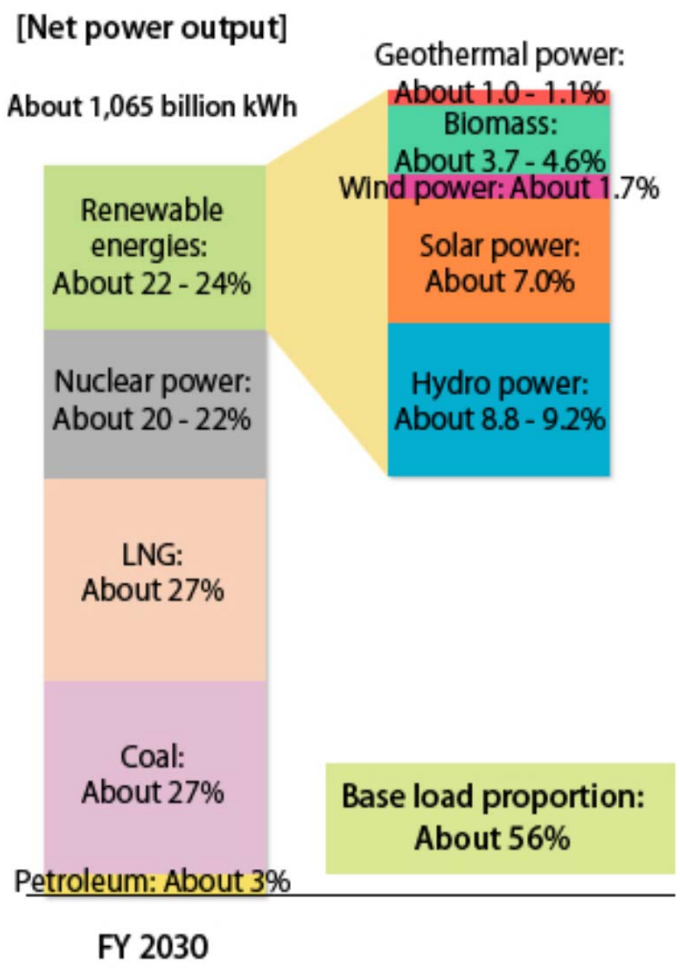
Outline

- Role play exercise
- Objective is to encourage students to investigate some issues further and to use what we have been learning proactively.
- Participants are supposed to act as one of the following;
  - Government,
  - Power producer and supplier (PPS) operating PV and wind power,
  - Major electric power company operating thermal (coal and LNG), nuclear, hydro etc.,
  - Implementer of CCS.
- Each category consists of a quarter of the class.

Japan's Intended Nationally Determined Contribution

- Japan's INDC towards post-2020 GHG emission reductions is at the level of a reduction of 26.0% by fiscal year (FY) 2030 compared to FY 2013 (25.4% reduction compared to FY 2005) (approximately 1.042 billion t-CO2 eq. as 2030 emissions), ensuring consistency with its energy mix (right), set as a feasible reduction target by bottom-up calculation with concrete policies, measures and individual technologies taking into adequate consideration, inter alia, technological and cost constraints, and set based on the amount of domestic emission reductions and removals assumed to be obtained.



Proposal for the 'best mix' for Japan's energy portfolio

Situation

- In 2020 the Japanese government recognizes that, taking into account of delay in restart of nuclear power plants (NPP), limited growth pf biomass and geothermal, and restriction of further increase of PV and wind power due to its intermittency and cost for FIT, it is unlikely that Japan achieves its GHG emission reduction goal by 2030 described in the INDC.
- Key stakeholders are invited to an open forum to discuss and formulate remedial measures such as;
  - Shift from coal to LNG,
  - Introduction of CCS,
  - Promotion of restart of NPPs and life prolongation of old plants,
  - Change of INDC to less ambitious (more negligent?) level.

Group A: Government

- **Mission:**

To solve the problem of climate change, the Japanese government shall contribute to the establishment of a fair and effective new international framework by reducing GHG emissions without jeopardizing energy security and posing excessive burden to the public and the industry in Japan.

- **Homework by and presentation on 10th December:**
  - Paris agreement and Japan's INDC; What we have actually committed?
  - Comparison of options for remedial measures, e.g., shift from coal to LNG, introduction of CCS, promotion of restart of NPPs and life prolongation of old plants, change of INDC to less ambitious level and so on (pros and cons from the government's perspective)

Group B: PPS operating PV and wind power

- **Mission:**

Achieve the emission reduction goals by increasing capacity of renewable energies and establish a profitable business model in a 'Carbon-free society'.

- **Homework by and presentation on 10th December:**
  - Electricity generation capacity and electricity generation of PV and wind power in Japan (current status and prediction)
  - Cost of PV and wind power in Japan together with changes in FIT price (current status and prediction)
  - How can we increase fraction of PV and wind power in the 'energy mix' more than the figure in slide 3 despite of their variability: (including requests to the government, if any)?

Group C: Major electric power company

- **Mission:**

Secure supply of electricity in a cost efficient manner achieving the goals for emission reduction at the same time.

- **Homework by and presentation on 10th December:**
  - Composition of generated electricity by source in Japan and difference among power companies (e.g., difference between Chubu and KEPCO),
  - Comparison of power sources in terms of cost and CO2 emission,
  - Suggestion (with comments on reasons behind it) of optimal composition of power sources* from power company's perspective (could vary from one company to another).

*Thermal power with CCS should be distinguished from the one without.

Group D: Implementer of CCS

- **Mission:**

To reduce emission of CCS while use of fossil fuel for power generation (and other industries such as cement and steel manufacturing in future) is continued.

- **Homework by and presentation on 10th December:**
  - Cost of CCS (total cost and cost for the individual processes, i.e., capture, transport and storage, current status and prediction)
  - How can we make a sustainable business model for CCS (incentives for CCS, e.g., FIT, carbon pricing, and subsidies)?
  - Estimated storage capacity of CO_2 within Japan's Exclusive Economic Zone
  - When and how much CO_2 should we plan to capture and store?

Timetable (10th December)

- Introduction: 14:55 - 15:00
- Presentation on homework (including brief discussion)
  - Group A: 15:00 – 15:30
  - Group B: 15:30 – 16:00
  - Group C: 16:00 – 16:30
  - Group D: 16:30 – 17:00
- Break: 17:00 – 17:15
- Discussion*: 17:15 – 18:00
- Presentation of proposals on remedial actions with reasoning
  - Team 1: 18:00 – 18:10
  - Team 2: 18:10 – 18:20
  - Team 3: 18:20 – 18:30

* Three teams will be formed. A team will include one or two members from each Group.

Contact

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Thanking you in advance for your active participation…