443rd Forum on Research Works December 27, 2022

Climate Change and GX Policy Challenges for 2023

~International and Domestic Policies and Measures in the Age of Energy Crisis~

Institute of Energy Economic, Japan

Junko Ogawa
Senior Researcher, Climate Change Group
Climate Change and Energy Efficiency Unit

Key points of this report

1. Background for 2023

- ✓ While the tight energy supply-demand balance and high energy prices are predicted to remain in 2023, a challenge is how to strike a balance between energy security and promotion of climate change prevention actions.

2. Mitigation Measures in the United Nations Framework Convention on Climate Change

- ✓ The cover decision at the 27th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) reaffirmed the importance of implementing emission mitigation actions based on the 1.5°C goal and adopted a work program to check progress annually.
- ✓ Regarding emission credits, technical negotiations fell short of producing any agreement on methodology or removals guidance for management by Article 6, paragraph 4, of the Paris Agreement. Therefore, Japanese enterprises should prioritize the use of internationally transferred mitigation outcomes under Article 6, paragraph 2 for the time being.
- ✓ The COP28 will conclude the final phase of the first Global Stocktake to assess global progress every five years. The Global Stocktake will also consider outputs to promote the enhancement of goals, seeking to effectively provide comprehensive information for each country's consideration of initiatives toward 2035.

3. Major Countries' Actions

- ✓ Climate change policy actions in the European Union, the United States, China, and India, which accounted for 60% of global CO2 emissions in 2020, will draw the attention of other countries developing their strategies. In 2022, they demonstrated the attitude of going ahead with climate change countermeasures. They, however, have also increased coal consumption to secure energy supply. These trends may have some impact on climate change policies for 2023.

4. Trends in Japan

- ✓ The government announced a green transformation initiative in 2021 and made rapid progress in decarbonization actions in 2022. Especially discussion on a growth-oriented carbon pricing (CP) system made a huge progress in 2022. The biggest focus of attention in 2023 will be the detailed institutional design for the CP system.
- ✓ In 2023, Japan will host Group of Seven meetings. Toward the G7 Hiroshima Summit on May 19-21, ministerial meetings will take place at various locations, including a meeting of climate change, energy and environment ministers in Sapporo in April. Japan, which features the highest heavy industry ratio among the G7 members and the position as the only Asian G7 member, should take advantage of such features to lead the G7. The key to global carbon neutrality will be the development of initiatives to involve Asia, which is switching from natural gas to coal under the current energy crisis and is expected to rapidly increase energy consumption due to population and economic growth.

UNFCCC COP27/CMA4 Overview (Mitigation)

- The 27th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27), the 4th session of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement (CMA4), and other climate change meetings took place in Sharm el-Sheikh, Egypt, November 6-20, 2022.
- The COP/CMA cover decision on mitigation reaffirmed the temperature goal under the Paris Agreement. “Matters relating to the work program for urgently scaling up mitigation ambition and implementation” were adopted, including annual checks on progress during the work program period through 2026.
- Regarding emission credits, technical negotiations were held without making a fuss.

Cover decision: Sharm el-Sheikh Implementation Plan

I. Science and urgency

✓ Resolved to seek further efforts to **limit global warming to 1.5℃.**

II. Energy

✓ **The unprecedented global energy crisis** underlines the urgency to rapidly transform energy systems to be more secure, reliable and resilient. **The importance of enhancing a clean energy mix, including low-emission and renewable energy, and support for just transitions during this critical decade is recognized.**

IV. Mitigation

✓ Initiatives should be accelerated to **phase down coal-fired power plants** with no emission reduction measures. The development, deployment and dissemination of technologies and the adoption of policies should be accelerated to transition towards **low-emission energy systems**.

✓ Latest nationally determined contributions indicate that global emissions in 2030 would be 0.3% less than in 2019, failing to meet the minimum cost scenario to limit global warming to 2℃ or 1.5℃.

✓ Parties are urged to **review and enhance 2030 goals by the end of 2030 as necessary to adapt to the temperature goal in line with their national conditions.**

XIII. Taking stock

✓ **It is emphasized that the first global stocktake achievements will provide information for parties to update and enhance their actions and support under their nationally determined contributions in line with relevant provisions of the Paris Agreement.**

✓ The achievements will contribute to enhancing international cooperation in climate change countermeasures when the parties update and enhance their actions and support in line with relevant provisions of the Paris Agreement.

Memo ①

*Further decides that the scope of the work programme should be based on broad thematic areas relevant to urgently scaling up mitigation ambition and implementation in this critical decade and **include all sectors**…*

(Mitigation Work Program Para 4.)

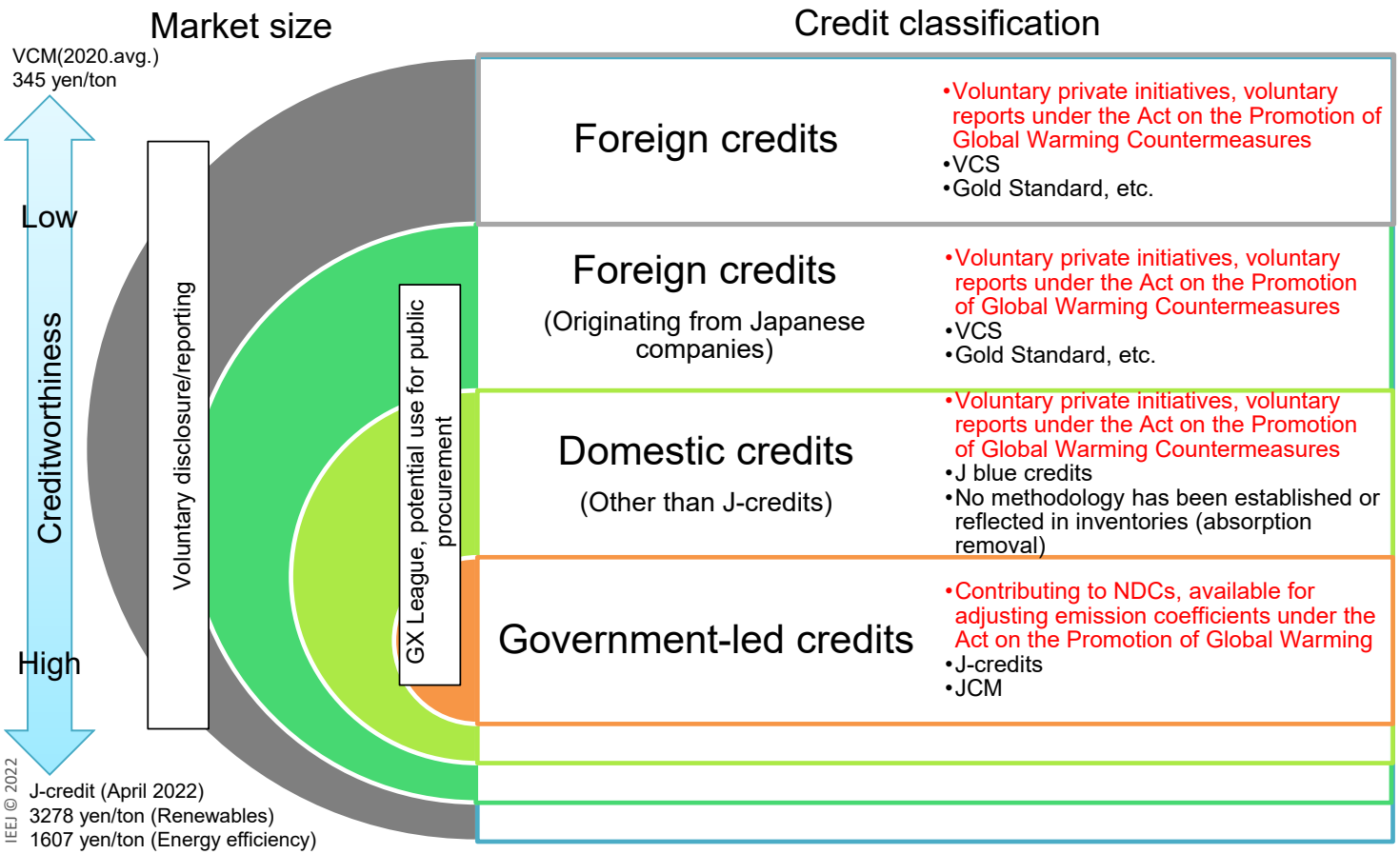
Memo ②

It was decided that emissions updated to meet GWP (global warming potential) 100-year lifetime values in the IPCC-AR5 report will be reported by the end of 2024.

	GWP100yr (AR4)	GWP100yr (AR5)	GWP100yr (AR6)
CO2	1	1	1
Methane (Non fossil origin)	25	28	27.2
Nitrous oxide	298	265	273

Related to Article 6 of the Paris Agreement (Emission credit system)

- The COP27 fell short of producing any agreement on methodology or removals guidance for management by the United Nations under Article 6, paragraph 4, of the Paris Agreement,
- Although priority may be given to international transfers of voluntary national emission cuts under Article 6, paragraph 2, consideration may continue about coordination (to avoid double counting).



●The COP26/CMA3 in 2021 agreed on the Paris Rulebook, regarding procedures to avoid double counting under Article 6, paragraph 2, and rules, forms and procedures for the mechanism under Article 6, paragraph 4. The COP27/CMA4 in 2022 agreed on procedures for tracking and reporting.

●Key issues in future negotiations are expected to include host countries' procedures to avoid double counting under Article 6, paragraph 2, and how to calculate emission cuts under the mechanism under Article 6, paragraph 4.

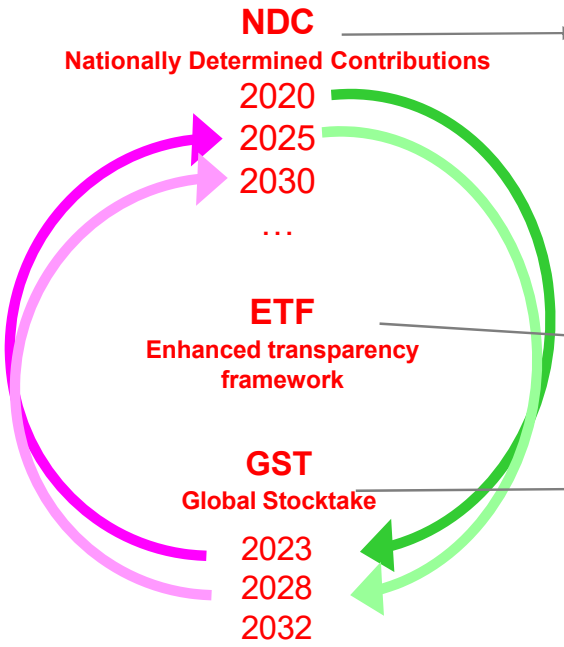
Reference

For details of credits and the COP27, see the following:
42nd IEEJ Energy Webinar "COP27 briefing meeting" (held on November 29, 2022)
https://eneken.ieej.or.jp/movie_detail.php?movie_info__id=376# (in Japanese)

Related to the Paris Agreement's Article 14
(Global stocktake)

- The COP28 in 2023 (to be hosted by the United Arab Emirates) will represent the final phase of the first global stocktake (GST) to assess global progress toward the long-term Paris Agreement goal every five years. It will assess progress made throughout the entire world.
- Output to scale up and enhance mitigation ambition will be considered.

Cycle of mechanism to scale up ambition



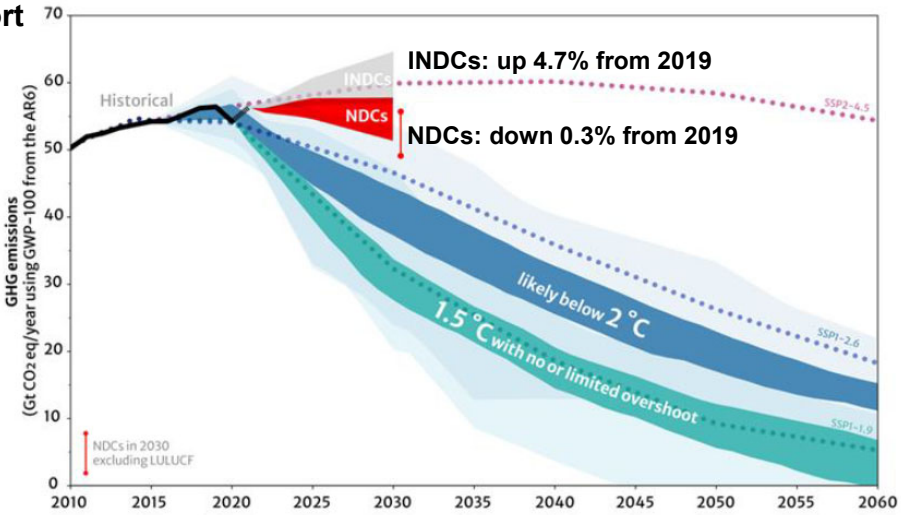
Submission of new or updated NDCs (Article 4, quinquennial assessment)

Reported initiatives (Article 13, submission of biennial transparency reports)

Collective progress toward objectives and long-term global goal (Article 14, quinquennial assessment)

Updated NDCs will be decided on and notified by each country (Article 4, updating NDCs every five years)

Comparison of emissions for previous INDCs and latest NDCs and for 1.5°C pathway and below 2°C pathway in 6th IPCC Assessment Report



"The information in paragraphs 9–16 and 18 above implies, despite some progress made since the previous version of this report, an urgent need for either a significant increase in the level of ambition of NDCs between now and 2030 or a significant overachievement of the latest NDCs, or a combination of both, in order to attain the cost-effective emission levels suggested in many of the scenarios considered by the IPCC for keeping warming likely below 2 or limiting it to 1.5 °C. If emissions are not reduced by 2030, they will need to be substantially reduced thereafter to compensate for the slow start on the path to net zero emissions."

(Source) UNFCCC, Nationally determined contributions Synthesis Report, October 2022

EU

- The EU is making gradual progress in legislating the Fit for 55 initiative to secure the enhancement of the 2030 emission reduction goal. It has agreed to introduce the Carbon Border Adjustment Mechanism (CBAM) and plans to phase out free allowances under the EU Emissions Trading System (EUETS) by 2034. However, details of the ambitious agreement must be checked further.
- The EU is coming back to coal-fired power generation due to the tightening energy supply-demand balance this winter. The energy crisis may exert some impact on progress in decarbonization.

Fit for 55 enhancement and legislation

- Considering raising a 2030 goal for GHG emission reduction from 1990 to 57% from 55%.
- Enhancing energy efficiency improvement and renewable energy expansion. Raising the 2030 energy efficiency improvement from 9% to 13% and renewable energy's energy mix share from 40% to 45%.
- The EUETS is set to cut emissions by 62% from 2005 by 2030 and expand its coverage to include transportation and buildings sectors from 2027. Effort sharing regulations for non-ETS sectors will be enhanced.
- CBAM: Final agreement has been reached on the introduction of the CBAM and the expansion of its coverage to include hydrogen. The EU plans to phase out free allowances under the EUETS from 2026 to 2034 and transition to the CBAM. Measurement rules are left for future consideration.
- Car CO2 emission standard: Sales of new internal-combustion-engine vehicles will by banned in 2035.

REPowerEU (May 18)

- An energy diversification strategy was published to substantially reduce the EU's dependence on Russian fossil fuels by the end of 2022 and eliminate it earlier than in 2030, while securing U.S. and other natural gas supply.

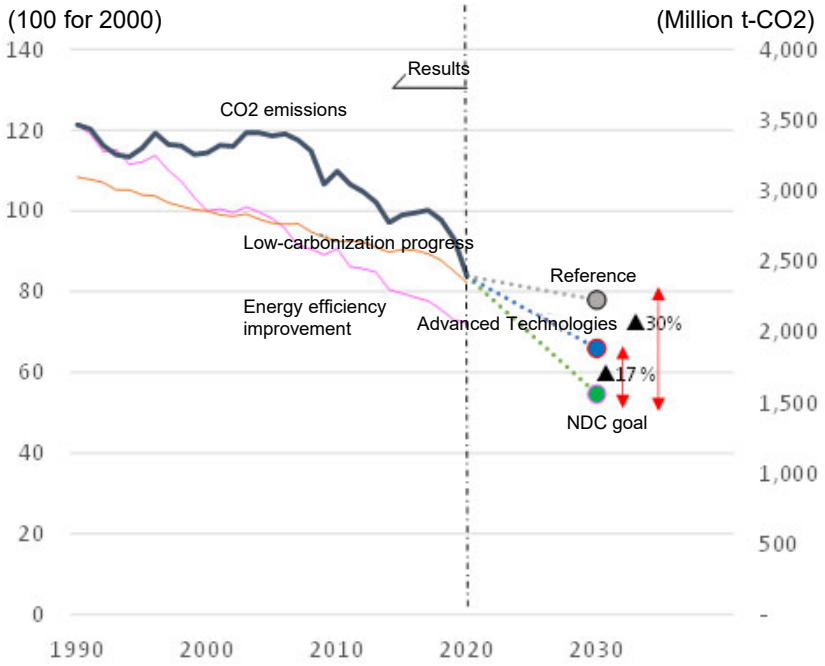
EU Taxonomy Regulation (July 6)

- The European Parliament voted not to oppose the European Commission's taxonomy regulation to include some nuclear and gas operations into sustainable economic operations (taking effect on January 1, 2023).

Responding to tightening supply-demand balance (this winter)

- The natural gas supply-demand balance has tightened further as developed countries have reduced Russian fossil fuel imports under their Russia sanctions.
- Although European countries had taken leadership in phasing out coal, Germany in June 2022 announced a plan to temporarily expand coal-fired power generation. Italy, Austria, the Netherlands and the United Kingdom are also considering utilizing coal-fired power generation.

EU CO2 emissions and NDC goal (1990 - 2030)



Data from the IEEJ Outlook 2023 were updated.
Note: While the EU goal is on a GHG basis, this figure covers CO2 alone.

U.S.

- The Inflation Reduction Act was enacted after turns and twists. The Inflation Reduction Act and the Infrastructure Investment and Jobs Act (enacted in 2021) envisage the highest climate change-related investment in U.S. history.
- A key point is how far the United States would expand clean energy infrastructure investment under these acts and come closer to its GHG emission reduction goal.

EPA litigation settlement (February 28)

- The U.S. Supreme Court held hearings on a lawsuit by 19 states and coal companies claiming that the Environmental Protection Agency (EPA) has no authority to set any new policy to regulate power plants. On June 30, the top court concluded that the Congress has not authorized the EPA to create any emission caps based on a transition approach adopted by the EPA in the Clean Power Plan.

Inflation Reduction Act Enactment (August 16)

- In response to the failure of the 2021 Build Back Better bill, the Inflation Reduction Act was enacted with a smaller climate change package. The act aims to cut budget deficits by $300 billion over a decade from fiscal 2022 to decelerate inflation. Spending on energy security and climate change measures under the act totals $369 billion, including tax credits. (The Rhodium Group and Princeton University estimate that GHG emissions would be cut by some 40% from 2005.) In addition, the act will impose the methane surcharge of $36 per ton equivalent of CO2 in 2024 and $60/t-CO2 from 2026 on oil and gas production, storage and pipeline facilities with annual emissions at 25,000 tons or more according to excess methane emissions. (The surcharge is combined with $1.55 billion in support for methane emission reduction).

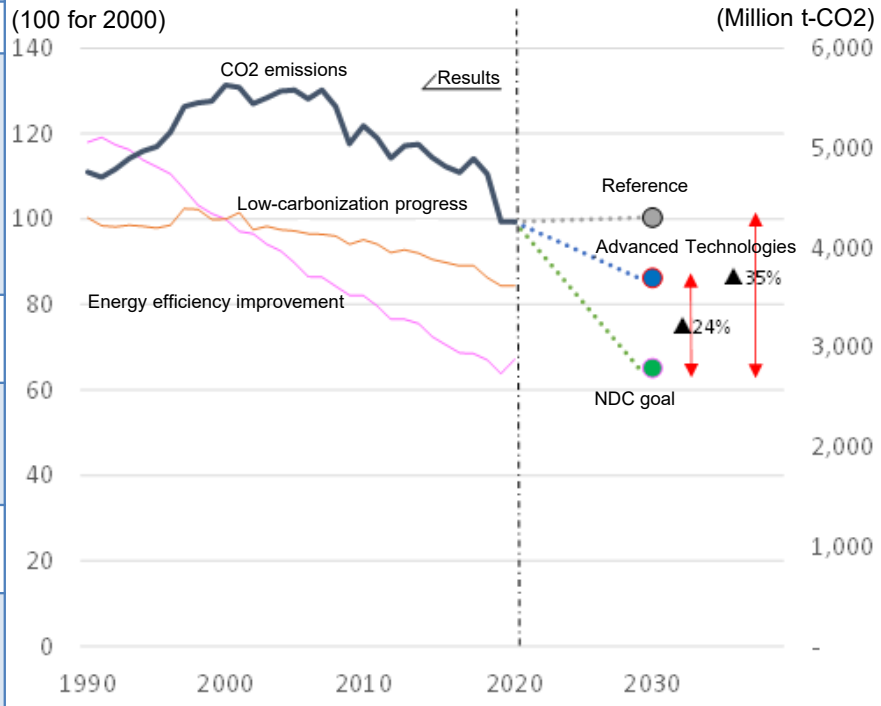
SEC proposed draft rules to enhance and standardize climate change-related information disclosure (March 21)

- The U.S. Securities and Exchange Commission (SEC) proposed draft rules to enhance and standardize climate change-related information disclosure for investors. In public comments submitted by June 17, the American Chamber of Commerce and the Business Roundtable raised opposition to the rules, but Microsoft and Salesforce supported them.

U.S. government proposed draft rules for climate change-related information disclosure (November 10)

- The U.S. government published draft rules that require business operators with $7.5 million or more in annual government procurement contracts to report Scopes 1 and 2 emissions. Those with $50 million or more in annual government procurement contracts are required to report Scopes 1, 2 and 3 emissions, disclose potential financial risks from climate change and set Science Based Targets (SBT). (Public comments will be accepted until January 13, 2023).

U.S. CO2 emissions and NDC goal (1990 - 2030)



Data from the IEEJ Outlook 2023 were updated.
Note: While the U.S. goal is on a GHG basis, this figure covers CO2 alone

China

- China has been shaking out inefficient production equipment under an energy efficiency law (established in 1997 and enhanced gradually later) and other laws, indicating its rapid promotion of energy efficiency improvement.
- Its emission intensity continued to deteriorate due to economic growth and abundant domestic fossil fuel resources until the mid-2010s. It has recently introduced policy goals to increase non-fossil energy sources' share of energy consumption.
- China has spent 10 years on developing its emissions trading system. The timing for expanding the range of sectors subject to the system is attracting attention. The steady operation of the system is important for the expansion.

Publication of the 14th five-year comprehensive work plan for energy conservation and emission reduction (January 24)

- Region-by-region restrictions were imposed on energy consumption excluding renewable energy electricity consumption growth from 2020.

Adoption of the 2022 government action policy and the annual economic/social development plan (March 11)

A plan was clarified to promote switching from energy intensity and consumption regulations to CO2 intensity and emission regulations.

Publication of the14th five-year plan for a modern energy system (prepared on January 29) (March 22)

Non-fossil energy sources' target share of the power generation mix was set at around 39%. Electricity's target share of final energy consumption was set at around 30%.

Publication of the comprehensive strategy for climate change countermeasures (June 13)

- The comprehensive strategy for enhancing climate change countermeasures through 2035 was published, calling for infrastructure development for adaptation measures based on a climate change risk analysis.

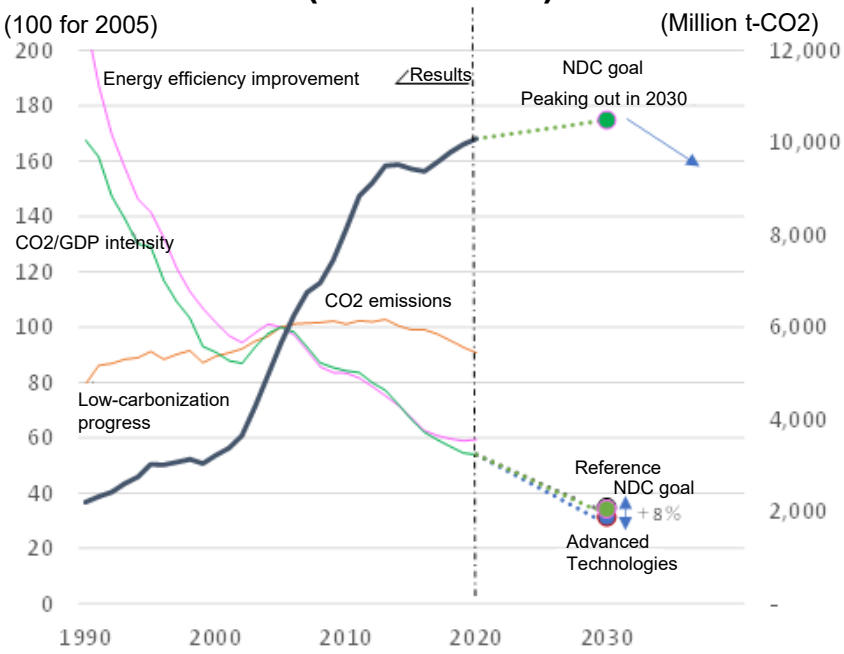
First anniversary of the emissions trading system's introduction for the power sector (July 16)

- Trading value in the past year totaled 8,492 million yuan (about 174 billion yen; about 1,100 yen/ton).
- The 12th five-year plan (2011-15) in 2011 set out China's first carbon reduction target and called for developing eight regional pilot emissions trading markets from 2013 to 2014.

2022 energy infrastructure investment increased (China National Energy Administration) (November)

Energy infrastructure investment in the first 10 months of 2022 increased by 27.0% to 460.7 billion yuan (about 9.1 trillion yen) for power plants. Investment grew by 4.3-fold to 157.4 billion yuan for solar power plants, by 42.8% to 64 billion yuan for fossil-fired power plants, and by 19.9% to 47.4 billion yuan for nuclear power plants. Investment decreased by 26.7% to 120.5 billion yuan for wind power plants and by 19.9% to 61.8 billion yuan for hydro power plants.

China CO2 emissions and NDC goal (1990 - 2030)



Data from the IEEJ Outlook 2023 were updated.
Note: While the Chinese goal is on a GHG/GDP intensity basis, this figure covers CO2 alone.

India

- India will chair the Group of 20 in 2023.
- India has implemented an energy conservation mechanism and other unique systems, making progress in energy efficiency improvement. The carbon intensity is deteriorating due to a coal consumption increase accompanying economic growth.
- In 2022, India submitted its updated nationally determined contributions and a long-term strategy to the United Nations, seeking to achieve carbon neutrality by 2070. Given many new coal-fired power plants, the low-carbonization of fossil-fired power generation may be a realistic approach for the immediate future. (How will India expand natural gas, renewable energy and hydrogen consumption?)
- The introduction of a carbon credit trading scheme is now under consideration.

Submission of updated NDC to the United Nations (August 26)

- The updated NDC did not include a plan to cut projected GHG emissions by 1 billion tons, which was cited in a statement by Prime Minister Narendra Modi at the COP26.

Lok Sabna (lower house) passed the Energy Conservation Act amendment (August 8)

- The amendment switches from energy intensity regulations to CO2 intensity and emission regulations to assess progress.
- The introduction of carbon trading (empowering the central government to specify the carbon credit trading scheme) is now under consideration.

The Indian government approved new capital region air pollution improvement projects (November 11)

- The Commission for Air Quality Management for National Capital Region and Adjoining Areas (CAQM) approved seven projects to improve air pollution in the Delhi metropolitan region. The automation of vehicle counting, the electrification of autorickshaws and other measures will be promoted.

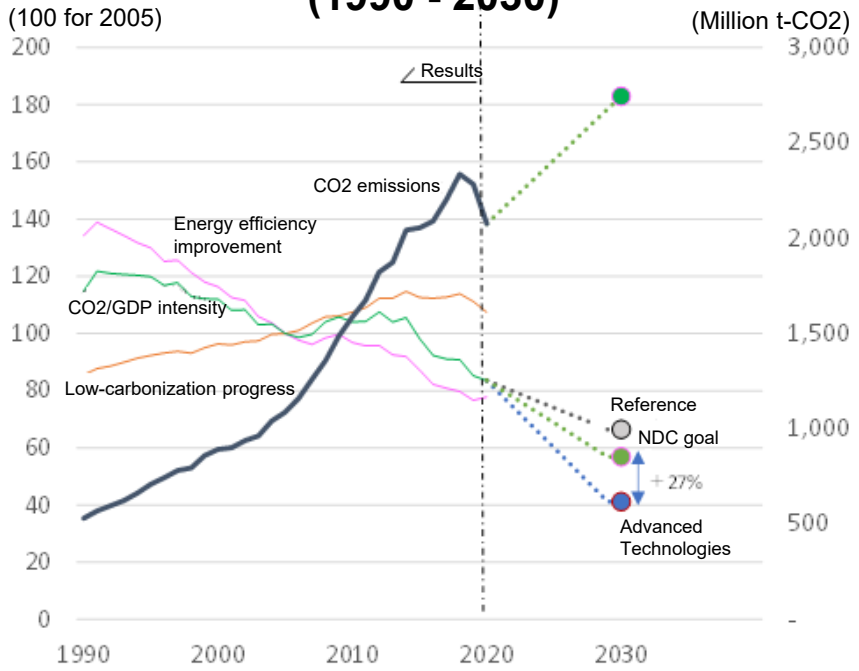
Submission of a long-term strategy to the United Nations (November 14)

- The strategy sets out the 2070 net-zero emission goal and includes the enhancement of biofuel and electric vehicle use, the promotion of smart city development and the improvement of industrial energy use efficiency.

Comment by state-run power utility NTPC (June 2)

- NTPC Chairman and Managing Director Gurdeep Singh, at a panel discussion of the Bloomberg NEF Summit on June 2, commented that coal-fired power generation would remain the core of electricity supply for the next 23 years.

India CO2 emissions and NDC goal (1990 - 2030)



Data from the IEEJ Outlook 2023 were updated.
Note: While the Indian goal is for the GHG/GDP intensity, this figure covers CO2 alone.

Growth-oriented carbon pricing: Government proposal and challenges

- The government published a green transformation (GX) initiative in late 2021 and accelerated discussion on growth-oriented carbon pricing in 2022.
- The biggest focus of attention regarding Japan's climate change countermeasures in 2023 will be detailed policy design of a growth-oriented carbon pricing (CP) scheme. A bill for overall concept of CP bill will be submitted to the National Diet during its next regular session, whereas some detail provisions will be submitted within two years. The following points should be addressed in the institutional design of CP.
  - Auctions for emissions trading in the power generation sector have the potential to push up electricity prices. The scheme, therefore, must not be designed to interfere electrification as a pillar of the carbon neutrality policy.
  - The GX surcharge had originally been planned to be imposed on final consumption but has finally been designed to be collected from the upstream sector such as fossil fuel importers. The surcharge, however, may thus be passed on to downstream prices, leading to additional burdens on industrial and residential sectors. Measures will be required to ease the CP scheme's adverse impacts on the industrial sector's international competitiveness and support low-income and rural households amid energy price spikes.
  - The government should explain this point clearly to get the public involved in the discussion.
  - Discussion on how to avoid duplication with existing scheme such as energy taxes, FIT for renewables, etc., and to design effective CP scheme should be promoted urgently.

Overview of government proposal

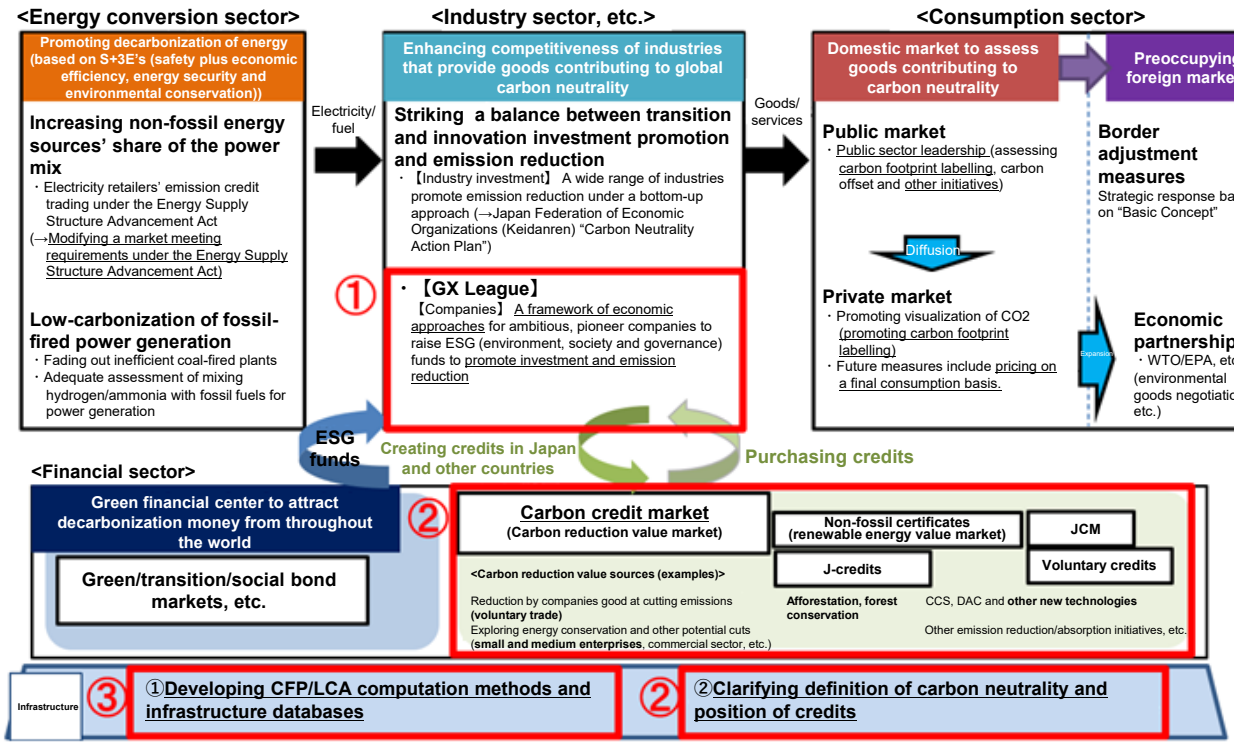
- ✓ GX economic transition bonds (20 trillion yen over 10 years) will be issued from FY2023 for providing early action incentives for business operators to take actions. Surcharge revenue under the growth-oriented-CP scheme will be used to redeem the government bonds by FY2050.
- ✓ In the early stage of ETS, companies' voluntarism will be respected, but the scheme will be gradually reinforced. From FY2033, the power generation sector will gradually reduce free allocation.
- ✓ Companies will be given a period of time to work intensively on GX, hereafter GX surcharge on carbon will be introduced in FY2028. The surcharge will be imposed on the fossil fuel importers to widely disperse surcharge burdens.

Key points of CP scheme	Scale	Investment targets	Carbon pricing	Timing of implementation	Points of regulations	Mitigation measures
• A hybrid scheme combining GX-ETS with a GX surcharge on carbon. • A GX economic transition promotion organization (tentative name) to undertake carbon pricing will integrally manage the scheme.	20 trillion yen will be invested in decarbonization (2 trillion yen/year over 10 years)	• Hydrogen, ammonia, renewables, storage batteries, manufacturers' energy efficiency improvement and fuel switching, etc.	• Surcharge: To be raised gradually (to be set flexibly) • ETS: auctions for the power generation sector • The combined burden of GX surcharge and GX-ETS will be set lower than the sum of FIT surcharge and oil/coal tax burden, and it will decline over the medium to long term.	• Surcharge: FY2028 • GX-ETS: From FY2026 (third-party certification, disciplinary enhancement, etc.) • Auctions for the power generation sector: From FY2033 • GX economic transition bonds will be redeemed by FY2050 at the latest.	• Surcharge: To be imposed on the upstream sector • ETS: High-emission industries, power generation sector, etc.	• Surcharge: Tax exemption for specified goods • ETS: Introduction of ceiling and bottom prices • Measures for avoiding overlapped burden of ETS/Surcharge

Framework of economic approaches to carbon neutrality

- Japan aims to efficiently realize carbon neutrality by 2050 as its national target and in turn to contribute to global carbon neutrality. To make this happen, Japan has to implement structural, economic and social reforms.
- For example, in addition to GX-ETS and GX Surcharge, supporting measures are necessary. Japan has been developing the carbon credit market that enables transparent trading and access to reliable foreign credits. Visualization such as carbon footprints to encourage behavioral change has been discussed.

Diagram of policy framework



(Source) Ministry of Economy, Trade and Industry, "Interim Report by the Study Group on Ideal Economic Approaches for Achieving Worldwide Carbon Neutrality," Updated in August 2021

①Emissions trading

An emissions trading scheme is under consideration by a panel of experts on GX League emissions trading
https://gx-league.go.jp/en/

②Credit trading

"Carbon Credit Report" published (June 2022)
https://www.meti.go.jp/shingikai/energy_environment/carbon_credit/20220627_report.html

The Tokyo Stock Exchange launched a pilot credit trading scheme in September 2022 before creating a real credit trading market in 2023.
https://www.jpx.co.jp/equities/carbon-credit/index.html

③CFP/LCA

"The Study Group on Product Carbon Footprint Calculations and Verification for Supply Chain-Wide Carbon Neutrality" is considering a CFP/LCA system, planning to formulate a CFP guideline within FY2022.
https://www.meti.go.jp/shingikai/energy_environment/carbon_footprint/index.html

G7 Summit (Climate change)

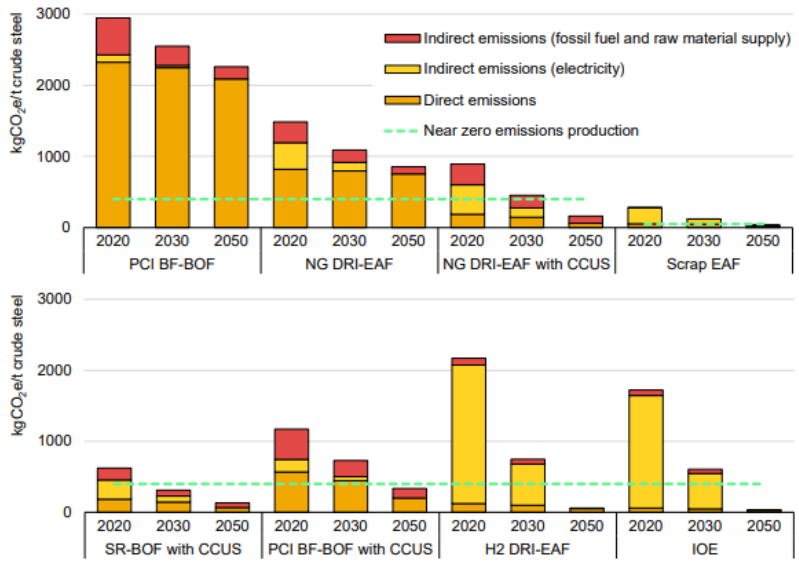
- Japan will host the 2023 Group of Seven Summit (May 19-21). G7 ministerial meetings will be held at various locations in Japan toward the G7 Hiroshima Summit. (A meeting of G7 climate change, energy and environment ministers will take place in Sapporo on April 15-16.)
- It is important for Japan to lead global climate change countermeasures by taking advantage of its characteristics that are highest heavy industry ratio among the G7 members and its position as the only Asian G7 member.
- The key to global carbon neutrality will be actions to involve Asia, which is switching from natural gas to coal under the current energy crisis and expected to rapidly increase energy consumption due to population and economic growth.

Recent major G7 climate change initiatives

- Industrial Decarbonization Agenda (IDA)
  - The 2021 G7 Summit agreed to create the IDA initiative as proposed by the United Kingdom and the United States to **seek ambitious GHG emissions cuts in heavy industries including steel and cement.**
  - The G7 agreed to develop and improve the standards and definitions of near-zero-emission materials based on the proposal by the International Energy Agency (IEA) (right figure).

- Climate Club – Created as proposed by G7 host Germany's Chancellor Olaf Scholz
  - The Climate Club is an open forum that seeks to accelerate climate change countermeasures primarily in the industry sector **to effectively implement the Paris Agreement** while abiding by international rules and **addressing carbon leak risks**.
  - December 2022 G7 Statement approving Terms of Reference for the Climate Club
    - The G7 invited international partners to participate in the Climate Club regarding industrial decarbonization. Then, the group vowed to closely cooperate with relevant international organizations and stakeholders. The G7 asked the Organization for Economic Cooperation and Development, in tandem with the International Energy Agency, to host an interim secretariat working together with other relevant organizations.

Near-zero-emission levels by steelmaking technology (IEA analysis)



(Source) IEA, "Achieving Net Zero Heavy Industry Sectors in G7 Members" 2022

Contact: report@tky.ieej.or.jp