

Chemical Industry's Stance on Carbon Neutrality

1. Contributive elements of chemical industry toward carbon neutrality (CN)

The Japan Chemical Industry Association (JCIA) formulated and published the "Chemical Industry's VISION on Global Warming Countermeasures" in May 2017, in order to address the global warming issues that face the entire world.

To achieve the Japanese government's declaration to reduce GHG (Green House Gas) emissions to net-zero by 2050, the chemical industry will allow the potential power of chemistry to emerge as a solution provider, thereby promoting and accelerating innovations that will resolve global issues and contribute to sustainable development.

(1) Roles of the chemical industry in a sustainable society

To achieve a sustainable society, plastics and other chemical products are indispensable as parts to be used for the social infrastructure. The chemical industry has played an important role in securing hygiene and other factors in social living, and is a key field where continuous substantial economic growth is expected globally.

(2) Initiatives by the chemical industry as a solution provider

The chemical industry will mainly promote the following initiatives toward CN.

a) Carbon circulation of raw materials

CCU (Carbon dioxide Capture and Utilization, signifying the material use of CO₂), material use of biomass, and the utilization of waste (such as plastic waste) as a carbon source.

b) Transformation of processes and structures to minimize energy consumption

Technological innovations to achieve energy saving of a different order of magnitude: process transformation (membrane separation process, etc.), innovation of energy transformation technologies (transforming electrical energy into thermal energy), utilization of DX (Digital Transformation), etc.

c) GHG emissions reduction throughout product lifecycle

Development of new materials that will lead to the innovation of the entire value chain, and the establishment of collaborative systems across industries

d) Overseas expansion of technological and business models toward a carbon circular society

Internationally expand Japan's technologies and systems on a business basis

The scope of contribution to GHG emissions reduction in the chemical industry shall be covered Scope 1 and 2 for the time being.

Scope 3 is considered and is recognized as a range of contribution when its calculation method is established and evaluated by a third party. The chemical industry will promote collaboration across industries in order to further contribute to GHG emissions reduction across the entire society.

2. Basic outline of CN-related measures in the chemical industry

(1) Clarify GHG emission sources and measure for GHG emission reduction in the chemical industry

- a) GHG emission sources in production processes
 - GHG emissions by the use of fossil resources as materials
 - GHG emissions by the use of fossil fuels by private power generation systems
 - Indirect GHG emissions by purchased electricity and steam
- b) Measures regarding GHG emissions reduction in production processes
 - Process rationalization (including yield improvement and waste reduction)
 - Introduction of innovative technologies (energy-saving, BAT (Best Available Technology), DX, electrification, etc.)
 - Fuels change for private power generation systems: low-carbon fuels, circulated carbon fuels, and decarbonized fuels
 - i) Low-carbon fuels: from coal/petroleum to LNG, etc.
 - ii) Circulated Carbon fuels: bio fuels and synthetic fuels (methanation, etc.)
 - iii) Decarbonized fuels: hydrogen and ammonia
 - Switching from utilization of privately generated energy (heat and electricity) to the utilization of zero-emission electricity
 - Utilization of renewable energy
 - Development of carbon recycling technologies
 - Separation/recovery and utilization of CO₂ (CCU, artificial photosynthesis, etc.)
 - Utilization of credits

(2) Contribute to GHG emissions reduction through products and services

As a solution provider, the chemical industry has contributed to GHG emissions reduction in the entire society, including in the use and disposal stages of its products and services, in collaboration with our value chain partners.

It is also necessary to formulate an evaluation system (for contribution to GHG emissions reduction through products and services) in collaboration with value chain partners, in order to establish infrastructure for supporting the cost increase required for achieving CN by the entire society.

Several examples are shown below for contribution to GHG emissions reduction by the chemical industry for the entire society.

- Supply of materials required for the creation of green energy (power generating elements, lightweight high-strength parts for wind power generation, hydrogen production technology, etc.), and technologies (battery materials) required for the stable utilization thereof
- Supply of products that achieve lightweight, long-term service life, and high efficiency
- Promotion of the carbon circulation of raw materials (thereby reducing the carbon amount derived from the input of new fossil resources)
 - Low material by use of plastic waste

Increase chemical recycling and material recycling, thereby minimizing energy recovery (and also reducing GHG emissions through combustion and disposal)

- Low material by use of biomass

(3) Request to the Japanese government regarding CN-related measures

The chemical industry addresses the following requests to the Japanese government so that the chemical industry can promote innovations throughout the value chain, and fully implement those innovations in society.

a) Increase stable and low-cost utility supply

- Achieve zero emissions electricity supplied by the electricity sector in 2050
- Supply stable and low-cost CO₂-free hydrogen and ammonia

b) Provide incentives toward low carbon, such as more efficient and energy-saving use of existing technologies

- Steady transition toward low carbon, such as energy saving in the manufacturing industry
- (Green) Initiatives that are already at the decarbonization level, such as recyclable energy

c) Support R&D

- (Innovations) R&D of innovative technologies that will contribute to decarbonization, and their implementation in society, such as artificial photosynthesis, CO₂ capture technology, bio fuel production technology, development of large-capacity power storage materials, fuel storage technologies, etc.

d) Establish internationally harmonized systems to support the cost increase due to R&D investment, capital expenditure, and the selection of fuels and materials by the entire society

3. Summary: Chemical Industry's stance on CN

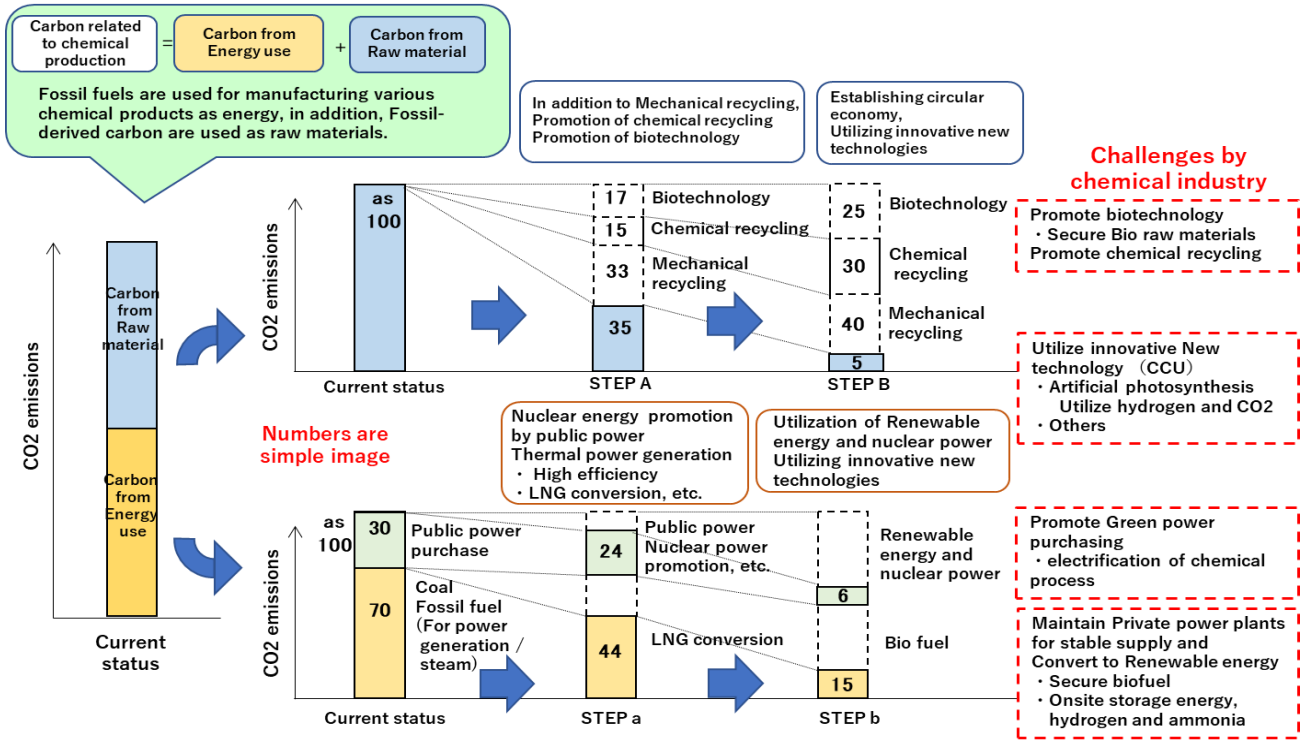
The Japanese government's declaration to reduce GHG emissions to net-zero by 2050 is an ambitious goal and shows a clear vision toward a sustainable society. It is extremely important for the Japanese chemical industry to maintain its global competitiveness. Toward this goal, the chemical industry will accelerate its measures to further advance processes and further contribute to reduce GHG emissions derived from energy and materials by developing technologies for CCU, artificial photosynthesis, chemical recycling, etc. Then chemical industry will make every possible effort to implement these technologies in society, toward the achievement of a resource-recycling society.

As a solution provider, the chemical industry can always have opportunities to respond to changes in the times and to meet the needs of the new era. While the Green Growth Strategic policy is likely to bring big changes in various industries through substitution of manufacturing processes and materials, the chemical industry will continue to contribute to GHG emissions reduction in the entire value chain

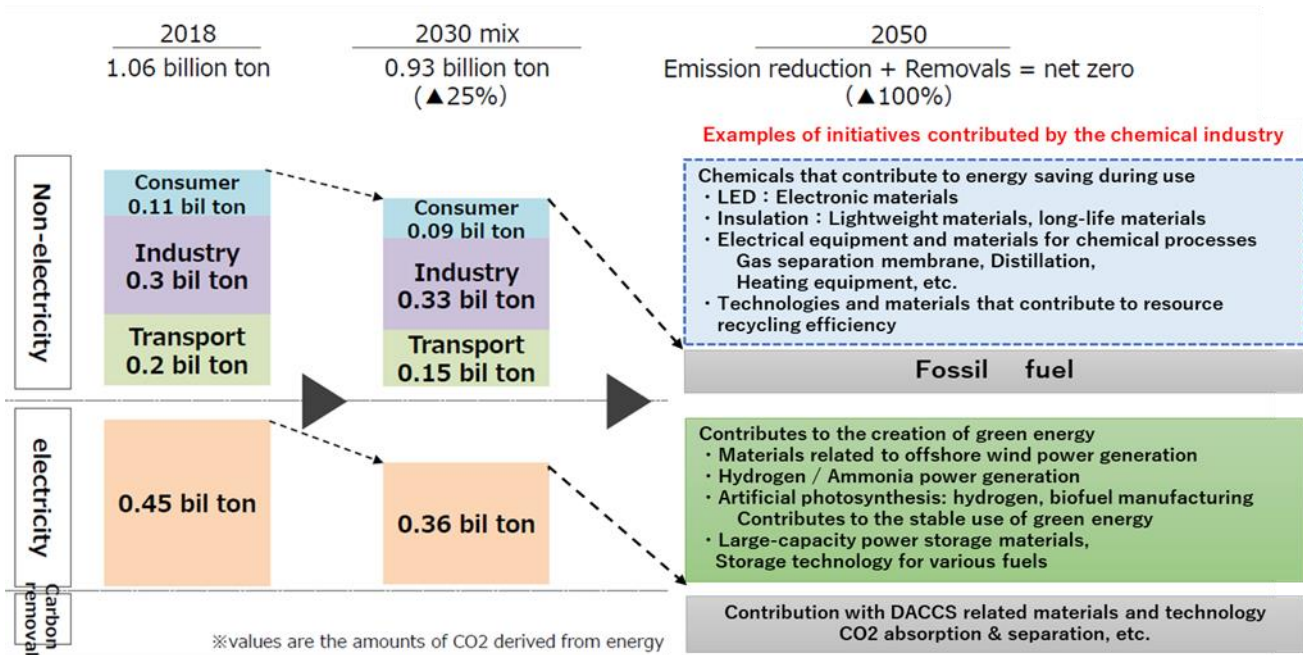
JCIA will promote Life Cycle Assessment (LCA) perspective from the viewpoint of a carbon circular society, and demonstrate the contribution of chemical products and innovations to environmental impact

reduction. And the chemical industry will collaborate closely with the government, other industries, and academia, to present the active presence of Japan as a whole.

【 Chemical industry's approach to carbon neutrality (Image) 】



【 CO2 emission control effect of the entire value chain (Image diagram) 】



Source: https://www.meti.go.jp/english/press/2020/pdf/1225_001b.pdf