


Strategies for Strengthening the International Competitiveness of the Chemical Industry

May 2026

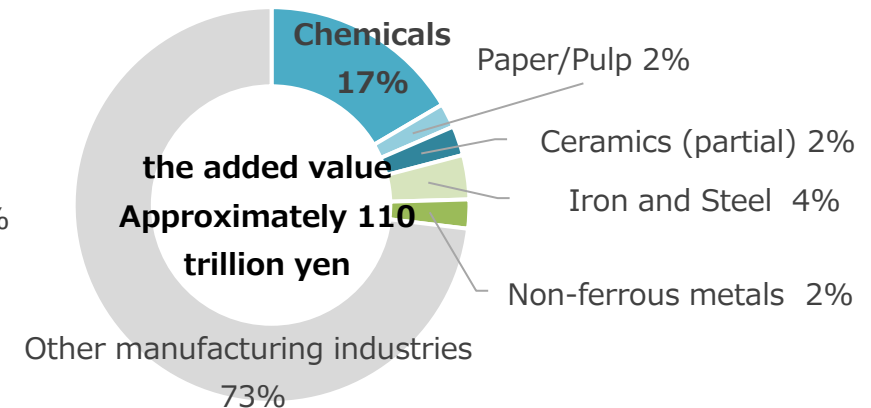
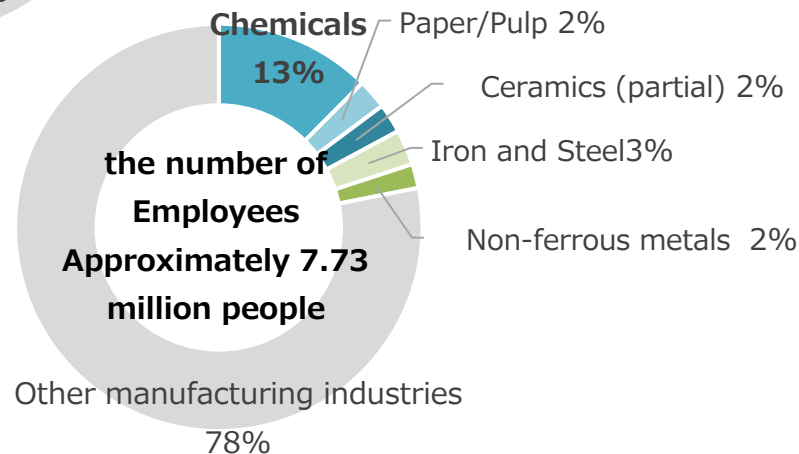
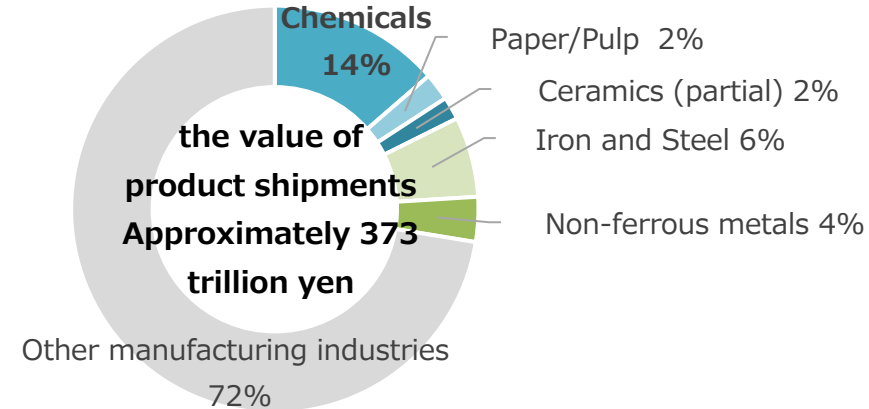
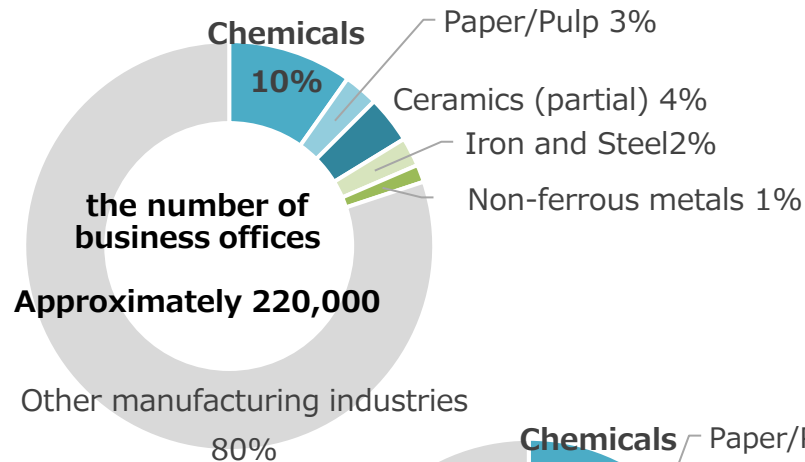
Material Industries Division

Ministry of Economy, Trade and Industry

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- 1. Overview of the Chemical Industry**
 2. Industrial Policy Strategy for Growth
 3. Industrial Policy Strategy for accelerating Green Transformation (GX)

The role of the Chemical Industry in Japan

- The chemical industry accounts for approximately 20% of the entire manufacturing industry in terms the added value. The second largest in the manufacturing industry after automotives.



(Note) The materials industry is the total of the following manufacturing industries in the Japan Standard Industry Classification

(1) Chemical engineering industry, plastic product manufacturing industry, rubber product manufacturing industry (chemical industry), (2) Pulp, paper, and paper product manufacturing industry (paper and pulp industry), (3) Ceramic, glass, and their product manufacturing industry (glass industry), (4) Cement and its product manufacturing industry (cement industry), (5) Refractory product manufacturing industry, carbon and graphite product manufacturing industry, abrasives and their product manufacturing industry, aggregate and masonry product manufacturing industry (other ceramic product manufacturing industries) * Items in brackets are abbreviated names

(Source) Prepared based on the 2024 Economic Conditions Survey (Manufacturing Industry Business Offices Survey)

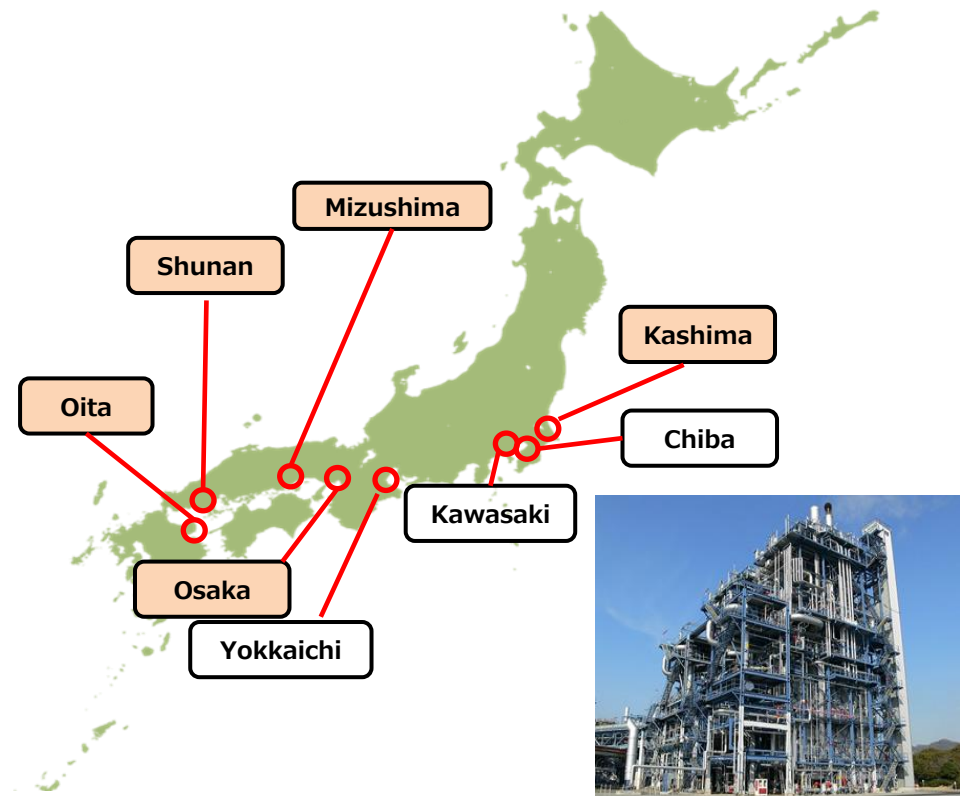
Location of Chemical Complex

- Using crude-oil-derived naphtha as feedstock, chemical complexes are integrated with oil refineries.
- 12 naphtha crackers in operation across 8 areas in Japan

Naphtha Crackers

Area	Company	Capacity (10Kt/Y)	Operation
Kashima	Mitsubishi Chemical	48.5	Jun 1992
Chiba	Maruzen Petrochemical	48.0	Apr 1969
	Keiyo Ethylene (Maruzen Petrochemical, Sumitomo Chemical)	69.0	Nov 1994
	Mitsui Chemical	55.3	Apr 1978
	Idemitsu Kosan	37.4	Jun 1985
Kawasaki	ENEOS (ex. JX)	40.4	Apr 1970
	ENEOS (ex. Tohnen)	49.1	Jan 1972
Yokkaichi	Tosoh	49.3	Jan 1972
Osaka	Osaka Petro Chemical Industries (Mitsui Chemical)	45.5	Apr 1970
Mizushima	AMEC (Mitsubishi Chemical, Asahi Kasei)	49.6	Jun 1970
Shunan	Idemitsu Kosan	62.3	May 1968
Oita	Crasus Chemical	61.8	Apr 1977

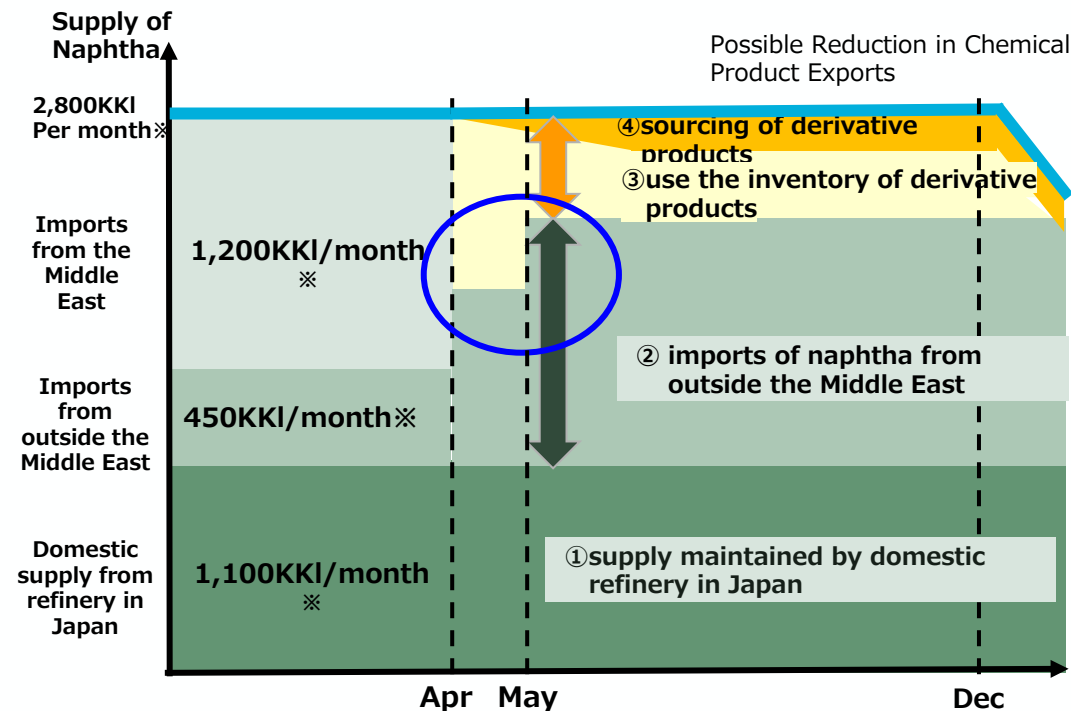
8 areas of chemical complex



Outlook for Supply and Demand of Chemicals Derived from Naphtha

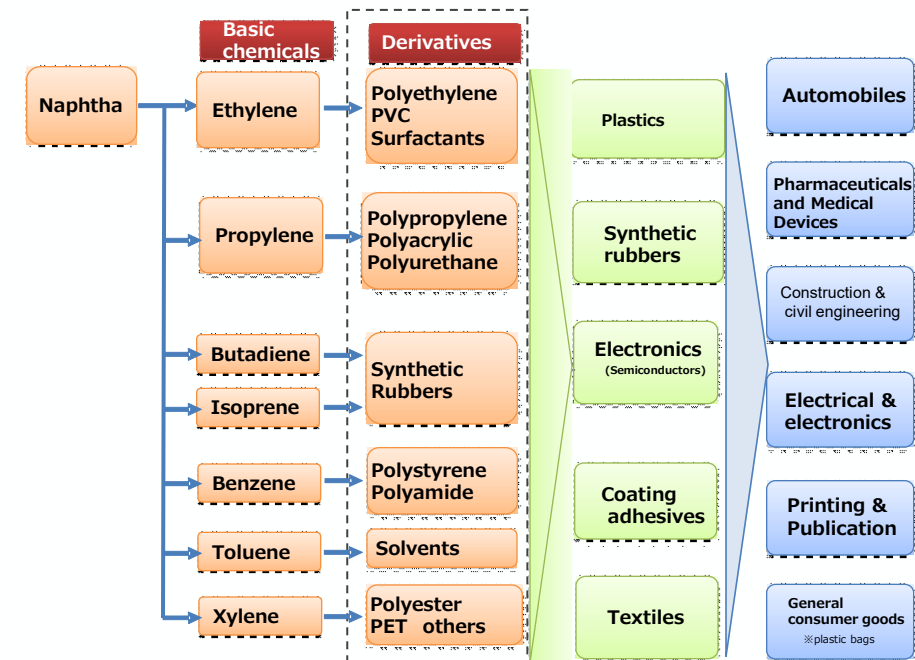
- In addition to the regular supply of naphtha from refinery in Japan, imports of naphtha from outside the Middle East-such as the United States, Algeria, and Peru - are projected to reach approximately three times compared with levels prior to the escalation of tensions in the Middle East(from 450KKL per month to 900KKL in April, and exceeding 1,350 KKL in May). These imports are expected to arrive in Japan in May.
- Combined with inventories of derivative products such as Polyethylene (approx. 1.8 months), the supply of naphtha-based chemical products is expected to meet demand beyond the previously projected six months and continue into next year.

Outlook for Supply (including action for imports of naphtha from outside the Middle East)



※average in 2024

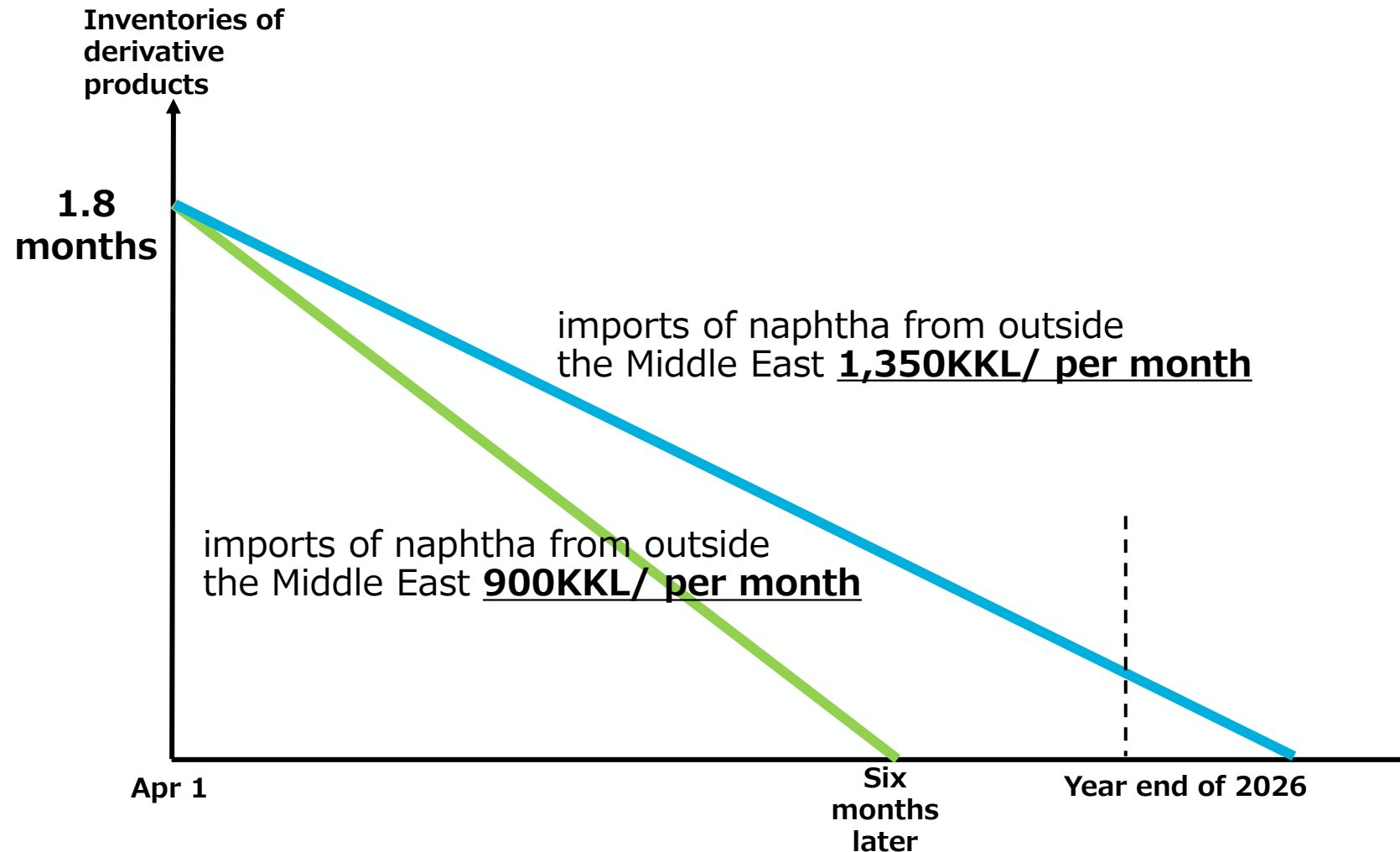
Inventories of derivative products (approx. 1.8 months)




※Since the inventory periods vary depending on each derivative product, procurement and other measures should be considered while closely monitoring the supply status of each derivative product.

Outlook for Supply and Demand of Chemicals Derived from Naphtha

- Further accelerating imports of naphtha from outside the Middle East is expected to extend supply security beyond year-end of 2026, utilizing inventories of derivative products.



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Growth Strategy (17 strategic fields, cross-sectoral challenges)

Exempt from Manufacturing Industry
Subcommittee (19th)
(Feb 19 2026)

“Council for Japan's Growth Strategy



Council on Economic and
Fiscal Policy

strategic investments that enhance resilience against potential crises and growth investment under public-private partnership in 17 strategic fields

NEW Subcommittee on Strategic Fields from Jan

(Chair : Deputy Chief Cabinet Secretary (Lower House) , Acting Chair : Assistant Chief Cabinet Secretary (Internal Affairs) directors, general of relevant ministries)

①AI Semiconductor NEW AI Semiconductor WG Jan~	○Minister of State for AI Strategy ○METI Minister · relevant ministries (NSS, NPA, FSA, DA, MIC, MOFA, MEXT, MHLW, MAFF, MLIT, MOE, MOD) 9 Experts	⑩Disaster & Economic Resilience / National resilience Disaster & Economic Resilience / National resilience WG Feb~ ○Min. for National Resilience ○Min. for Disaster Management · relevant ministries (CAO(DM), MIC, MHLW, ANRE, MLIT) 19 Experts
②Ship building NEW Ship building WG Jan~	○MLIT Minister ○Minister of State for Economic Security · relevant ministries (NSS, CAO, ISA, MOFA, MEXT, METI, MOE, ATLA) 7 experts	⑪New Drugs & Advanced Medical Care / Drug discovery NEW New Drugs & Advanced Medical Care / Drug discovery WG Jan~ ○S&T Minister ○DA Minister · relevant ministries (MEXT, MHLW, METI) 10 experts
③Quantum Technology NEW A Quantum Technology WG Jan~	○S&T Minister · relevant ministries (MIC, MOFA, MEXT, METI, MOD) 7 experts	⑫Fusion Energy NEW Fusion Energy WG Jan~ ○S&T Minister (MEXT, METI, NRA Director- General) 7 experts
④Synthetic Biology & Biotechnology NEW Synthetic Biology & Biotechnology WG Jan~	○METI Minister · relevant ministries (CAO (STI / AM), MEXT, MHLW, MAFF, MLIT) 12 experts	⑬Materials (Critical Minerals & Components) Industrial Structure Manufacturing Industry Subcommittee Feb~ ○METI Minister · relevant ministries (CAO, MOFA, MEXT, MOE) 15 experts
⑤Aerospace / Aviation & space NEW Aerospace / Aviation &space WG Jan~	○Minister of State for Economic Security relevant ministries (CAO (SPACE), MIC, MEXT, METI, MLIT, MOD) 10 experts	⑭Port Logistics NEW Port Logistics WG Jan~ ○MLIT Minister · relevant ministries (NCO, MOF, METI) 9 experts
⑥Digital & Cybersecurity NEW Digital & Cybersecurity WG Jan~	○METI Minister ○DA Minister · relevant ministries (MIC, MEXT, MHLW) 11 experts	⑮Defense Industry NEW Defense Industry WG Jan~ ○METI Minister ○MOD Minister · relevant ministries (NSS Deputy Director-General) 18 experts
⑦Content Industry NEW Content Industry WG Jan~	○CJ Minister · relevant ministries (JFTC (Deputy Director-General level) , MIC, MOFA, MEXT, METI) 15 experts	⑯Information & Communications NEW Information & Communications WG Jan~ ○MIC Minister · relevant ministries (METI, MOD) 12 experts
⑧Food Tech NEW Food Tech Dec~	○MAFF Minister · relevant ministries (METI) 7 experts	⑰Ocean & Marine Development NEW Ocean & Marine Development Jan~ ○Minister for Ocean Policy · relevant ministries (NSS, CAO (STI) , MOFA, MEXT, FA, METI, MLIT, JCG, MOE, MOD) 10 experts
⑨Resource & Energy Security / Green Transformation (GX) Resource & Energy Security / (GX) WG Jan~	○METI Minister · relevant ministries (MOFA, MOF, METI, MOE) 7 experts	

Actions for cross-sectoral challenges

- ①【New Technology-Driven Nation and Strengthening Competitiveness】Industrial Structure Council Jan~
Subcommittee on a New Direction of Economic and Industrial Policy
○METI Minister
·relevant ministries (CAO (STI) , MEXT)
·13 experts
- ②【Human resource development】Jan~
NEW Human resource development WG
○MEXT Minister ·relevant ministries (CAO(STI), MIC, MHLW, METI)
·4 experts+2 for each theme
- ③【Start up】NEW Startup Policy WG Jan~
○Startups Minister, State Minister of CAO, Parliamentary Vice-Minister of CAO
(Startups and Financial Services) , State Minister of METI ·relevant ministries
(CAO (GSC) , CAO (STI, Regulatory) , FSA, DA, MIC, MEXT, NHLW, MAFF · METI · MLIT · MOE · MOD)
10 experts
- ④【Finance】NEW Asset Management Nation New Strategy WG Jan~
○Minister for Financial Services, Deputy Chief Cabinet Secretary (Lower House)
·relevant ministries (FSA, MIC, MOJ, MOFA, MEXT, MHLW, METI)
·10 experts
- ⑤【Labor Market Reform】NEW Labor Market Reform WG Jan~
○MLHW Minister · relevant ministries (CAO(Growth Strategy)
CAO(Regulatory Reform), METI, MLIT, MEXT)
·11 experts
- ⑥【Reducing the Burden of Housework and Other Domestic Duties】Jan~
NEW Intermministerial Liaison Conference on Promoting the Use of Services Contributing to Reducing
the Burden of Housework and Other Domestic Duties
○Minister in charge of Japan's Growth Strategy · Assistant Chief Cabinet Secretary (Domestic Affairs) · relevant
ministries (CAO(Growth Strategy), CFA, MLHW, METI) Discussions are also being held at the Subcommittees
- ⑦【Wage Hike】Government-Labor-Management Discussions Nov~
○Minister in charge of Developing an Environment for Wage Increases
RENEW Working Group on Enhancing the Vitality of SMEs and Other Businesses for Wage HikesWG
(Deputy Chief Cabinet Secretary (HC) ·Assistant Chief Cabinet Secretary (Domestic Affairs), CAO (Assistant
Chief Cabinet Secretary's Office, Growth Strategy, Regional Future) , NPA, FSA, MIC, MOFA, NTA, MEXT, MLHW,
MAFF, METI, SMEA, MLIT, MOE) Discussions are also being held in at the Small and Medium Enterprise Policy
Making Council and the Labor Policy Council.
- ⑧【Cyber Security】Expert Committee for Cybersecurity Feb~
○Minister in charge of Cybersecurity
·relevant ministries (CAO(Cyber security) , NPA, MIC, MEXT, METI, MOD) 8

※In principle, positions not specified are at the Director-General level. ·18 experts

The Importance of Strengthening National Autonomy and Strategic Indispensability through Circular Economy

Key Bottlenecks in Resource Circulation

- 1 **Fair competition framework** Fair competition is impaired by improper scrap yard practices and opaque domestic and overseas trading routes.
- 2 **Securing circular resources** Circular resources are dispersed, difficult to collect regularly. economic rationality, outflows of metals and disposal of plastics over recycling. Export controls abroad limits imports of circular resources.
- 3 **Reuse and Recycling Technologies** Immature technologies and infrastructure to supply industrial-grade quality products
- 4 **Established Demand and Markets** Insufficient rules and incentives to create demand for recycled materials, leading to underdeveloped markets.
- 5 **Business Models for Circular Economy** weak competitiveness, and investment for scaling up and improving efficiency has been limited

➡ **Enhancing our national autonomy and strategic indispensability by addressing critical bottlenecks.**

- **Autonomy:** avoids excessive dependence on specific countries
- **Indispensability:** strategic advantages in critical technologies, making the country indispensable to the international community

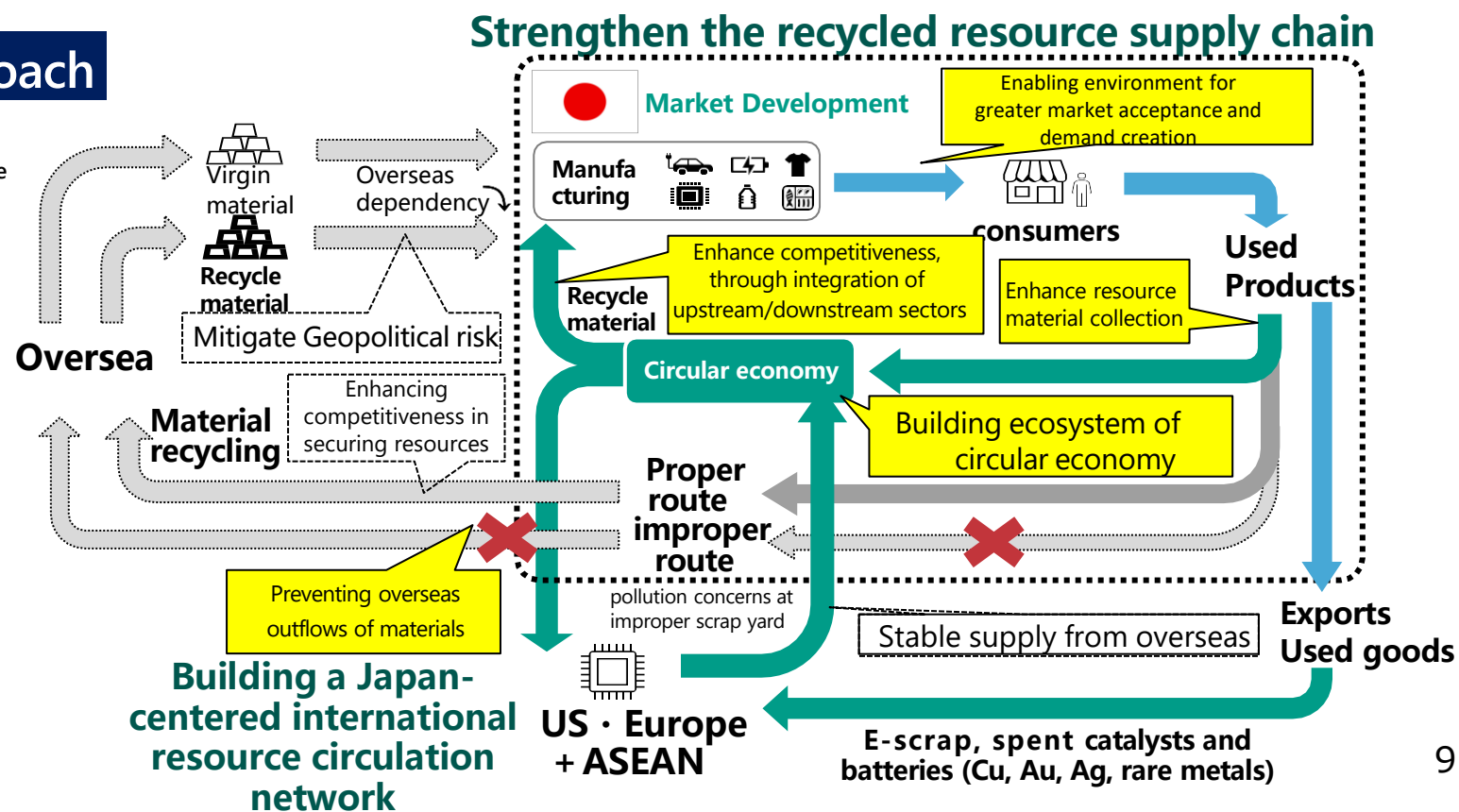
Strategic Approach

【Autonomy】

- ✓ Strengthen the recycled resource supply chain to stabilize the supply of recycled materials (quality, volume, price)
- ✓ Market development driven by the creation and expansion of demand

【Indispensability】

- ✓ Building a Japan-centered international resource circulation network by leveraging Japan's advanced smelting technologies and collaborating with like-minded countries



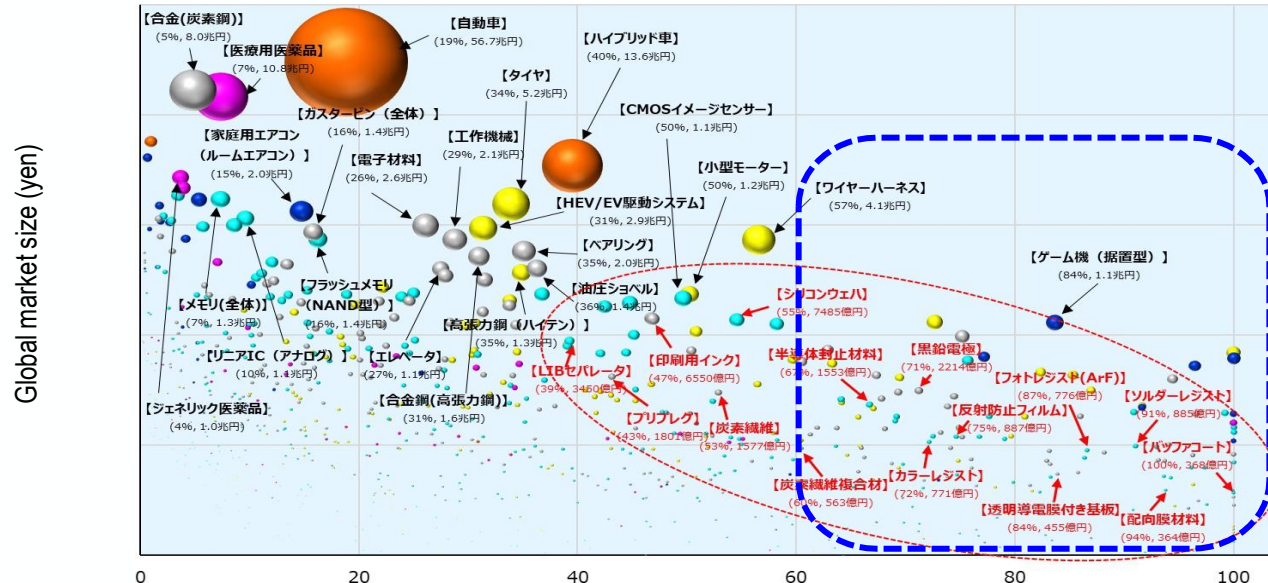
International competitiveness of Japan's material industry

- Japan's materials industry has strong global market shares in high-performance materials and maintain international competitiveness.
- The industry underpins Japan's strategic indispensability as a global powerhouse in high-performance materials essential to global value chains.

< Japan's material industry in the global market (2022) >

	Japan	US	EU	China
Products global market share over 60%: number of products [total amount]	224[18]	117 [66]	69[25]	53[41]
Products over JPY 1 trillion : number of products [total amount]	20[109]	40[240]	28[222]	31[271]

Legend
Y-axis: global market size (¥)
X-axis: Market Share (%)
Bubble : market size (¥)



Japan holds a distinguished position with an overwhelmingly high number of materials (224) with global market share over (60%)

Components and materials essential to industry

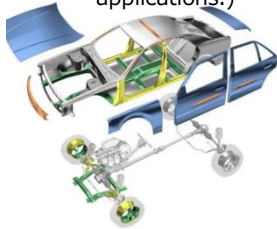
- Japan's components and materials industry strengthens competitiveness of Japan's manufacturing sector and addresses societal challenges by supplying high-quality materials that meet the advanced requirements of end use products (Automobiles, industrial machinery, semiconductors, aerospace, energy, and medical applications).
- Government support to date includes R&D initiatives through NEDO and measures to strengthen manufacturing sector under the Economic Security framework.

Steel

- Specialized casting facilities developed, produce high-quality products.

High-strength steel

(Lightweight, high-strength steel sheets used in automotive bodies and other applications.)



Seamless steel pipe

(A steel pipe without joints. Used for oil and natural gas drilling, etc.)

Electrical steel sheet

(Steel sheets with superior magnetic properties, used in motors, transformers, and related applications.)

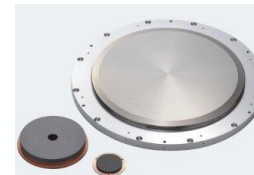


Non-ferrous metals

- Specialized casting facilities developed, produce high-quality products.

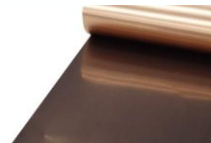
Sputtering target

(thin-film deposition processes for semiconductor)



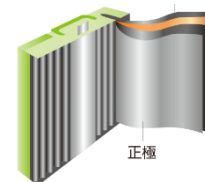
Copper foil

(for circuit board and battery applications)



Aluminum Foil

(for Li-ion battery capacitors)



Chemicals

- Advanced engineering integration and quality control, produce high-performance, high-quality materials.

Carbon Fiber

(lightweight and high-strength properties, for aircraft, hydrogen tanks for fuel cell vehicles, and sports gears)



Glass Cloth

(for an insulating material for semiconductor substrates and related applications)
Substrate: a board for packaging semiconductor chips.



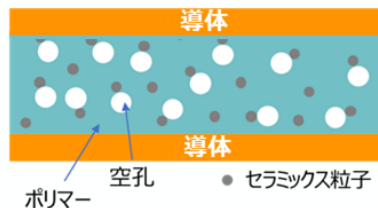
Enhancing the Global Competitiveness of Advanced Functional Materials through AI-Enabled Development of Next-Generation Materials

- Strengthen competitiveness and indispensability of High-performance components and materials with Japan's dominant global share and technological advantage ((i) advanced fibers, (ii) high-performance polymers, (iii) functional films, (iv) high-purity fine particles, and (v) advanced ceramics, among others) by integrating materials data platform and expertise with advanced AI technologies to predict promising candidates for new material compositions and manufacturing processes. Build-up an ecosystem designed to achieve a tenfold acceleration in new materials development that reduces development time and cost.
- In particular for advanced composite materials that requires multiple functional performances, such as light weight, high heat resistance, high-frequency performance, and processability, the key for development is the joint development by material manufacturers that leverages engineering integration of each company. Promoting AI-driven collaborative materials development project through secure computation platforms that protect confidential inter-company data.

<Examples of Advanced Functional Materials>

【Materials for next generation communication】

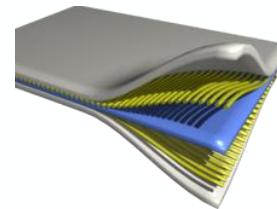
Polymer × Ceramics



Polymer-Ceramic composite for High-Frequency Applications, significant reductions in power consumption (1/36 of conventional materials)

【Alternative Materials to PFOS and Related Substances】

Film × Film



Development of next-generation composite materials by integrating multi-layer films, including durable organosilicon materials, to achieve enhanced heat resistance and processability.→ alternatives to regulated substances such as PFOS.

Industrial Policy Strategy for Economic Security

- Japan's chemical industry plays a vital role in supplying critical materials for economic security such as semiconductors and advanced electronic components from the Japan's material industry. In order to secure a stable supply of economically critical products, we implemented support measures since 2022, pursuant to the Economic Security Promotion Act, to enhance production capacity, stockpiling, recycling, and other initiatives related to chemical products and materials.
- In addition, ensuring the stable supply of Japan's supply chains requires not only securing a stable supply of primary resources, but also quality and quantity as well as utilization of secondary resources, namely recycled materials. To this end, the Government of Japan formulated the "Circular Economy Action Plan" in April this year, which includes initiatives to expand supply and demand for recycled plastics.

strategic critical materials under economic security initiative

semiconductors (incl. materials)	Advance electronic parts (incl. materials)
battery (incl. materials)	Permanent Magnets
parts for aerospace	Parts for rocket
parts for maritime vessel	Machine Tools and Industrial Robots
uncrewed Aerial Vehicles	Satellites
Ventilators	Antimicrobial Preparations
Fertilizer	Cloud-Based Programs
Critical minerals	Flammable Natural Gas

Chemicals in the "Circular Economy Action Plan"

- Building framework and rules for expanding the market volume of recycled materials (Promoting upstream-downstream collaboration for high-quality recycled plastics from packaging waste, and creating demand for recycled materials through Act on the Promotion of Effective Utilization of Resources.)
- Roadmap for greater adoption of recycled plastics in the automotive industry (certificates for the use of recycled materials, initiatives to establish centralized aggregation hubs)
- Deployment of data platform across value chain to ensure traceability for quality assurance of recycled materials
- R&D based demonstration project for plastic resource Circulation Systems

Example of government support for critical materials for economic security

Government support to ensure the supply of critical materials for economic security such as semiconductors and advanced electronic components under the Act on the Promotion of Ensuring National Security

DIC Corporation

Epoxy resin for semiconductors
Expansion of production capacity (appx. 59%)

- place : Ichihara city, Chiba
- supply start : Jul, 2029
- total project : appx. 9 billion JPY
(the subsidy appx. 3 billion JPY, maximum)



Toray Industries, Inc.

Biaxially Oriented Polypropylene film
for Automotive Film Capacitor
Expansion of production capacity
(appx. 34%)

- place : Nasushiobara city, Tochigi
- supply start : Mar, 2027
- total project : appx. 9 billion JPY
(the subsidy appx. 3 billion JPY, maximum)



Nitto Boseki Co., Ltd.

Glass cloth with low thermal expansion property
for the cutting-edge technology
logic IC device
Expansion of production capacity
(appx. 200%)

- place : Fukushima city, Fukushima
- supply start : Jul, 2027
- total project : appx. 7.2 billion JPY
(the subsidy appx. 2.4 billion JPY, maximum)




Mitsubishi Chemical Corporation

Synthetic Silica Powder for Semiconductors
Expansion of production capacity
(appx. 35%)

- place : Kitakyushu-city, Fukuoka
- supply start : Sep, 2028
- total project : appx. 11.1 billion JPY
(the subsidy appx. 3.7 billion JPY, maximum)

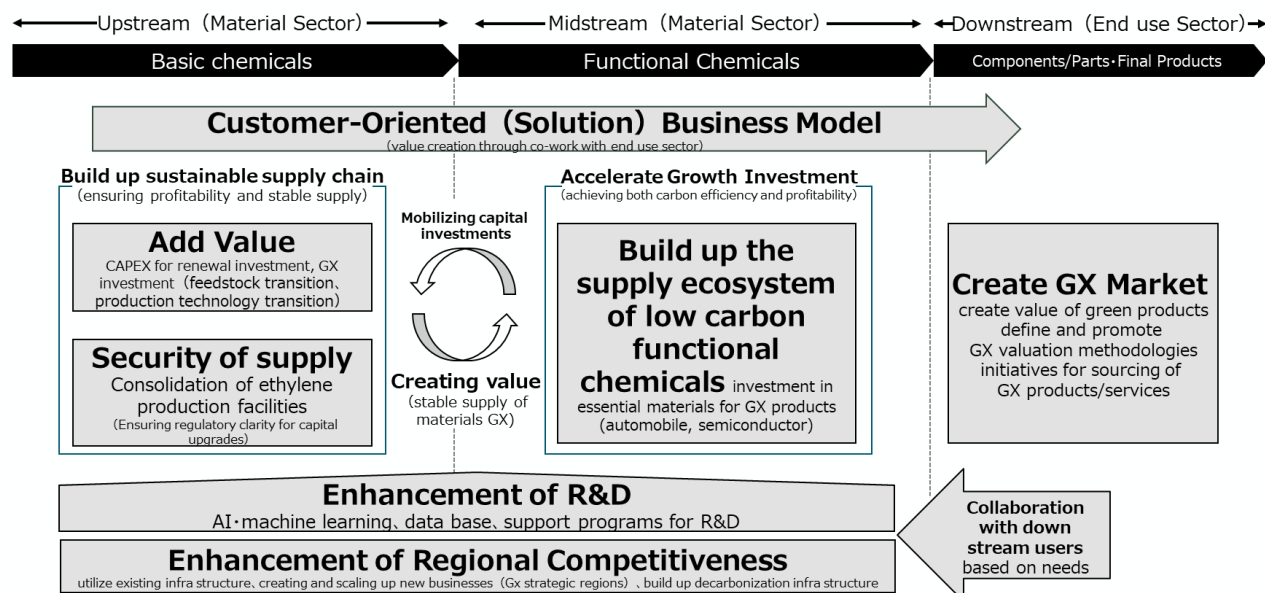


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GX Chemical (Natural Resources, Energy Security, Green Transformation (GX))

- “GX Chemical” is the functional materials essential for the production of downstream products contributes for GX, such as automotive, battery, semiconductors and the basic chemicals contributes for low carbon or decarbonizing.
- The Japanese company has strong competitiveness in the GX functional materials, especially strong market share in the semiconductor materials
- In an expanding and increasingly competitive global market, we will accelerate strategic growth-oriented investment in GX functional chemicals to strengthen competitiveness. At the same time, responding to downstream decarbonization needs and supply chain resilience, we will invest in GX basic chemicals to build a sustainable supply foundation and to deliver low-carbonization/ decarbonization and stable supply.

<GX Chemical Initiatives Overview>



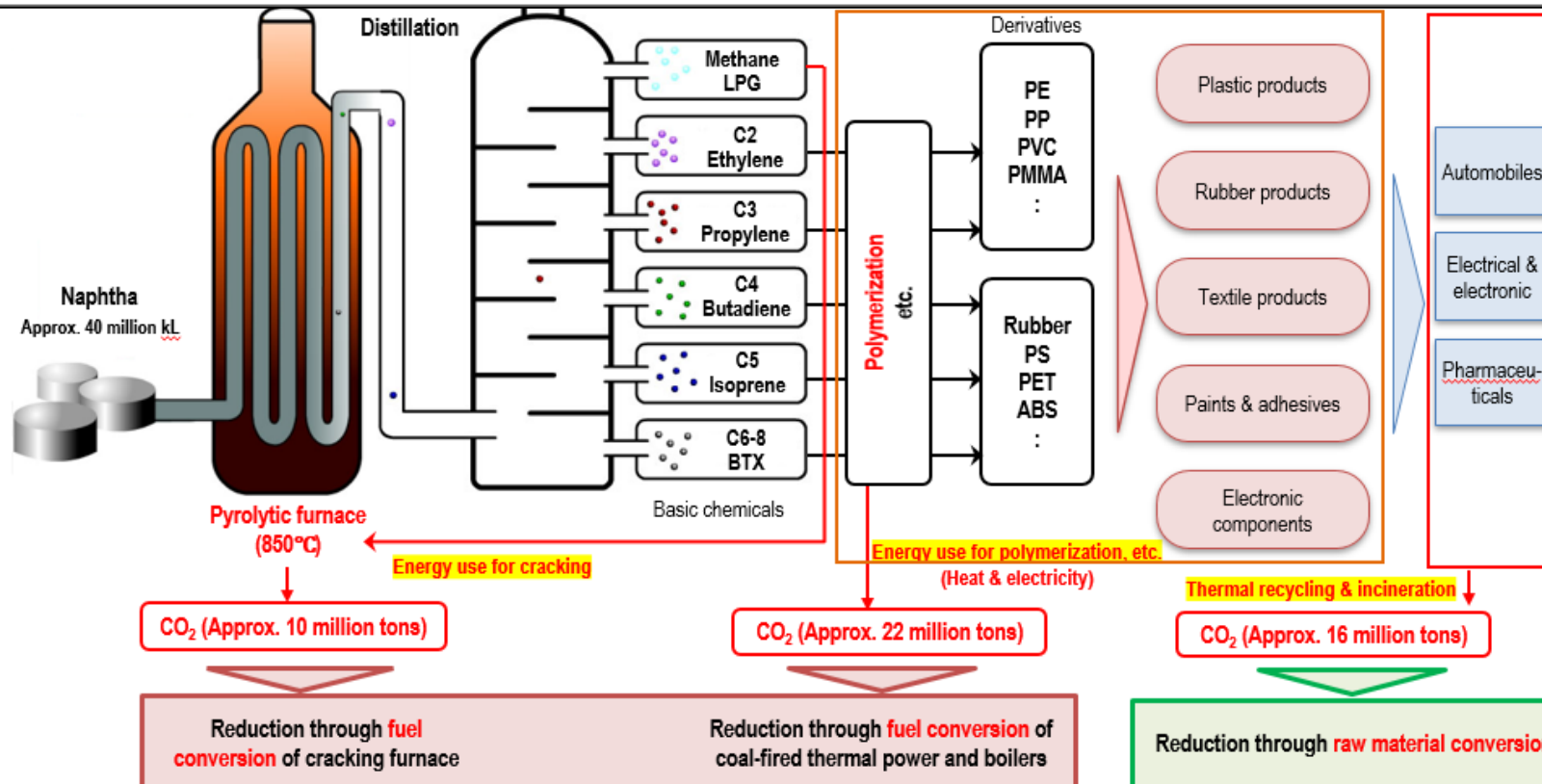
<Our Goal>

- Achieve a ¥3.2 trillion GX chemicals market across domestic and international markets by 2040 (40% global share)
- Build a sustainable supply foundation and expand the GX basic chemicals market by advancing decarbonization/low-carbonization through stable supply of basic chemicals

Chemical production flow from naphtha cracking with CO2 emission

Excerpt from the materials of the 12th Expert Working Group on the Realization of GX (November 17, 2025)

- ◆ The Japanese chemical industry manufactures and supplies ethylene and other basic chemicals through naphtha cracking, which serves as **a competitive advantage for downstream industries such as the automobile, electrical, and electronics sectors.**
- ◆ Chemical companies have also focused on functional materials (materials for semiconductors, displays, and batteries). Currently, individual companies have a number of products with a small sales scale but a high global market share, steadily generating profits.
- ◆ Phase 1 GX focuses on fuel and feedstock conversion in basic chemicals.
Phase 2 GX will explore prioritizing functional chemicals



Green Innovation Fund : Development of technologies for the supply of feedstocks using CO₂ and other carbon sources

- Most feedstocks are naphtha from oil refining; about half of CO₂ emissions from the chemical industry arise from naphtha cracking process to produce basic chemicals (e.g., ethylene, propylene)
- Around 60% of waste plastics are used as thermal energy (thermal recycling), ultimately being emitted as CO₂, highlighting the need for fundamental measures

R&D
Program

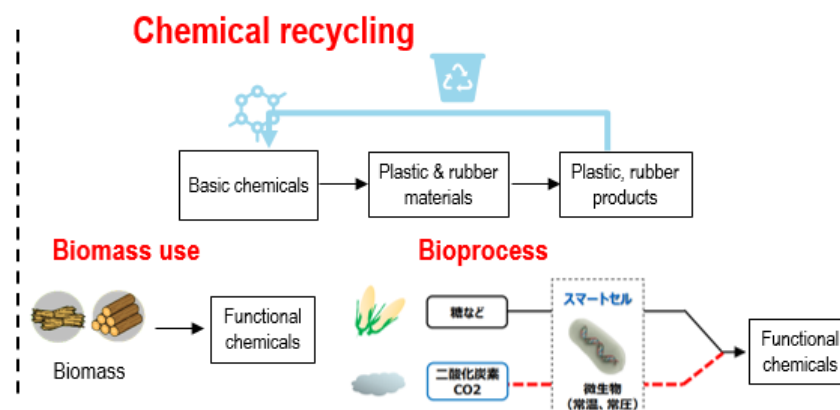
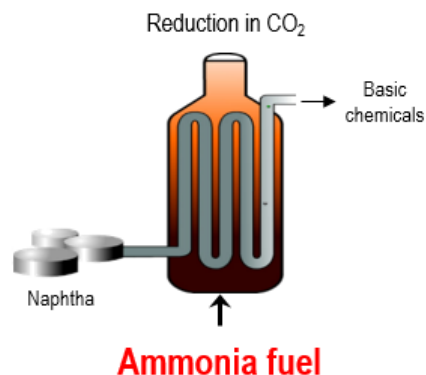
- ① advanced naphtha cracking furnace technologies through carbon-free heat sources
- ② technologies to produce chemicals from waste plastics and waste rubber
- ③ technologies to produce functional chemicals from CO₂
- ④ technologies to produce chemicals from alcohols

Today : Naphtha → Petrochemical Products

(1) Fuel conversion
Ammonia, etc.

+

(2) Raw material conversion
Chemical recycling (using waste plastics) / Biomass use, etc.



Example of Green Innovation Fund

Development of functional material production technology using CO₂

[aim use CO₂ as feedstock]

- **Partial substitution of fossil-based feedstocks with CO₂** in the production of functional chemicals (e.g., polycarbonate, polyurethane) Enhance functional performance, including electrical, optical, and mechanical properties.
- **Improve functional properties, including electrical, optical, and mechanical characteristics**



High-performance
Polycarbonate
(for camera lenses)

Development of production technology from waste plastics and waste rubber

[aim to reduce CO₂ emission around half]

- Establish **technologies to produce plastic feedstock (e.g., ethylene and propylene) from waste plastics and rubber**
- Target yields 60–80%, **reduce CO₂ emissions during production around half**



Waste plastic-base
pyrolysis oil
(as a feedstock for
plastics)

Example of Hard-to-Abate Industry Support Program 2025 (Mitsubishi Chemical, Asahi Kasei, Mitsui Chemical)

- **Discontinuance of operations of ethylene production facility in Mizushima and consolidation of operations in Osaka**, aiming to strengthen production resilience and decarbonization through transition of feedstocks from fossil-based to bio-based feedstocks for basic chemicals via process transformation
- The support program represents a model for GX by **strengthening production resilience** and to promote **GX leveraging the feedstock transition technology**, hence it will enhance the international competitiveness. In areas where each company has competitive advantages, it aims to create added value—including green premiums—through solution-oriented business models and to achieve higher profitability.

Support Program

■ Total investment and subsidy

Of the total investment of JPY 21.2 billion, JPY 10.4 billion subsidy (subsidy rate: 50%)

■ Reduction of CO₂ Emission

▲506 Kt-CO₂/year by consolidation of ethylene production

■ Project

- **Structural Transformation** : Mitsubishi Chemical and Asahi Kasei will discontinue operations of ethylene production facility in Mizushima. They will consolidate the operation in the ethylene production site operated by Mitsui Chemical in Osaka. After consolidation, the new JV owned by three companies will operate the production facilities.
- **Process Transformation** : Install a pilot facility in Mizushima to produce green basic chemicals from bioethanol leveraging Asahi Kasei's "Revolefin™" technology. By FY2034, they will start commercial production in Osaka. They will jointly explore further decarbonization projects in Mizushima.

Strategy for GX by chemical companies

Mitsubishi Chemical

Create the demand for **packaging and automotive** sectors by leveraging established commercial channels across three pathways: biomass, recycling, and CCU

Asahi Kasei

Contribute to solving societal challenges and reducing CO₂ emissions by providing green materials and solutions leveraging **catalyst and process technologies** developed in petrochemicals

Mitsui Chemical

Expand green products into **high-value sectors such as automotive and semiconductors**, leveraging business advantages and technological strengths