

**JGC Group Long-Term Management Vision
2040 Vision**

Full Text

July 7, 2021

JGC Holdings Corporation



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Executive Summary

1. Purpose of the JGC Group

Since the JGC Group's founding in 1928, the Group has changed with the times in supporting industry and society at large. The Group's business has always stood at the crossroads of issues that must be faced to balance the need for energy with the environment.

Change is now sweeping through the business environment where the Group operates. To continue to enjoy sustained growth, we believe we must respond swiftly and flexibly to current trends while transforming ourselves based on the global, long-term perspective of enhancing planetary health and a shared sense of purpose among the Group's stakeholders.

"Enhancing planetary health" – contributing to a healthy future for people and the Earth – is now the reason for the Group's existence. This sense of purpose has guided us in establishing "2040 Vision," our long-term management vision.

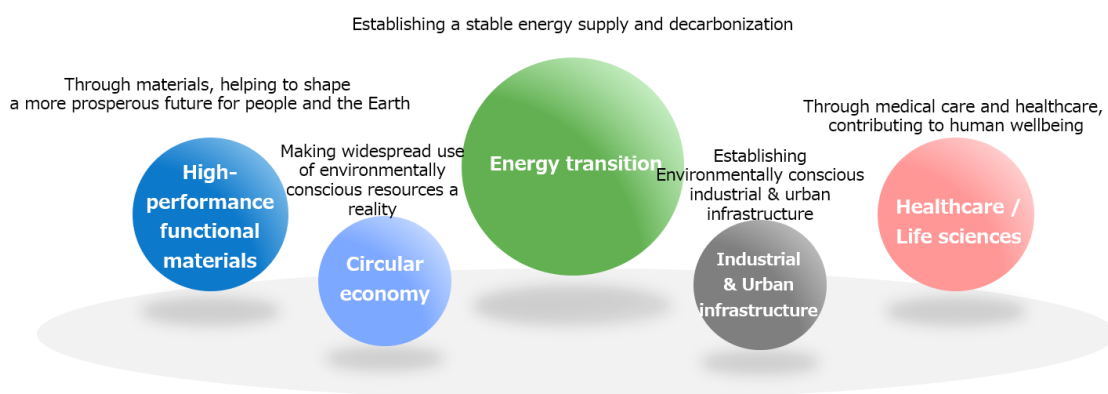
2. 2040 Vision of the JGC Group

Guided by the purpose of enhancing planetary health, the JGC Group will pursue the vision for 2040 by applying proven capabilities and experience to address the three social issues of balancing energy stability with decarbonization, reducing the environmental impact of resource consumption, and building and maintaining vital infrastructure and services.

Working toward these solutions, the Group will be diversifying operations into the following five (5) areas and transforming into a corporate group that contributes to enhancing planetary health.

Business areas:

- Energy transition
- Healthcare/Life sciences
- High-performance functional materials
- Circular economy
- Industrial & Urban infrastructure

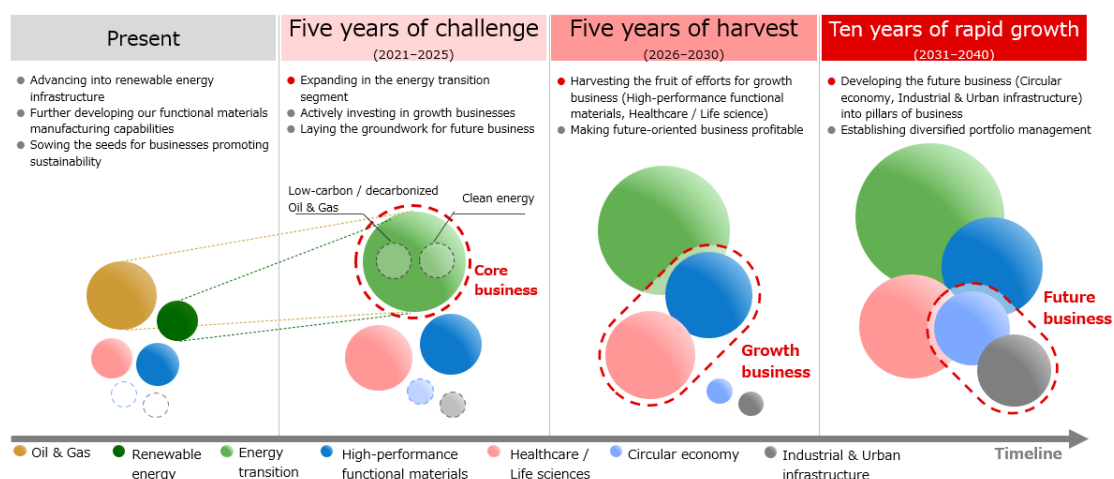


3. Three aspects of the transformation

The JGC Group has enjoyed sustained growth by constantly evolving, and now the decisive transformation the Group is taking on marks a major turning point: the transformation of its business areas, business models, and organization.

3.1. Business area transformation

As the Group makes steady progress in expanding its business into five areas, this long-term transformation will occur over three phases, in consideration of factors such as when its investments will come to fruition. The course charted will take place in the three phases of "five years of challenge" (2021–2025) focused on the core business in energy transition, "five years of harvesting" (2026–2030) the fruit of efforts in the growth businesses of high-performance functional materials manufacturing and healthcare/life sciences, and "ten years of rapid growth" (2031–2040) as the Group add the future business of circular economy and industrial & urban infrastructure as pillars of business.



The Group will take the following courses of action in five business areas.

Energy transition

Adopt low-carbon/decarbonization practices in the Oil & Gas sector and expand clean energy, for a net-zero society.

Healthcare/Life sciences

Further develop segments providing pharmaceuticals and hospitals domestically as well as in emerging economies, to promote health through medical care.

High-performance functional materials

Develop and produce unmatched high-performance functional materials in growth segments, applying core technologies.

Circular economy

Cultivate markets and build ecosystems supporting circular economy for a sustainable society.

Industrial & Urban infrastructure

Provide environmentally conscious industrial & urban infrastructure integrating multiple systems.

3.2. Business model transformation

In EPC business, the Group will implement its "IT Grand Plan 2030" and "EPC DX" in particular for the transformation of the EPC business model. The Group will seek business model expansion upstream and downstream in the value chain, building on its accumulated experience, and establishing new business models applying digital technologies.

In the area of non-EPC business models, while reinforcing its existing high-performance functional materials production, the Group will undertake transformation that leverages JGC Group strengths in licensing, PMC and other consulting, maintenance and digital O&M, digital platform business, as well as participation in new business.

3.3. Organizational transformation

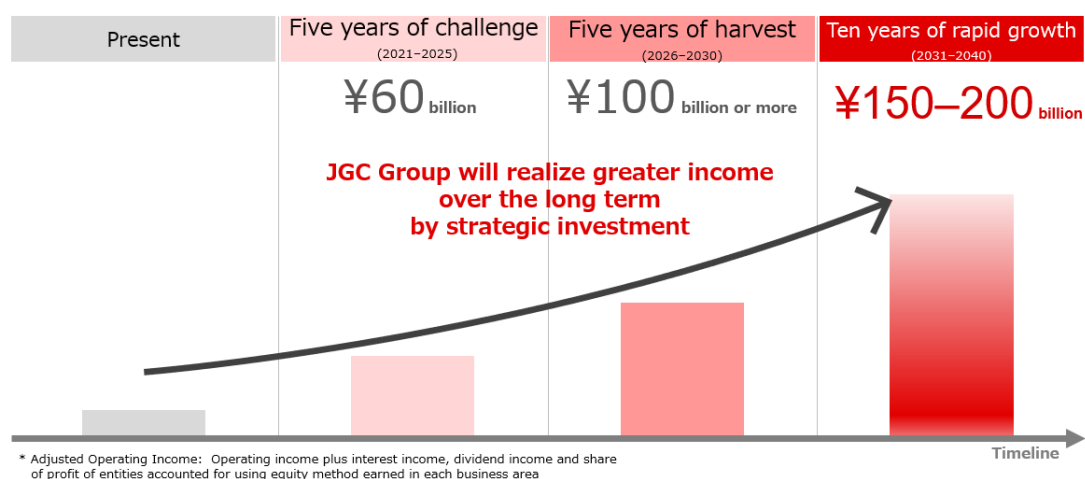
To guide the transformation of its business areas and business models steadily toward success, the Group will also promote organizational transformation. Here, the Group will focus on strengthening its framework for "regional management" to solve local social issues and fostering a "culture of innovation" to develop new technologies and business more rapidly and creatively.

4. Target level for operating income

Through its transformation, the Group envisions it will generate operating income of ¥60 billion by 2025, ¥100 billion or more by 2030, and ¥150–200 billion by 2040. The Group will also make strategic investments for greater revenue over the long term.

Target level of operating income*

These three facets of transformation will support us in reaching ¥150–200 billion of income in 2040. Strategic investments to be made over the long term.



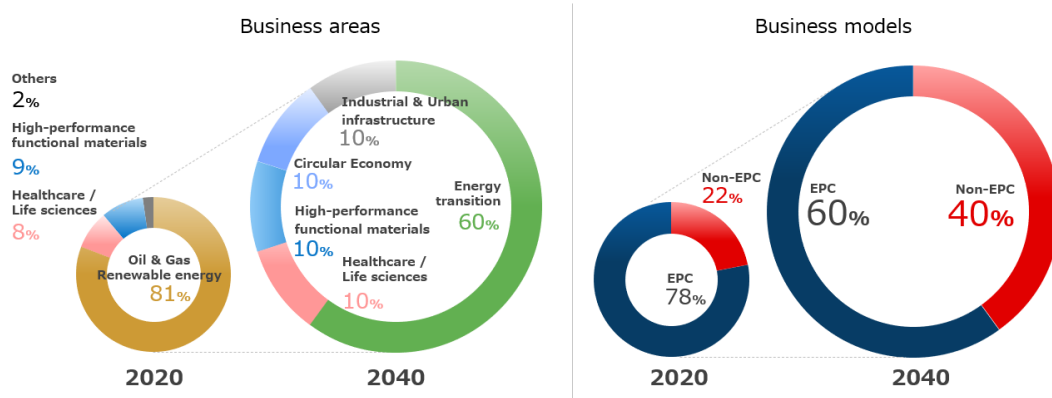
The transformation of business will be complete by 2040, when its diversified portfolio will reflect

JGC Group Long-Term Management Vision
2040 Vision

these changes.

Sales contribution by business areas and models

Taking on social issues through a variety of business models in more diverse business areas



Group message

In establishing the 2040 Vision, the JGC Group makes the following three commitments to all stakeholders over a period of 20 years. For the JGC Group to transform itself, achieve sustainable growth, and fulfill a valuable role in society, nothing is more important than for us to continue to provide an environment for all engaged in and with the Group to work with high motivation.

1. We will foster a culture that takes on the challenge of the unknown and encourages innovation
2. We will work toward a shared purpose and maintain a tradition of mutual respect
3. We will create an environment where exchanges of the diverse ideas of a vibrant workforce lead to positive outcomes and new value

1 Introduction

Currently, social and industrial paradigm shifts are unfolding faster than ever against background factors such as global climate change issues, advances in digital technology, and the pandemic crisis of COVID-19 since 2020. Amid growing uncertainty about the future, issues involving the health and welfare of the people and the Earth are also becoming more serious.

Change is sweeping through the Group's business environment as well, giving us a renewed awareness that its own transformation is inevitable. Under these conditions, the JGC Group recently established its "2040 Vision" as a long-term vision with the future 20 years from now in mind, so that the Group continues to respond to current environmental changes and will be pursuing long-term growth.

To make the 2040 Vision a reality, the Group will hone the core competencies that have been cultivated in existing business and apply innovation to establish new business, as the Group takes on corporate transformation from a long-term perspective.

This document is intended to convey to all stakeholders, including members of the Group, the kind of company we aspire to be.

2 Purpose of the JGC Group

2.1 Historical roles since the company was founded

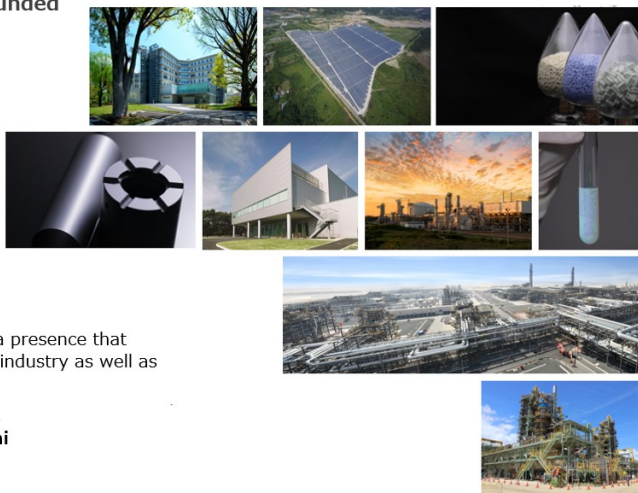
Historical roles since the company was founded

Supporting the foundations of industry and society at large,
at the crossroads of challenges in
balancing energy and environmental needs



I want the company to be a presence that supports the foundation of industry as well as society regardless of era

Founder Masao Saneyoshi



The predecessor of the JGC Group, Japan Gasoline Company, was established in 1928 targeting the oil refining business. Demand for fuel oil in Japan was growing, and the company aspired to free the country from relying on expensive imports by supplying economical fuel oil from domestic refining operations, which would contribute to industrial and social development. The company later moved on from refining but, even after becoming Japan's first EPC contractor, the Group has always focused on the social imperative of balancing energy needs and environmental impact, remaining a presence that supports the foundations of industry and society at large.

2.2 Purpose of the JGC Group

For the JGC Group to continue to enjoy sustained growth, we believe the Group must keep responding swiftly and flexibly to current environmental changes while transforming ourselves based on the global long-term perspective of contributing to a healthy future for people and the Earth, which expands on our founding management stance of contributing to industrial and social development. We have also recognized a need to redefine the purpose of the Group so that all stakeholders in the Group share this sense of purpose and we steadily carry out our transformation.

This thinking underlies the Group's newly redefined purpose: "Enhancing planetary health." The health of people and the Earth are intertwined. We will enhance ourselves in working toward a more prosperous future – this is the message behind the Group's purpose.

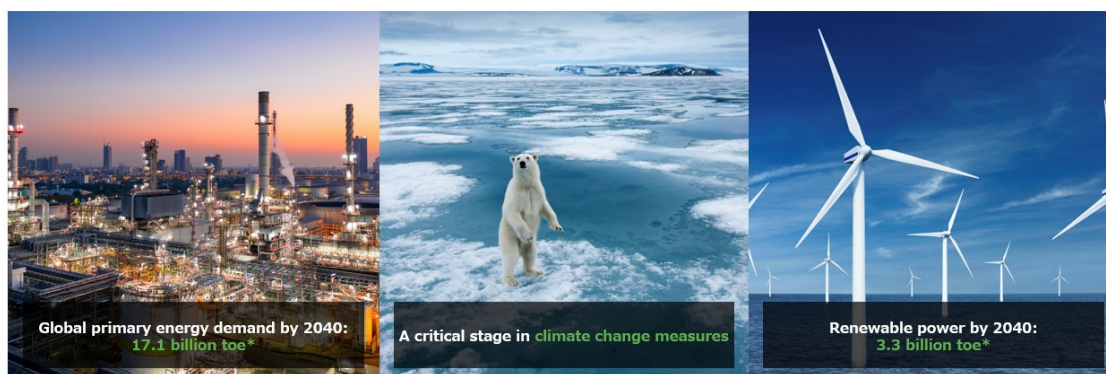
This purpose has guided us in establishing the 2040 Vision, our long-term management vision.

Purpose of the JGC Group
Enhancing planetary health

3 Social issues targeted by the JGC Group

Through the lens of "enhancing planetary health", what challenges await the world in 2040, and what action is needed in the meantime?

3.1 Pursuing both a stable energy supply and decarbonization



Of particular interest to the JGC Group are developments in the energy sector. According to the International Energy Agency's (IEA) *World Energy Outlook 2020*, global primary energy demand is set to expand with demographic and economic growth from 14.4 billion toe¹ in 2019 to 17.1 billion toe in 2040 under stated policy scenario.² Even if this demand drops as climate change measures of many countries take off, it is expected that the trend toward greater energy consumption will continue globally, especially in emerging countries.

Looking ahead to the world in 2040, climate change remains a major challenge. According to the IPCC's *Special Report on Global Warming of 1.5°C* published in 2018, the global average temperature has already risen by 1°C relative to preindustrial levels, and at the current rate of warming, a further increase of 1.5°C is expected between 2030 and 2050. It is thought that limiting the increase in average temperature relative to preindustrial levels to 1.5°C will require net-zero CO₂ emissions by 2050. The world is already moving toward this ambitious 1.5°C target. Renewable energy holds promise as a new energy source, and some forecasts suggest that the current supply of 900 million toe will rise to 3.3 billion toe by 2040.³ The Group expects this global trend toward lower carbon, and carbon neutrality, is likely to accelerate.

1 Ton of oil equivalent

2 IEA (2020), *World Energy Outlook 2020*, from Stated Policies Scenario

3 IEA (2020), *World Energy Outlook 2020*, from Sustainable Development Scenario

3.2 Reducing the environmental impact of resource consumption



As the scale of production and consumption expands with economic growth, CO₂ emissions across manufacturing processes are increasing, and more waste is being generated. Total global waste stood at 2 billion tons in 2016 and is projected to reach 3.4 billion tons in 2050, of which 12% will be plastic waste that is not biodegradable.⁴ Micro- and nanoplastics in this non-biodegradable waste spread through the air and oceans, which raises concerns that the impact on ecosystems and human health will become more serious.⁵ The Group believe there is a need for resources with a lighter environmental footprint that do not represent new sources of waste.

3.3 Building and maintaining vital infrastructure and services



Asia, Africa and other emerging regions will see an accelerated urban population influx as their economies grow. Asia in particular may see an increase in the urban population ratio from about 50% in 2018 to 66.2% in 2050.⁶ One global challenge the Group will be focusing on is developing and maintaining the industrial and urban infrastructure needed as this urbanization continues.

Greater medical needs are also expected, especially in emerging markets where economies are growing and people are living longer. Developing medical infrastructure and providing better

⁴ World Bank (2018), *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*.

⁵ UNEP (2016), *Marine Plastic Debris and Microplastics: Global Lessons and Research to Inspire Action and Guide Policy Change*.

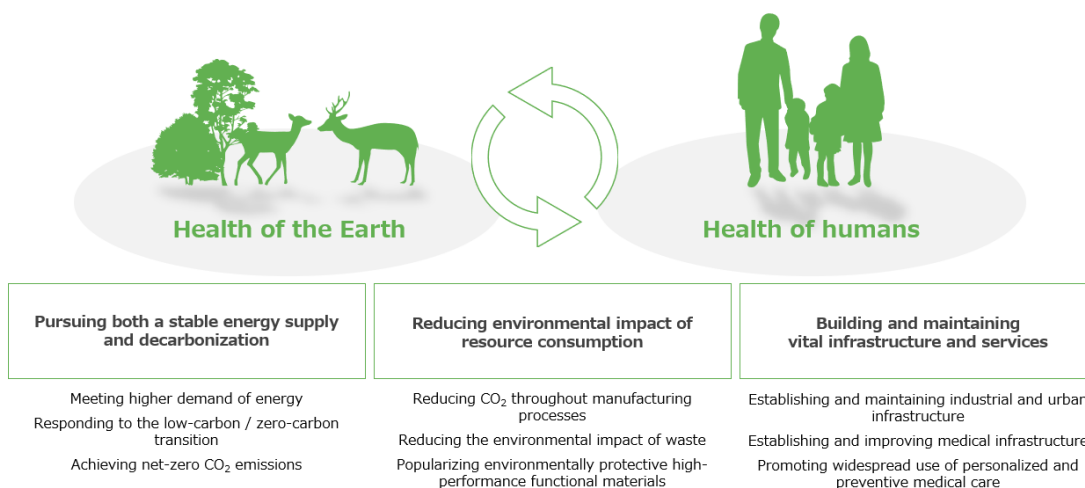
⁶ United Nations (2018), *World Urbanization Prospects 2018 Revision*.

treatment will be required, and needs will increase in specialized medical fields.

Meanwhile, as birthrates decline and populations age in Japan as well as other advanced nations, the Group are already seeing a need to maintain social systems and ensure quality of life through personalized and preventive medical care. It is anticipated that the emerging markets will share these needs by 2040.

3.4 Role of JGC Group toward 2040

In view of these environmental changes, the Group believes that the social issues which should be addressed in the years leading to 2040 can be summarized along these lines: pursuing both energy stability and decarbonization, reducing environmental impact of resource consumption, and building and maintaining vital infrastructure and services. These issues pertain to the health of the Earth and people alike. To contribute toward solutions, the Group will apply its experience and capabilities accumulated to date.

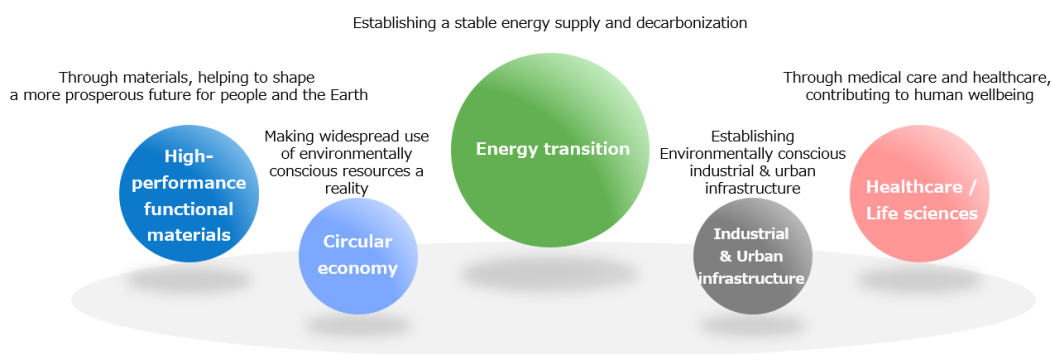


4 2040 Vision of the JGC Group

4.1 Five business areas

As a corporate group committed to enhancing planetary health, the Group will leverage its technologies and experience, applying its core competencies to fulfill this purpose in five business areas.

A corporate group that contributes to enhancing planetary health in five (5) business areas



Energy transition

One task for the company to confront is responding to global demand for both “more energy” and “carbon neutrality”. As the Group adopts low-carbon/decarbonization practices in its core Oil & Gas business, it will integrate this business with clean energy business (for which the efforts have accelerated since the 2010s) under the new concept of "energy transition."

Healthcare/Life sciences

In the area of pharmaceuticals, drug discovery has become more diverse and sophisticated, from large molecule drugs to biopharmaceuticals and new modalities. The field of medicine also faces some urgent issues, such as realization of digitally enhanced smart hospitals and responding to greater medical needs in emerging economies. The Group will further contribute to human health through healthcare and life sciences based on an extensive experience in supporting domestic pharmaceutical and healthcare clients since the 1970s.

High-performance functional materials

The potential of materials will also help the Group shape a more prosperous future for people and the Earth. The Group manufacturing companies will apply expertise in catalysts, fine chemicals, and fine ceramics to develop new products and expand capacity in applications linked to its other business areas, such as carbon/chemical recycling, environment/new energy, semiconductors/telecommunications, and life sciences.

Circular economy

The Group will work toward solutions to issues associated with waste generated from the life cycle

of petrochemical products such as plastics, as the Group promote widespread adoption of resources with a lighter environmental footprint. For this purpose, the Group will apply process engineering capabilities from refining and petrochemicals in order to build "circular economy" operations into a profitable pillar of business with the partners.

Industrial and Urban infrastructure

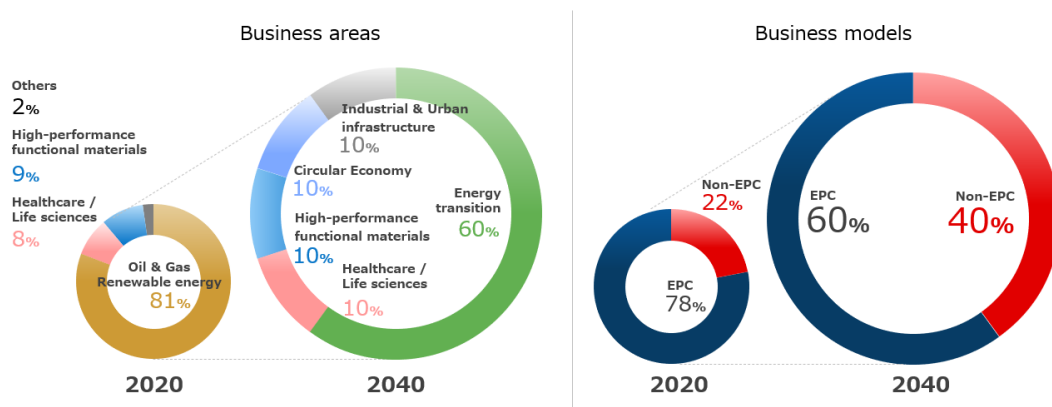
The Group will venture into industrial and urban infrastructure based on its fundamental technologies and project management capabilities developed to date, which enable us to meet urbanization needs through environmentally conscious solutions where demographic and economic growth is expected. The efforts in this area will involve implementing integrated industrial and urban infrastructure that also applies solutions from energy transition, circular economy, and other business areas.

4.2 Sales contribution by business areas and models

Envisioned for 2040 is a transformation into a corporate group doing business in these five areas, beyond the current focus on Oil & Gas, and a shift from its EPC-focused business model to various other models.

Sales contribution by business areas and models

Taking on social issues through a variety of business models in more diverse business areas



The Group will diversify its business areas. Target sales contribution of each area is roughly 60% in energy transition and 10% each in the healthcare/life sciences, high-performance functional materials, circular economy and the industrial & urban infrastructure segments. Similarly, in diversifying business models, the Group will increase the sales contribution from non-EPC models to 40% or more.

5 Overview of transformation supporting the vision

5.1 Three aspects of transformation supporting the 2040 Vision

Becoming the corporate group envisioned for 2040 – working in these five areas to enhance planetary health – calls on its commitment to transformation as individuals and an organization. Thus, the JGC Group will take on transformation in three ways to realize the 2040 vision.

Business area transformation

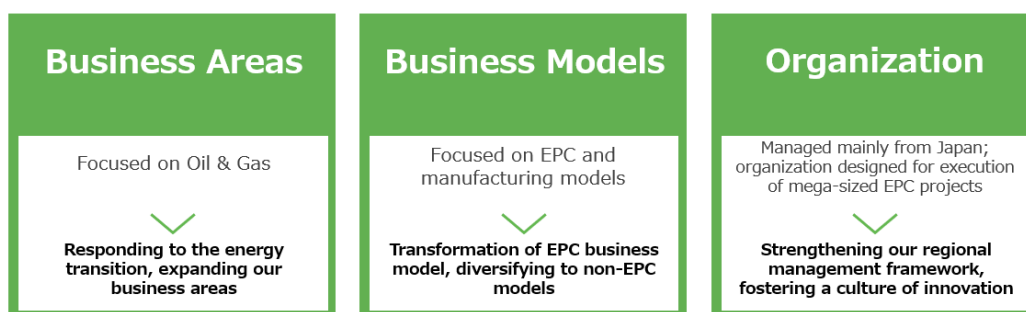
The Group will transform its business area focusing on Oil & Gas to meet the needs of energy transition, as well as expand business areas to other than energy-related areas.

Business model transformation

The Group will transform its existing EPC- and manufacturing-centered model by making the EPC model more sustainable and, by diversifying the revenue structure through a variety of models, stabilize income.

Organizational transformation

In organizational transformation, the Group will add to the current organization, with group management focused in Japan and optimized for mega-size projects, by strengthening a framework for regional management that can contribute to local development through smaller projects firmly based in emerging economies, as well as by fostering a culture of innovation for the development of new technologies and business.



5.2 Path to business area expansion

The Group business will be expanded into five areas over three phases, based on the scale of expansion and the timing of when its investments will come to fruition. Portfolio expansion will involve gradually developing business in areas the Group have identified as "core" (specifically, supporting energy transition), "growth" (high-performance functional materials manufacturing, and healthcare/life sciences), and "future" (circular economy and industrial & urban infrastructure) into profitable pillars of business.

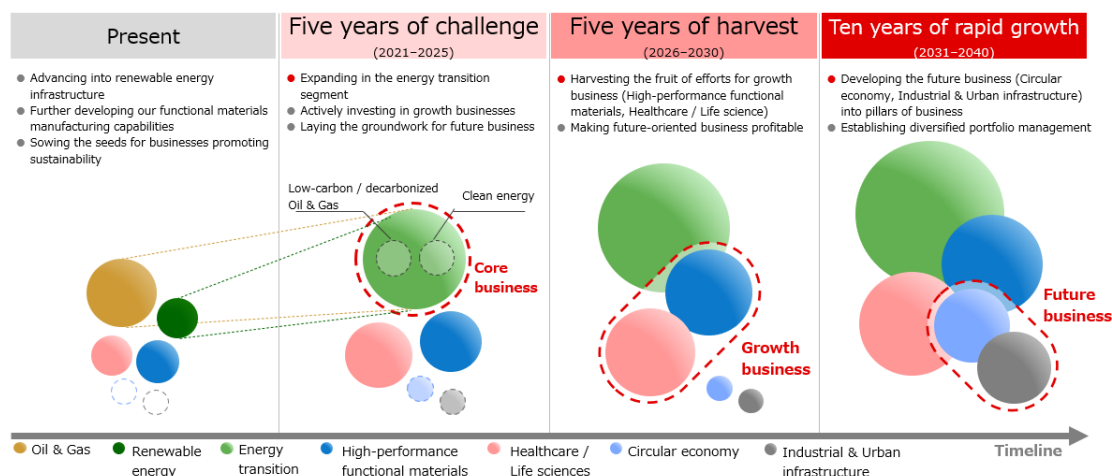
The first phase from FY2021, positioned as "five years of challenge," marks a shift to low-carbon/

JGC Group Long-Term Management Vision 2040 Vision

decarbonized Oil & Gas through the adoption of low-carbon/decarbonization technologies in the traditional Oil & Gas business. Meanwhile, another business in the energy transition area that the Group will develop into a core business is clean energy, which includes renewable energy. The Group will also actively invest in growth businesses and lay the groundwork for future business at this time.

The next "five years of harvest" are positioned as a phase to develop operations in both high-performance functional materials and healthcare/life sciences into pillars of business, and to make other future business profitable.

In the final "ten years of rapid growth," the Group will establish diversified portfolio management in all five business areas, with operations supporting a circular economy and industrial & urban infrastructure added as pillars of business.



5.3 Target level for operating income

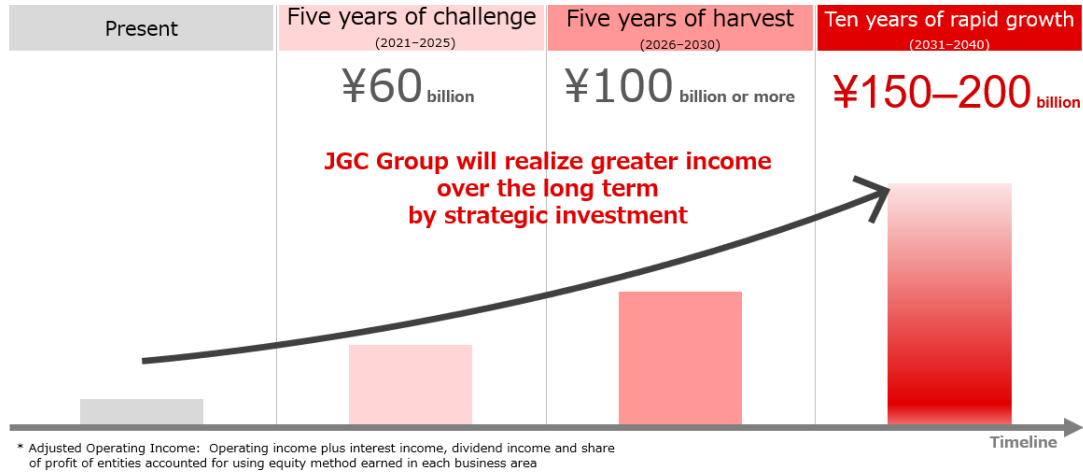
Through the transformation of both its business areas and business models over the coming years to 2040, the Group is targeting operating income of ¥60 billion by 2025, ¥100 billion or more by 2030, and ¥150–200 billion by 2040.

For greater revenue over the long term, the Group will continue to make strategic investments.

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Target level of operating income*

These three facets of transformation will support us in reaching ¥150–200 billion of income in 2040.
Strategic investments to be made over the long term.

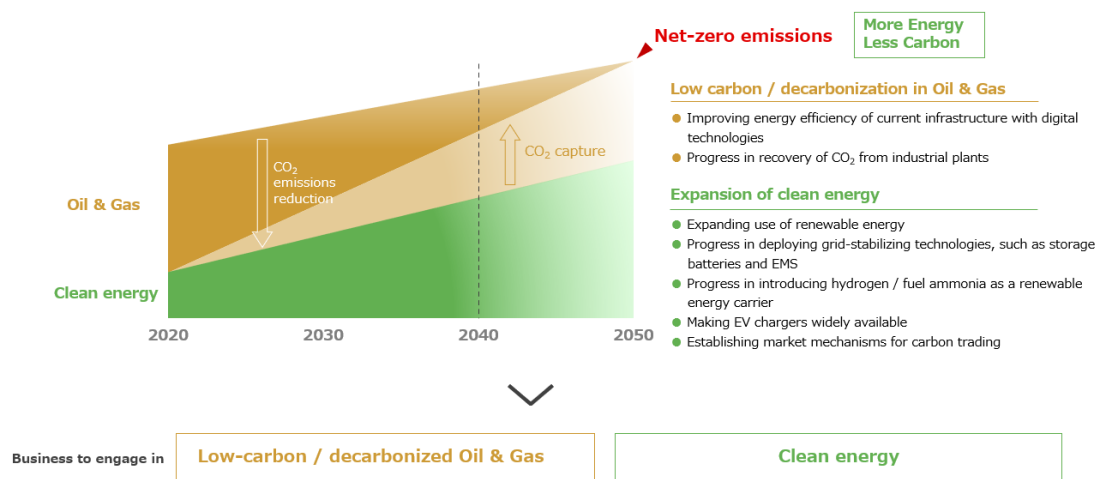


6 Business area transformation

6.1 Core business: Energy transition

The Group will engage in energy transition business by both promoting low-carbon/decarbonization in Oil & Gas (through reduced emissions and adoption of carbon-capture technologies) and expanding use of clean energy in response to the global consensus on net-zero CO₂ emissions by 2050.

In this way, operations in the Group's energy transition area will simultaneously address the two challenges of more energy and less carbon by combining low carbon/decarbonization in Oil & Gas with expansion of clean energy.



6.1.1 Energy transition – low-carbon/decarbonized Oil & Gas

To meet energy demand that is expected to increase amid economic growth in emerging markets, and to meet needs in the energy transition to low carbon and decarbonization in the world's Oil & Gas industries, the Group will draw on its Oil & Gas experience – expertise and experience in mega-size projects, as well as experience in CCS facility design and construction.

Here, the Group will focus on the four segments of CCS, energy-saving technologies, carbon credits, and "blue" hydrogen/ fuel ammonia.⁷

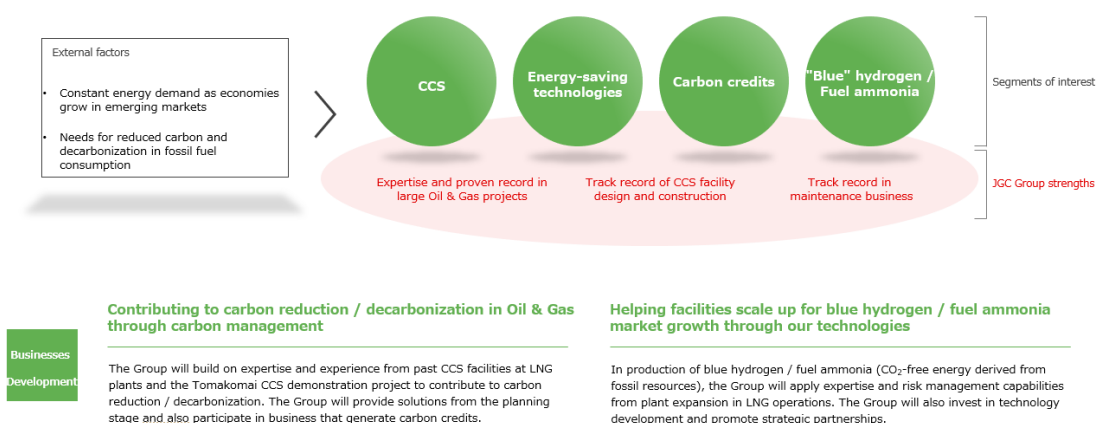
The business development plan is as follows.

- **Contributing to carbon reduction/decarbonization in Oil & Gas through carbon management**

The Group will build on expertise and experience from past CCS facilities at LNG plants and the Tomakomai CCS demonstration project to support carbon reduction/decarbonization in Oil & Gas. Not only EPC, the Group will also actively provide solutions from the business planning stage and participate in business that generates carbon credits.

- **Helping facilities scale up for blue hydrogen/fuel ammonia market growth through its technologies**

Production of blue hydrogen/fuel ammonia (CO₂-free energy derived from fossil resources) will require producers to introduce the CCS technology mentioned earlier and expand facilities to meet higher demand. The Group will support widespread adoption of blue hydrogen/fuel ammonia by applying accumulated expertise and risk management capabilities from LNG operations, investing in technology development, and promoting strategic partnerships.



6.1.2 Energy transition – clean energy

In the global trend toward carbon neutrality by 2050, renewable energy is expected as a key solution and the market growth is expected to this area. Building on technologies cultivated in solar and biomass power generation, construction management expertise, and process engineering

⁷ Hydrogen/fuel ammonia derived from fossil resources with a carbon footprint reduced by means such as CCS

technologies, the Group will proactively venture into clean energy and meet these decarbonization needs.

The Group will focus on the three segments of offshore wind power, "green" hydrogen/ fuel ammonia⁸, and small modular reactors (SMRs). The business development plan is as follows.

- **Entering offshore wind power, starting in Japan and building on expertise in construction management**

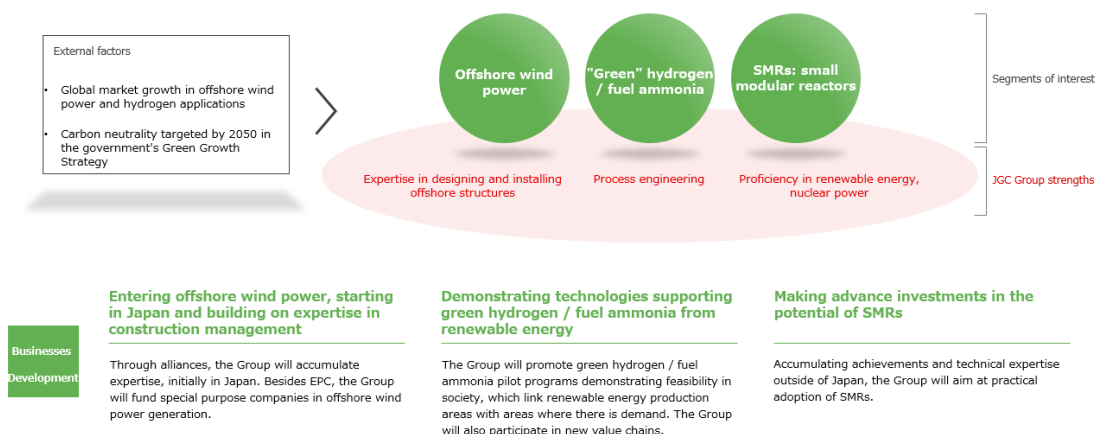
The Group has taken on offshore wind power generation by setting up a dedicated business unit in 2018. Applying construction management expertise, the Group will form alliances to participate – initially in Japan, where the market is expected to take shape over the next several years. In addition to construction, the Group will fund special-purpose companies for its offshore wind power generation business.

- **Demonstrating technologies supporting green hydrogen/ fuel ammonia from renewable energy**

The Group will apply expertise gained in pilot programs to date as we demonstrate the feasibility of using green hydrogen/fuel ammonia from renewable-powered water electrolysis as an energy carrier, anticipating participation in new energy value chains for the benefit of society.

- **Making advance investments in the potential of SMRs**

As for nuclear power, safety remains the first priority, and there are expectations for the role nuclear power can play as a non-greenhouse gas energy source as well as a potential source of hydrogen. The Group anticipates establishing a track record of achievements in the overseas construction of smaller, safer, next-generation nuclear reactors called SMRs as the Group explore the feasibility of practical adoption.



⁸ Hydrogen/fuel ammonia derived from renewable energy

6.2 Growth business: Healthcare/Life sciences

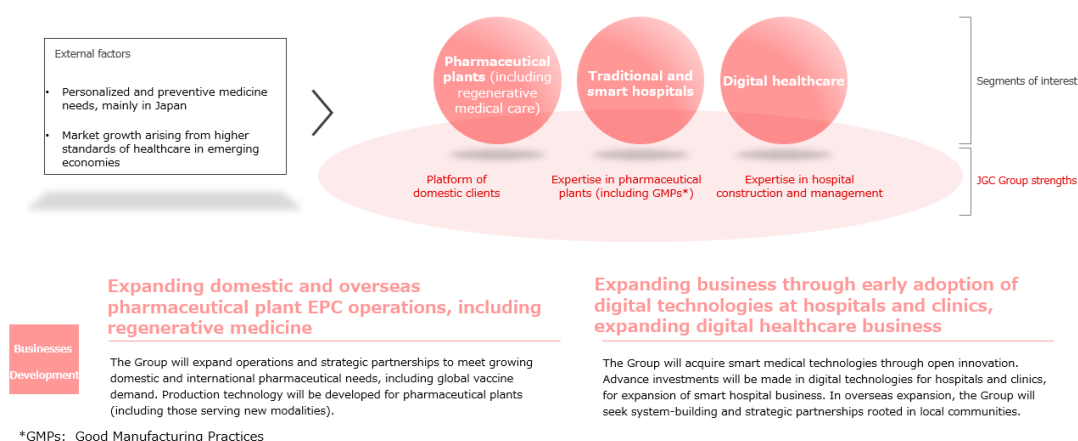
Applying its domestically developed pharmaceutical engineering, client base, and expertise in hospital construction and management, the Group will meet the growing needs in personalized and preventive medical care mainly in Japan and respond to market expansion overseas as medical standards further improve in emerging economies.

Here, the Group will focus on the three segments of pharmaceutical plants (including for regenerative medicine), hospitals (traditional and smart), and digital healthcare.

- Expanding domestic and overseas pharmaceutical plant EPC operations, including regenerative medicine**

The Group will expand operations to meet growing pharmaceutical needs, including global vaccine demand, as the Group consider domestic and international strategic partnerships. The Group will acquire and refine advanced production technologies in line with the technical requirements of domestic clients, including in the field of new modalities such as regenerative medicine, which continues to expand as needs emerge in personalized medical care.
- Expanding business through early adoption of digital technologies at hospitals and clinics, expanding digital healthcare business**

In hospitals, the Group will apply open innovation to acquire smart medical technologies. Advance investments will be made in digital technologies for hospitals and clinics, for the expansion of smart hospital business. The business the Group intend to establish can contribute in preventive medical care by collecting health and medical data to drive digital healthcare operations with the potential to improve the quality of treatment. Overseas, the Group will actively build an operating framework focused on local community and seek strategic partnerships.



6.3 Growth business: High-performance functional materials

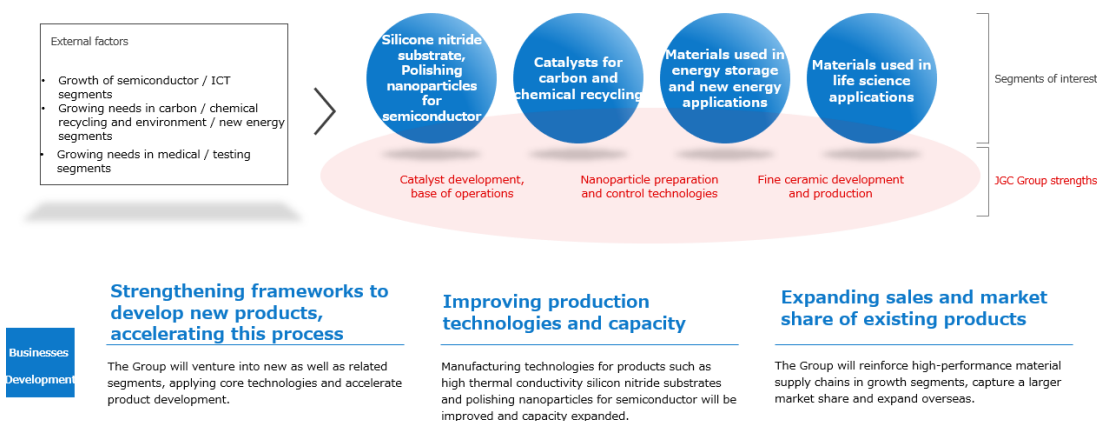
The Group will take on the development and production of unique high-performance functional materials in growth segments, applying its conventional core technologies (in materials development

and production techniques).

The Group will focus on the four new segments of high thermal conductivity silicon nitride substrates and semiconductor polishing nanoparticles, catalysts for carbon and chemical recycling, materials used in energy storage and new energy applications, as well as materials used in life science applications.

Business development will be accelerated as follows, drawing on the Group strengths of its base of operations for catalyst development, its nanoparticle preparation and control technologies, and its fine ceramic development and production.

- Strengthening frameworks to develop new products, accelerating this process**
The Group will venture into new as well as related segments by applying core technologies. Product development will be reinforced and accelerated.
- Improving Production technology and capability**
The Group will actively invest in order to develop technologies and expand facilities in growth segments such as high thermal conductivity silicon nitride substrates and semiconductor polishing nanoparticles. Production capacity of high-performance functional materials will be expanded.
- Expanding sales and market share of existing products**
The Group will further refine core technologies, enhance cost-competitiveness, and strengthen marketing. Supply chains for products in growth segments will be reinforced and expanded to overseas markets, to capture a larger market share.



6.4 Future business: Circular economy

By drawing on process engineering expertise cultivated in oil refining and petrochemicals processes and networks with its clients and partners, the Group will show leadership in market formation and ecosystem-building to support a circular economy for a sustainable society.

- **Creating recycling value chains through partnerships**

The Group will fulfill a role in creating value chains by applying chemical recycling technologies in areas including plastic and fiber waste recycling, next-generation aviation fuel (SAF⁹), and CO₂ mineralization. The Group will provide licensing as well as operational consulting that applies operational expertise gained from its commercial demonstrations and pilot programs.

6.5 Future business: Industrial & Urban infrastructure

Applying expertise in managing overseas projects, the Group will respond to demand for construction of industrial and urban infrastructure as economies grow in emerging markets by providing environmentally conscious industrial facilities and urban infrastructure.

- **Becoming a major player in the industrial & urban infrastructure market, venturing into integrated infrastructure development**

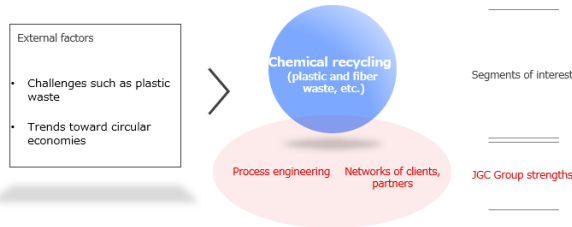
In the short term, the Group will build on experience to expand its track record in industrial facilities. In urban infrastructure, including railways and water treatment facilities in Asia, the Group will forge relationships of trust with new clients centered on EPC business. Over the long term to 2040, the Group will provide comprehensive services from conceptual design and construction to operation and maintenance for industrial parks and urban development as integrated infrastructure that applies solutions from energy transition, circular economy, and other business areas.

⁹ Sustainable aviation fuel (SAF)

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Circular economy

Showing leadership in market formation and ecosystem building to support a circular economy for sustainable society



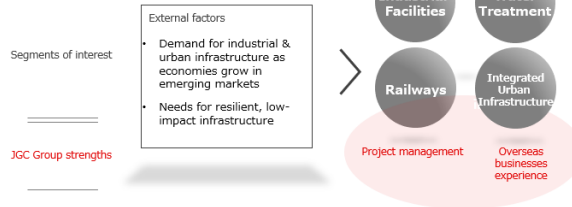
Creating recycling value chains through partnerships

Businesses
Development

The Group will acquire chemical recycling technologies, such as for plastic and fiber waste, for widespread adoption in society. The Group will provide licensing as well as operational consulting applying operational expertise from commercial demonstrations.

Industrial & Urban infrastructure

Providing environmentally conscious industrial & urban infrastructure integrating multiple systems



Becoming a major player in the Industrial & Urban infrastructure market, venturing into integrated infrastructure development

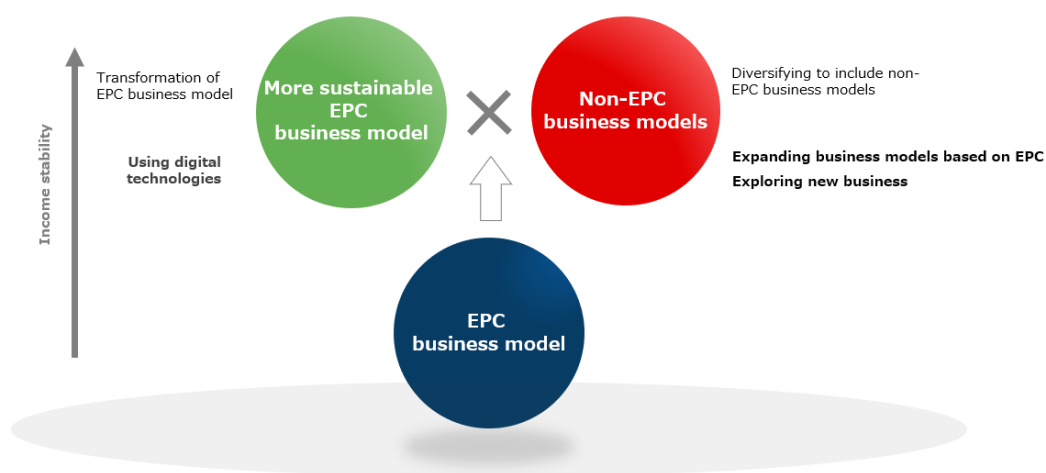
Businesses
Development

The Group will construct industrial facilities, expanding its track record, while accumulating an array of technologies and a solid record in the Industrial & Urban infrastructure segment, such as for railways and water treatment. Services to be provided range from conceptual design to construction and operation of integrated infrastructure (as seen in industrial parks and urban development).

7 Business model transformation

Transformation of the EPC model, diversifying to expand into non-EPC models

For the Group to continue to fulfill valuable roles in society, our belief is the Group must generate more stable revenue and achieve sustained growth. Thus, the Group will apply digital technologies in transforming the EPC business model itself, expand from this model into non-EPC models upstream and downstream of value chain, and seek new business models that are unrelated to EPC, as the Group diversify the revenue structure.



7.1 Transformation of the EPC business model: Initiatives applying digital technologies

Transformation of the EPC business model for greater income stability will call for maintaining and strengthening its EPC execution capabilities, a strength of the Group. Essential are digital technologies, which are rapidly evolving.

Future goals for 2030

To enhancing the Group's EPC capabilities, digital technologies will be adopted as the Group pursue the goal of the IT Grand Plan 2030 (long-term information strategies established in 2018): namely, executing EPC projects twice as rapidly, with one-third the current man-hours, by 2030. Specifically, the plan charts a roadmap consisting of the following five innovation programs.

- Innovation in engineering capabilities through AI design
- Project digital twins and predictive simulations (Project Simulator)
- Dramatic improvements at construction sites from 3D printers and automated construction
- Improved productivity through standardized, modular plants
- Development of smart community technology

The Group has been working toward these goals since the IT Grand Plan was first established. These

efforts have gained momentum through various measures, such as the formation of the EPC DX Department in 2020. The Group will be investing to develop digital technologies and verifying actual results in projects to ensure the JGC Group remains competitive in EPC execution.

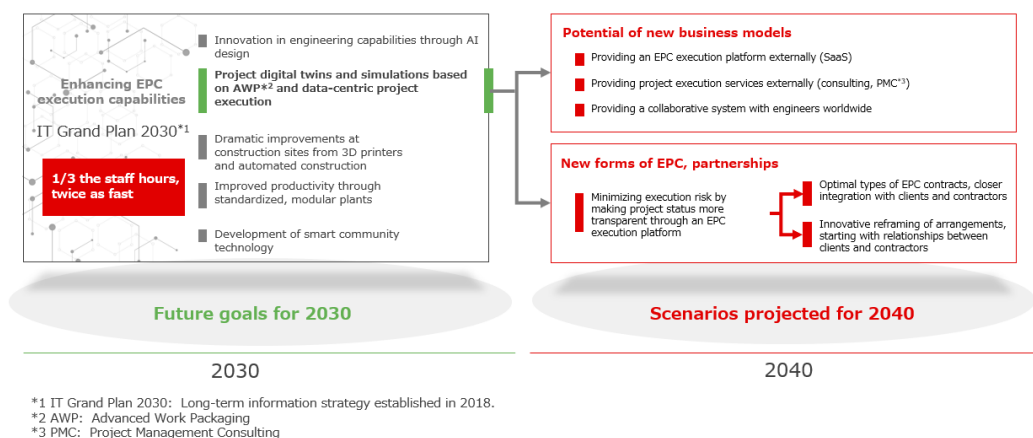
In the digital twin innovation program, the Group is developing an EPC Execution Platform integrating project execution information, converting from conventional workflow to a data-centric form and used in conjunction with Advanced Work Packaging (AWP) methods. The platform is expected to be developed by 2025 and will be phased in, starting with compatible projects. Establishing this platform will enable centralized storage and management of all data relevant to EPC project execution and practical adoption of a "project simulator" to forecast future status on project costs and schedules.

Several other initiatives will also be implemented over this time frame, including optimal plot plan design applying AI, innovative, generative equipment design, use of new materials for plant structures, on-site manufacturing by large-scale 3D printers, and plants delivered on the basis small standardized modules. Through these advanced technologies, the Group will be seeking further gains in EPC execution.

EPC business scenarios projected for 2040

The Group believes that it will become standard practice to conduct EPC business on the EPC Execution Platform by 2030. The significance lies in its potential to make project status more transparent to stakeholders, reduce the risks of EPC execution and, when the Platform is shared with clients and other stakeholders, even transform traditional lump-sum contracts. This may also enable new business models, with services such as providing SaaS (“software as a service”) used in project execution, offering associated consulting services, and/or delivering collaborative system services with engineers around the world, as in gig opportunities.

With these scenarios in mind, the Group will continue to anticipate the emergence of new digital technologies and invest proactively as the Group transform its EPC business.



*1 IT Grand Plan 2030: Long-term information strategy established in 2018.
*2 AWP: Advanced Work Packaging
*3 PMC: Project Management Consulting

7.2 Business model diversification

To date, the Group has engaged in EPC business under a lump-sum EPC business model in which the Group undertake a full scope from engineering to procurement and construction. Looking ahead to 2040, the Group expect a greater need for value co-creation, to take on new and unprecedented technologies and business. To meet these needs and provide highly value-added solutions, the Group will expand its business model upstream and downstream in the value chain, building on technologies cultivated in its traditional EPC business model. The Group also intends to establish new business models applying digital technologies.

In developing non-EPC business models, the Group will reinforce existing the manufacturing of high-performance functional materials and expand this model. Primarily, the following new business is currently envisioned.

Non-EPC business model expansion based on EPC

- Licensing: Technologies used in hydrogen/fuel ammonia applications, chemical recycling, and the like
- Consulting, PMC: Low-carbon/decarbonization consulting, basic/master planning for hospitals, circular economy consulting, PMC for urban development, among others
- Maintenance services, digital O&M: CO₂ emission optimization support, smart O&M, smart hospital O&M, urban infrastructure O&M, and others

Diversification into new business models

- Platform business: Platforms for generating/monitoring carbon credits, energy supply/demand optimization, digital healthcare (medical information banks), circular economy supply chain platforms, and the like
- Business participation: CCS/CCUS business, offshore wind business, hydrogen/fuel ammonia business, hospital management, commercial demonstration of chemical recycling, and the like

Example of business	Non-EPC business model expansion based on EPC			Diversification into new business models	
	Licensing	Consulting/ PMC	Maintenance, digital O&M	Digital Platform	Business Participation
Energy transition	<ul style="list-style-type: none"> Hydrogen / fuel ammonia technologies 	<ul style="list-style-type: none"> Low-carbon, decarbonization consulting 	<ul style="list-style-type: none"> CO₂ emission optimization support Smart O&M 	<ul style="list-style-type: none"> Platform for generating and monitoring carbon credits Energy supply / demand optimization 	<ul style="list-style-type: none"> CCS / CCUS business Offshore wind business Hydrogen / fuel ammonia business
Healthcare / Life sciences	—	<ul style="list-style-type: none"> Basic / master planning for hospitals 	<ul style="list-style-type: none"> Smart hospital O&M 	<ul style="list-style-type: none"> Digital healthcare (medical information banks) 	<ul style="list-style-type: none"> Hospital management
Circular economy	<ul style="list-style-type: none"> Chemical recycling technologies 	<ul style="list-style-type: none"> Related technology consulting 	—	<ul style="list-style-type: none"> Supply chain platforms 	<ul style="list-style-type: none"> Commercial demonstrations of chemical recycling
Industrial & Urban infrastructure	—	<ul style="list-style-type: none"> PMC for urban development 	<ul style="list-style-type: none"> Urban infrastructure O&M 	—	—

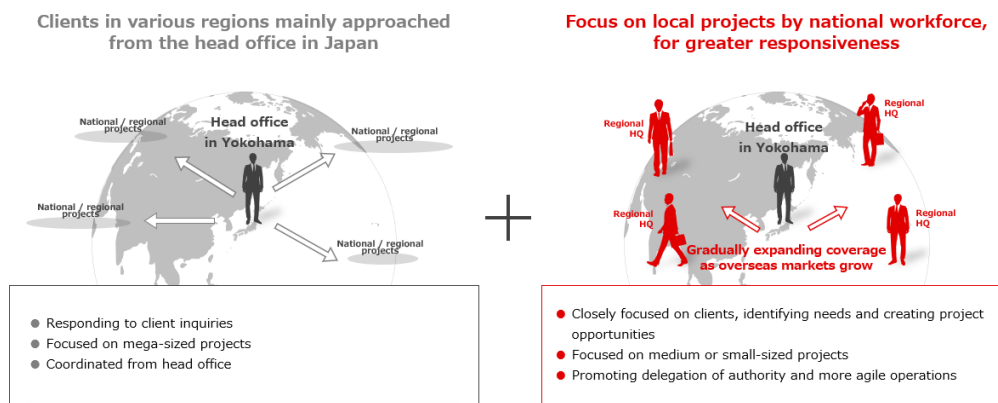
8 Organizational transformation

Ensuring that the Group attains the goals of its 2040 Vision will also require transformation into the kind of organization that can support transformation in business areas and models. As specific initiatives in this organizational transformation, the Group will strengthen its framework for regional management and foster a culture of innovation.

8.1 Stronger framework for regional management

As an organization whose purpose is to enhance planetary health, the Group sees many potential segments in which the Group can contribute in emerging economies where further increases in population and energy demand are expected. To contribute to solutions for social issues, instead of its existing approach of taking the initiative from a head office in Japan, the Group believe a framework will be needed to uncover needs and create project opportunities by working closely with local clients and proposing and executing solutions promptly in line with local conditions.

Supplementing the current organizational structure, which approaches clients in each country or region from a headquarters in Japan, the Group believe it will be essential to establish regional headquarters as a framework for management with stronger sales and project execution functions. Besides reorganizing current group companies overseas, the Group will make these business units more agile by delegating authority, as the Group reinforce this framework for regional management focused on local projects by a national workforce that builds closer ties with local clients.



8.2 More vibrant culture of innovation

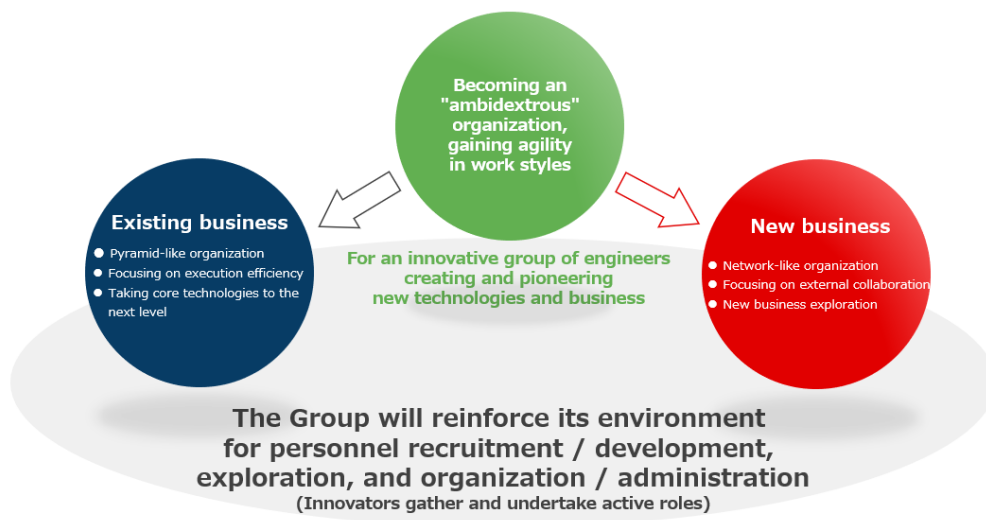
The Group has traditionally been organized in the form of a pyramid, which has advantages in execution of mega-size projects. Leveraging organizational strengths from this arrangement, the Group have sought to streamline execution and perfect its core technologies.

On the other hand, external collaboration and resource allocation for new business exploration have

been limited compared to those for mega-size EPC projects. Attaining the 2040 Vision calls on the Group to transform into an "ambidextrous" organization, agile in workstyle, to undertake both existing and new business. The Group we aspire to become through transformation has a corporate culture of constant innovation, repeating a cycle of creating new business and applying proven execution capabilities to nurture it to maturity.

Employees who wish to fulfill valuable roles for society, true to the Group purpose of enhancing planetary health, will be encouraged to launch new business and take the initiative in nurturing it. This is the corporate group we will transform into – one with a culture of innovation where new operating companies are successively born.

Achieving this transformation will involve measures in recruitment and training, innovation processes, and organizational/administrative programs, as we create an environment where innovators gather and play active roles.



9 Commitment to carbon neutrality by 2050

As a key element in considering the new purpose of the Group, enhancing planetary health, the Group is committed to the ambitious target of reducing the Group's CO₂ emissions to net zero by 2050 and helping stakeholders reduce emissions to achieve a global consensus on carbon neutrality by 2050.

10 Group message: Creating an environment of high motivation

We believe one of the most important factors enabling the Group to play a valuable role in society and fulfill our purpose is to continuously create an environment of satisfaction for all who come together in the Group as well as encouragement to enjoy creative work.

With this in mind, we make the following three commitments to all stakeholders.

We will foster a culture that takes on the challenge of the unknown and encourages innovation

To realize the 2040 Vision, we will recognize any initiatives to shape the future, without being bound by precedent, and create opportunities to do so.

We will work toward a shared purpose and maintain a tradition of mutual respect

Pursuing the three aspects of transformation will see some decentralization of personnel and a greater diversity of personal qualities and working styles. Values that have been easily shared by many members to date may be more difficult to share universally in the future. However, even under these new conditions, we will continue to share the spirit behind the 2040 Vision and purpose of the Group, as we continue our fine tradition of mutual respect.

We will create an environment where exchanges of the diverse ideas of a vibrant workforce lead to positive outcomes and new value

To progress toward our 2040 Vision, professionals in a variety of fields must come together and integrate their diverse knowledge to inspire new innovation. We will create an environment of exchange of knowledge and ideas and promote the creation of new values.

We make the above three commitments because “**our highly talented colleagues are the JGC Group's greatest treasure**”.



JGC Group Long-Term Management Vision
2040 Vision

We conclude our 2040 Vision with these three commitments to our colleagues who will join us in forging a new JGC Group.