

# Compass

# A c t i o n

**A detailed roadmap for achieving Compass 2030**

November 26, 2021

**Tokyo Gas Co., Ltd.**

- ✓ Compass 2030 is the Tokyo Gas Group's management vision announced in November 2019. It sets forth three challenges for transforming the Group for the future: 1) Leadership in the transition to Net-Zero CO<sub>2</sub> emissions, 2) Establishment of a value co-creation ecosystem, and 3) Transformation of the LNG value chain. **We are now steadily advancing along the path and will further accelerate our actions for attaining this vision.**
- ✓ Dramatic changes are now sweeping across the environmental, social, institutional, and market landscapes. Japan aims to become carbon neutral by 2050 and is seeking to lower its greenhouse gas emissions by 46% in 2030. Momentum is growing for the realization of the SDGs and an inclusive society. The energy market is becoming increasingly volatile. In this period of massive change never before encountered in our company's history, **we have formulated "Compass Action" as a detailed roadmap for achieving Compass 2030.**
- ✓ We recognize that we have a mission to society that our Group is uniquely qualified to perform: firmly leading the way to low-carbon and decarbonized society with a mix of renewable energy and LNG/natural gas as a promising transitional energy, and providing solutions to the diversifying challenges faced by society, communities, and customers. We will pursue the changes needed to expeditiously fulfill this mission, and in so doing ensure sustainable management and enhance our enterprise value.

## Compass Action Focuses

### Focus

1

Lead transition to Net-Zero CO<sub>2</sub>

**Responsibly lead the transition with gaseous & renewable energy**

Lead the transition to a sensible, realistic carbon-neutral society while firmly maintaining a stable supply of energy

### Focus

2

Establish a value co-creation ecosystem

**Accelerate value co-creation via digital transformation and reinforced face-to-face engagement**

Evolve our social challenge-solving businesses by advancing digital transformation and combining it with our strengths in face-to-face engagement

### Focus

3

Transform the LNG value chain

**Improve each business's earning power and resilience to change**

Transform into a corporate culture that enhances earning power across each business, thereby supporting the sustainable growth of the Group as a whole

## Part I: Profile

1. Compass Action: Overview
2. Responsibly lead the transition with gaseous & renewable energy
  - Roadmap for transitioning to carbon neutrality
  - Sophisticated use of natural gas: Transitioning from low-carbon to decarbonized
  - Decarbonizing gas: Building a carbon-neutral methane value chain
  - Decarbonizing electricity: Building a renewable energy value chain
3. Accelerate co-creation via both digital transformation & strengthening of face-to-face engagement
  - Digital transformation & strengthening of last-mile services (B2C)
  - Digital & face-to-face solutions (B2B)
4. Improve each business's earning power and resilience to change
  - Transitioning to a holdings group structure
  - Group human resources reforms
  - Cost structure reforms & DX
5. Targeted investment in growth areas
6. Financial strategy supporting investment

## Part II: Close-up

- Core strategies & concrete actions for each business

Reference: Progress status of key actions toward achieving Compass 2030 (past 12 months)

# Compass Action: Overview

## Vision

Changes in environment

Accelerating toward vision

Focuses of transformation

Our Group's strengths

## Point 2

### Establish a value co-creation ecosystem

#### Social

Growing emphasis on ESG & SDGs, coexistence of digital/face-to-face preferences

Expectations for solutions to diversifying challenges faced by society, communities & customers

### Accelerate value co-creation via digitalization and reinforced face-to-face engagement

Expanded investment in new businesses + evolution of businesses to solve social challenges

- **Transform into the energy market's digital marketing front runner**
  - ✓ Nationwide operation as a digital marketer (TG Octopus Energy)  
(Use digital & face-to-face channels to **increase retail power contracts beyond 5 million in 2030**)  
(2.87 million contracts as of end-September 2021)
- **Evolve into the No. 1 player in customer satisfaction through value co-creation at the last-mile<sup>\*1</sup>**
  - ✓ Launch services in Kanto area that **provide solutions to each type of lifestyle need**, then **expand nationwide** via alliances
- **Transform into a provider of solutions for community challenges**
  - ✓ Provide nationwide and globally solutions for decarbonization and strengthening resilience through coordination with local government & businesses

Accelerate value co-creation through low-carbon & decarbonization solutions

- Strong bonds with customers & communities
- Large customer base in Tokyo metro area

## Point 1

### Lead transition to Net-Zero CO<sub>2</sub>

#### Environmental

Japan aims to be carbon neutral in 2050 and to reduce GHG emissions by 46% in 2030

Evolve the role of LNG/natural gas as transitional energy

### Responsibly lead the transition with gaseous & renewable energy

Solid investment in LNG/gas + expanded investment for deploying decarbonization technologies

- **Transform into the top leader at the forefront of the transition**
  - ✓ Thoroughly use natural gas + develop practical CCUS<sup>\*2</sup>
  - ✓ Strengthen gas-fired thermal power as balancer for renewable energy
- **Create value chain for carbon-neutral methane<sup>\*3</sup>**
  - ✓ Form alliance for achieving low-cost, practical deployment of hydrogen & carbon-neutral methane  
(Hydrogen: JPY30/m<sup>3</sup><sup>\*4</sup> or lower in 2030)
- **Create renewable energy value chain leveraging our Group's unique strengths**
  - ✓ Establish revenue model that covers from power source development, O&M<sup>\*5</sup> to renewable energy sales.  
(Renewable power source transaction volume in 2030: 6 GW\*)  
(\*Compass 2030's original target was 5 GW)

Increase business agility for the transition

- Ability to deal in multiple transitional methods
- Power to offer decarbonization solutions to both the supply side and the demand side

## Point 3

### Transform the LNG value chain

#### Market & Institutional

Increased market volatility, further liberalization

Further growth can be achieved by turning energy liberalization & market volatility into business opportunities

### Improve each business's earning power and resilience to change

Transition to holding company system + stronger portfolio management of multiple businesses

- **Transform into corporate culture that enhances the earning power of each business**
  - ✓ Enable more autonomous management of internal companies and operating companies
  - ✓ **Major realignment** of management structure on a Group-wide level
  - ✓ Establish a business model that **leads our market volatility responsiveness toward the stabilization of earnings**
- **Shift to a human resources system that encourages pursuit of challenges in ways that leverage diversity**
  - ✓ Employ and cultivate **diverse human resources** at each internal company and operating company
- **Pivot to a financial strategy that promotes growth investing**
  - ✓ Step up investment in growth areas by **selling/replacing assets and boldly revamping cost structure**

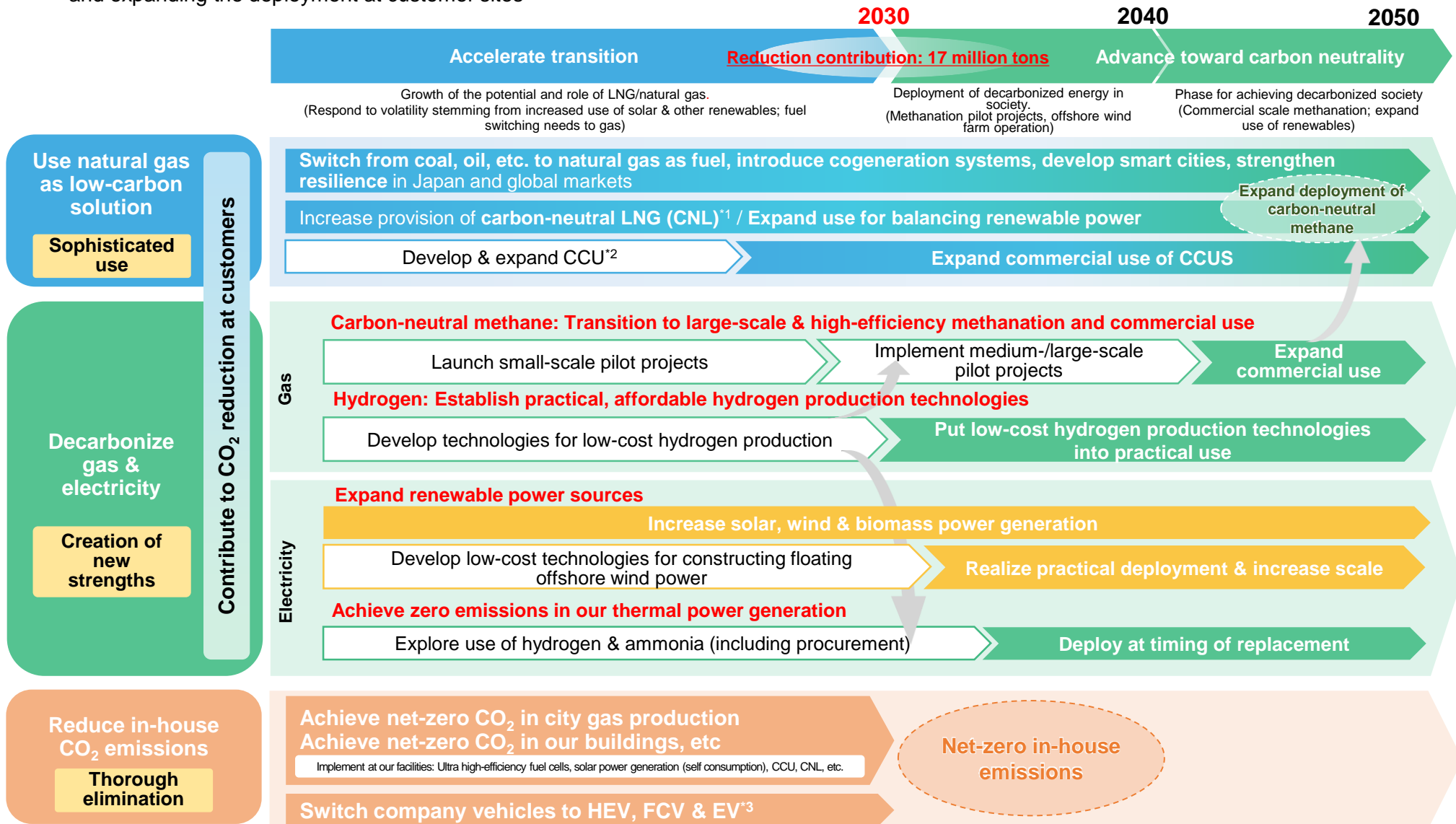
- Comprehensive strength spanning from energy procurement to retail
- Operational strength in energy infrastructure & services

<sup>\*1</sup>: Technical work performed at customers' residences <sup>\*2</sup>: Carbon capture, utilization & storage <sup>\*3</sup>: Methane synthesized (methanated) from CO<sub>2</sub>-free hydrogen (produced from renewable source electricity) and CO<sub>2</sub> captured at power plants, factories, etc. <sup>\*4</sup>: The hydrogen supply cost (CIF price) target set by the Japanese government. It is premised on a reduction in the cost of hydrogen production equipment, and achievement of low-cost renewable electricity made possible by factors such as growth of the renewable energy market. <sup>\*5</sup>: Operation & maintenance

# Roadmap for transitioning to carbon neutrality

- We will achieve a carbon reduction contribution of **17 million tons by 2030\*** across all our business activities worldwide
- We will **lead the transition to carbon neutrality by developing strengths in gas/electricity decarbonization technologies** and expanding the deployment at customer sites

\*Compass 2030's original target was 10 million tons in Japan only.



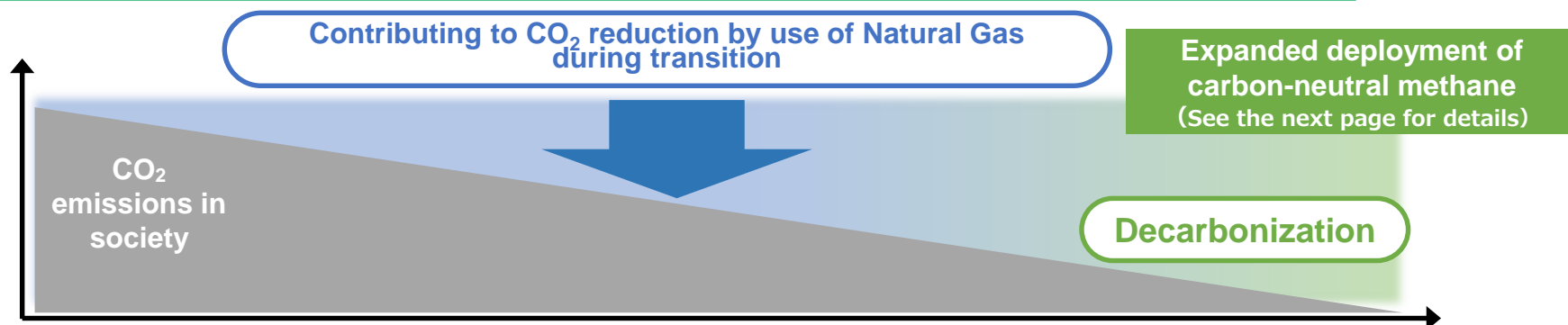
\*1: A type of LNG that is deemed carbon neutral as greenhouse gas emissions generated by the processes from natural gas exploration to combustion are offset with carbon credits received on forest conservation projects, etc.

\*2: Carbon capture & utilization \*3: Hybrid electric vehicles, fuel cell vehicles & electric vehicles

## Sophisticated use of natural gas: Transitioning from low-carbon to decarbonized

- During the transitional period, we will contribute to **reduce CO<sub>2</sub> emissions at domestic & overseas customer sites** by promoting **fuel switching, smart city development, carbon-neutral LNG, and CCUS**
- We will firmly lead the transition while **containing the social costs of low carbon and decarbonization**, responsibly ensuring the stable supply of energy.

Our Group's strengths: A proven track record in using natural gas for low-carbon solutions and know-how in optimal energy management



### Switching to natural gas as a fuel

- ✓ Switch fuels used in manufacturing industries<sup>\*1</sup> from coal, oil, etc. to natural gas (**a shift to low-carbon in a heat use which accounts for approx. 70% of Japan's final consumption of energy**)
- ✓ Introduce high-efficiency equipment
- ✓ Build high-efficiency LNG-fired power plants

Sophisticated use of natural gas can contribute to tremendous reduction of CO<sub>2</sub> emissions

<sup>\*1</sup>: Coal & oil account for approx. 60% of primary energy supply in Japan, and there is strong potential in fuel switching globally, especially in Asia

+

### Sophisticated smart energy networks

- ✓ Utilize digital tools in the use of electricity and heat (optimized operation based on collection and analysis of data on heat load, operating condition, etc.)
- ✓ Establish area-wide optimized operation combining natural gas cogeneration, renewables, fuel cells, etc.
- ✓ Strengthen solutions that support ZEH & ZEB<sup>\*2</sup>

Deployment in Japan and global markets can contribute to energy savings, lower CO<sub>2</sub> emissions, and enhanced resilience

<sup>\*2</sup>: Homes and buildings designed to completely offset primary energy consumption per year

+

### Carbon-neutral LNG/CCUS

- ✓ Expand the use of carbon-neutral LNG
  - Establishment of Buyers Alliance (30 corporate members)
  - Control of quality
- ✓ CO<sub>2</sub> capture/utilization<sup>\*3</sup> at customer sites and CO<sub>2</sub> capture/storage (CCUS)

Capturing & offsetting natural gas-related CO<sub>2</sub> emissions

<sup>\*3</sup>: Development of on-site CCU technology for producing potassium carbonate using CO<sub>2</sub> from city gas equipment, launch of concrete production utilizing captured CO<sub>2</sub>



# Decarbonizing gas: Building a carbon-neutral methane value chain

- We will **establish our own core technologies in methanation & hydrogen production** as part of our efforts toward decarbonization of gaseous energy
- We will **build a carbon-neutral methane value chain to realize deployment in future society** through coordination with public-private alliances and global players

**Our Group's strengths: Hydrogen production expertise gained from fuel cell development, etc., and Japan's foremost gaseous energy supply infrastructure**

Low-cost, large-volume production

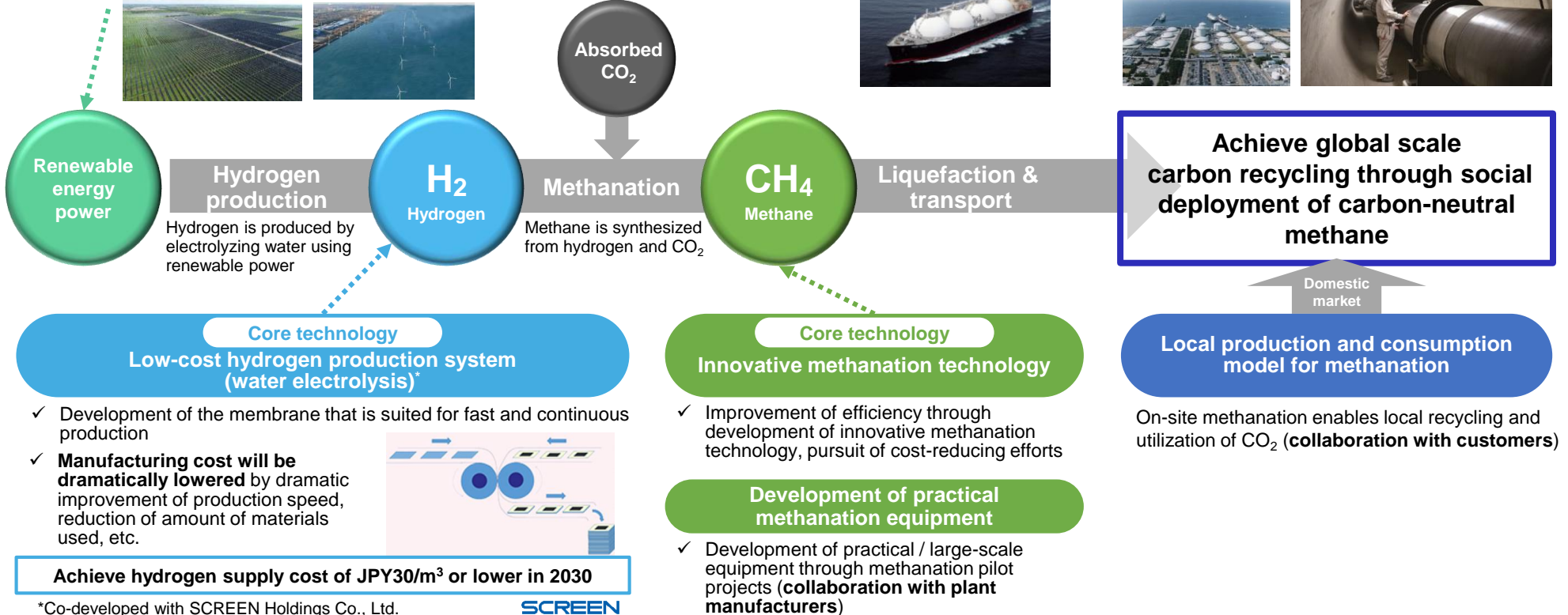
Transport using existing equipment

Utilization through existing infrastructure

Selecting suitable methanation sites

Leveraging existing infrastructure

- ✓ As groundwork for large-scale methanation globally, select suitable sites with firm access to low-cost, large-volume renewable source electricity and CO<sub>2</sub> (**collaboration with a trading companies, etc.**)



# Decarbonizing electricity: Building a renewable energy value chain

- We will **build a renewable energy value chain leveraging our Group's unique strengths** by engaging in a full spectrum of renewable power business from development of renewable power projects to operation and maintenance(O&M) and to the retailing of the generated green power
- We will **expand renewable power source transaction volume in Japan and global markets beyond our original vision (5 GW\* → 6 GW)**, while maintaining profitability \*Compass 2030's original target

**Our Group's strengths: Stable long-term operation of power generation infrastructure, O&M capabilities, customer base**

## Large-scale renewable energy development

## Utilization of generated power

### Expansion of different types of power sources

2030

Solar, onshore wind & biomass power

Bottom-mounted offshore wind power

Floating offshore wind power

### Core technology

**Floating offshore wind power technology, with potential for early commercialization**

- ✓ Early deployment of basic technologies and supply chain of Principle Power, a global leader in floating wind power platform whose owners include Tokyo Gas
- ✓ Achieve competitive pricing by developing technologies for low-cost mass production of floating platforms



**Steadily expand solar, onshore wind, biomass, offshore (bottom-mounted) power sources**  
**Achieve early deployment in society by focusing on development of floating offshore wind power**

### Development-to-operation revenue model

Development & construction

Ownership

Management (O&M)

Engineering and O&M by Tokyo Gas Engineering Solutions

**Engage as a Group in all stages to stand out from the pack and improve profitability**

**Revenue sources spanning from power generation to sales**

Market trading

**Include generated green power into power procurement portfolio (power & environmental value)**

Sales to customers (create diverse rate plans)

Tokyo Gas

TG Octopus Energy



## Develop decentralized renewables

## Utilize generated power

- ✓ Leverage experience in behind-the-meter business to spread solar power among residential, commercial, and industrial customers nationwide

- ✓ Utilization of generated power by customers
- ✓ Offer our own power purchasing service



# Digital transformation & strengthening of last-mile services (B2C)

- We will **expand areas of value provision** to customers by leveraging **digital marketing** and enhance lineup of **last-mile services**

**Our Group's strengths: Digital expertise of Octopus Energy, last-mile solution capabilities, channel networks of LIFEVAL, etc.**

## Digital transformation of B2C marketing

### Launch of Octopus Energy services (Nov. 2021)



Founded energy retailing joint venture (TG Octopus Energy) as a new brand, under a **strategic partnership with Octopus Energy**,\* a fast-growing company in the UK's energy market

\*The company acquired over 3 million customers in just 6 years in the UK's highly competitive electric power market

### Diverse electricity rate plans

- ✓ Broaden range of rate plan choices, including renewable-based, time-based, market price-linked, commercial (low-voltage power), and other plans



### Digital marketing, CRM\*

- ✓ Digital communication focused on customer engagement, active social listening and customer support leveraging social media
- ✓ Acceleration of marketing cycle and expansion of satisfied customer base by offering one-to-one services tailored to customer lifestyles and values

\*Customer relationship management

### Nationwide deployment

- ✓ Phased expansion of sales areas, with **nationwide deployment** by first half of FY2022

**Increasing customer satisfaction and creating shared value by offering personalized energy services**

## Expansion of B2C last-mile services

**Full entry into plumbing repairs & housecleaning business**

**Expand services supported by strengths in last-mile service**



**Sophisticated operations** (call taking, troubleshooting, inventory management, solution proposal)



**Providing value through combinations of services**

### Stress-free

### Home equipment

- Special support for gas equipment
- Plumbing & air conditioning repairs
- "Zuttomo Solar," "Anshin W Denchi" (solar power + storage batteries) etc.

### Housework support

### Monitoring

- Housecleaning
- Residential monitoring service
- Vacant home management service
- Elderly care support, etc.

### Reliable

### Nationwide deployment

- ✓ Phased expansion of sales areas through alliances, etc., with eye on nationwide deployment

**Contributing to specific lifestyle needs and social challenges quickly, conveniently, reliably and affordably**

Full tap into advantages of digital & face-to-face engagement to **increase no. of energy service accounts**

## Digital & face-to-face solutions (B2B)

- We will **nationwide & globally provide packaged solutions** that enhance customer convenience, community growth and shift to low-carbon and decarbonization

**Our Group's strengths: Remote monitoring & control technologies that use AI, etc., ability and experience in providing solutions, from proposal to implementation & facility management**

### Enhancing convenience with B2B digital solutions

Using AI, remote control, etc. to help conserve energy, lower CO<sub>2</sub> emissions, and save labor

#### HelionetAdvance

- ✓ AI-driven forecasting of electricity & heat demand at offices & factories
- ✓ Reduction of energy usage and CO<sub>2</sub> emissions through automated control of operations hard to perform manually

#### Joy series



- ✓ Central monitoring of customer utility equipment at factories, etc.
- ✓ Responding to needs for labor-saving through combination with energy services

#### Virtual power plants (VPP)

- ✓ Utilize customers' electricity surplus
- ✓ Provide customers with new revenue opportunities

### Strengthening total packaged solutions in B2B face-to-face services

Offering one-to-one solutions from the customer's perspective

#### SolarAdvance



- ✓ Installation of solar generators without need for customers to make initial investment
- ✓ Provision of total solution including operation & maintenance (promotion of local production/local consumption and self-production/self-consumption of renewable energy)

#### Engineering

- ✓ Nationwide and global deployment of top-level engineering services (design & construction to operations & maintenance)

#### Environmental consultation

- ✓ All-in-one support spanning from CO<sub>2</sub> emissions volume analysis, planning, disclosure to solution implementation

Evolve into solutions provider that tackles customers' specific needs and community challenges

Nationwide & global deployment

### Advanced smart energy networks

#### Traditional smart energy

- ✓ Contribute to urban development by conserving energy, lowering CO<sub>2</sub> emissions, and strengthening resilience through combination of heat, electricity & renewables

#### Expand range of services

#### Advanced smart energy

- ✓ Net-Zero CO<sub>2</sub> (CNL, renewables)
- ✓ Provision of BCPaaS\* (earthquake proofing + disaster mitigation services)
- ✓ Services that improve office and lifestyle comfort

\*BCP services optimized for each customer's needs

**Packaged offering of optimal solutions to customers for decarbonization, factory labor-saving, etc.**

### Provider of solutions to community challenges

#### Japan

- ✓ Solutions to community challenges such as transition to low-carbon/decarbonization and resilience enhancement through coordination with local government & businesses (formation of comprehensive partnership agreements)

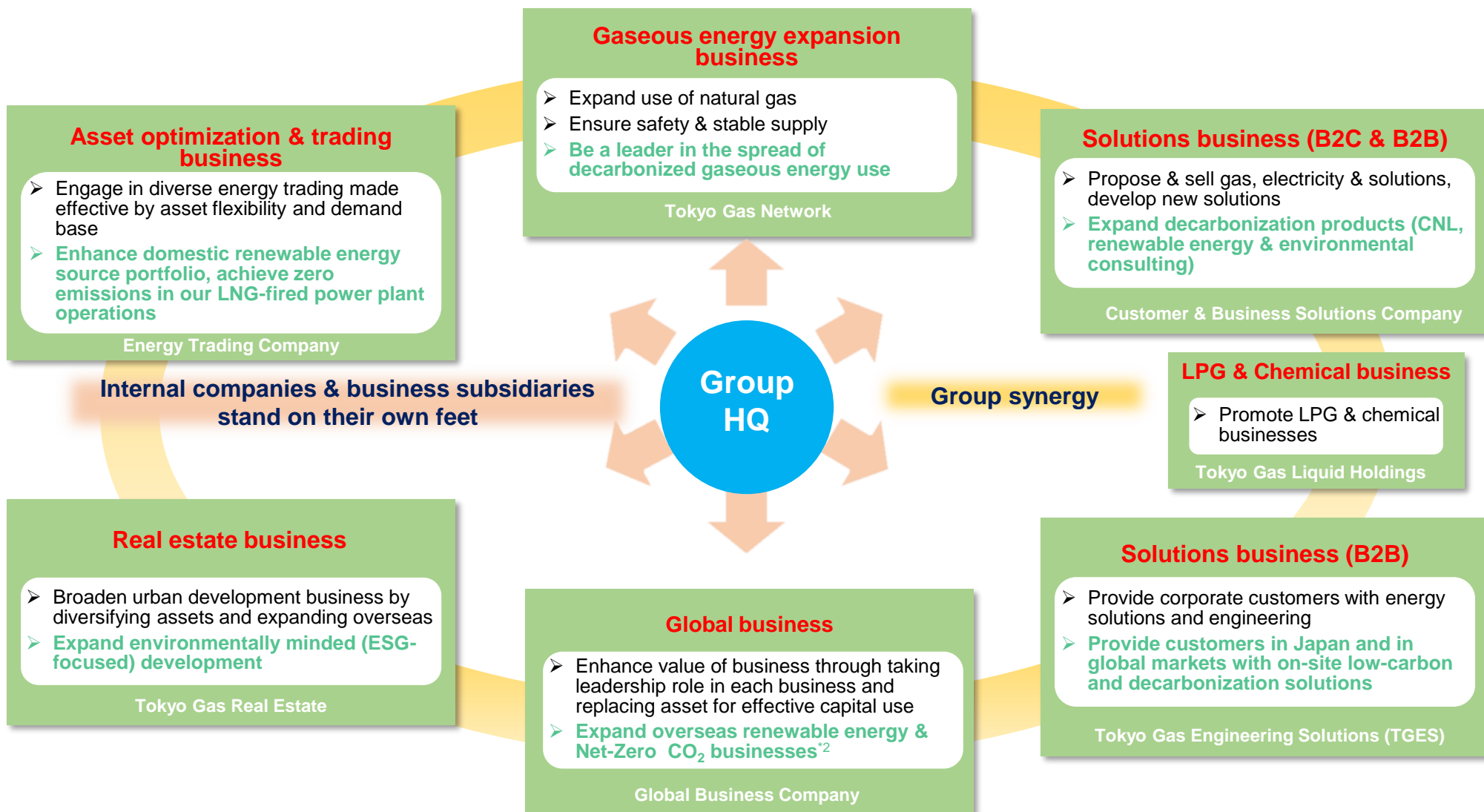
#### Global

- ✓ Support for urban development via district heating & cooling projects and power distribution projects

**Contribution to appealing urban development, improvement of environmental sustainability, and other solutions for community challenges**

## Transitioning to a holdings type group structure

- We will **transition to a group structure** where internal companies (quasi branch companies) and business subsidiaries will **stand on their own feet** and independently grow as they engage with their markets and customers
- The **internal companies and business subsidiaries<sup>\*1</sup>** will be given **greater discretion** in order to realize agile decision-making, and we will **pursue group synergy** through collaboration within the Group



\*1: Organizational format and names are tentative.

\*2: Hydrogen, afforestation, CCS, renewable gas, etc.

## Group human resources reforms

- In conjunction with the shift to a holdings group type structure, we will **transform human resources system to one that encourages challenge and diversity**, so as to strengthen our internal companies and business subsidiaries



## Cost structure reforms & DX

- Strengthen competitiveness by implementing effective **cost structure reforms, business process re-engineering (BPR), DX** and other approaches

Expand BPR initiatives across the Group to achieve large-scale reduction in workload

Carry out group-wide DX talent training and advance digitalization-driven reforms in domains from service development to internal operations

### Indirect costs

- ✓ Cut indirect costs by reassigning staff to growth areas
- ✓ Reduce rent by using free-address office environments and reducing floor space
- ✓ Use data analysis to achieve effective and efficient fuel management of company vehicles

### DX

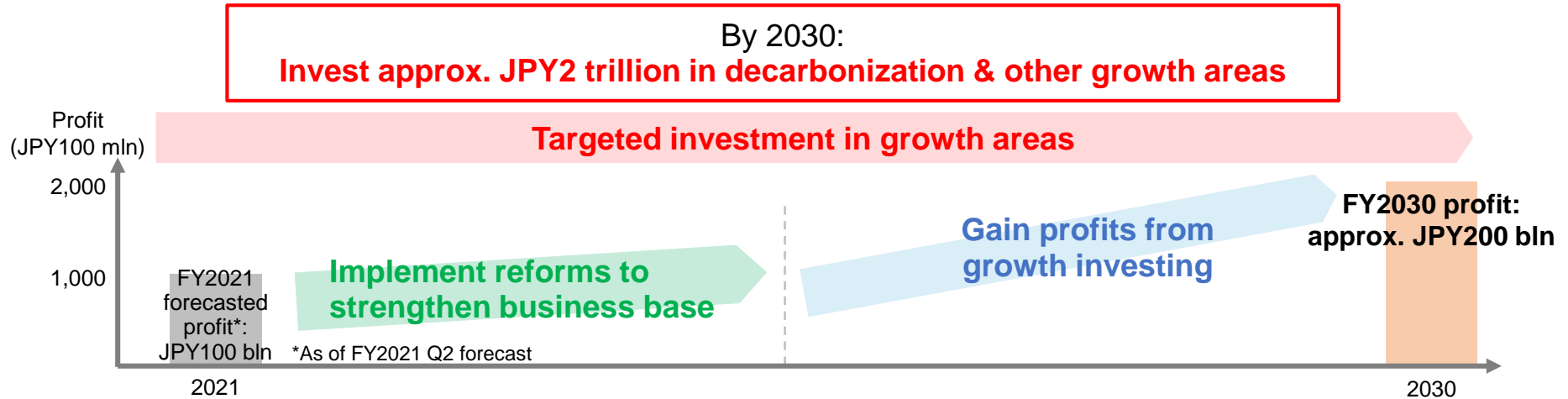
- ✓ Streamline meter reading and related processes by installing smart meters
- ✓ Streamline field operations with process/work information-sharing tools
- ✓ Use drones and robots to automate inspection

### Service-related

- ✓ Expand range of online procedures for greater convenience
- ✓ Redesign services for greater eco-friendliness and digitalization  
Reduce paper use in work processes

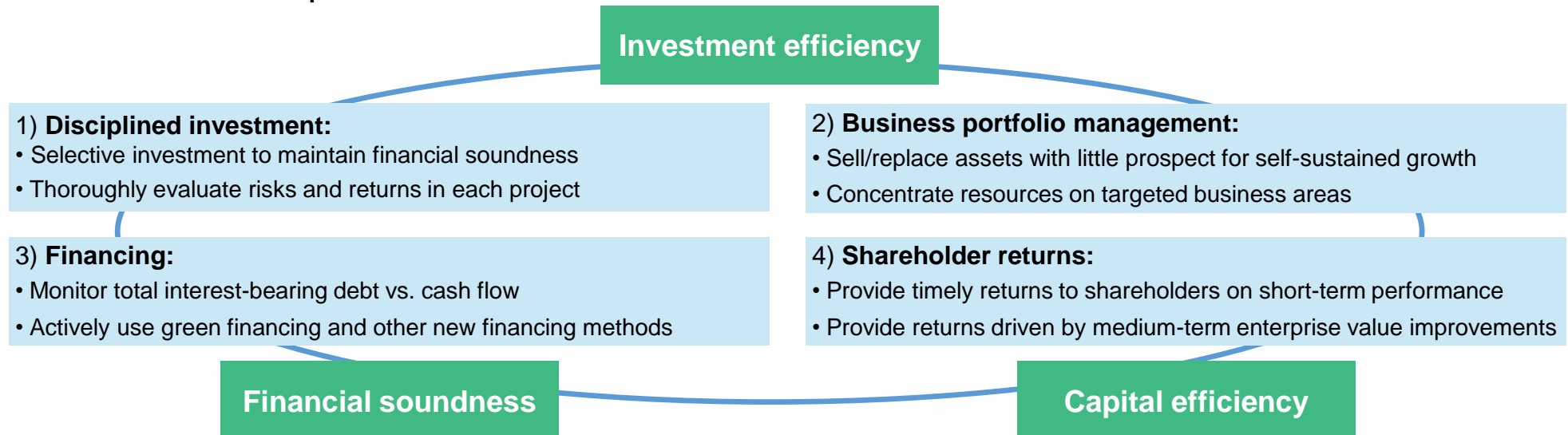
## 5. Targeted investment in growth areas

- **Shift investment to decarbonization & other growth areas, and place capital aggressively** (early investments in decarbonization + active investment in other growth areas)
- **Strengthen business platform by implementing reforms** in first half of 2020s , achieve **profit growth from investments in the second half**



## 6. Financial strategy supporting investment

- Support growth investing by **enhancing investment/capital efficiency** and by employing effective cash flow management to secure **sufficient investment capital**



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- Core strategies & concrete actions for each business

Reference: Progress status of key actions toward achieving Compass 2030 (past 12 months)



## Asset optimization & trading business

(Energy Trading Company)

### Growth vision

**Asset optimization & trading business** that creates value via asset optimization and diverse trading

### Points of change

**Value transformation:** Leverage asset flexibilities to maximize value of energy, expand trading and build a trading platform  
**Business model transformation:** Establish a model for monetizing market volatility

### Strengths of our Group

- ✓ Abundant LNG-related assets, trading volume and trade management capabilities
- ✓ Scale of electricity business (generation and retail) and trade experiences

### Expanded trading

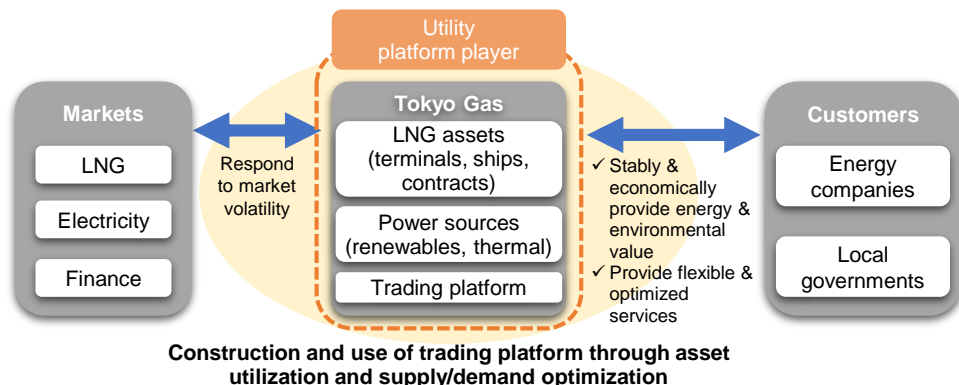
- ✓ Expand LNG trading with players inside and outside Japan utilizing LNG procurement portfolio and financial trading
- ✓ Increase gas and electricity wholesaling to gas companies, local governments, etc., offer low-carbon and decarbonization solutions

### Greater flexibility

- ✓ Flexibly utilize LNG-related assets (terminals, LNG vessels, contracts, etc.), and further increase flexibilities through external partnerships
- ✓ Expand scale and flexibilities of power source portfolio, especially renewable power sources and balancing power sources (gas-fired power plants, fuel cell, etc.)

### Sophisticated risk management

- ✓ Construct a trading platform and risk management system for swift and flexible trading of LNG, electric power, and environmental value that is in step with market trends



## Gaseous energy expansion business

(Tokyo Gas Network)

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### Growth vision

**Gaseous energy expansion business** that develops and grows demand

### Points of change

**Business transformation:** Expand value-added businesses and offer low-carbon and decarbonization solutions using gaseous energy  
**Platform transformation:** Achieve efficient & sophisticated safety by promoting DX and BPR

### Strengths of our Group

- ✓ Many years of experience in safe, stable supply
- ✓ Ties with customers and communities

### Expanded use of gaseous energy

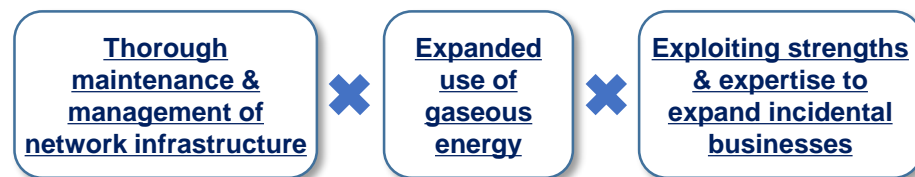
- ✓ Actively develop city gas customers, contribute to CO<sub>2</sub> emissions reduction at customer sites
- ✓ Transport carbon-neutral methane (in future)

### Expansion of value added businesses

- ✓ Provide services leveraging centralized smart meter system (remote operation and monitoring of smart meters)
- ✓ Provide disaster prevention solutions (disaster prevention mapping system, disaster response operations support service, building damage forecasting service)

### Ensuring safe & stable supply, promotion of DX & BPR

- ✓ Realize remote meter reading to accommodate installation of smart meters, and remote valve opening/closing
- ✓ Pursue advanced DX and BPR premised on securing sufficient level of safety



## Solutions business (B2C)

(Customer & Business Solutions Company)

### Growth vision

**Solutions business** that offers energy services nationwide

### Points of change

**Sales transformation:** Expand number of customer accounts nationwide through digital and face-to-face channels

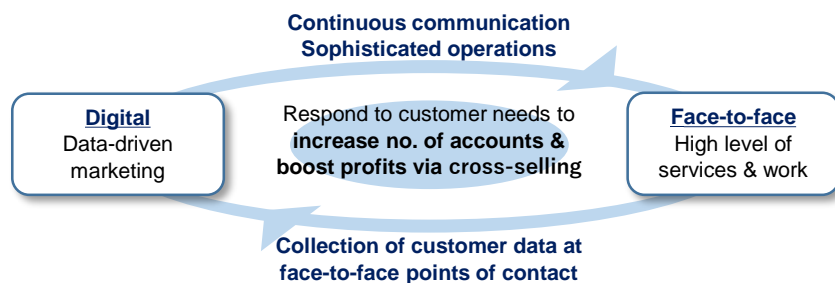
**Structural transformation:** Boldly reform cost structure and realign sales organization

### Strengths of our Group

- ✓ Face-to-face channels that form the basis for providing services for supporting the last mile
- ✓ Digital marketing expertise of TG Octopus Energy

### DX + last-mile service expansion

- ✓ Increase customer base through sophisticated one-to-one digital marketing
- ✓ Expand last-mile services (plumbing repairs, housecleaning, air conditioning & electrical equipment repair, etc.)



### Business structure reforms

#### (cost structure reforms & realignment of sales organization)

- ✓ Boldly reform cost structure by diverting from traditional style of work
- ✓ Establish total equipment service company for residential customers, expand product & engineering solutions

## Solutions business (B2B)

(Customer & Business Solutions Company, TGES)

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### Growth vision

**All-in-one B2B solutions business** that provides energy, solutions, engineering

### Points of change

**Sales transformation:** Nationwide/global deployment of all-in-one solutions

**Domain transformation:** Expand engineering capabilities to the field of renewable energy

### Strengths of our Group

- ✓ Deep ties with customers through energy services
- ✓ Ability to propose user-centric solutions

### Expansion of digital services & environmental products

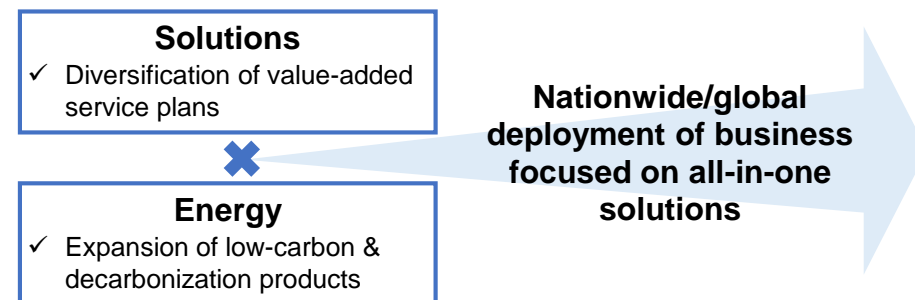
- ✓ Expand selection of digitally driven solutions (AI-enhanced efficient energy service, central system for monitoring customer equipment, etc.)
- ✓ Broaden low-carbon & decarbonization solutions (responding to customer needs with CNL, renewable power sources, CCU, etc.)

### Expansion of engineering services to renewable energy

- ✓ Expand LNG-focused engineering services to the field of renewable energy
- ✓ Offer efficient O&M services using digital tools

### Nationwide/global all-in-one solutions (sales organization realignment)

- ✓ Integrate into TGES the B2B sales organizations that was previously split into gas/electricity sales (Tokyo Gas) and solutions sales (TGES)
- ✓ Offer all-in-one solutions services that respond to national/global customer needs



## Global business (Global Business Company)

- Growth vision** **Value-adding global business group** that achieves growth by taking leadership role in each business
- Points of change** **Investment transformation:** Investment focused on growth areas where we can proactively create value.  
**Portfolio transformation:** Improve capital efficiency by replacing/recycling assets
- Strengths of our Group**
- ✓ Ability to stably operate businesses
  - ✓ LNG related expertise

### Resources development business

- ✓ Grow the shale gas development subsidiary in US as a revenue base by expanding assets in the surrounding areas

### LNG infrastructure business

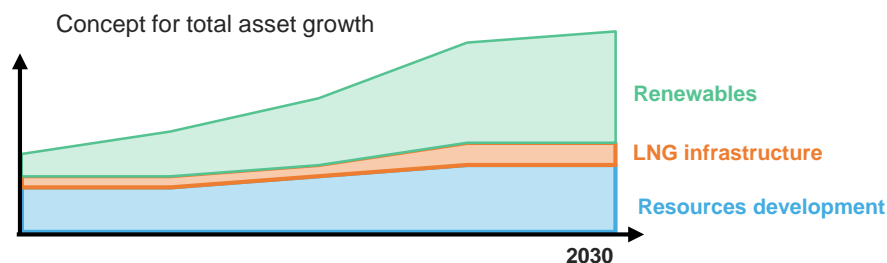
- ✓ Expand into growth markets in Asia by leveraging LNG trading experience and value enhancement expertise, including construction and operation of infrastructure

### Renewable energy & Net-Zero CO<sub>2</sub> business

- ✓ Increase and grow renewable energy investments to establish a new revenue sources, and commit to the Net-Zero CO<sub>2</sub> business
- ✓ Enter into Asia and Europe market using experience in development, construction, operation, and power sales in North America

### Replacement / recycling of global assets

- ✓ Boost profitability & capital efficiency through asset replacement (portfolio realignment)



## Real estate business (Tokyo Gas Real Estate)

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- Growth vision** **ESG-focused real estate development business** incorporating energy and environmental expertise
- Points of change** **Business model transformation:** Evolve toward ESG-focused development and circular business model  
**Target transformation:** Expand asset types and areas
- Strengths of our Group**
- ✓ Ownership of high-quality lands in the Tokyo metro area
  - ✓ Synergy achieved by leveraging the Group's expertise

### ESG-focused development

- ✓ Engage in highly value-added ESG-focused development, including leveraging Group's wide range of services to introduce renewable energy use and provide optimized energy management

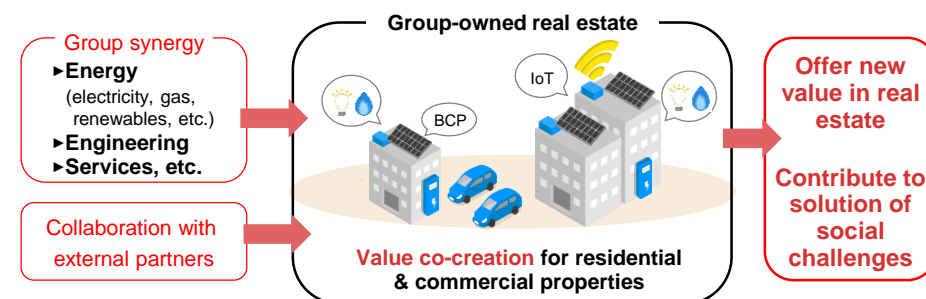
### Circular model

- ✓ Establish a circular model to increase the value of real estate assets acquired from the outside and developed through Group's synergy and recycle gains on asset development and sales to the next investment

### Asset & area expansion

- ✓ Broaden the types of assets operated in the Tokyo metro area (logistics, etc.) and expand business overseas by utilizing our global business networks.

### Concept for ESG-focused real estate development business



## New businesses

### Growth vision

**Establish new businesses that solve social challenges** by leveraging our Group's strengths & digital technologies

### Points of change

- ✓ Cultivate new businesses by combining asset-driven and business model-driven enterprises
- ✓ Accelerate new business development in areas that promise market scale/growth, where we can leverage our Group's strengths

### Strengths of our Group

- ✓ Customer base in Tokyo metro area
- ✓ Our data resources and land holdings

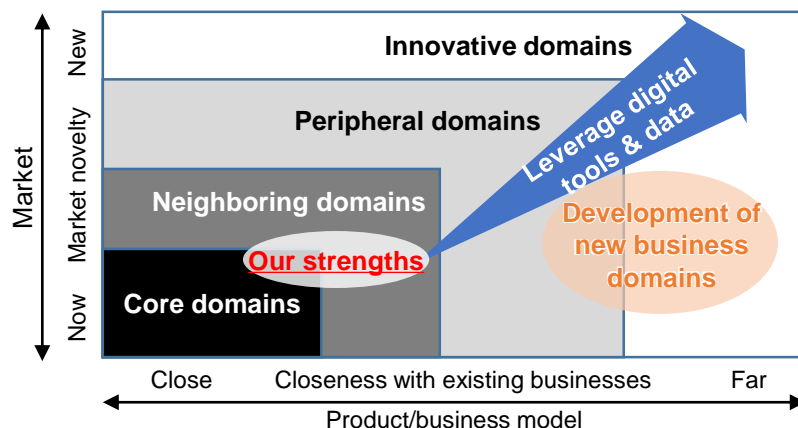
### Example of new business

#### EV charging service for housing complexes



- ✓ Service launch in November 2021
- ✓ Service provides management of individualized EV charging service use via remote control units, QR codes, smartphone apps, etc.
- ✓ Dedicated chargers are installed at points such as parking spaces contracted by housing complex residents to create a convenient charging environment free of wait times and the need to move the vehicle
- ✓ The business utilizes the system platform of Ubiden (a startup that signed a capital/business alliance with Tokyo Gas)

### Business domain concept



## Technological development (decarbonization)

### Growth vision

Utilize existing & new technologies to **acquire & commercialize core technologies**

### Points of change

- ✓ Newly acquire not only technologies that utilize energy, but also ones that produce energy
- ✓ Create new strengths by combining our accumulated technologies/expertise with new AI & data tools

### Strengths of our Group

- ✓ Core technologies built up in city gas business
- ✓ National and global R&D networks

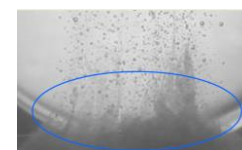
### Acquisition of new core technologies

#### Decarbonization technologies

- ✓ Develop low-cost hydrogen production systems
- ✓ Develop innovative methanation technologies
- ✓ Develop floating offshore wind power technologies
- ✓ Develop low-carbon/decarbonized combustion technologies (development of hydrogen continuous combustion furnace; optimization of combustion equipment diagnostics/control)
- ✓ Devices using microbubbles technology to store CO<sub>2</sub> underground
- ✓ Develop on-site CCU technology for producing potassium carbonate using CO<sub>2</sub> from city gas equipment; develop CO<sub>2</sub>-absorbing concrete manufacturing technology



Hydrogen combustion-type continuous combustion furnace

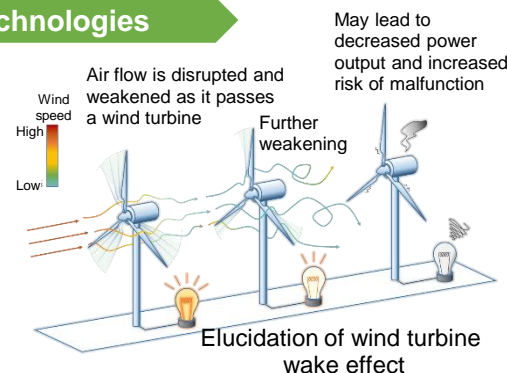


Microbubbles

### Repurposing of existing core technologies

#### O&M cost rationalization technologies

- ✓ Repurpose existing core technologies built up in city gas business, including fluid, material, earthquake resistance, and non-destructive testing technologies
- ✓ Develop technologies for reducing significantly the O&M costs of renewable energy (solar, wind, etc.) systems, LNG terminals, etc.



1	Lead transition to Net-Zero CO <sub>2</sub>	Development/commercialization of new technologies through open innovation & other approaches
	Sophisticated use of natural gas	<div>CCUS<ul style="list-style-type: none"><li>✓ Launch of CO<sub>2</sub>-absorbing concrete production that is the world's first to use CO<sub>2</sub> from city gas equipment (Jul. 2021)</li><li>✓ Japan's first potassium carbonate production system to use CO<sub>2</sub> from city gas equipment (Sep. 2021)</li></ul></div> <div>CNL<ul style="list-style-type: none"><li>✓ Introduction of carbon-neutral city gas in Marunouchi district, the largest project of its kind in Japan (Oct. 2021)</li></ul></div>
	Decarbonization of gas & electricity	<div>Hydrogen &amp; methanation<ul style="list-style-type: none"><li>✓ Tokyo Gas &amp; Screen signed agreement to jointly develop water electrolysis cell stack toward low-cost green hydrogen production (May 2021)</li><li>✓ Start of methanation demonstration in FY2021 (Jul. 2021)</li><li>✓ Start of feasibility study toward creation of carbon-neutral methane supply chain with Petronas and with Sumitomo Corporation/with Mitsubishi Corporation (Nov. 2021)</li></ul></div> <div>Renewable energy<ul style="list-style-type: none"><li>✓ Advancement of offshore wind power project (capacity: approx. 160,000 kW) in the Kashima Coastal Industrial Zone (Apr. 2021)</li><li>✓ Launch of Sasutena Denki electricity rate plan based on essentially 100% renewable energy (Jun. 2021)</li><li>✓ Start of commercial operation of mega solar farm in Iwakuni, Yamaguchi Prefecture (Jul. 2021)</li><li>✓ Partial commencement of operation of Aktina Solar Project (150 MW) in the US (Aug. 2021)</li><li>✓ Joint implementation of Sakaide biomass power project (Oct. 2021)</li><li>✓ Power generation system at Sodegaura Power Plant (formerly Tokyo Gas Baypower) to be upgraded with gas engines to serve as a source of balancing power for renewable energy (scheduled to go into operation in 2024)</li></ul></div>
2	Establish a value co-creation ecosystem	Diverse service combinations for offering solutions to customers and communities
	B2C	<div>Digital<ul style="list-style-type: none"><li>✓ Launch of strategic partnership with Octopus Energy (UK) and establishment of TG Octopus Energy (Dec. 2020)</li><li>✓ Start of demonstration testing of demand response service for residences (Jul. 2021)</li><li>✓ Commencement of EVrest EV charging service for housing complexes (Nov. 2021)</li></ul></div> <div>Last mile<ul style="list-style-type: none"><li>✓ Start of Tokyo Gas housecleaning service (May 2021)</li><li>✓ Launch of fixed-rate service for plumbing &amp; electricity repairs (Oct. 2021)</li></ul></div>
	B2B	<div>Community challenge solutions<ul style="list-style-type: none"><li>✓ Project for introducing renewable energy, etc. at 65 public elementary &amp; middle schools in Yokohama (Mar. 2021)</li><li>✓ Establishment of Utsunomiya Light &amp; Power Co., Inc. (Jul. 2021)</li><li>✓ Signing of comprehensive partnership agreement with Hadano City and Hatano Gas to promote carbon-neutral urban development (Nov. 2021)</li></ul></div> <div>Service expansion<ul style="list-style-type: none"><li>✓ Establishment of basic agreement with JT Group to take over its software business, which holds the top share of its market segment in Japan (Jul. 2021)</li><li>✓ Formation of business alliance agreement with the Kansai Electric Power Co., Inc. for VPP business using decentralized energy resources (Nov. 2021)</li></ul></div> <div>Smart energy<ul style="list-style-type: none"><li>✓ Establishment of Tokyo Gas Nomura Real Estate Energy Co., Ltd. for supplying energy to the Shibaura 1-Chome Project (Apr. 2021)</li></ul></div>
3	Transform the LNG value chain	Implementation of <b>cost-cutting measures and BPR</b> , and transformation of <b>organization</b> for carrying out governance reforms and improving earning power
	Business structure & platform reforms	<ul style="list-style-type: none"><li>✓ Cost reforms: Redesigning of processes &amp; systems through procurement reforms &amp; BPR</li><li>✓ DX: Streamlining of processes by using AI/data-driven tools for forecasting and optimization; enhancement of customer convenience, including provision of services online</li><li>✓ Organization: Transition to a company with a nominating committee, etc. (Jun. 2021)</li></ul>

