

## Medium-Term Management Plan

# Staying Ahead 2022 with Digitalization and Green

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March 29, 2018



## Previous medium-term management plan review

# 1. Previous medium-term management plan review

- Financial targets were successfully achieved in FY2014 but the Group incurred an impairment loss in FY2016 during an unprecedented downturn in the shipping market
- Basic strategies were steadily implemented and are aimed for further qualitative reforms

		Annual Target		(Unit: billion yen)		
		FY2014	FY2016	Annual Result		
				FY2014	FY2015	FY2016
Financial Results	Revenues	2,300	2,500	2,402	2,272	1,924
	Operating Income/Loss	70	100	66	49	-18
	Recurring Profit/Loss	70	120	84	60	1
	Net Income/Loss	35	80	48	18	-266
	ROE	5%	9%	6%	2%	-41%
	Payout Ratio	25%		25%	56%	-

Strategic Achievements /Results	Asset Strategy	Plan: Reconfigure business portfolio, maximize asset efficiency (Reinforce asset-light strategy for containerships and dry-bulk carriers, focus on LNG and offshore business) <ul style="list-style-type: none"> <li>Sold minority share of N. American terminal business, U.S. cruise ship business, and reefer transportation business</li> <li>Integrated the container shipping businesses with KL/MOL, acquired all shares of Yusen Logistics</li> <li>Sold and scrapped surplus dry bulk vessels</li> <li>Suffered less investment opportunities in LNG and offshore business due to the dramatic drop in oil prices</li> </ul>
	Differentiation Strategy	Plan: Achieve differentiation through technological capabilities <ul style="list-style-type: none"> <li>Reduced significant amount of fuel consumption through the IBIS project</li> <li>Optimized container inventory through the Eagle Project</li> <li>Developed next-generation logistics solutions through Symphony Creative Solutions' IoT</li> </ul>



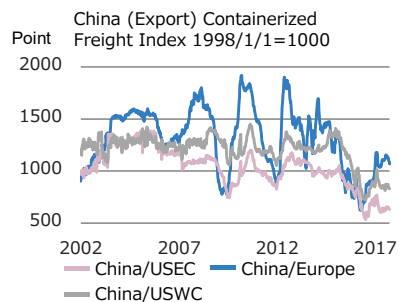
## Key initiatives of the new medium-term management plan

## 2. External environment surrounding the NYK Group

Shipping market has been increasingly volatile and technological and societal changes are dramatically altering the business environment

### Volatile business environment

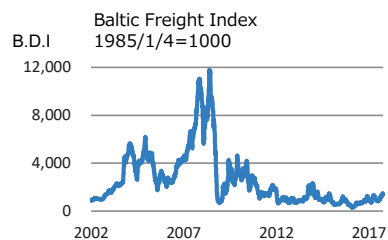
#### Container Market Freight Rate Index



#### Container market

- Volumes continue to recover moderately
- Excessive vessel supply to continue with massive number of new deliveries

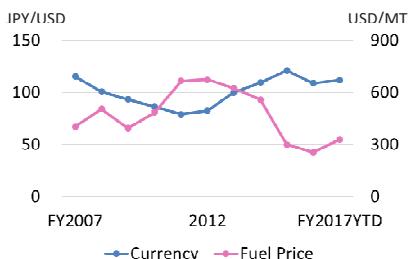
#### Dry-bulk Market Trends



#### Dry-bulk market

- Rates hit an all-time low in 2016
- Full-fledged market recovery is expected to take time

#### Currency and Fuel Price Trends



#### Currency/fuel price trend

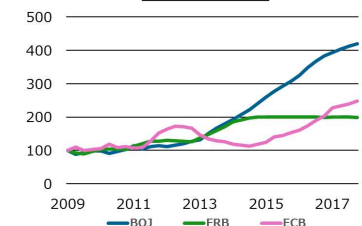
- Significant fluctuation seen in the past 10 years
- Future outlook remains unclear

### Significant societal changes

#### Future uncertainty

- Excessive liquidity
- Probability of recession
- Protectionism, local production for local consumption movement

#### Total Assets Index of Major Central Banks (2009/3=100)



#### Technological progress (Digitalization)

- Technological innovation incl. IoT, Big Data, AI, etc.
- Changes in customer needs caused by the rapid development of technology
- Increasing awareness towards efficiency and cost reduction

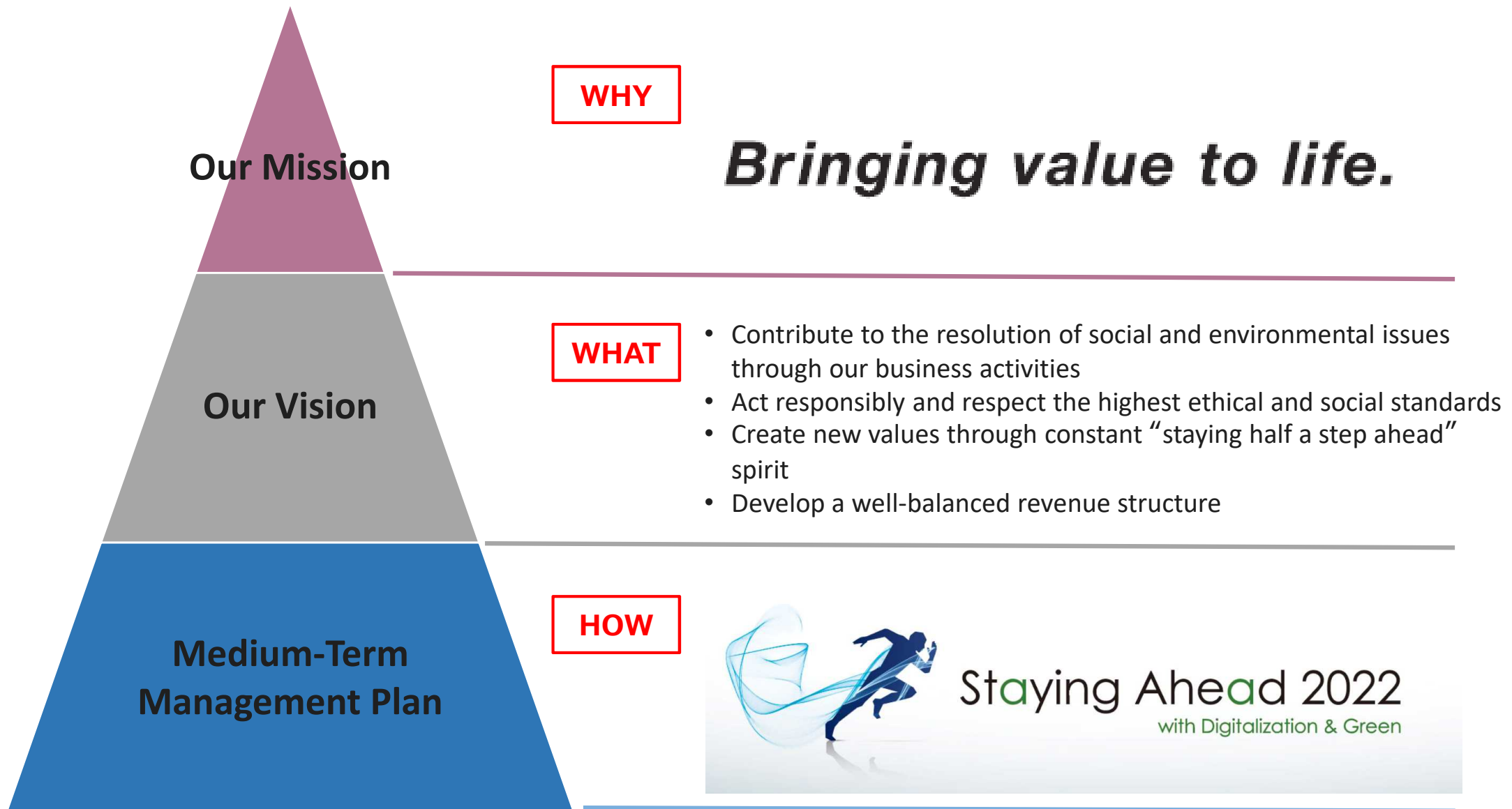


#### Environmental responsiveness (Green)

- Transition to a low-carbon society
- Increasingly stringent environmental regulations
- Integration of ESG criteria into the corporate value assessing process



### 3. Schematic diagram of the new medium-term management plan



## 4. Basic strategies of “Staying Ahead 2022 with Digitalization and Green”

### Step 1

Reconfigure business portfolio to withstand volatile market conditions

- Decisively reform the dry-bulk business
- Lead the new container JV (ONE) to success

**Optimize  
business portfolio**

### Step 3

Accelerate growth by constantly improving our technological, informational and network capabilities

- Implement Digitalization and Green initiatives

**Increase efficiency  
and  
create new values**

**Reduce market volatility  
Accelerate business growth  
and improve profitability**

**Secure stable-  
freight-rate  
business**

### Step 2

Develop well-balanced revenue structure

- Leverage logistics capabilities with YLK
- Strengthen car carrier and auto-logistics businesses
- Reinforce LNG and offshore businesses

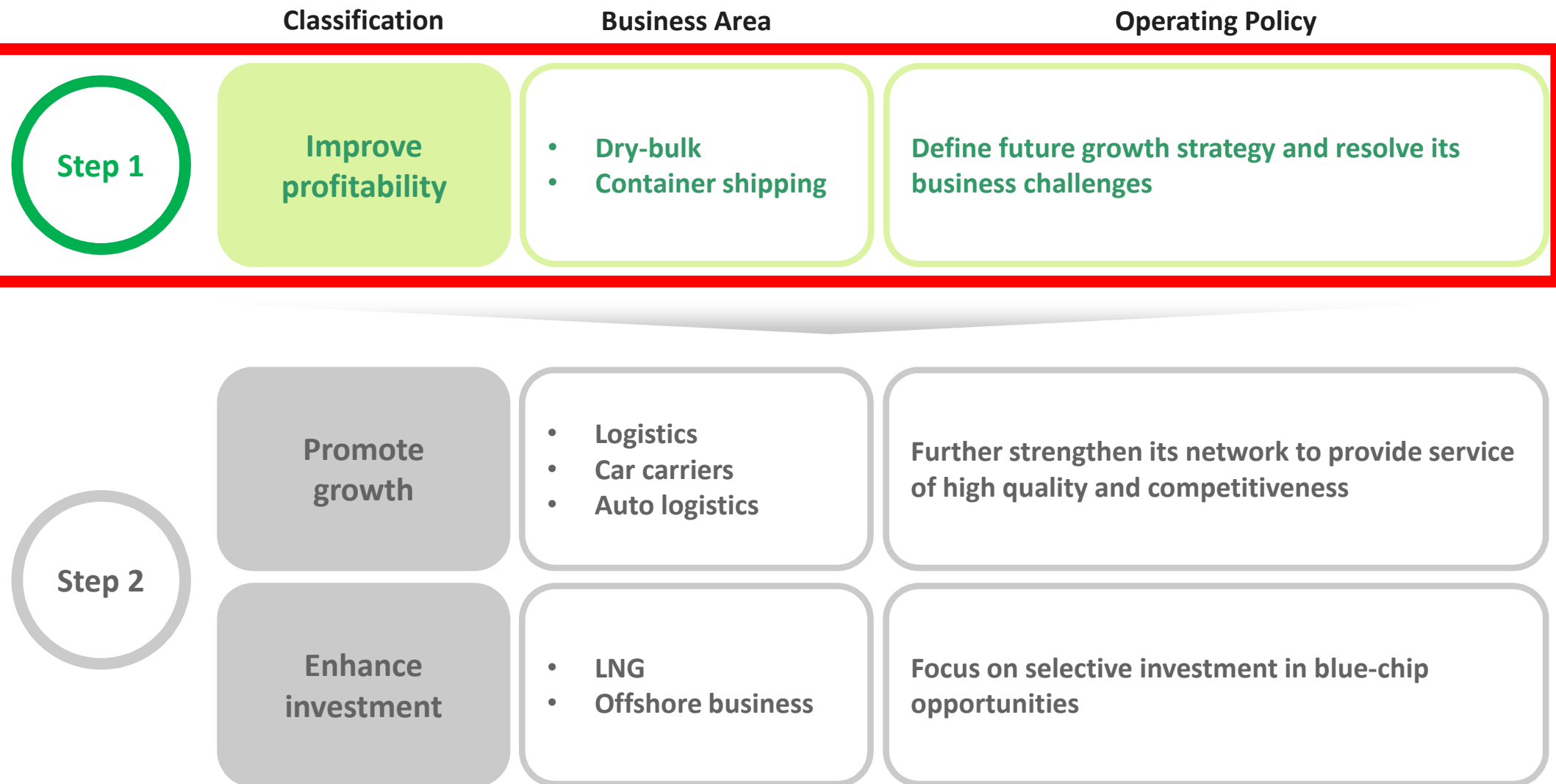


## Step 1: Optimize business portfolio



# Step 1: Optimize business portfolio

- Minimize market volatility by optimizing business portfolio
- Carry out structural reforms to low-profit and unprofitable businesses



# Step 1: Optimize business portfolio

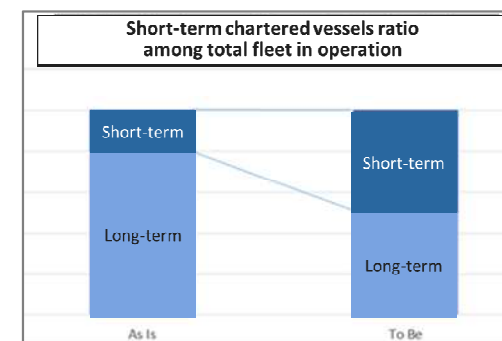
Improve  
profitability

Dry-bulk

Decisively reform dry-bulk business and improve its profitability

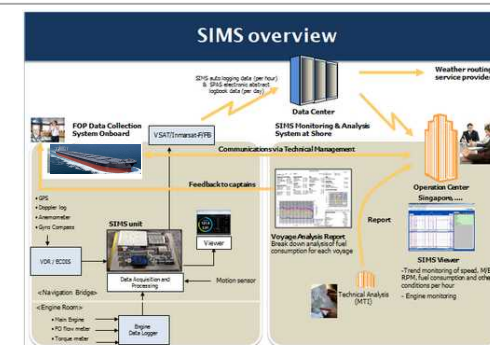
Strengthen business structure  
to withstand volatile market  
conditions

- Strictly control market risk exposure
- Separate owner/operator functions in aim to gain cost competitiveness and market adaptability
- Optimize fleet composition based on cargo contracts
- Secure stable earnings with efficient operation and fleet allocation



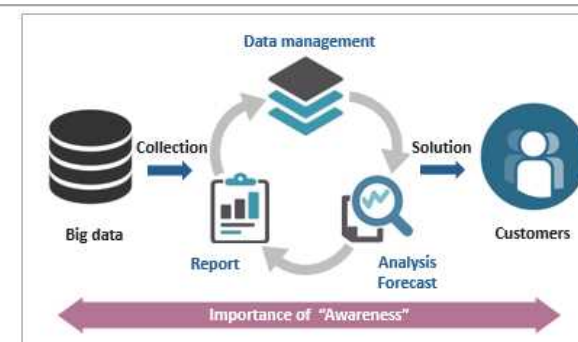
Reduce fleet and operating  
costs by effective application  
of ICT expertise

- Differentiate through expertise in IT and vessel operation
- Enhance practical application skills with usage of onboard IoT data management system (SIMS)



Enrich customer engagement  
with proposal-based  
marketing and sales activities

- Accurately identify customer needs and provide best solutions
- Further strengthen long-term and stable win-win partnership with the customers



# Step 1: Optimize business portfolio

## Container shipping

Made a major strategic shift pursuing operational efficiency and economy of scale through the integration of container shipping business

### Initiatives to date

#### Reformed service structure

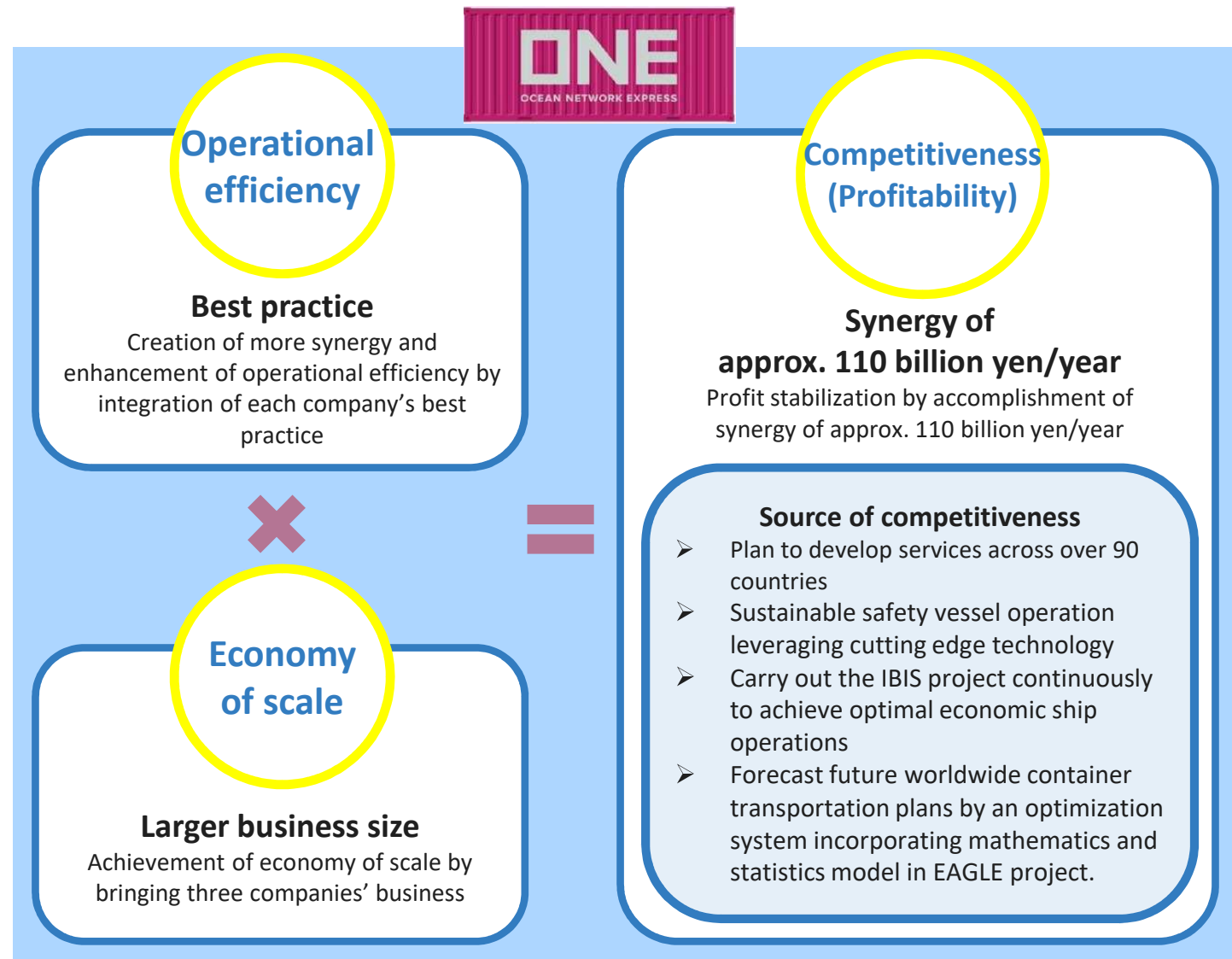
- Expanding container shipping service network through THE Alliance

#### Reduced market volatility

- Switching to newly built large vessels with high cargo-loading rates and fuel efficiency
- Reducing fuel consumption by upgrading existing vessels
- Saving fleet and operating costs by efficiently deploying vessels
- Efficiently utilizing containers for higher profit margin

#### Improved technological capabilities

- Working to ensure safe, fuel efficient operations by utilizing big data

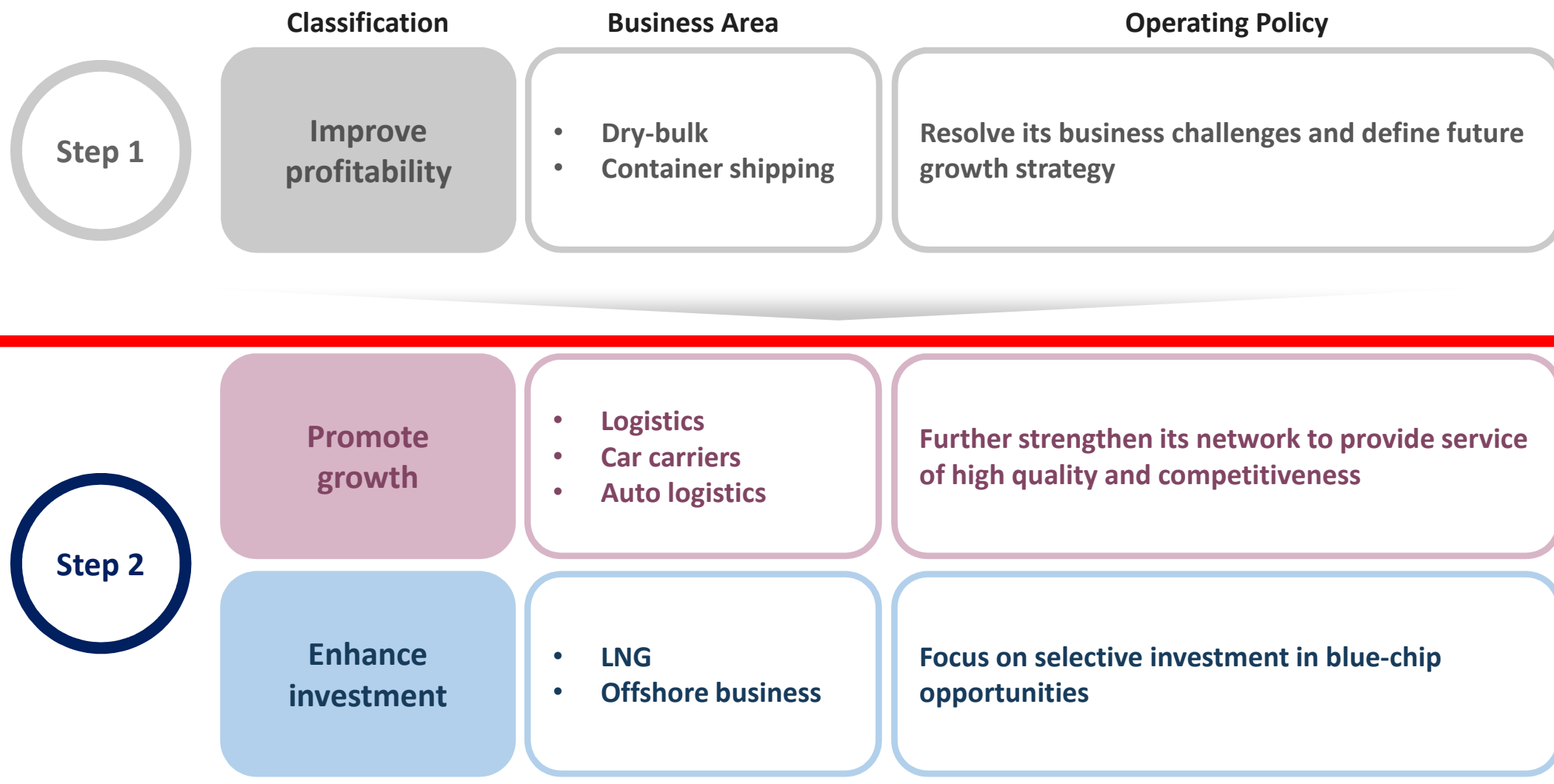




## Step 2: Secure stable-freight-rate business

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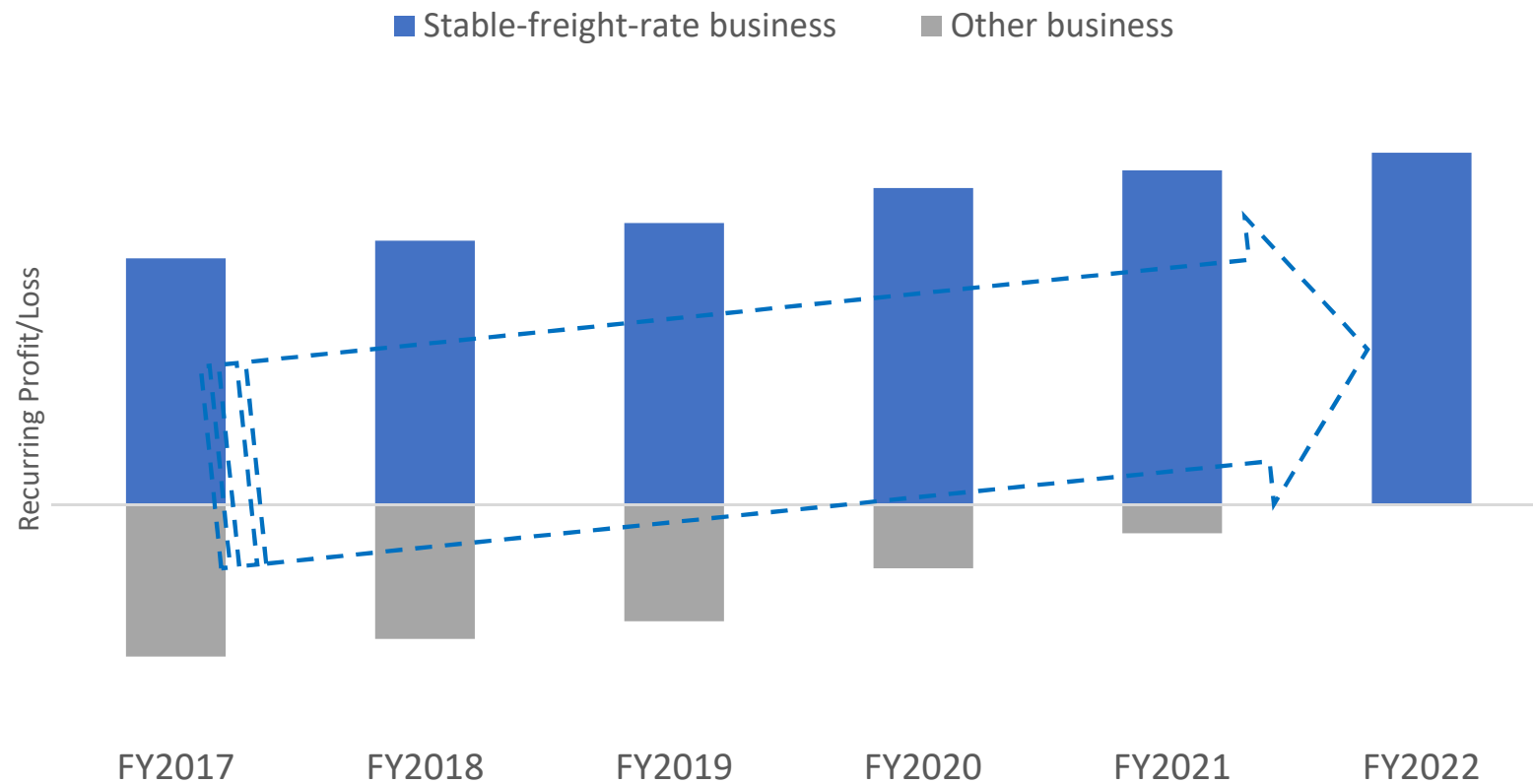
Secure stable-freight-rate business by leveraging on segments classified in “promote growth” and “enhance investment” areas



## Step 2: Secure stable-freight-rate business

Develop a well-balanced revenue structure by securing stable-freight-rate business

\* Graph shows image of revenue improvement



## Step 2: Secure stable-freight-rate business

Promote  
growth

Logistics  
Car carriers  
Auto logistics

### Initiatives to date

#### Logistics

- Fully acquired Yusen Logistics
  - Repositioning logistics business as the Group's core business
  - Deepening collaboration of each business and strengthening sales capabilities
  - Seeking synergetic effect by mutually utilizing its global network and management resources



#### Car carriers Auto logistics

- Globally expanding roll-on/roll-off (RORO) terminal facilities and onshore value-added services in addition to maritime automobile transport
- Focusing on technological innovation and human resource development to maintain the highest level of quality control

### Future actions

#### Logistics

- Enhance total logistics business and run a selective and concentrated investment policy focusing on growing industries and emerging markets
- Fully utilize the Group's management resources supported by the pillars of people, assets, IT, and capital to strengthen sales capabilities

#### Car carriers Auto logistics

- Focus on improvement of transportation/cargo handling efficiency using digital techniques and make proactive efforts on environmental issues
- Develop and provide a sophisticated, high-quality finished-car logistics looking ahead to the structural changes in the automotive industry

## Step 2: Secure stable-freight-rate business

Enhance investment

LNG  
Offshore  
business

### Initiatives to date

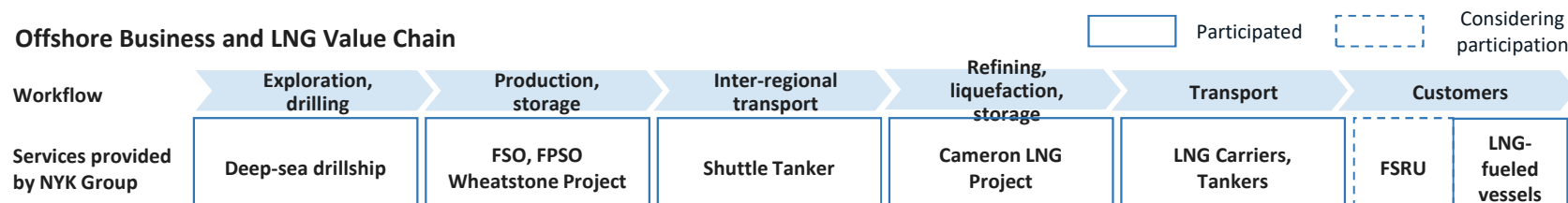
#### LNG

- Winning orders for the transportation of LNG, sourced from shale gas fields in North America
- Expanding its business scope to feature offerings for transporting LNG, operating LNG-fueled vessels, and supplying and marketing LNG as marine fuel

#### Offshore business

- Developing business at every stage of the energy value chain, from upstream to downstream

### Offshore Business and LNG Value Chain



### Future actions

#### LNG

- Further expand and develop business in newly emerging countries.
- Strongly promote LNG marine fuel sales business in response to the increasing interest in LNG-fueled vessels

#### Offshore business

- Make selective investments in areas of strength and technological expertise
- Enter into new businesses in regards to the broad transformations in the global energy landscape and to effectively meet customers needs



### **Step 3:**

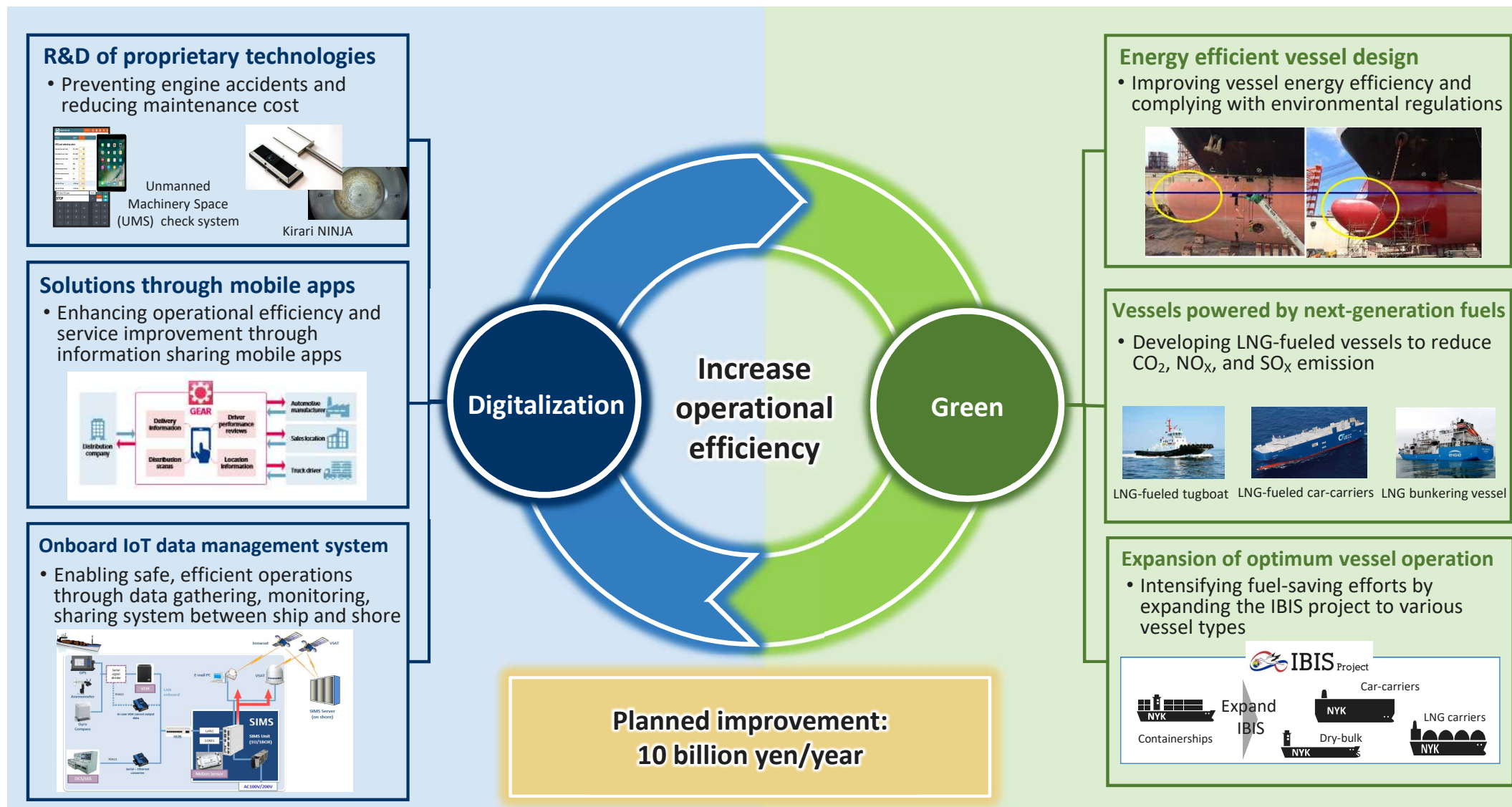


**Increase efficiency and create new values  
- with Digitalization and Green Initiatives -**

# Step 3: Increase efficiency and create new values

<Initiatives to date>

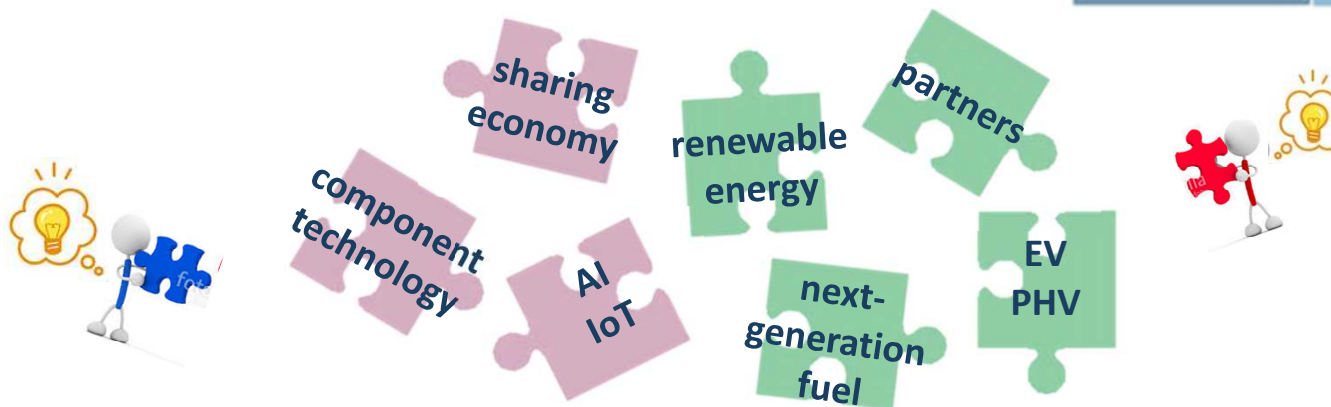
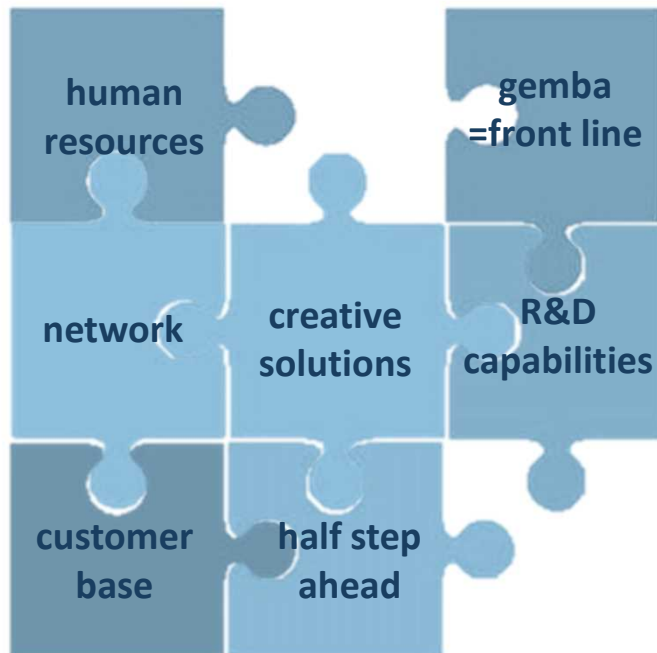
Working on various technological developments and increasing operational efficiency



## Step 3: Increase efficiency and create new values

<Future activities>

### Core competence of NYK



### Commercialization factors in the society

# Step 3: Increase efficiency and create new values

Transform the entire supply chain more environmentally sustainable with the application of the latest digital technology

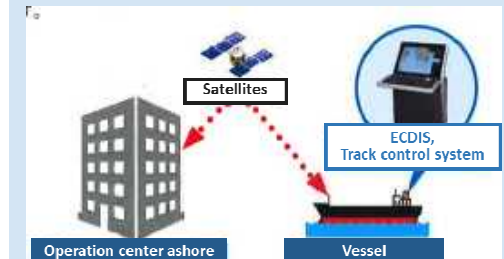
## Simulation technology by Digital Twin concept



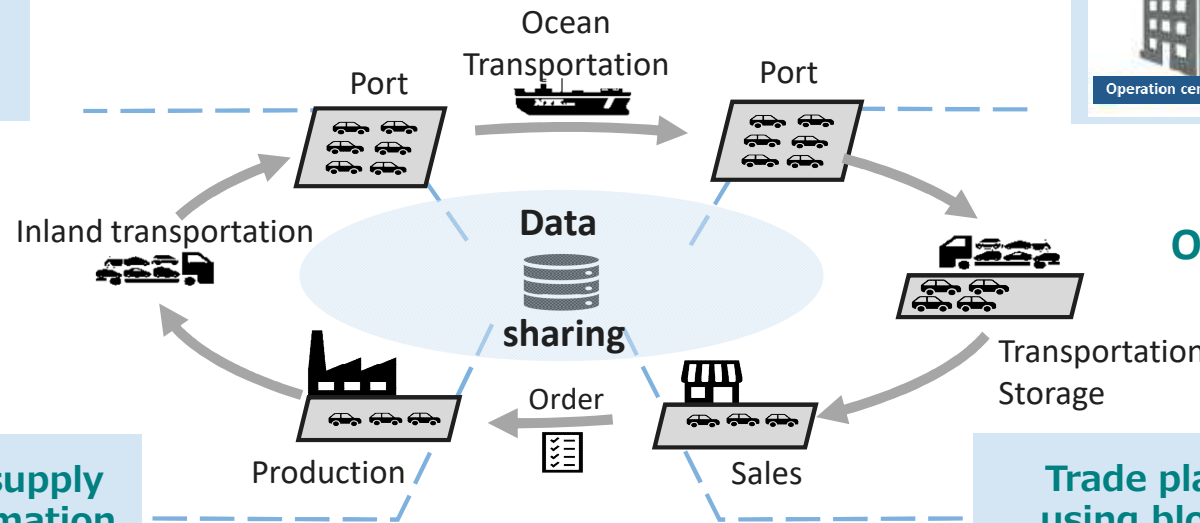
## Optimization of route, operation, and cargo space planning



## R&D for advanced automation ship

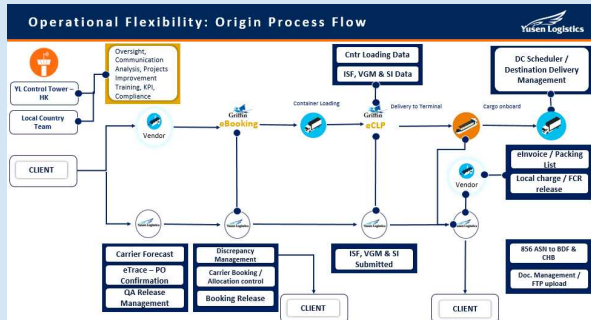


## Lead-time reduction



## Operational process efficiency

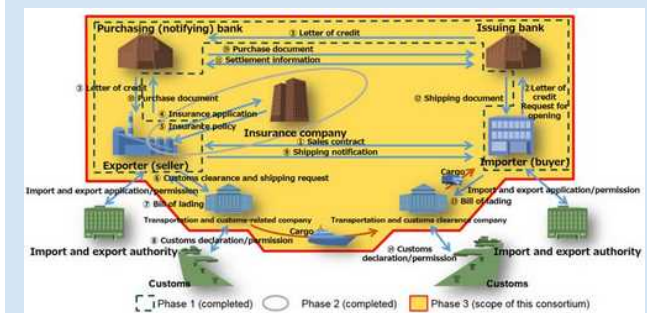
## Visualization of the entire supply chain with centralized information



## Digital forwarding



## Trade platform development using block chain technology





## Step 3: Increase efficiency and create new values

Implement Green Business initiatives to take new challenges on renewable energy business for driving future growth and value creation

Offshore wind power system



Biomass



Hydrogen carrier



Green terminal



## Step 3: Increase efficiency and create new values

### <Progress management>

New key performance indicator “Power Index” to be adopted for monitoring and reporting the progress of the Digitalization and Green initiatives.

Digitalization		Green
Data analysis Application development	Optimization of the supply chain	Green business
<p><u>Quantitative indicators</u></p> <ul style="list-style-type: none"><li>Amount of data measured onboard</li><li>Number of application software developed</li></ul> <p><u>Qualitative indicators</u></p> <ul style="list-style-type: none"><li>Safe navigation Downtime reduction, accidents prevention</li><li>Environmental, energy-saving operations CO<sub>2</sub> reduction, comply with IMO guidelines</li></ul>	<p><u>Quantitative indicators</u></p> <ul style="list-style-type: none"><li>CO<sub>2</sub> reduction per ton-mile in comparison to 2015 baseline</li></ul> <p><u>Qualitative indicators</u></p> <ul style="list-style-type: none"><li>Following priority measures are to be set its deadline, process, and goals respectively for close monitoring.<ul style="list-style-type: none"><li>a. Digital-twin</li><li>b. Automation technology</li><li>c. Blockchain trade platform</li><li>d. Digital forwarding</li><li>e. Supply chain optimization</li></ul></li></ul>	<p><u>Quantitative indicators</u></p> <ul style="list-style-type: none"><li>Amount of renewable generating capacity with direct/indirect involvement</li></ul>



## Financial targets and capital policy / Integration of ESG principles to management strategies

# Financial targets and capital policy

## Earnings and financial targets

(Unit: billion yen)	FY2017 Latest outlook	Medium-Term Target (by FY2022)
Recurring Profit	27 billion yen	70-100 billion yen
ROE	2.1%	min 8.0%
Shareholders' Equity Ratio	25%	min 30%
DER	1.9	1.5 or lower

Exchange rate (1US\$):  
Bunker oil prices (1MT):

¥111.26  
\$343.20

¥105  
HSFO \$320 LSGO \$620 (\*)  
\*HSFO = High Sulphur Fuel Oil / LSGO = Low Sulphur Gas Oil

## Dividend policy

Basic policy for the return of profits to shareholders is to pay stable dividends aiming for a payout ratio of 25% on a consolidated basis

## To achieve ROE target

**ROE target**  
2.1% → min 8.0%

### Profitability

Accelerate business growth and improve profitability  
Reduce cost



### Liquidity

Reduce stockholdings  
Review and effectively utilize real estates

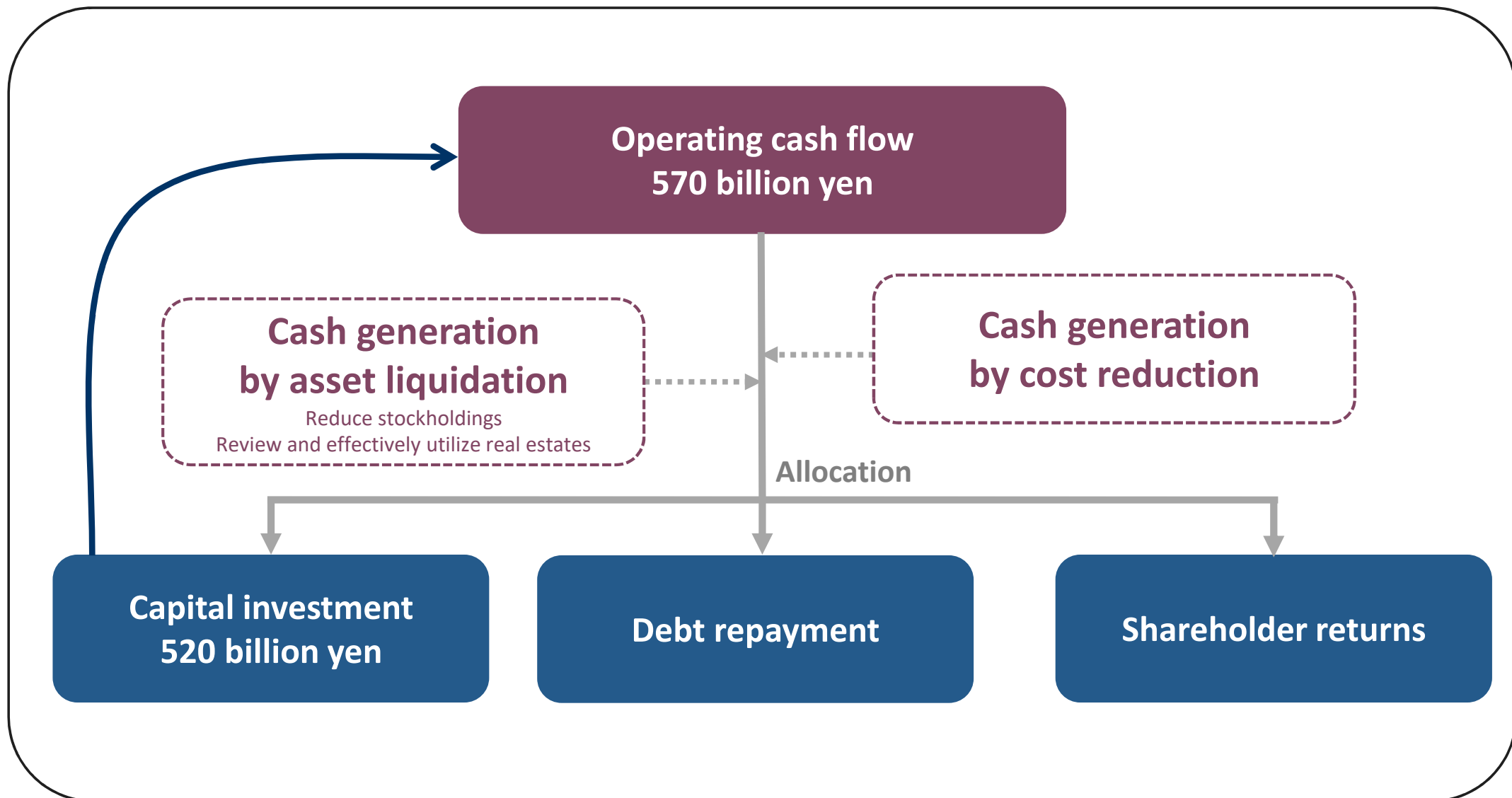


### Financial Leverage

Maintain investment grade or equivalent rating

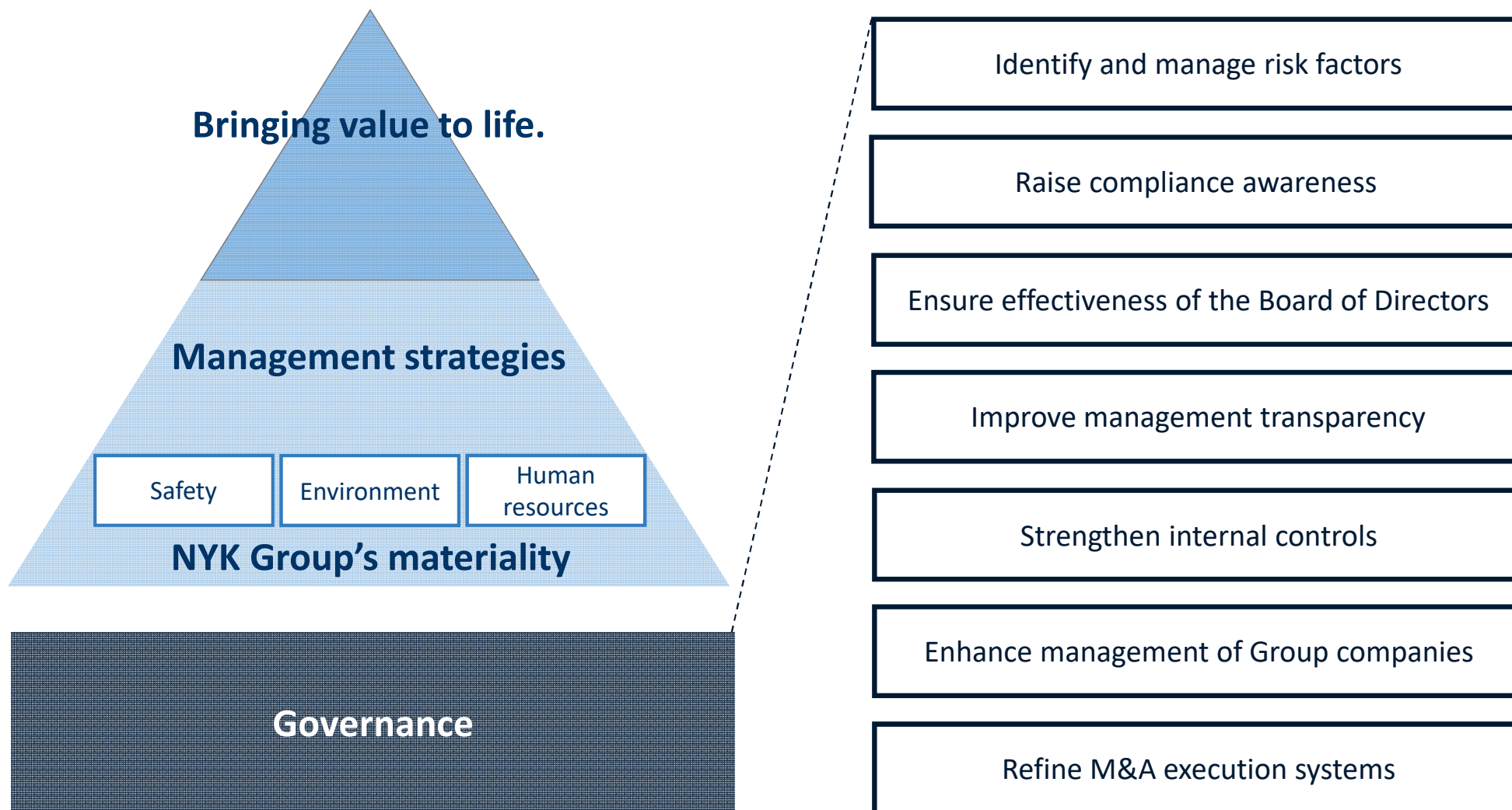


## ► Outlook for cash flow allocation (5 years cumulative FY2018-22)



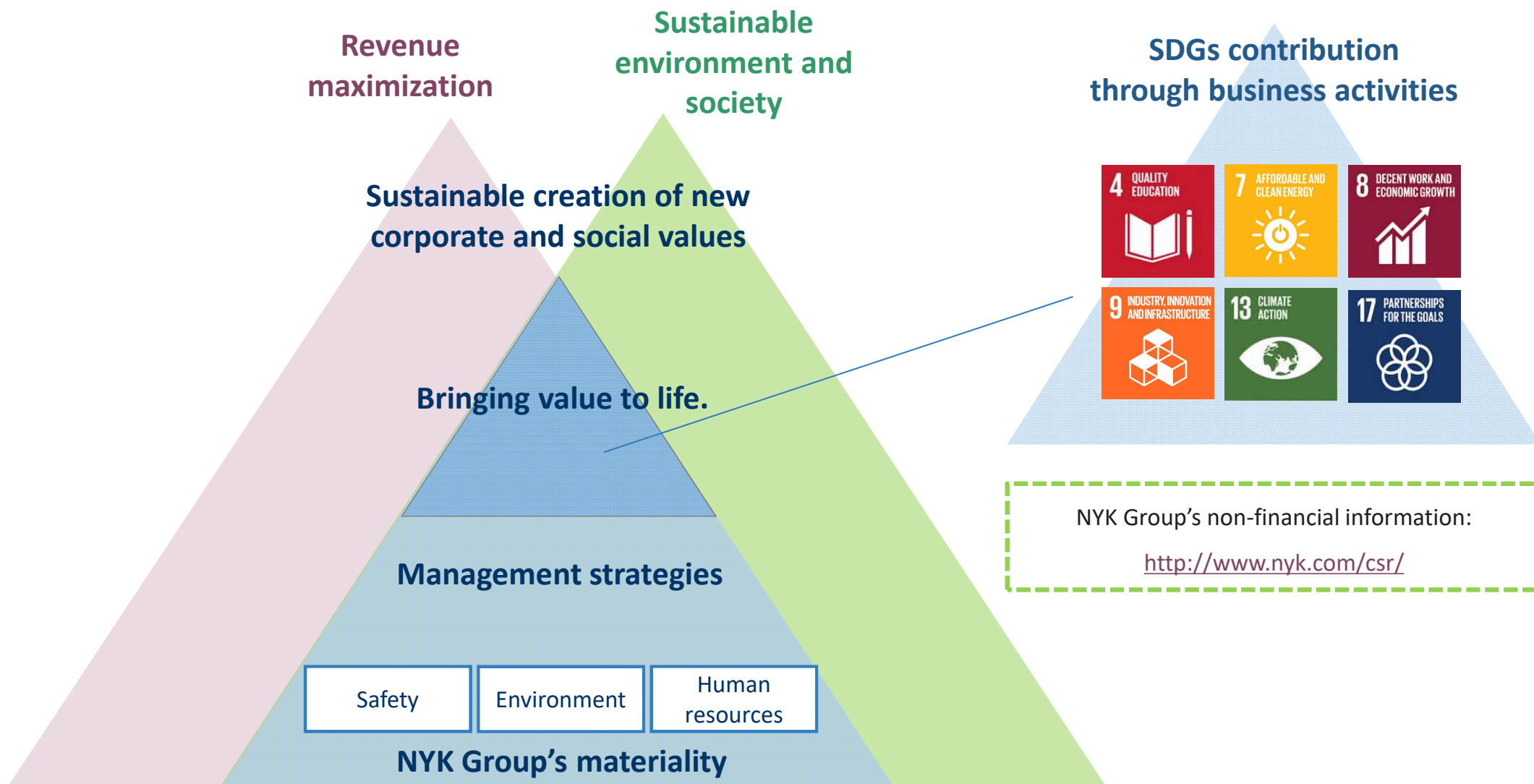
# Integration of ESG principles to management strategies – to strengthen corporate governance

Positioning governance as the foundation of all corporate activities and will further strengthen its governance by integrating ESG principles into its management strategies



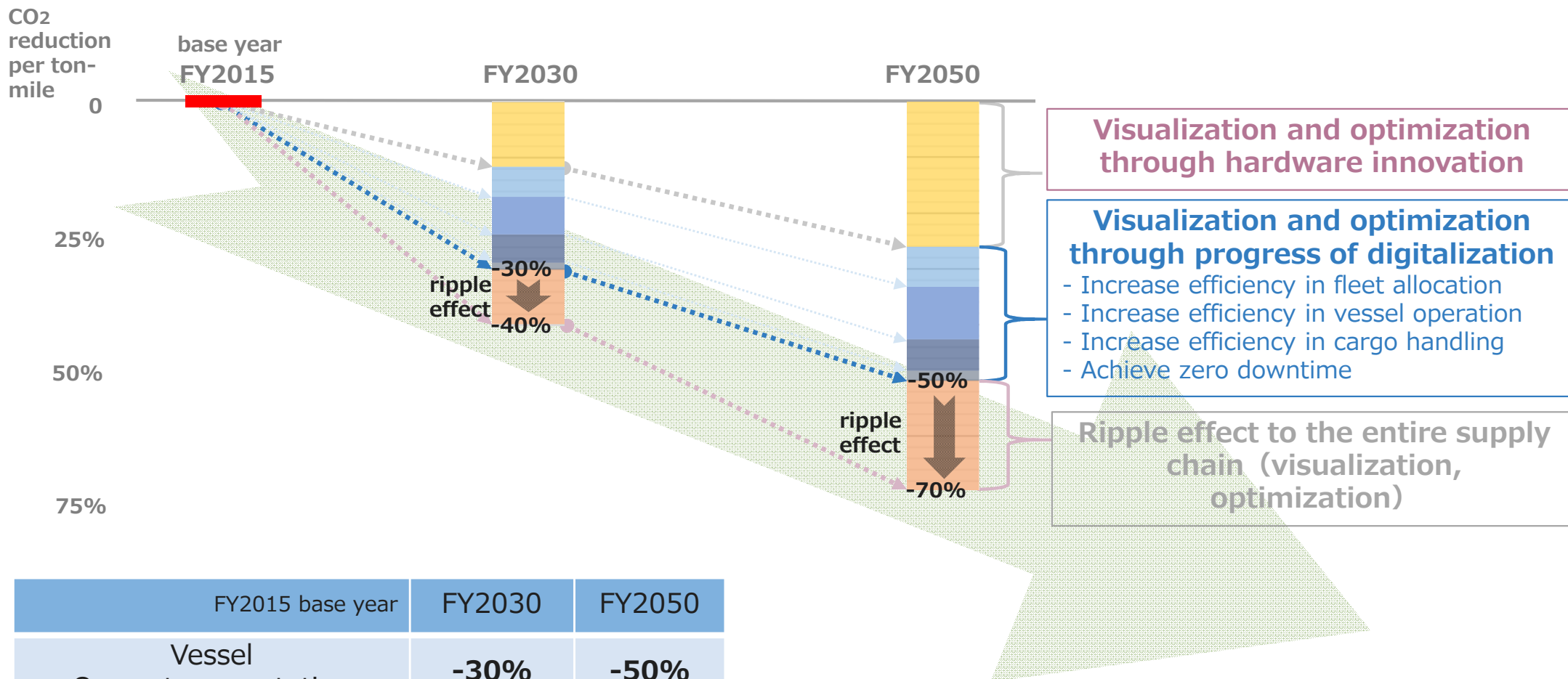
# Integration of ESG principles to management strategies – to contribute to the sustainable environment and society

Working to ensure our business activities contribute to the sustainable development of society and enrichment of our corporate value



## Appendix

# Appx. 1: CO2 reduction goal (Medium to long-term environmental goal)



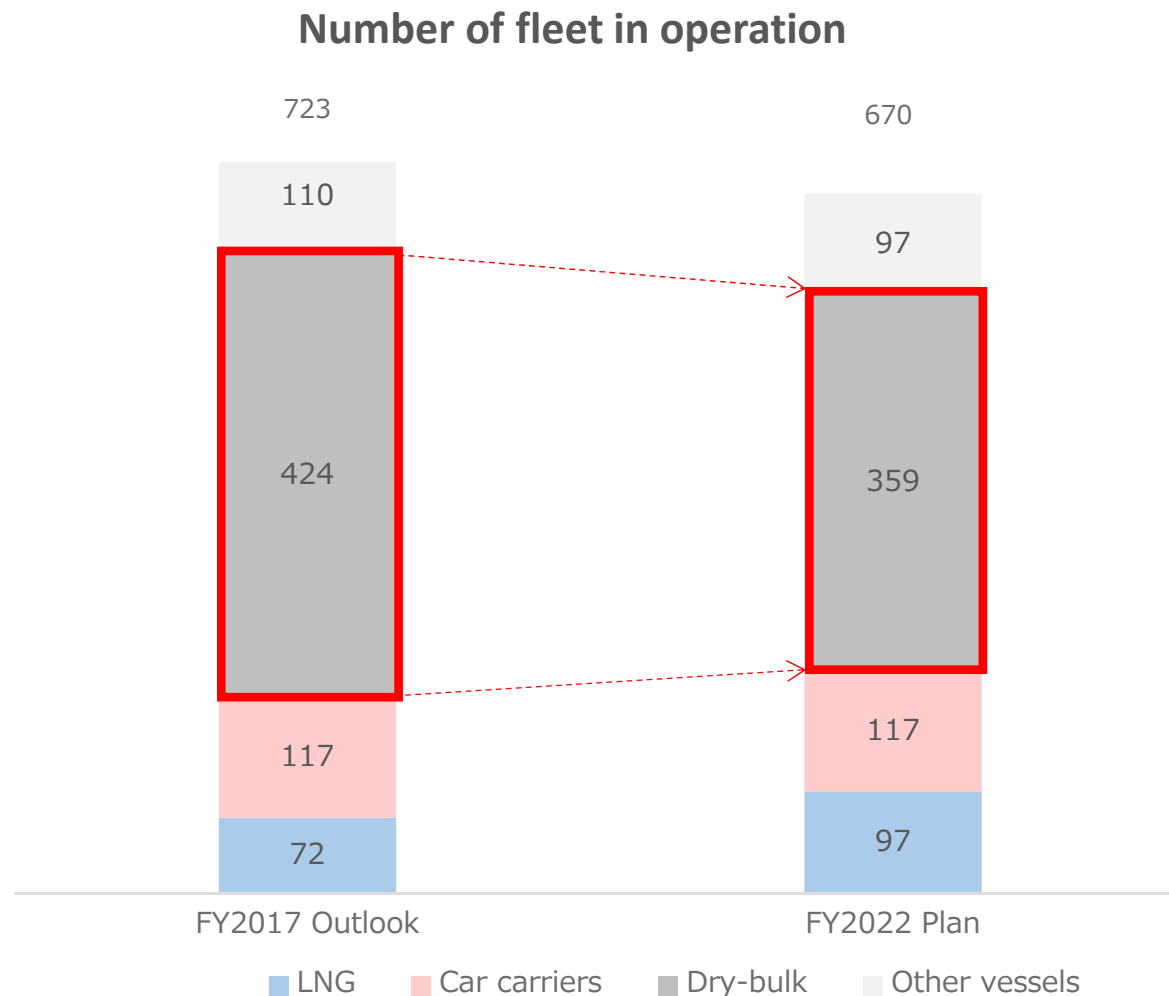
FY2015 base year	FY2030	FY2050
Vessel Ocean transportation	-30%	-50%
Ripple effect to the entire supply chain	-40%	-70%

Submitted the above target to the Science Based Target initiative (SBTi) for assessment, in recognition of keeping the rate of global temperature rise below 2 degrees centigrade at the end of the century, with regard to the pre-industrial era.

$$\begin{aligned}
 &\text{Environmental management indicator} \\
 &\text{(Based on IMO Guidelines)} \\
 &= \frac{\text{Environmental load (CO}_2 \text{ emissions from vessel transportation)}}{\text{Value added by the business}} \\
 &\quad \left( \frac{\text{Mass of cargo in tons} \times \text{Transport distance in kilometres}}{\text{Value added by the business}} \right)
 \end{aligned}$$

## Appx. 2: Fleet in operation

Rationalize fleet size, reinforce asset-light strategy for vessel types with higher volatility, mainly dry-bulk carriers



\* Container ships excluded

# Glossary - in the order of appearance

	page
<b>Drillship</b> A drillship is a vessel designed for use in deepwater and ultra-deepwater applications, mainly for exploratory offshore drilling of new oil and gas wells or for scientific drilling purposes.	16
<b>FSO (Floating Storage and Offloading System)</b> An FSO system is a vessel designed to receive crude oil produced from nearby subsea wells and to store the oil until it can be offloaded onto a shuttle tanker and transported ashore.	16
<b>FPSO (Floating Production, Storage &amp; Offloading System)</b> An FPSO unit is a ship-shaped offshore installation that produces crude oil by separating solids, water, and gases from liquid drawn from reservoirs beneath the seabed and storing it until it is offloaded into shuttle tankers or export tankers.	16
<b>Wheatstone Project</b> The Wheatstone Project is a natural gas liquefaction being promoted by the U.S.-based Chevron Corporation and other companies in Australia. NYK participates in the project together with Mitsubishi Corporation and Tokyo Electric Power Company Incorporated.	16
<b>Shuttle tanker</b> A shuttle tanker, often called a 'floating pipeline', loads crude oil from floating production, storage, and offloading (FPSO) units in deepwater fields and then transports the oil to crude oil storage units or petroleum storage stations on land.	16
<b>Cameron LNG Project</b> The Cameron LNG Project is a natural gas liquefaction and export project located in the U.S. state of Louisiana jointly owned by Semptra Energy, ENGIE SA, Mitsui & Co. Ltd., and Mitsubishi Corporation. NYK's investment in Cameron LNG will be made through Japan LNG Investments LLC (JLI), a joint venture company between NYK and Mitsubishi Corporation.	16
<b>FSRU (Floating, Storage and Regasification Unit)</b> An FSRU is a floating facility for the storage and regasification of LNG. FSRU receives regular shipments of LNG from LNG carriers, transfers it to the onboard storage tanks and sends it to shore in gaseous phase through a sub sea pipeline.	16

# Glossary - in the order of appearance

	page
<b>Unmanned Machinery Space (UMS) check system</b> A newly developed electronic system for “UMS checking”, specialized for mobile devices . A “UMS check” is a measurement which needs to be made before an engine plant and equipment are operated unattended (e.g., at night). This not only greatly reduce data-entry time compared to entry with a conventional keypad, but also notifies the crew if abnormal figures are entered, allowing the crew to respond quickly to abnormalities.	18
<b>Kirari NINJA (No Hands INSide Just A camera)</b> Kirari NINJA is a device that can automatically photograph the inside of a vessel engine’s combustion chamber, jointly developed by NYK/Monohakobi Technology Institute (MTI), and Daito Electron Co. Ltd. Currently, in order to inspect a combustion chamber, crew has to enter the inside of the engine after having stopped the engine. By installing this devise on the upper part of the piston in the combustion chamber, photographs in all directions of the interior can be taken during one round of vertical piston movement. Consequently, the crew’s inspection workload can be dramatically alleviated and with accurate and precise monitoring of the interior of the combustion chamber makes it possible to implement timely maintenance, thereby preventing engine accidents and reducing maintenance cost.	18
<b>GEAR</b> GEAR is a mobile application developed by Symphony Creative Solution (SCS) designed to centralize operational information and to streamline the logistics operation with the usage of its data. The application provides data such as delivery information, shipment status, cargo location, driver evaluation, etc. and shares them with manufacturers, freight forwarders, and customers.	18
<b>Onboard IoT data management system (SIMS, Ship Information Management System)</b> SIMS is a system which allows to share data among workplaces on land and sea in real time, including detailed hourly updates on shipping operations and data related to fuel consumption. Optimized economic vessel operations and energy-saving operations are realized by visualization of information and close information-sharing among crew members, shipowners, ship operators, and ship managers.	18
<b>Energy efficient vessel design</b> NYK/MTI, at the design stage of building or remodeling vessels, conducts an in-depth analysis of operational data accumulated during shipping operations, such as sea-speed, engine load, horse-power, draft, displacement, etc., to make the vessels consume less fuel with the goal of reducing environmental burden. By modification of the bulbous bow and installing energy-saving devices, 23% reduction in CO <sub>2</sub> emissions was subsequently certified by the ship classification society ClassNK.	18



	page
<b>Vessels powered by next-generation fuels</b> As international regulations on emissions for ships tighten in the next few years, including the rules concerning SOx in the form of the 2020 global sulphur cap, NOx with the establishment of Nitrogen Emission Control Areas (NECAs) in 2021., and IMO's Energy Efficiency Design Index (EEDI) requiring all new ships to be 30% more energy sufficient than those built in 2014, LNG is expected to become an important alternative fuel for the maritime industry. NYK Group is currently expanding its business scope to feature offerings for transporting LNG, operating LNG-fueled vessels, and supplying and marketing LNG fuel, with deployment of "Sakigake", Japan's first LNG-fueled tugboat from 2015, "Auto Eco", the world's first LNG-fueled Pure Car and Truck Carrier from 2016, and "ENGIE Zeebrugge", world's first purpose built LNG bunkering vessel (LBV).	18
<b>IBIS project (Innovative Bunker and Idle-time Saving project)</b> Project conducted on NYK's containerships from fiscal 2012 with the aim to achieve optimal economical vessel operations using SIMS (definition mentioned above). From fiscal 2013, the knowledge and know-how acquired by IBIS was used on other types of vessels in the IBIS Two project to optimize ship's operations according to the characteristics and conditions of each vessel.	18
<b>Digital Twin</b> A virtual model of a process, product or service. This pairing of the virtual and physical worlds allows analysis of data and monitoring of systems to head off problems before occurrence, prevent downtime, develop new opportunities and even plan for the future by using simulations. It is one of the important technologies, which support "Industrial 4.0". NYK practices a simulation technology of ship performance in service to estimate the impact of waves, wind speed and wind direction. Also NYK utilizes the technology for optimizing fleet operation and advanced ship design.	20
<b>Optimization of route, operation and cargo space planning</b> An aim to achieve optimal economic ship operations through introduction of advanced operational support system. The system will be developed by combining NYK's knowledge and know-how cultivated in the analysis of IBIS and its supporting Business Intelligence tools, with digital technologies such as AI and Digital Twin, enabling optimization and automation of vessel operation.	20

# Glossary - in the order of appearance

	page
<b>Advanced automation ship</b> Advanced automation ship is a ship, which equips with onboard and/or remote automation systems to support crews' awareness, decision and action, for such as navigation and engine operations, by utilizing various sensor data. At this stage, crews make final decisions on controls or actions. However, through further accumulation of real sensor data (big data) and development of higher leveled automation technologies, autonomous ships, where computers autonomously make final decisions on controls or actions for navigations and engine controls, and/or full remote control of a ship may be realized. At the next stage, we assume manned autonomous ship or manned remote control ship, on which on-board crews will override ship's controls in emergency situations.	20
<b>Trade platform development using block chain technology</b> An aim to explore solutions to the challenges in trade procedures between businesses, across industries and national boundaries as well as to conduct POCs** for enhancing efficiency and reliability in trade procedures using blockchain. *POC stands for Proof Of Concept, which means a positive attempt for demonstrating that a new concept, theory, principle, and the like can be realized.	20
<b>Digital forwarding</b> (Online platform for freight forwarding) A customer oriented on-line logistics platform allowing customers to choose the best combination of desired departure date, transit time and mode of on-carriage at the respective price, just like booking a flight through an online platform. Once certain amount of data is collected through the system, materialization of automated routing is to be considered running big data analytics and deep learning.	20
<b>Visualization of the entire supply chain with centralized information</b> Supply chain optimization initiative conducted by Yusen Logistics (YLK). Origin Cargo Management (OCM) in YLK's terms. The system promotes customers to track the progress of components and finished products through the supply chain and exercise centralized control over order and product flows, allowing them to reduce overstock, optimize domestic transportation and improve lead times.	20



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