

Energy & Environment Business Plan

Senior Executive Vice President, President and CEO,

Energy & Environment

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MITSUBISHI HEAVY INDUSTRIES, LTD.





1. Business Overview

2. Review of 2012 Medium-Term

Business Plan

3. 2015 Medium-Term Business Plan

4. Summary



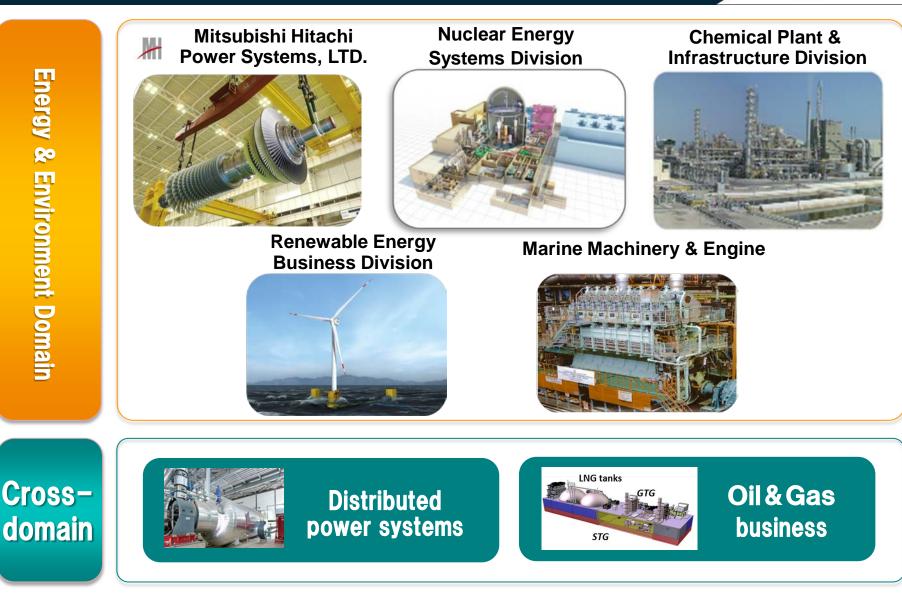
1. Business Overview

- 1-1. Business of Energy & Environment Domain
- **1–2.** Business Structure

1-1. Business of Energy & Environment Domain

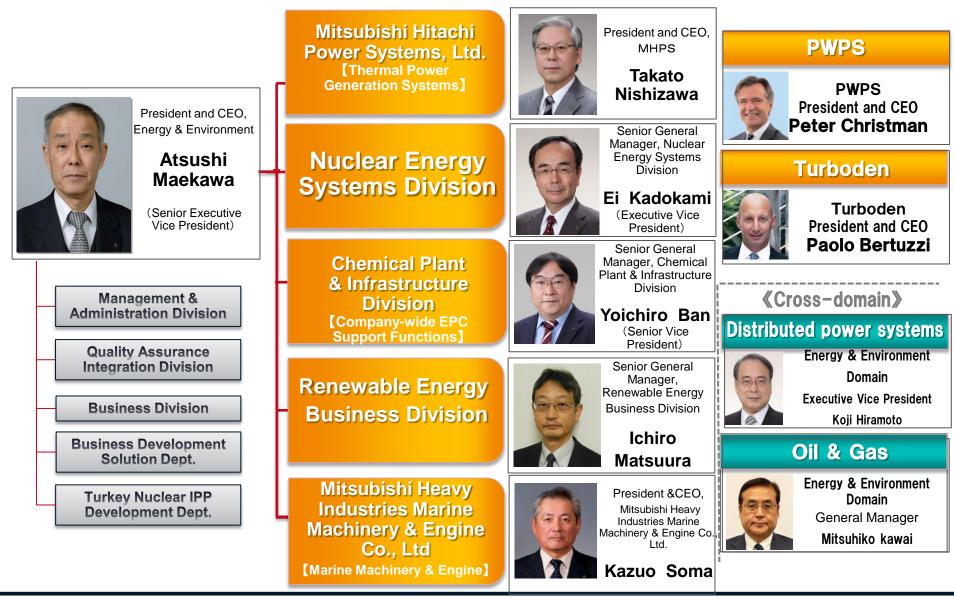


Energy & Environment Domain



1-2. Business Structure





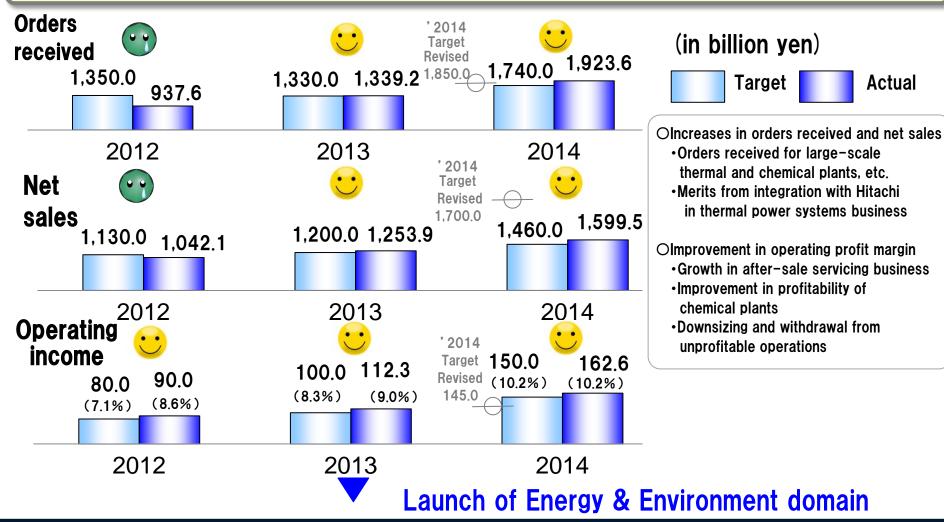


2. Review of 2012 Medium-Term Business Plan

- 2-1. Targets and Results
- **2–2.** Overall Level of Achievement
- 2-3. Percentages of Total Company Orders, Sales, Profits
- 2-4. Management Status for Each Business Position

2-1. Targets and Results

Thanks to implementation of various reforms, including domain system and M&A synergies, targets were almost all achieved.



2-2. Overall Level of Achievement

Growth preparations were completed.

Ready to shift to new full-fledged growth and aggressive approach phase.

		FY2014 923.6 billion yen (×2.1-fold) 162.6 billion yen (×1.8-fold)
 Strength and synergy benefits from domain system and M&A's Exchanges of human resources, administrative consolidation and efficiency enhancement Integration with Hitachi in thermal power systems (MHPS) Acquisition of PWPS and Turboden (expansion of small/medium-size gas turbine lineup) 	Acceleration of globalization • Preparation of overseas bases • Establishment of JV with Vestas in offshore wind turbines	 Portfolio management employing strategic business evaluations Withdrawal from production of lithium batteries Cash flow creation from strategic business evaluation system

2015 Business Plan: Taking Up New Challenges

2-3. Percentages of Total Company Orders, Sales, Profits.

FY2014 Actual (in billion yen) 54.1 $\triangle 2.7$ 59.4 (1%) (∆<mark>1%)</mark> (2%) 162.6 84.1 1,304.6 1,599.5 1,319.5 (28%) 55%) (28%) Orders (40%) 1,923.6 (33%) Net sales Operating (41%) received 3,992.1 Income 4,699.1 296.1 417.4 28.5 (9%) (10%) 999.2 483.9 23.4 529.5 (21%) (12%) (8%) (13%)

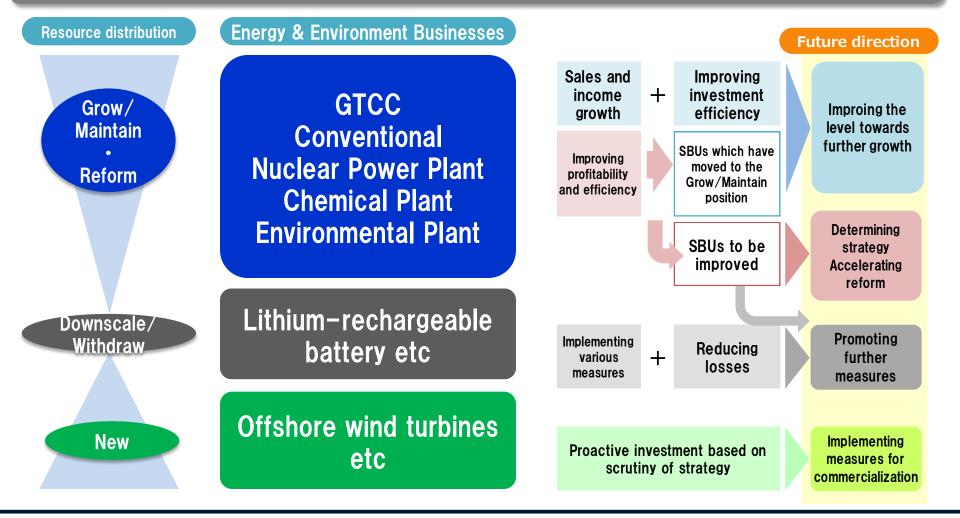
- Energy & Environment
- Commercial Aviation & Transportation Systems
- Integrated Defense & Space Systems
- Machinery, Equipment & Infrastructure
- Others, Eliminations or Corporate

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2-4. Management Status for Each Business Position

Portfolio management targeting enhanced corporate value Promotion of downsizing and withdrawal from unprofitable businesses



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3. 2015 Medium-Term Business Plan

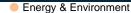
- **3–1.** Basic strategies
- **3–2.** Numerical targets
- **3–3.** Measures for achieving targets
- 3-4. Short-term earnings and longer-term growth initiatives

3-1. Basic strategies (1/3)

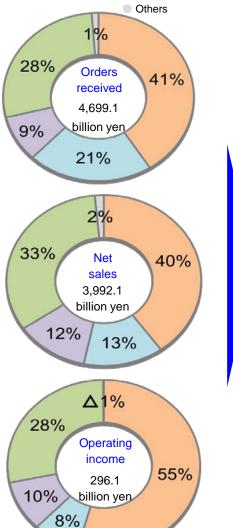
Business Domain Strategies		Main Measures				
Energy & Environment	 Simultaneously pursue short-term earnings and mid/long-term growth, with business expansion and profitability at the core (swift response to moves made by mega competitors) Promote long-term continuation policy for nuclear power business 	 Enter markets for high-performance models (large-scale GT); enhance lineups Strengthen servicing business (employ ICT and big data; invest human resources) Expand networks of domestic and overseas manufacturing bases Expand business in distributed power generation systems (joint development with Machinery, Equipment & Infrastructure domain) Full-scale entry in oil & gas upstream business (keeping collaborations and M&A's in view) 				
Commercial Aviation & Transportation Systems	 Improve profitability of commercial airplane products Advance MRJ development and improve airframe value Undertake bold conversions in commercial and cruise ship businesses Expand business in land transportation systems 	 Promote increased production in businesses for Boeing and develop next-generation production processes Steadily carry forward the MRJ's development and develop a high-volume manufacturing base Develop a new infrastructure export model based on domain synergies Develop new business model for cruise ship business Strengthen ability to promote business in large-scale overseas projects (Doha, etc.) 				
Integrated Defense & Space Systems	 Undertake sustained strengthening of existing businesses and prepare for next expansion step (initiatives to promote overseas business and conversion to commercial market needs) 	 Undertake concentrated strengthening of integrated defense systems (land, sea, air) Newly launch a state-of-the-art technology business department and promote the following: Development of new overseas businesses through tieups with overseas partners Development consumer demand-based businesses applying dual-use technologies 				
Machinery, Equipment & Infrastructure	 Along with the Energy & Environment domain, pursue achievable and immediately effective measures from the perspective of supporting the MHI Group's scale and earnings 	 Promote and accelerate PMI in metals machinery and forklift trucks Expand oil & gas business involving compressors Establish a global business structure for turbochargers Further accelerate business restructuring (including M&A's) 				



3-1. Basic strategies (2/3)



- Commercial Aviation & Transportation Systems
- Integrated Defense & Space Systems
- Machinery, Equipment & Infrastructure

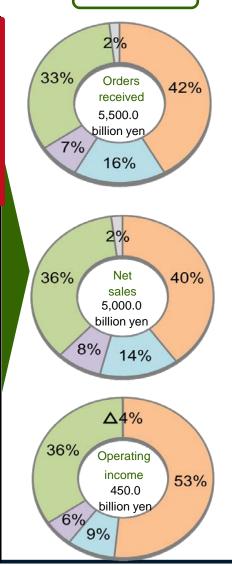


FY2014

Domain	Main measures and fluctuating factors	Orders/ Net sales	Operating income
	• Expanded synergies at MHPS	Ø	Ø
Energy & Environment	 Overall expansion of servicing business 	0	Ø
	 Distributed power systems, oil & gas, etc. 	0	-
	 Expansion of Boeing-related business 	O	O
Commercial Aviation &	 MRJ (contribution to net sales starting FY2017) 	0	Δ
Transportation Systems	 Strengthening of land transportation systems 	-	0
	 Reform of commercial ship business 	-	0
Integrated Defense & Space Systems	 Demand to hold steady through FY2017; preparations for expansion of business in equipment, etc. 	-	-
	 Synergies at Primetals (steelmaking business) 	O	O
Machinery, Equipment & Infrastructure	 Strengthening of compressors, turbochargers, etc. 	0	0
	 Accelerated business restructuring (including M&A's) 	0	0

FY2017

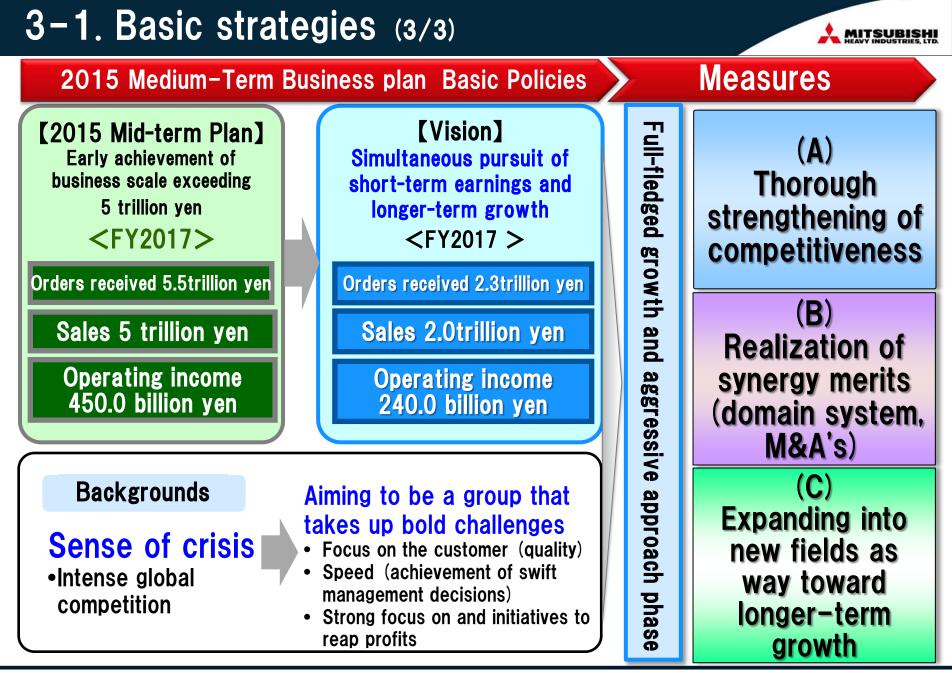
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MHPS: Mitsubishi Hitachi Power Systems, Ltd.

MRJ: Mitsubishi Regional Jet

Primetals: Primetals Technologies, Ltd.



3-2. Numerical targets





3–3. Measures for achieving targets



Simultaneous pursuit of short-term earnings and longer-term growth

(A) Thorough	(B) Realization of	(C) Expanding into new
strengthening of	synergy merits	fields as way toward
competitiveness	(domain system, M&A's)	longer-term growth
 GTCC Conventional Servicing Business Environmental Plant Chemical Plant Nuclear Power Plant 	 Active exchanges of (human) resources Consolidation of bases Restructuring of group companies: elimination of overlapping work functions 	 Oil & Gas Distributed Power Business Development SOFC (Solid Oxide Fuel Cell) Offshore Wind Turbines EMS (Energy Management System) O & M

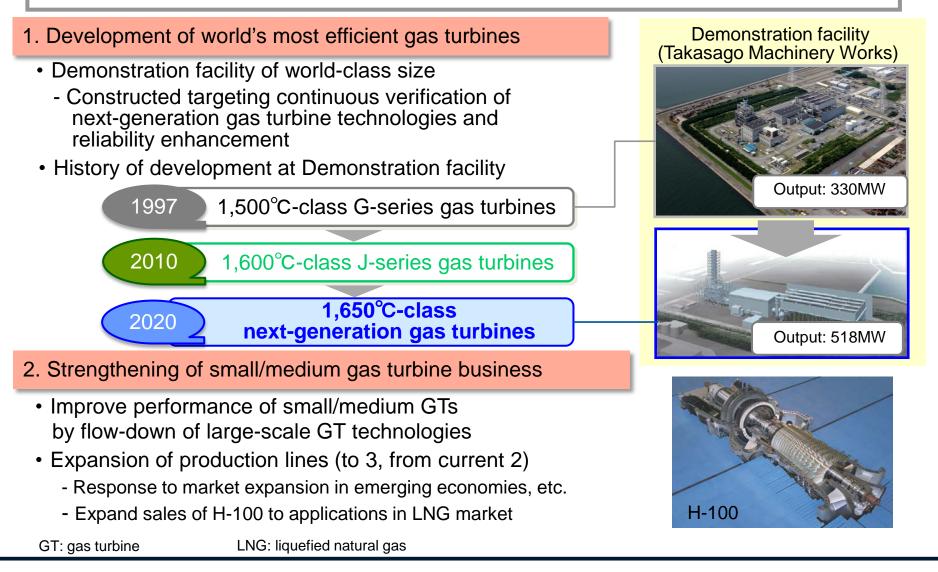


(A) Thorough strengthening of competitiveness

- 1 GTCC
- **2** Conventional
- **3** Servicing Business
- **④** Environmental Plant
- **5** Chemical Plant
- **6** Nuclear Power Plant

(A) **1**GTCC (1/2)

Further strengthening of gas turbine business



(A) (1) GTCC (2/2) Swift response to increased global demand Successive orders for J-Series gas turbines Cumulative orders worldwide: 38 units Increased demand due to lower natural gas prices, expanded product lineups through M&A's Further sales expansion and strengthening of order taking capability M-501 J-Series gas turbine Europe (49units) Asia (232units) Japan (236units) 193 184 Middle East & Africa (174units) 39 North & South America (128units) Takasago, Japan 108Savannah, USA Hitachi, Japan Total orders to date: 826 units Oceania (7units) 🕢 (including 38 J-Series) Quantities as of May 31, 2015

(A) ②Conventional

Further strengthening of conventional plants

Aggressive development of domestic and overseas markets

- Successive orders for 110MW coal-fired plants
- •Orders received for lignite-fired ultra-supercritical projects (Poland, etc.)
- Orders received for 1000MW-class ultra-supercritical project

• Full-scale launch of IGCC plants (540MW at Nakoso, Hirono)



Joban Joint Power Co., Ltd. Nakoso Power Station Unit No.10



Osaki CoolGen Corporation's IGCC demonstration plant (conceptual rendering) (within Chugoku Electric Power Co.'s Osaki Power Station)

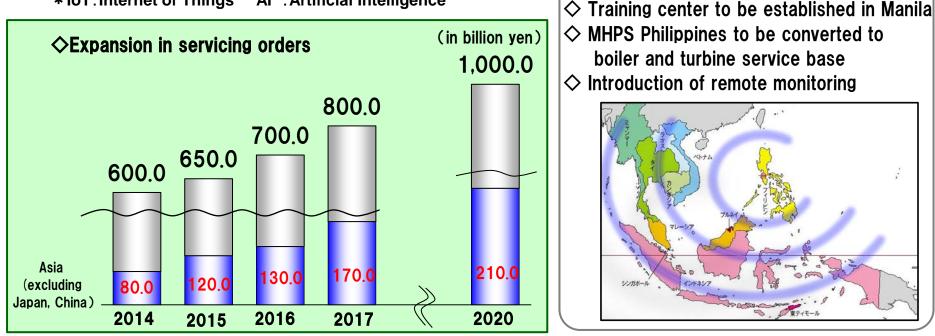
(A) ③Servicing Business

Expansion of servicing business applying new, unconventional methods

- (1) Strengthening of service bases (Saudi Arabia, Philippines, Mexico, etc.)
- **(2)** Focused allocation of human resources into servicing business
- (3) Expansion of servicing business using new technologies
 - •Adoption of advanced inspection and maintenance technologies

Proactive use of IoT and AI

* IoT: Internet of Things AI : Artificial Intelligence







Formation of special service zones (e.g. Southeast Asia)

(A) ④ Environmental Plant

Business scale expansion through product and technology synergies



- Establishment of new JV with FEIDA of China (initiative against Chinese soot dust and PM2.5)
- Establishment of new company dealing in electrostatic precipitators Achievement of full lineup in high-performance flue-gas treatment system components (SCR, EP, FGD)

* SCR: Selective Catalyst Reduction GGH: Gas-Gas-Heater EP: Electrostatic Precipitators FGD: Flue Gas Desulfurization

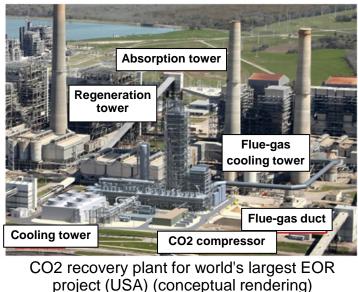
(A) (5) Chemical Plant

Win and increase orders for main product line (fertilizer plant, methanol plant, etc.) by enhancing their competitiveness

- **1.** Conversion of business model
 - (i.e. investment, entering new business)
 - Investment in methanol/dimethyl ether plant for Trinidad & Tobago
- 2. Win and increase orders in Central Asia
 - Fertilizer plant for Turkmenistan
- 3. Commence business in CO2-EOR * Production: Around 5,000 t/day (largest EOR in the world)
 - 4,776t/day plant in USA (world's largest) to commence operations in 4th quarter of 2016
 * C02-EOR (enhanced oil recovery)



Fertilizer complex (ammonia, urea)



(A) 6 Nuclear Power Plant

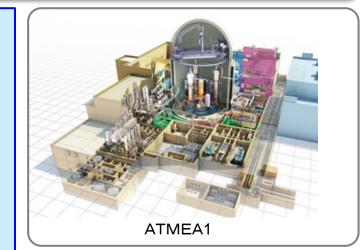
- Contributions to restarts and decommissioning
- Expanded global adoption of ATMEA1 as global strategic reactors

1. Contribution to restarts

- •Focused allocation of human resources and technology into restarts
- Contributions in safety improvement measures

2. Promotion of projects in Turkey and Vietnam

- •Expanded applications of global strategic reactors ATMEA1
- 3. Establishment of department to handle light-water reactor decommissioning projects
 - Provision of new reactor decommissioning solutions







(B) Realization of synergy merits

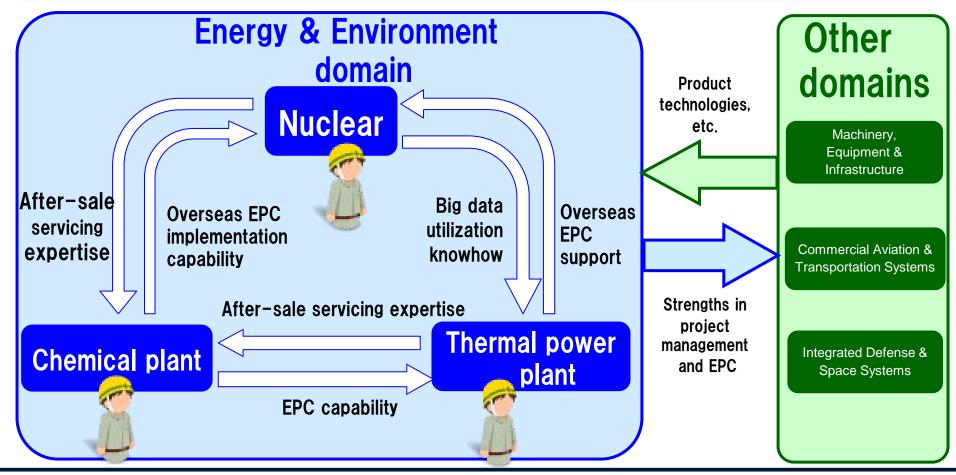
- **1** Active exchanges of (human) resources
- **2** Consolidation of bases
- ③ Restructuring of group companies: elimination of overlapping work functions

(B) ①Active exchanges of (human) resources

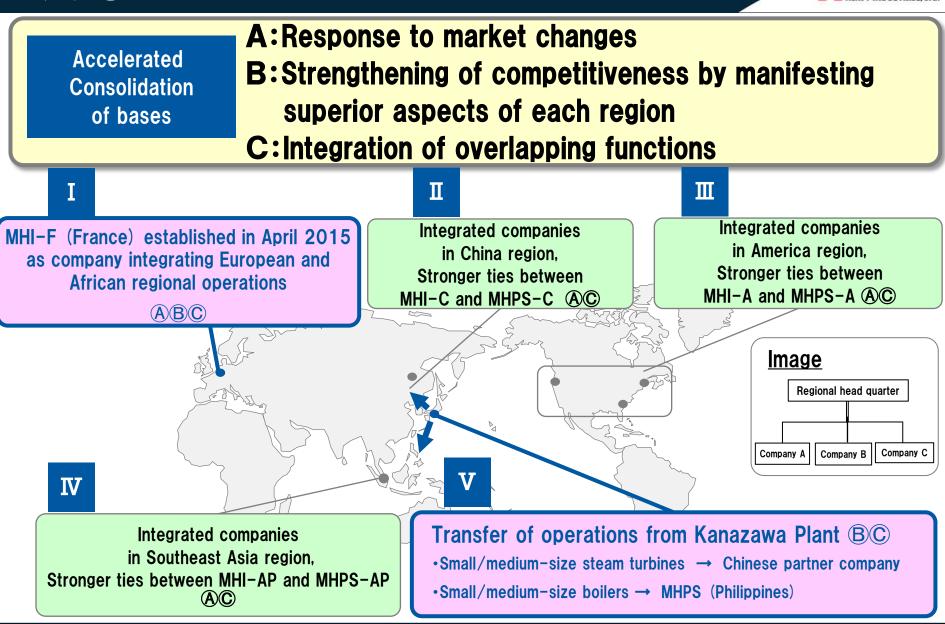
Total:

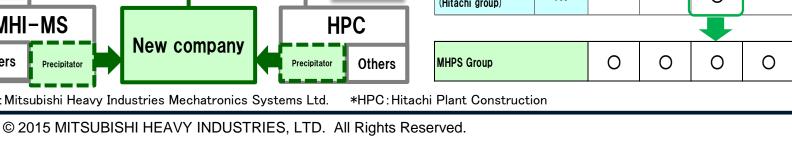
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Active, effective allocation of human resources in response to market changes

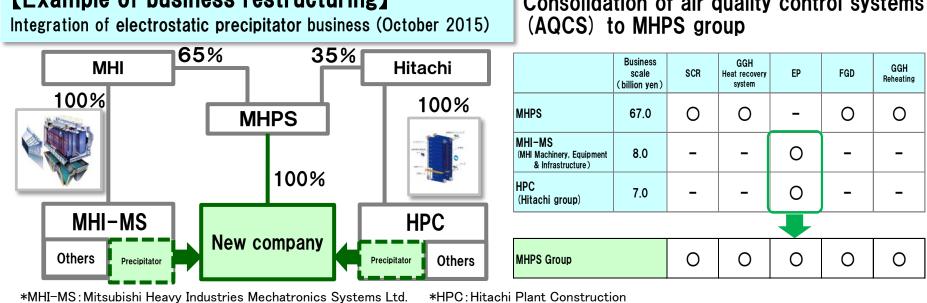


(B) ②Consolidation of bases





 Elimination of overlapping or superfluous facilities in tandem with M&A's and business restructuring – Consolidation of functions to higher competitive bases Elimination of overlapping corporate functions [Example of business restructuring] Consolidation of air quality control systems



 In tandem with business restructuring, restructuring of group companies -Approx. 15% reduction in number of group companies (101 in 2014) \rightarrow 87 in 2017)

(B) ③ Restructuring of group companies; elimination of overlapping work functions





(C)Expanding into new fields as way toward longer-term growth

- **1** Oil & Gas Business Development
- **2** Distributed Power Business Development
- **③** SOFCs (Solid Oxide Fuel Cell)
- **④** Offshore wind turbines
- **5** EMS (Energy Management System)
- **6 0** & M (Operation & Maintenance)

(C) (1) Oil & Gas (1/2)

Expand business scale from approx. 100bn yen to 300bn



* LNG: liquefied natural gas



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- : Energy & Environment
- : Integrated Defense & Space Systems
- : Commercial Aviation &
 - **Transportation Systems**
 - : Machinery, Equipment & Infrastructure

2. Near-term initiatives

- · Promotion of cross-domain activities through establishment of Oil & Gas Business Development Department (April 2015)
- One-stop service depot enabling swift response to diverse customer needs
- Provision of integrated solutions, etc. fusing multiple product technologies
- Development of new models for collaborating with other companies, and expansion of new business areas

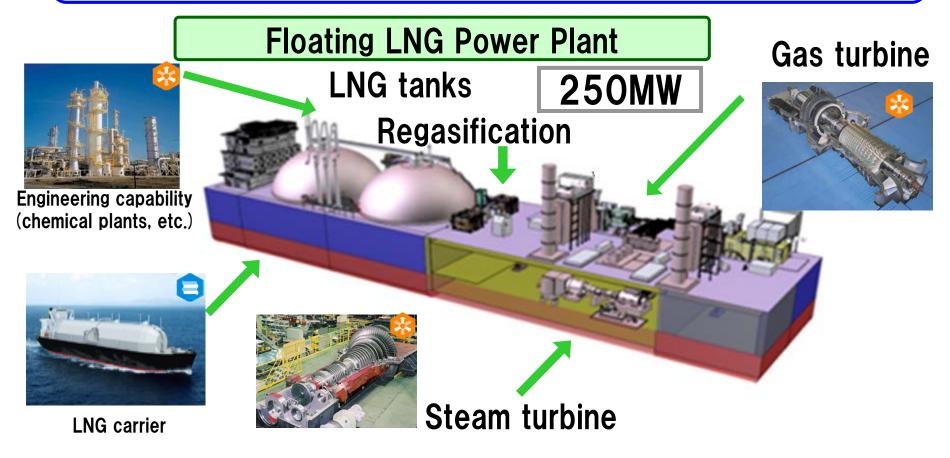
Business scale 300 bn yen 100 bn yen 2018

radiation

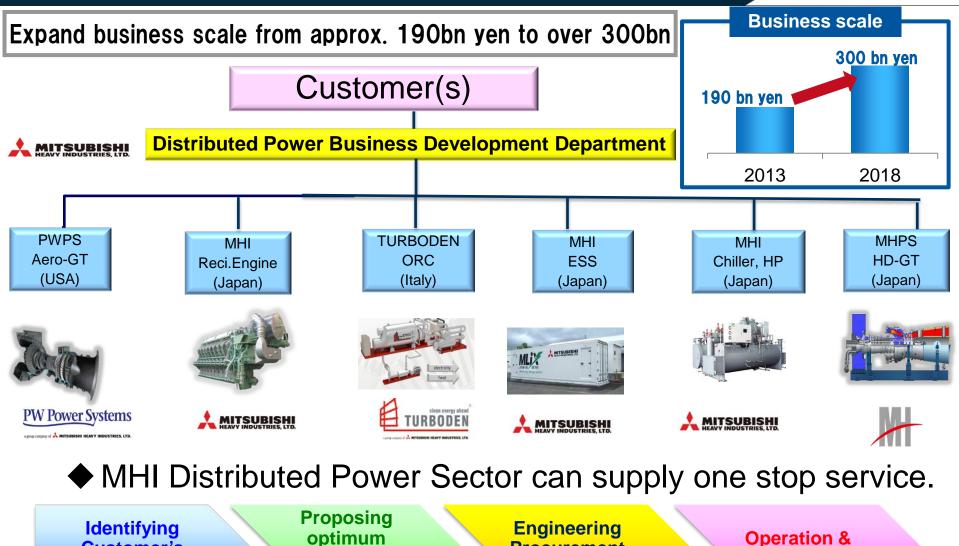


(C) 10il & Gas (2/2)

- In-depth examination of MHI's superiority/organizational capability
 Determination of areas of superiority
- Target : Middle East and Southeast Asia markets



(C) ② Distributed Power Business Development



Identifying Customer's requirement Engineering Procurement Construction

Operation & Maintenance

ORC : Organic Rankine Cycle

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system &

solution

(C) ③SOFC (Solid Oxide Fuel Cell)

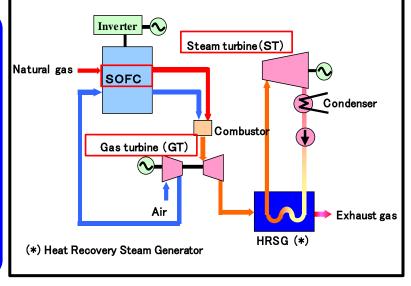
1. 250kW-class SOFC hybrid demonstration unit

Order for hybrid power system integrating SOFC stack with micro gas turbine, from Kyushu University

Target on early realization, in time for 2020 Tokyo Olympic Games



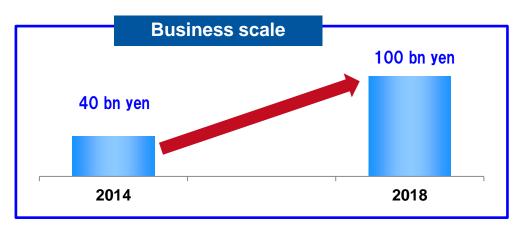
2. Triple combined cycle system Target set on 70% efficiency rating ①SOFC ②Gas turbine ③Steam turbine SOFC-integrated hybrid power system generating electricity in 3 stages



* SOFC (Solid Oxide Fuel Cell)

(C) ④Offshore wind turbines (1/2)

Expand business scale from approx. 40bn yen to 100bn





MHI Vestas Offshore Wind

JV with Vestas of Denmark in April 2014

 [Major recent orders for offshore wind turbines]
 Burbo Bank extension (UK): 32 units (world's largest output: V164-8.0MW)
 Bernsion Project (UK): 116 units (V112, 2.45M)

•Rampion Project (UK): 116 units (V112-3.45MW)

(C) ④ Offshore wind turbines (2/2)



MHI Vestas V164 blade plant

- V164 wind turbine blade manufacturing base
- Location : Isle of Wight, southern England



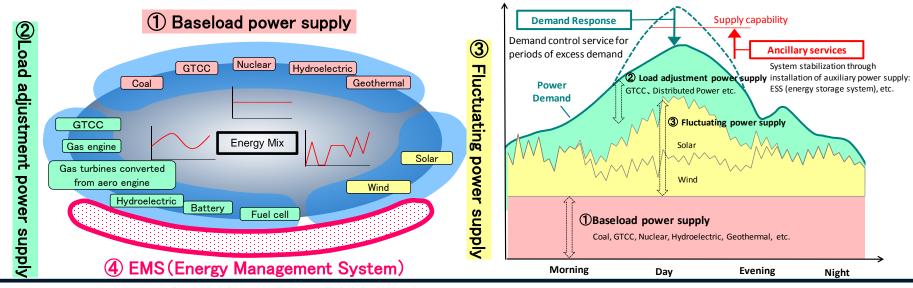


(C) **5**EMS (Energy Management System)



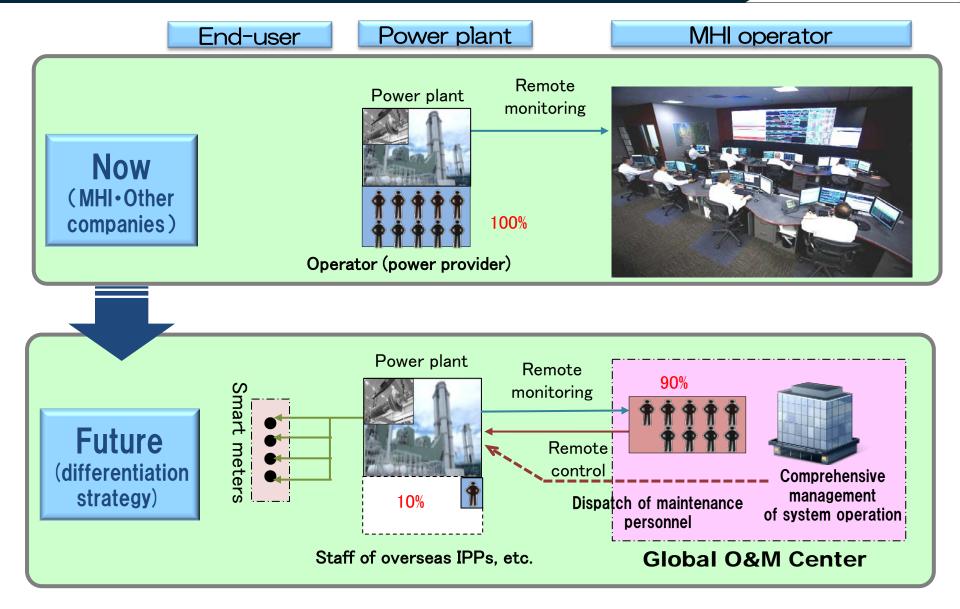
- Response to needs for high performance (energy savings), advanced load adjustment capability and heat/power co-generation capability
 Entry into demond response and another convision capability
- **O** Entry into demand response and ancillary services areas

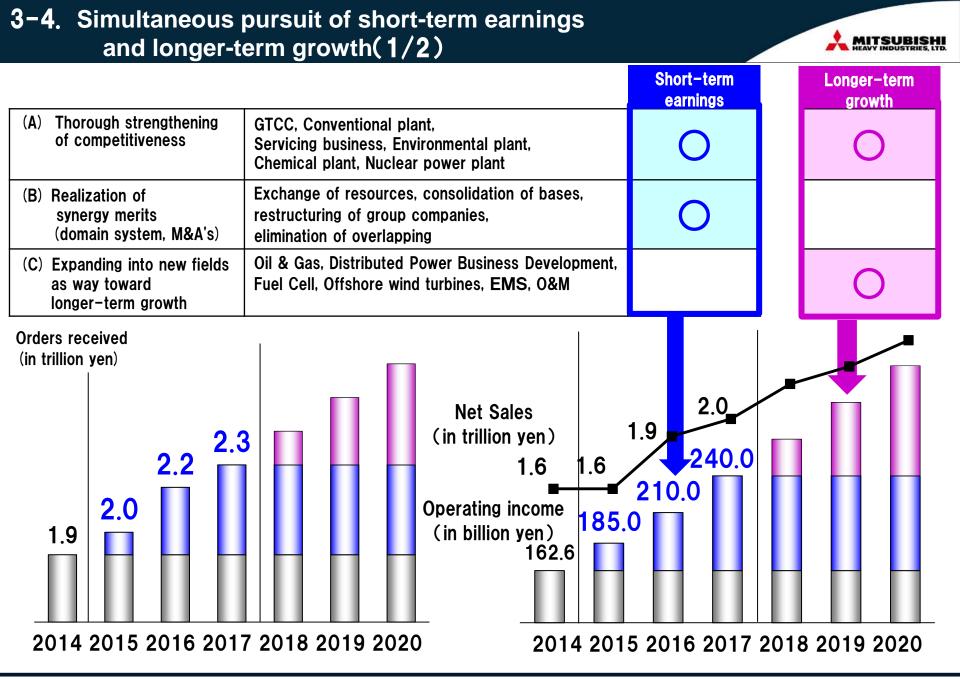
Keihanna Eco City, Next-generation Energy and Social Systems Demonstration Project	Verification of demand response effect Target: approx. 700 households in Kyoto Pref. (Kyotanabe City, Kizugawa City, Seika Town) (Kansai Electric Power, Mitsubishi Electric, MHI)			
Takanohara Area Energy Supply Feasibility Study	Results of Keihanna demonstration ⇒Consideration of feasibility of multi-service supply business model centering on energy (Kansai Electric Power, MHI, Toppan Printing, etc.)			



(C) 60&M (Operation & Maintenance)







3-4. Simultaneous pursuit of short-term earnings and longer-term growth(2/2)



Schedule

		Short-term earnings				long-term growth				
				2015	2016	2017		2018~		
	1. GTCC	large size	▼1,600℃-class GT	Developmer	nt of 1,650℃-clas	s next-generation	GT	Response to increased global demand		
		mid / small size	Flow-do	wn of large	e-scale GT techi	nologies; synergi	es	Response to market expansion in newly emerging economies, etc.		
	2. Conventional		Response to domesti Aggressive developm		'		_ ∸ ➡	→Expansion of overseas development		
			lignite-fired/1000M	N-class ult	ra-supercritical pr			Commencement of IGCC operations at Nakoso and Hirono		
	3. Servicing Business		<mark>Deliv</mark> e LTSA (long-term se					Proactive development of new strengths (technologies)		
(A)			Application of adv		ection/maintenanc			Proactive development of new strengths (technologies)		
Thorough strengthening of competitiveness	4. Environmenal		A (Mar 2015) 🔻 of EP (Oct 2015)	Aggressiv treatment	e development of his systems	h-performance flue	-gas	Response to expanding markets for PM2.5 solutions, etc.		
competitiveness			Methano	l/dimethyl	ether plant for T	rinidad & Tobago				
	5. Chemical Plant	Turkmenistan fe					Successive orders for subsequent plants			
			World's largest(4,776t/day)CO2-EQR plant, for USA							
	6. Nuclear Power Plant Biglobal strategic Plant Biglobal strategic Plant Decommissioning Biglobal strategic Decommissioning						100th anniversary for foundation of Turkey (2023)			
		-	Nuclear power plant projects in Turkey and Vietnam					Promotion of global strategic reactors		
				Establishm	ent of Light-wate	r-Reactor Decom	missi	oning-Project Dept: (July, 2015) Response to decommissioning market		
(B)	1. Active exchange (human) resourc	es of	Establish	ment of MH	IF and MHPSC (A Transfer of ope	pril 2015) rations from Kar	azav	va Plant		
Realization of synergy merits	2. Consolidation of bases		▼ Consolidation of EP business (Octber 2015)							
(domain system, M&A's)			Number of g	group comp	oanies 101 ⇒ 8	7				
(C)	1. O i I & G a s 2. Distributed Power Business				of Oil & Gas Busin	iess Developmen	Dep			
Expanding into new fields as	Development			on in new fields	n in an Dan an Cha		Full-scale entry into new fields			
way toward longer-term	3. SOFC 4. Offshore wind turbines		▼ Establishment o ▼Establishment of MH	Il Vestas Of	a Power Supply B fshore Wind (Apri	usiness promotioi I 2014)	ı vep	St. (July 2014)		
growth	5. EMS 6. O&M				Deregulation of	power industry		Comprehensive energy management		



4. Summary

Pledges as CEO of the Energy & Environment domain

4. Summary



Pledges as CEO of the Energy & Environment domain

2015 Business Plan

Entry into full-scale growth and aggressive approach phase Vigorous implementation of all measures

Transition to a group that boldly takes up challenges

Customer-focused, speedy (faster management decisions), focus on realizing profits, bold challenger
 Simultaneous pursuit of short-term earnings and longer-term growth (business expansion and profitability at the core of Energy & Environment domain)



Our Technologies, Your Tomorrow

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