

# Corporate Strategy

Nov. 2017

**MITSUBISHI ELECTRIC CORPORATION**

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### Note

FY2013: April 1, 2013-March 31, 2014  
FY2014: April 1, 2014-March 31, 2015  
FY2015: April 1, 2015-March 31, 2016  
FY2016: April 1, 2016-March 31, 2017  
FY2017: April 1, 2017-March 31, 2018

# 1. Forecast for FY2017 (Consolidated performance)

(Billions of yen)	FY2013	FY2014	FY2015	FY2016		FY2017	
	Actual	Actual	Actual	6-Month	Actual	6-Month	Forecast (Oct. 2017) 2 <sup>nd</sup> half rate
	100JPY/USD 135JPY/EUR	111JPY/USD 138JPY/EUR	120JPY/USD 133JPY/EUR	105JPY/USD 118JPY/EUR	109JPY/USD 119JPY/EUR	111JPY/USD 128JPY/EUR	105JPY/USD 120JPY/EUR
Net Sales	4,054.3	4,323.0	4,394.3	1,972.3	4,238.6	2,076.3	4,390.0
Operating Income	235.1	317.6	301.1	121.7	270.1	149.2	315.0
(%)	5.8%	7.3%	6.9%	6.2%	6.4%	7.2%	7.2%
Income before income taxes	248.9	322.9	318.4	123.7	296.2	185.2	350.0
Net Income	153.4	234.6	228.4	88.3	210.4	131.1	250.0
ROE (Return On Equity)	10.9%	13.9%	12.4%	-	10.9%	-	
Shareholders' Equity	1,524.3	1,842.2	1,838.7	1,777.6	2,039.6	2,170.5	
(%)	42.2%	45.4%	45.3%	46.6%	48.9%	52.2%	
Debt	373.4	381.9	404.0	370.7	352.1	338.5	
(%)	10.3%	9.4%	10.0%	9.7%	8.4%	8.1%	
FCF (Free Cash Flow)	310.2	180.1	111.2	118.6	217.3	39.8	
Dividend (yen per share)	17	27	27	9	27	14	
Dividend ratio(%)	23.8%	24.7%	25.4%	-	27.5%	-	

# 1. Forecast for FY2017 (Segment Forecast)

		FY2013	FY2014	FY2015	FY2016	FY2017
		Actual	Actual	Actual	Actual	Forecast (Oct. 2017)
(Billions of Yen)		100JPY/USD 135JPY/EUR	111JPY/USD 138JPY/EUR	120JPY/USD 133JPY/EUR	109JPY/USD 119JPY/EUR	108JPY/USD 124JPY/EUR
Energy & Electric Systems	Net Sales	1,180.0	1,228.9	1,264.6	1,227.9	1,250.0
	Operating Income/Loss	76.3	72.4	50.3	44.3	61.0
	(%)	6.5%	5.9%	4.0%	3.6%	4.9%
Industrial Automation Systems	Net Sales	1,098.7	1,282.7	1,321.9	1,310.1	1,420.0
	Operating Income/Loss	98.0	145.9	159.1	140.0	177.0
	(%)	8.9%	11.4%	12.0%	10.7%	12.5%
Information & Communication Systems	Net Sales	548.2	559.5	561.1	447.7	450.0
	Operating Income/Loss	5.5	18.9	14.9	12.7	15.0
	(%)	1.0%	3.4%	2.7%	2.8%	3.3%
Electronic Devices	Net Sales	194.6	238.4	211.5	186.5	200.0
	Operating Income/Loss	10.0	30.1	16.8	8.3	13.0
	(%)	5.2%	12.7%	8.0%	4.5%	6.5%
Home Appliances	Net Sales	944.3	944.8	982.0	1,004.4	1,030.0
	Operating Income/Loss	52.8	54.2	63.8	69.6	56.0
	(%)	5.6%	5.7%	6.5%	6.9%	5.4%
Others	Net Sales	676.0	740.5	707.7	713.6	730.0
	Operating Income/Loss	19.8	23.7	23.6	23.2	23.0
	(%)	2.9%	3.2%	3.3%	3.3%	3.2%
Total	Net Sales	4,054.3	4,323.0	4,394.3	4,238.6	4,390.0
	Operating Income/Loss	235.1	317.6	301.1	270.1	315.0
	(%)	5.8%	7.3%	6.9%	6.4%	7.2%

\*Inter-segment sales are included in the above chart.

## 2. Management Policy

### Maintain Balanced Corporate Management for Sustainable Growth



### Toward a Higher Level of Growth

#### Growth Targets to be Achieved by FY2020

- Net Sales 5 trillion yen or more
- OPM 8% or more

#### Management Targets to be Continuously and Stably Achieved

- ROE 10% or more
- Debt Ratio 15% or less

The debt ratio target, "15% or less," represents the Company's financial discipline, which will allow the Company to secure the financing capability to raise necessary funds for further, greater investment.

#### Strive for Continuous Innovation

Through continuous innovation, we develop new frontiers.

#### Pursue the Satisfaction of the Four Stakeholder Categories

Social Contributions

Excellent Products and Services

**Society**

**Customers**

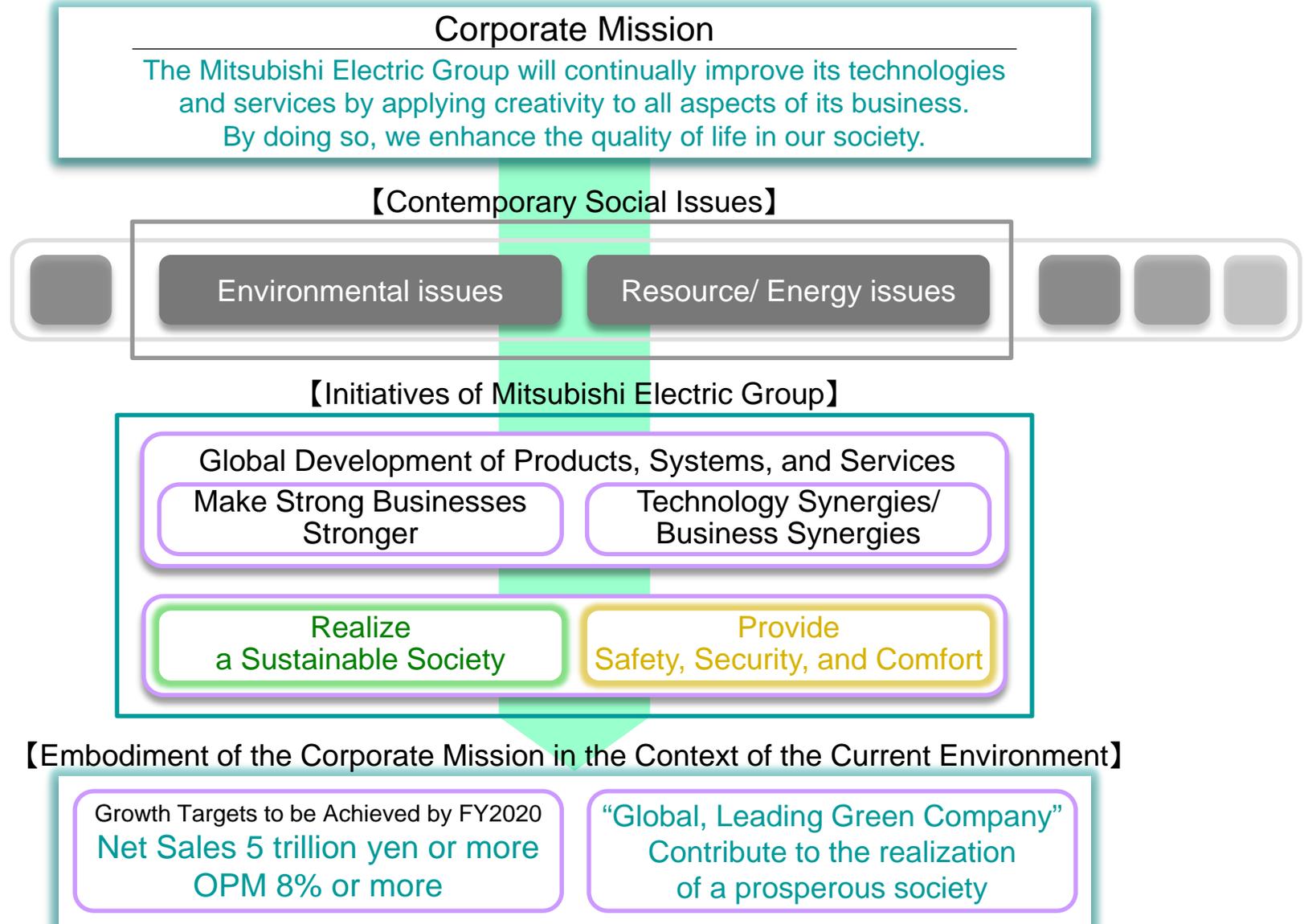
Increase Corporate Value

Rewarding Workplace

**Shareholders**

**Employees**

### 3. Embodiment of the Corporate Mission



## 4. Simultaneously Achieve a “Sustainable Society” and “Safety/ Security/ Comfort”

### Realize a sustainable society

#### Low-carbon society

[examples]

#### SiC power module mounted products

All-SiC power module inverter equipment for railcars

- Achieved significant miniaturization and 40% increased energy-savings compared to before



High efficiency packaged air-conditioner for shops/ offices

- Realize high levels of energy-savings (APF 5.5) by all-SiC DIPIPM and high efficiency compressors
- Reduce environmental impact by adopting low global warming potential refrigerant R32

#### Hybrid battery energy storage system



Contribute to expanding the introduction of renewable energies by a coordinated control of storage batteries with different features (e.g. Amount of renewable energy which can be introduced in Oki islands increased from c. 3,000kW→ c. 11,000kW)

#### Resource conservation/ Recycling

[examples]

#### Aftermarket service

Renewal of elevators (minimum refurbishing), etc.

#### Recycling (home appliances)

Use technology to sort main plastics (PP/ PS/ ABS) from mixed plastics of home appliances and reuse them in the Company's products (Closed recycling)

#### Reduce environmental burden

[examples]

#### Improve environmental management level of domestic and overseas manufacturing bases

### Provide safety, security, and comfort

#### Security

Provide security systems for buildings and factories according to their varying security levels



[examples]

#### Safe driving assistance

Realize a safe and comfortable motorized society through advances in driving-assistance technology which combine automobile control/ HMI/ communication/ sensors technologies

#### Artificial satellite

- Contribute to monitoring weather phenomenon, global environment, understanding disaster situations, and surveillance of marine and forest environments
- Improve safety precision of automated driving systems and realize appropriate maintenance of social infrastructure by utilizing high-accuracy positioning information (Utilizing of quasi-zenith satellites)
- Contribute to the development of communication and broadcast infrastructure in each area through developing communication satellites

#### Safety standard (FA equipment)

Provide safety and security to production sites around the world through the wide range of product lineup, which are certified by international safety standards, assisting a sustainable increase in productivity

#### Room air conditioner

Improve comfort by advanced sensing technology and prediction prefetching driving of “Move Eye mirA.I.”

L-774 mirA.I.



Respect human rights and promote the active participation of diverse human resources  
Promote diversity (hire and utilize diverse talents), etc.

Strengthen corporate governance and compliance on a continuous basis  
Promote CSR procurement (such as environment, quality, human rights, compliance), etc.

- Selected as the CDP A list company (the top award) for “Climate” and “Water” for 2 years in a row



- Selected as a stock name included in the FTSE4 Good Index Series, an index for SRI



FTSE4Good

- Chosen as a stock name for all of the 3 ESG indexes which GPIF adopts
- FTSE Blossom Japan index
- MSCI Japan ESG Select Leaders Index
- MSCI Japan Empowering Women Index (WIN)

Mitsubishi Electric Group will contribute to SDGs by further pursuing sustainable growth

SDGs: “Sustainable Development Goals” adopted by the United Nations as goals to achieve towards 2030



\*SiC: Silicon Carbide, DIPIPM: Dual Inline Package Intelligent Power Module, APF: Annual Performance Factor, PP: Polypropylene, PS: Polystyrene, ABS: Acrylonitrile Butadiene Styrene,

HMI: Human Machine Interface, SRI: Socially Responsible Investment, ESG: Environment/ Social/ Governance, GPIF: Government Pension Investment Fund

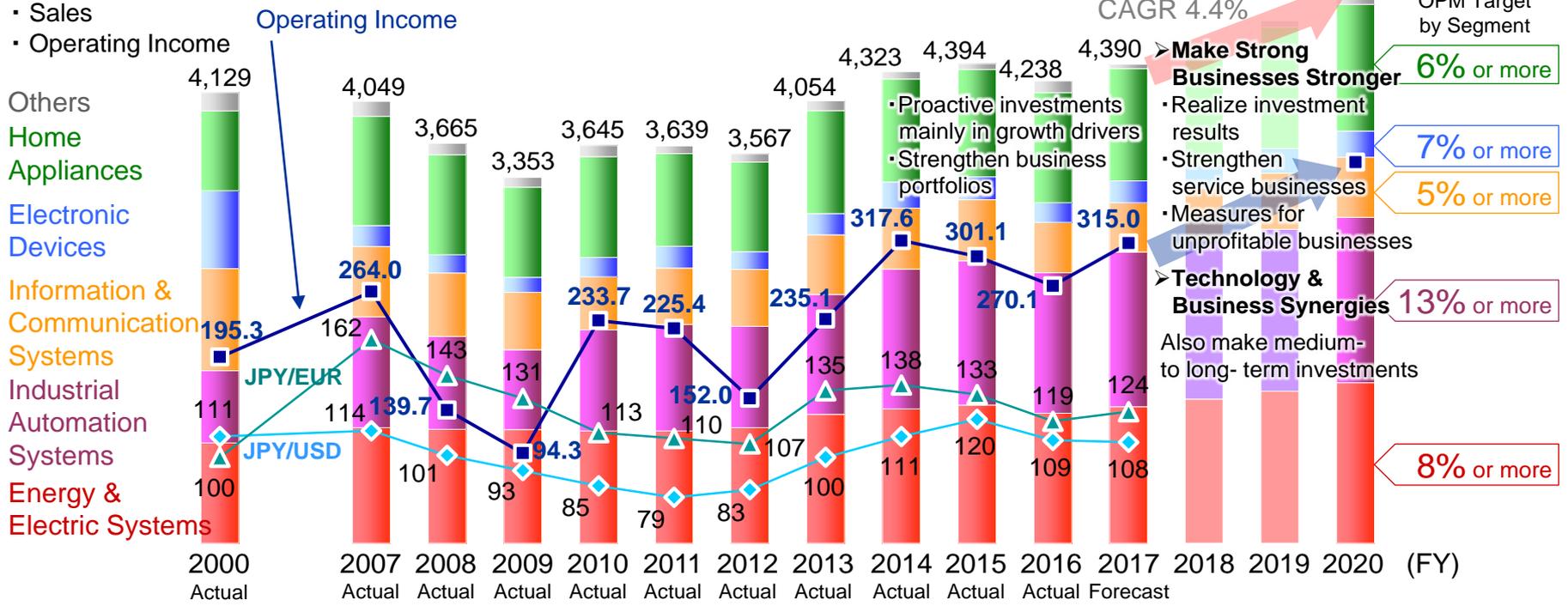
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# 5. Pursue Sustainable Growth

## (1) Ensure "High-Quality" Growth

Billions of yen

- Sales
- Operating Income



%

OPM 4.7 6.5 3.8 2.8 6.4 6.2 4.3 5.8 7.3 6.9 6.4 7.2 **8% or more** Growth Target

ROE 18.2 15.1 1.3 3.1 12.4 10.3 5.7 10.9 13.9 12.4 10.9 **10% or more**

Debt ratio 33.6 15.8 20.3 16.7 14.5 16.0 15.9 10.3 9.4 10.0 8.4 **15% or less**

To Be Continuously and Stably Achieved

\*CAGR: Compound Average Growth Rate

## 5. Pursue Sustainable Growth

### (2) Initiatives in FY2016 (Overview)

#### Strengthen development and production systems to enhance global expansion (Capital investments)

- Started operation of new elevator plants (AMEC in Thailand: May 2016, IMEC in India: Sep. 2016)
- Established a new company to develop/ produce room air-conditioners (MACT in Turkey: Registration Apr. 2016, Production start planned for Jan. 2018)
- Strengthen system for aftermarket service and production for FA products (Nagoya Works: New building operation started Oct. 2016, MEAMC in China: New plant construction completed Mar. 2017)
- Commenced construction of new automotive equipment plant (Himeji Works: Production start planned for May 2018)
- Commenced construction of new plant for satellite equipment (Kamakura Works: Production started Oct. 2017) etc.

#### Drive technological development for further value creation (R&D)

- Started operation of demonstration facility for middle-voltage direct current distribution (Power Distribution Systems Center: Jul. 2016)
- Development of automated design deep-learning algorithm (the world first\*1) and high-speed training algorithm for deep-learning (Announced Oct. 2016)
- Development of DC circuit breaker technology (the world's fastest\*2) for railway power-supply system (Announced Jan. 2017)
- Development of the world's smallest\*3 SiC inverter for HEV (Announced Mar. 2017)
- Development of automated mapping technology and extraction of transitions technology for high precision 3D maps (Announced Mar. 2017) etc.

\*1 As of Oct. 7, 2016 (Own company research) \*2 As of Jan. 30, 2017 (Own company research) \*3 As of Mar. 9, 2017 (Own company research)

#### Reallocate management resources to growth businesses (Strengthen the business portfolio)

- Consolidated and reorganized the subsidiaries under Italy's commercial air-conditioning business (Formerly DeLclima) (Jan. 2017)
- Transferred the mobile phone sales company (Apr. 2016)

#### Others

- Established Dynamic Map Planning Co., Ltd. (Jun. 2016)
- Named as one of CDP "A list" companies (in 3 areas): Climate change, Water, Supplier (climate change/ water)
- "Director General Prize of Agency of Natural Resources and Energy" at the New Energy awards for FY2016: Station energy saving inverter (S-EIV<sup>®</sup>)
- "Director General Prize of Agency of Natural Resources and Energy" at the Energy Conservation Grand Prize awards for FY2016: Realize an energy-saving factory using IoT technology (Nagoya Works)
- "Nikkei Industrial Daily prize" for the 35<sup>th</sup> Nikkei Superior Products/ services Award for FY2016: Ultra high speed elevator etc.

## 5. Pursue Sustainable Growth (3) Global Expansion

View on strengthening business competitiveness and realizing results

- Up to FY2020, expand business mainly in Japan, North America, Europe and China
- Growth in revenue as a result of investment into emerging markets will come to fruition after FY2020

### Japan

Achieve stable growth and greater profitability as a core operating region to drive business expansion

【Major initiatives since FY2014】\*

- [P] • The demonstration facility for MVDC distribution at the Power Distribution Systems Center (Jul. 2016)
- HVDC verification facility at Transmission and Distribution Systems Center (1<sup>st</sup> half of FY2018)
- [T] • New plant in Itami Works (Apr. 2015)
- New plant for control panels in Kobe area (Jun. 2016)
- [B] • Opened new training center for Inazawa Works (Jun. 2016)
- [AR] • Engineering facility for Air-Conditioning & Refrigeration Systems Works (Mar. 2016)
- Development engineering/ testing facility at Shizuoka Works (Jun. 2019)
- [FA] • New aftermarket service support facility at Nagoya Works (Oct. 2016), The 2<sup>nd</sup> FA development center (Jul. 2017)
- [AE] • Developed next-generation driving-assistance technology concept car “EMIRAI4” (Oct. 2017)
- Himeji Works’ new plant (May 2018)
- [S] • Established Dynamic Map Planning Co., Ltd. (Jun. 2016), Increased capital investment (Jun. 2017)
- Kamakura Works’ new plant (Oct. 2017, Oct. 2019)

### North America/ Europe/ China

Achieve greater competitiveness in current markets

while increasing the scale of operations

【Major initiatives since FY2014】\*

#### North America

- [T] • Strengthened MEPPi maintenance system (May 2014)
- [AE] • Strengthened MEAA production system (Oct. 2014, Jan. 2016)

#### Europe

- [T] • MEKT (Italy) (Apr. 2014)
- Invested (capital participation) MEDCOM (Poland) (Oct. 2015)
- [AR] • Wholly acquired DeLclima (Italy) (Feb. 2016), and consolidated and reorganized their subsidiaries (Jan. 2017)
- [AL] • MER (Russia) (Nov. 2014)
- Established MEU Norway branch (Oct. 2015)

#### China

- [B] • MESE’s new plant (Nov. 2015)
- [FA] • MEAMC’s the 2<sup>nd</sup> plant (Apr. 2017), Expansion of the 2<sup>nd</sup> plant (Oct. 2018)

[P] Power Systems	[FA] FA Systems
[T] Transportation Systems	[AE] Automotive Equipment
[B] Building Systems	[S] Space Systems
[AR] Air-Conditioning & Refrigeration Systems	[AL] ALL

\*The month/ year in brackets note when the facilities started/ will start operation

### Asia (excl. China)/ Others

Cultivate new markets by developing local business networks

【Major initiatives since FY2014】\*

#### Thailand

- [P] • ME-TH as a sales company (Aug. 2015)
- [B] • AMEC’s new plant (May 2016), new elevator test tower (Jun. 2017)
- [AR] • MCP’s new building (Jul. 2015)
- Established MKY training center (Aug. 2015)

#### Myanmar

- [AL] • Established MEAP Yangon branch (Apr. 2014)

#### Korea

- [B] • KMEC’s new plant (Feb. 2018)

#### India

- [T] • MEI’s new plant (Nov. 2015)
- [B] • IMEC’s new plant (Sep. 2016)

#### Turkey

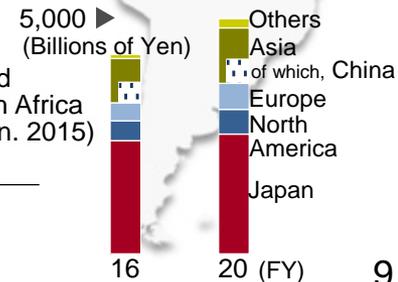
- [AR] • Established MACT (Apr. 2016), start operation of new plant (Jan. 2018)

#### Mexico

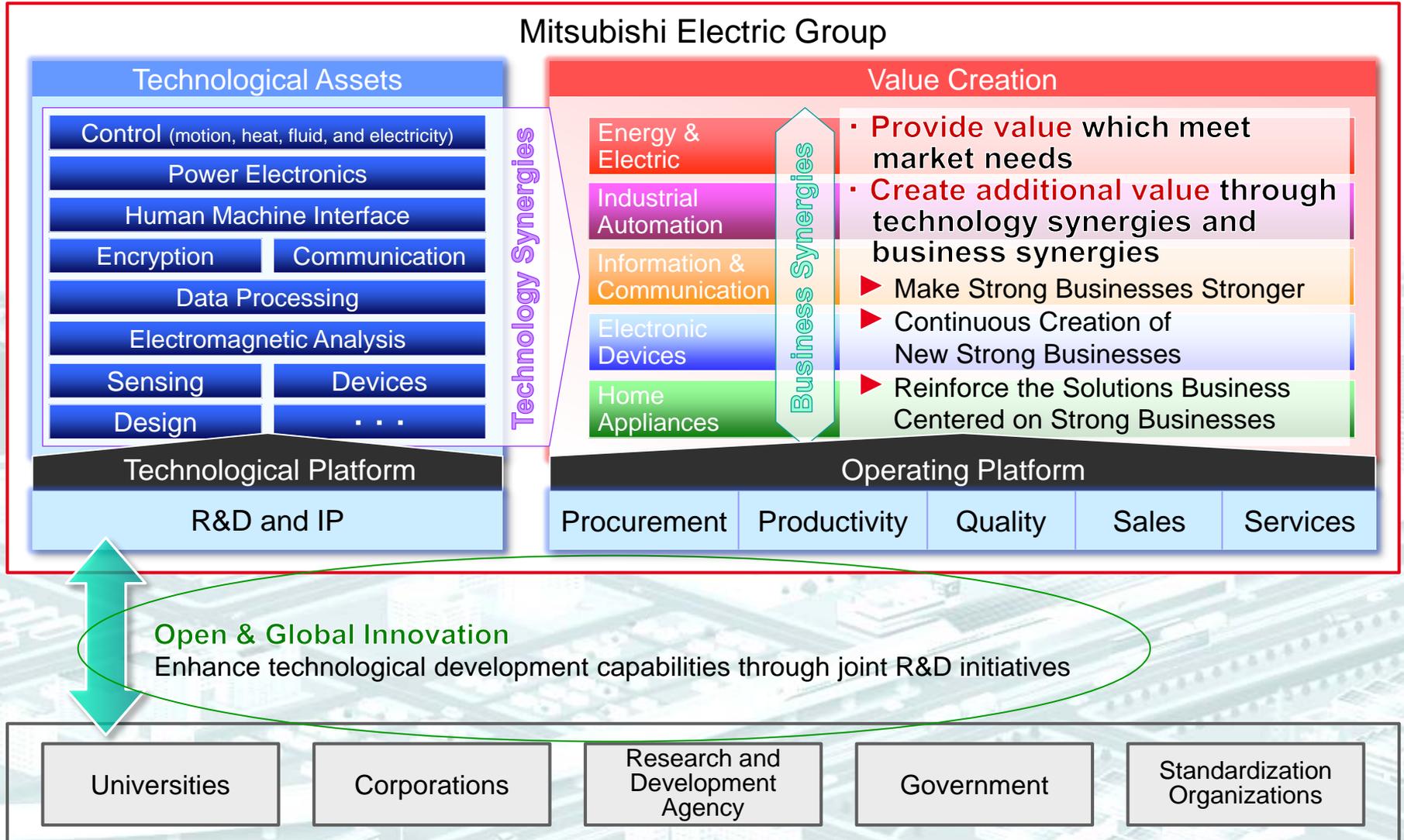
- [AE] • MEAX (Oct. 2014)

#### South Africa

- [AL] • Established MEU South Africa branch (Jun. 2015)

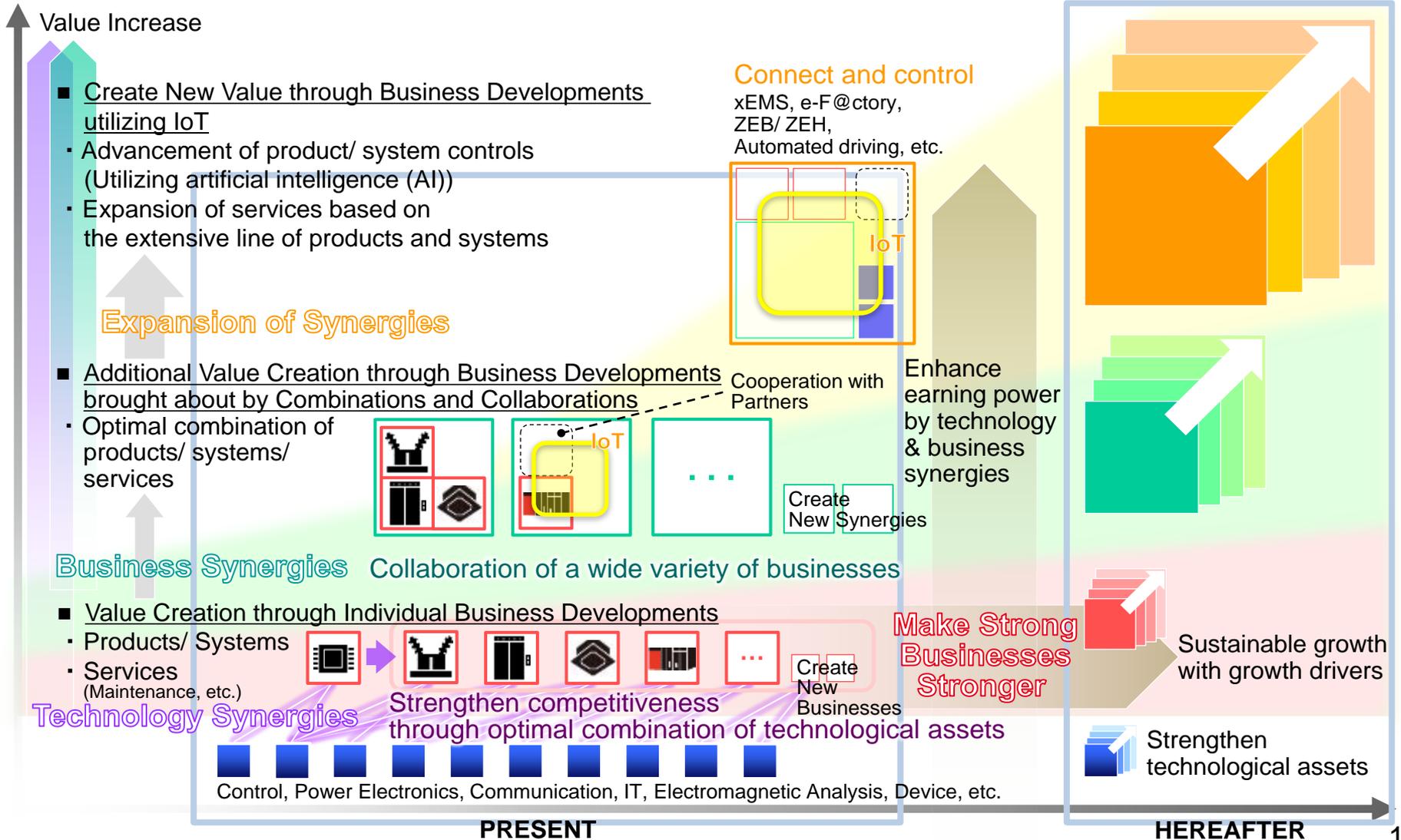


## 6. Growth through Value Creation (1) Overview



## 6. Growth through Value Creation

### (2) Expansion of Products/ Systems/ Services and the Way to Create Value



\*EMS: Energy Management System, ZEB: net Zero Energy Building, ZEH: net Zero Energy House

# 7. Make Strong Businesses Stronger

## (1) Growth Drivers

### Energy & Electric Systems

- **Power Systems**  
Power generation systems, Transmission & distribution systems, Power distribution systems, Particle therapy systems, etc.
- **Transportation Systems**  
Inverters, main motors and air conditioning systems for railcars, Train Vision, Train control and management systems, Railcar operation management systems, Signaling systems, etc.
- **Building Systems**  
Elevators, Escalators, Building management systems, etc.
- **Public Systems**  
Water treatment systems, Disaster prevention systems, etc.



# Growth Drivers



### Industrial Automation Systems

- **Factory Automation (FA) Systems**  
PLCs, AC servomotors, CNCs, Industrial robots, Laser processing machines, etc.
- **Automotive Equipment**  
Starters, Alternators, EPS system products, Car multimedia, Electric powertrain system, ADAS products, etc.



### Information & Communication Systems

- **Space Systems**  
Satellites, Ground systems for satellite control, etc.
- **Defense Systems**  
Radar equipment, Antennas, etc.
- **Communication Systems**  
Optical, wireless and satellite communications systems, etc.
- **Video Monitoring Systems**  
Network camera systems
- **IT Solution**

### Electronic Devices

- **Power Devices**  
SiC modules, IGBT modules, etc.
- **High Frequency and Optical Devices**  
High frequency devices (GaN and GaAs), Optical devices, etc.
- **TFT LCD Modules**

### Home Appliances

- **Air-Conditioning & Refrigeration Systems**  
Room and package air conditioners, Multiple AC units for buildings, Lossnay ventilation systems, Chillers, etc.
- **Housing Equipment**  
Smart appliances, Lighting, HEMS, etc.
- **Kitchen and Other Household Appliances**

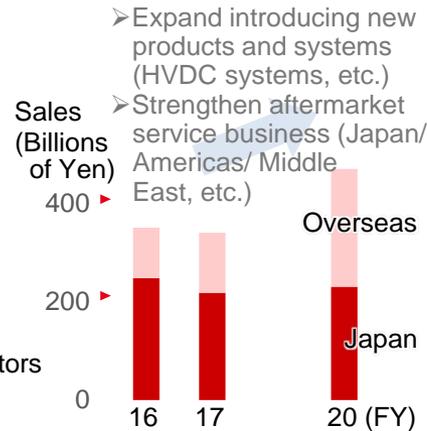
\*EPS: Electric Power Steering, ADAS: Advanced Driving Assistant System, IGBT: Insulated Gate Bipolar Transistor, GaN: Gallium Nitride, GaAs: Gallium Arsenide, HEMS: Home Energy Management System

## 7. Make Strong Businesses Stronger (2) Value Creation in Growth Drivers

### Power Systems Business

Provide a highly efficient, environment friendly products and systems from power generation to transmission and distribution which contribute to the stable supply of electricity

- Stabilize the power system when renewable energy use expands  
Provide power electronics systems (such as HVDC systems) and high-capacity energy storage systems, etc.
- Contribute to building the infrastructure which underpins the electricity system reforms  
The Company's share in smart meter (communication system): 5 out of 10 Japanese electric power companies
- Maintain aging products, and respond to needs for replacement into high efficiency products with a shorter construction period  
Respond to advancing needs, such as inspection of turbine generators by ultra-thin robots (Total number of turbine generators delivered: c. 2,100 units, of which aged equipment: c. 1,000 units)



- ▶ Expand introducing new products and systems (HVDC systems, etc.)
- ▶ Strengthen aftermarket service business (Japan/ Americas/ Middle East, etc.)
- Launched D-SMiree system for MV/ LV DC Distribution (Jul. 2016)
- Started to build HVDC verification facility at Transmission and Distribution Systems Center (Oct. 2016)
- Established companies which will construct and operate the world's state-of-the-art coal-fired power plant (in relation to Fukushima's reconstruction) (Oct. 2016)
- Developed a ultra-thin inspection robot for power generators (Jan. 2017)
- Started to provide the solutions that utilize IoT Platform "INFOPRISM" for Social Infrastructure & Energy Systems (Nov. 2017)

### Transportation Systems Business

Optimize the total energy of railway transport by leveraging the strength of products and systems which can realize "driving" "braking" and "controlling" in a single company

- Improve energy efficiency of railcars and regenerative power during braking  
Launched compact and lighter high efficiency models (railcar traction inverter and APS with all-SiC power modules, and air-conditioning equipment for railcars)
- Energy conservation of the station building as a whole  
Launched station energy saving inverter (S-EIV<sup>®</sup>) which supply excess regenerative power to the station's power facilities
- Safe and efficient train operation using train control which applies wireless technology (CBTC)
- Energy-savings by replacing railcar electrical products to high-efficiency models  
Expand renewal/ maintenance/ aftermarket service utilizing the local sales bases



- ▶ Capture demand in Japan/ Europe/ India, etc. (Reap the results of investment)
- ▶ Strengthen aftermarket service business (Europe/ Americas, etc.)
- Was awarded a contract for the verification and testing of CBTC system by MTA New York City Transit (Jan. 2016)
- Was awarded a contract for railcar air conditioning system for Rhine-Ruhr express train network (Mar. 2016)
- Received orders from the Transport for New South Wales for railcar electric equipment (Sep. 2016)
- Productized storage battery-type auxiliary power device for small-scale train stations (S-EIV<sup>®</sup>) (Sep. 2016)
- Started commercial operation of the mass production E235 railcar installed with all-SiC inverter, for East Japan Railway Company (May 2017)

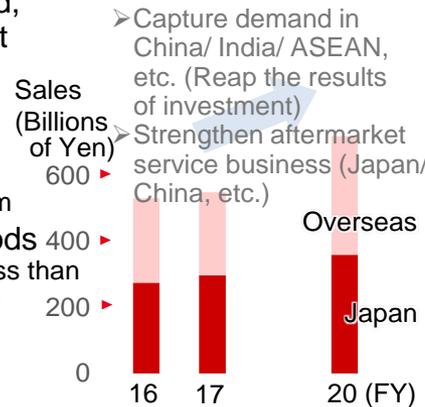
## 7. Make Strong Businesses Stronger

### (2) Value Creation in Growth Drivers

#### Building Systems Business

Provide total support from new installation to maintenance, and renewal, through highly safe and reliable products as well as high field engineering capabilities

- Provide safety and reliability based on a rich track record, and achieve energy-savings by reducing size and weight of product lineup
- Reduce operation cost and energy consumption of the total building
  - Monitor and control building facilities such as air conditioning, lighting and enter/ exit situation with a building management system
- Minimize the downtime of elevators during renewal periods
  - Started to provide new renewal products which realize "0 days" (less than 24 hours) of continuous downtime for elevators during construction (Number of units up for renewal by FY2020: c. 90,000 units)
- Provide premium maintenance services
  - Strengthen maintenance system and expand services

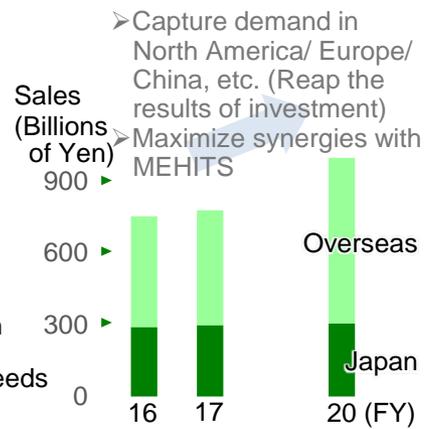


- Capture demand in China/ India/ ASEAN, etc. (Reap the results of investment)
- Strengthen aftermarket service business (Japan/China, etc.)
- Launched "NEXIEZ-S" for low rise residential and office buildings (Aug. 2016)
- Started operation of IMEC (Sep. 2016)
- Launched "Elemotion+[ZERO]" for elevator renewals (Dec. 2016)
- Registered as a ZEB Planner (May 2017)
- Expanded the specification for the standard-type elevator "AXIEZ" (Jun. 2017)
- Expanded the elevator types which are subject to Elemotion+[ZERO] (approx. 50% of elevators manufactured by the Company which will be up for renewals in FY2020) (Oct. 2017)

#### Air-Conditioning & Refrigeration Systems Business

Respond to energy-saving needs unique to the region through high functionality/ high efficiency devices and advanced control technologies

- Respond to environmental and energy-saving regulations, and lower environmental burden
  - Adopt technologies such as all-SiC DIPIM mounting, aluminum flat tube heat exchanger, and high efficiency compressors
  - Adopt refrigerant R32
  - Adopt our original Flash Injection Circuit (to achieve both high heating capability and high energy efficiency under cold external temperatures)
- Respond closely to the needs of different regions
  - Respond to the broad range of needs from room air-conditioning to large size air-conditioning and refrigeration systems including chillers mainly in Europe, through the acquisition and consolidation of DeLclima (currently: MEHITS)
  - Launch heating and hot-water supply system meeting European needs
- Develop renewal and maintenance business
  - Renew into new-refrigerant air conditioner in a shorter construction period using existing piping (replace models)
  - Accelerate receiving orders for maintenance services through collaboration with building systems business (Japan)
  - Strengthen facility operating systems and remote management services (overseas) (Italy: RMI)



- Capture demand in North America/ Europe/ China, etc. (Reap the results of investment)
- Maximize synergies with MEHITS
- Achieved 100% ownership of Italy's commercial HVAC company DeLclima (Feb. 2016)
- Started operation of the new engineering facility at the Air-Conditioning & Refrigeration Systems Works (Mar. 2016)
- Established MACT (Apr. 2016)
- Started operation of Iwade logistics center at the Air-Conditioning & Refrigeration Systems Works (Jun. 2016)
- Consolidated and reorganized subsidiaries under formerly DeLclima (Jan. 2017)
- Launched a room air-conditioner with "Move Eye mirA.I.", the world's first\* AI application which predicts the sensible temperature (Nov. 2017)

\*as of Nov. 2017, own research

# 7. Make Strong Businesses Stronger

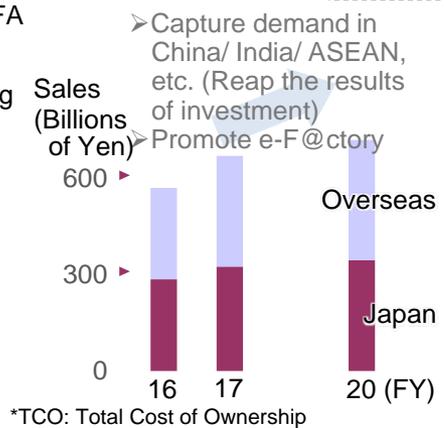
## (2) Value Creation in Growth Drivers

### Factory Automation (FA) Systems Business

Propose an optimal “manufacturing method” made possible by the evolution of “e-F@ctory”, the FA-IT integrated solution

[e-F@ctory] Propose solution which reduces total cost across the phases of development/ production/ and maintenance, utilizing FA technology and IT

- TCO reduction through “e-F@ctory”
  - Improve real-time information gathering capabilities through rich FA product lines and network formations, and support multi-cycle, flexible production system with different models and quantity
  - Improve factory utilization, delivery timing and quality by proposing automation using robots
- Develop products meeting the global needs
  - Elevate response capabilities to meet local needs and various international standards, through expansion of overseas development centers (in Europe/ China/ India)
- Strengthen support systems
  - Implement initiatives towards remote services using IT (electrical discharge/ laser processing machine)
  - Continue to strengthen service bases such as Global FA Centers (including satellite bases) (50 locations in 30 countries)

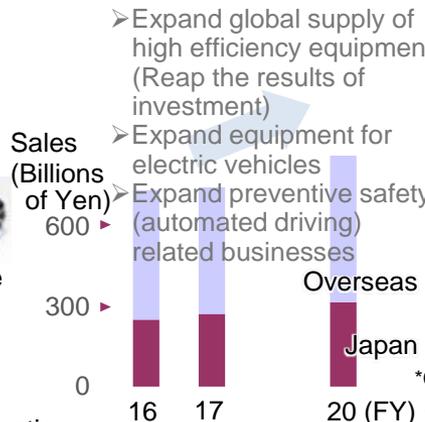


- Completed the 2<sup>nd</sup> plant of MEAMC (Mar. 2017)
- Started operation of two additional FA Centers in Mexico (May 2017)
- Supported the establishment of Changshu Innovation Center for Green & Intelligent Manufacturing (Jul. 2017)
- Completed the 2<sup>nd</sup> FA development center in Nagoya Works (Jul. 2017)
- Started expansion of the 2<sup>nd</sup> plant of MEAMC (Sep. 2017)
- Started production capacity expansion for servomotors/ amplifiers to 480k units per month (Oct. 2017)
- Announced development of new edge computing products (Nov.2017)

### Automotive Equipment Business

Realize environment-friendliness, safety and security, and comfort by coordinating and integrating a wide range of high efficiency equipment, including electric power train systems, and advanced control technology

- Improve fuel mileage and reduce environmental burden
  - Contribute to further improvement in fuel mileage and reducing environmental burden by globally supplying a wide variety of high efficiency equipment which meet market needs, and offering electric powertrain systems
- Improve comfort during driving
  - Contribute to further improving comfort through next-generation information equipment which integrates entertainment/ navigation/ connectivity/ driver assistance functions
- Realize a safe and comfortable automated driving
  - Contribute to realizing an automated driving society by connecting and integrating existing products and system control technology to expand preventive safety businesses, and by strengthening collaboration with communication technology/ infrastructure businesses with the view of advanced driving support



- Started construction of new facility in Himeji Works (Strengthen production system for electric powertrain products) (Feb. 2017)
- Started field test for autonomous driving using CLAS signals with “xAUTO”, the autonomous driving test vehicle (Sep. 2017)
- Developed the concept car “EMIRA14” (Oct. 2017)
- Started mass production of crankshaft ISG system for 48V hybrid vehicles (for Daimler AG) (Oct. 2017)



\*CLAS: Centimeter-Level Augmentation Service, BSG: Belt-driven Starter-Generator, ISG: Integrated Starter-Generator © Mitsubishi Electric Corporation

## 7. Make Strong Businesses Stronger (2) Value Creation in Growth Drivers

### Space Systems Business

Contribute to building a global social infrastructure through satellite systems products across various areas

- Contribute to the prevention of global warming, enhanced monitoring of climatic phenomena and global environment, and understanding of disaster situations (develop observational satellites)

Development of "GOSAT-2" to improve the measurement accuracy of green house gas concentration distribution, "Himawari-8,9" to improve resolution and drastically reduce imaging time, and "Daichi-2" to improve resolution and wider observation of land

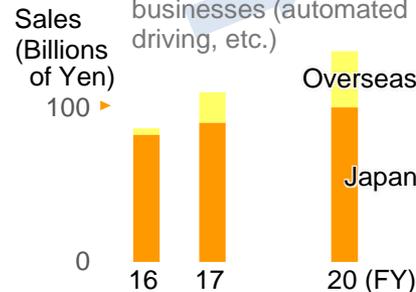
- Offer high-precision positioning Information (develop positioning satellites)

Development of the 2<sup>nd</sup>-4<sup>th</sup> quasi-zenith satellites (completed launch during FY2017)

- Advance communications/ broadcasting infrastructure in various regions (develop communication satellites)

Development of "TURKSAT-4A/ 4B" for TURKSAT (Turkey) and "Es'hail 2" for Es'hailSAT (Qatar)

- Capture satellite systems demand in Japan and overseas (Reap the results of investment)
- Expand high precision positioning related businesses (automated driving, etc.)



- Established Dynamic Map Planning Co., Ltd. (DMP) (Jun. 2016)
- Agreed on development cooperation with u-blox (Switzerland) on receiver chips for automobiles that respond to quasi-zenith satellites "Centimeter level positioning augmentation service" (Sep. 2016)
- Selected for the prime contractor of the Engineering Test Satellite 9 (Apr. 2017)
- Increased capital investment in DMP (DMP has shifted from a planning company to an operating company) (Jun. 2017)
- Established Sapcorda Services, which provides high-precision GNSS positioning service (Aug. 2017)
- Started operation of new Satellite Component Production Facility in Kamakura Works (Oct. 2017)

\*GOSAT: Greenhouse gases Observing SATellite, GNSS: Global Navigation Satellite System

### Power Devices Business

Provide key devices for energy-savings based on the most advanced power semiconductor technology by anticipating the needs of customers

- Increase the value and competitiveness of customer's products

Supply low power loss 7<sup>th</sup> generation IGBT devices which enable energy-savings and improve product performance

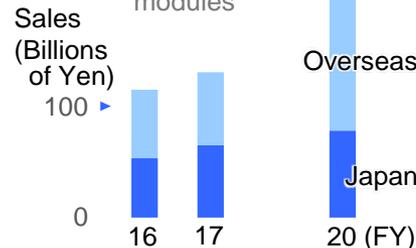


- Realize low electricity consumption

Develop and supply low power loss SiC mounted devices

- Railcars** Make the inverter for railcars compact and lighter, ensure lower losses and high reliability
- Automobiles** Make inverters compact, expand interior spaces, improve fuel mileage
- Home Appliances** Further energy-savings, compact refrigerating systems, flattening and miniaturizing devices
- Industrial** Improve productivity of machine tools by enabling high-torque, high speed, high function

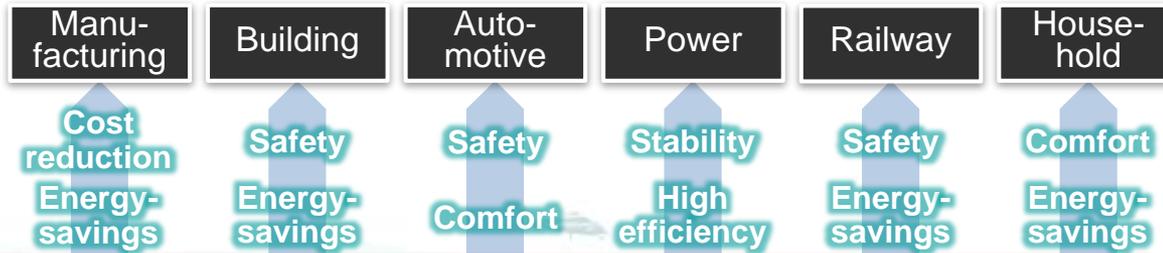
- Expand launching 7<sup>th</sup> generation IGBT modules and SiC modules



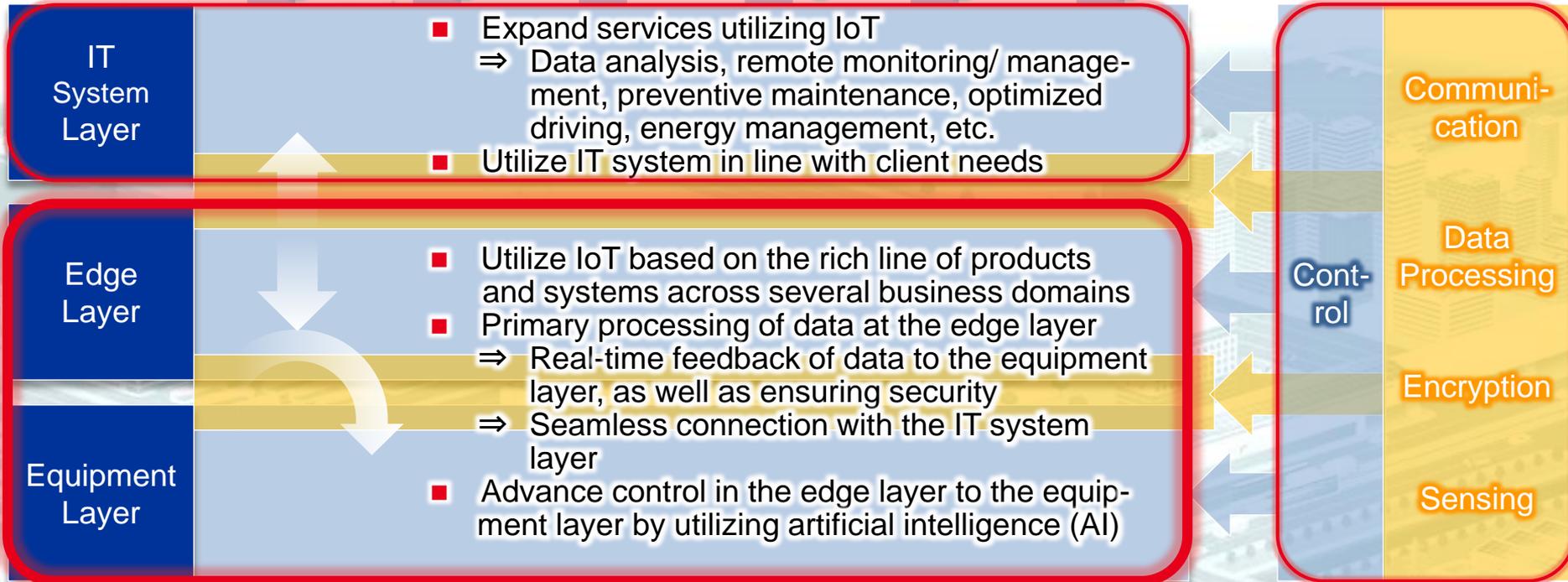
- Started to provide samples of "IPM G1 series" with 7<sup>th</sup> generation IGBT (May. 2016)
- Launched Super-mini Full SiC DIPIPM (Aug. 2016)
- Expanded lineup of "IGBT module T Series" with 7<sup>th</sup> Generation IGBT (Sep. 2016)
- Launched SiC-SBD (Mar. 2017)
- Expanded lineup of 1200V Large DIPIPM Ver.6 (Aug. 2017)
- Expanded lineup of HVIGBT Module X series (Sep. 2017)
- Launched LV100-type HVIGBT Module X series (Sep. 2017)

\*HVIGBT: High Voltage Insulated Gate Bipolar Transistor, IPM: Intelligent Power Module, SBD: Schottky Barrier Diode

## 8. Technology Synergies and Business Synergies (1) Create New Value by Utilizing IoT



Technological assets to utilize IoT



Key parts to support the strong equipment

## 8. Technology Synergies and Business Synergies (2) Initiatives for Utilizing Artificial Intelligence (AI)



Mitsubishi Electric's AI creates the State-of-the-ART in technology

Deep Learning

Reinforcement Learning

Big Data Analysis



### Areas of Maisart application (Examples)



\*MMS: Mobile Mapping System

### Automated analysis of camera images

#### Image analyzing solution **kizkia**

Analyze images from cameras, and detect specific people/ objects/ conditions in real-time

【Detecting targets (Examples)】

#### Detecting Human attributes

People pushing strollers, wheelchairs

#### Detecting misplaced items

Items left behind

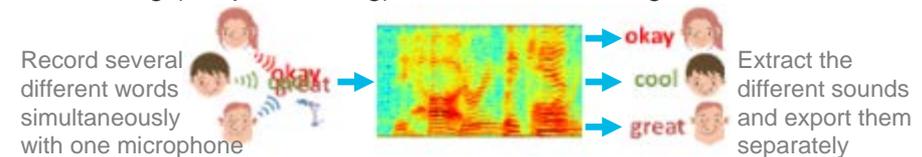
#### Detecting wobbling movements

Walking unnaturally and unsteadily



### Sound separation technology

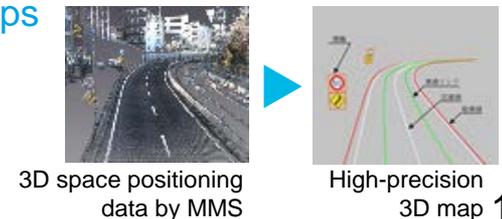
Separate multiple sound data by a clustering process using deep learning (deep clustering) and recover the original sound



【Potential applications】 Automatic speech recognition systems in cars, homes, elevators, etc.

### Automated mapping/ extraction of transition for high-precision 3D maps (in development)

Utilize the technology of AI and MMS automatically produce and renew high-precision 3D maps



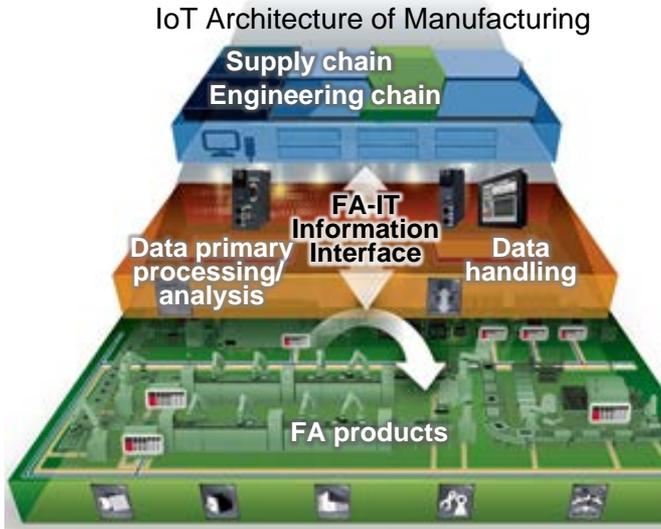
# 8. Technology Synergies and Business Synergies

## (3) Value Creation through Utilizing IoT in Manufacturing



Partner companies (Sep. 2017): e-F@ctory 458, CC-Link 3,069

Examples using e-F@ctory



**IT system**

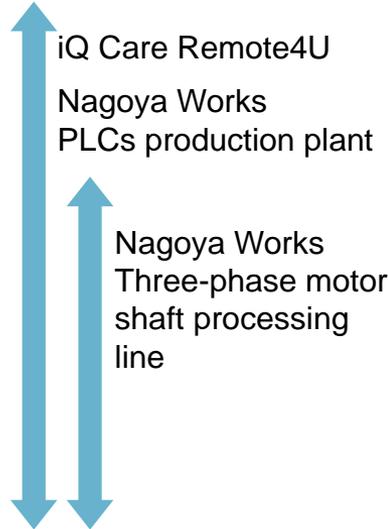
- Corporate business management
- Data analysis for operational improvement
- Production management and execution orders

**Edge**

- Seamless coordination between FA-IT
- Primary process and analysis of field data
- Real-time feedback to the field

**Production site**

- Production execution
- Sensing
- Acquisition of production and equipment data



**Nagoya Works**

With edge computing at the core, increase productivity of the total factory by connecting the rich product line up which supports the production site with the IT system

■ Three-phase motor shaft processing line



15% improvement in the total machining cycle time for the shafts  
By providing feedback on the machining outcome across different processes, automatically adjust the machining conditions

■ PLCs production plant



30% productivity improvement, 30% reduction in energy cost, 50% reduction in quality losses  
Improvement in utilization rate by implementing production operation status management system/ assembly directing system

**iQ Care Remote4U**

Expand the aftermarket service business by utilizing IT system

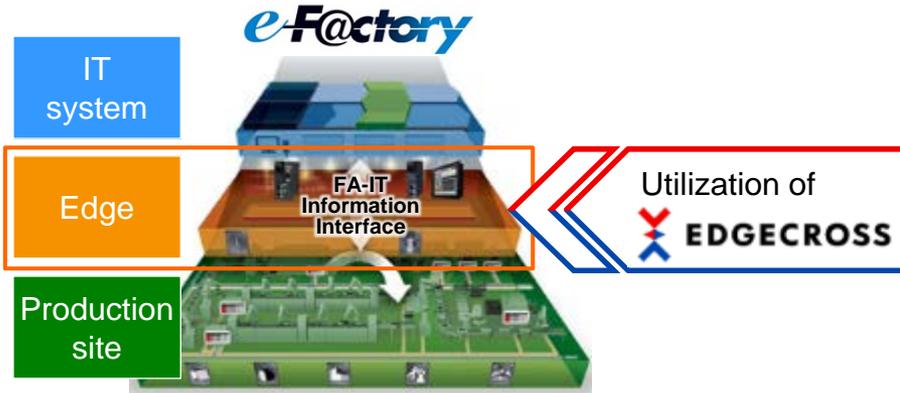
■ Remote service for electrical discharge/ laser processing machine

- Collect and accumulate information on machining and operation track record and electricity consumption of laser processing machine
- Contribute to the production process and reduction of running cost by analyzing the information collected



## 8. Technology Synergies and Business Synergies

### (3) Value Creation through Utilizing IoT in Manufacturing



Utilize Edgecross in e-F@ctory, and promote proposals which enable further improvement at the production sites

#### ■ Develop edge computing products (Responding to Edgecross)

- Realize a production site- centered edge computing which collects, analyzes, and diagnoses production site data
- Use data to contribute to the improvement in the production sites such as preventive maintenance and quality improvement

H/W

#### MELIPC series

An industrial PC which collects various production site data on a real-time basis, provides feedback to production sites, and enables smooth linkage to IT systems in e-F@ctory (CC-Link IE built in)



S/W

#### Real-time data analyzer

A S/W which enables the off-line analysis/ real-time diagnosis of various data by utilizing the analogous waveform recognition technology of the AI Maisart



#### MC Works64 edge computing edition

A S/W which can provide advanced visualizations such as 3D images and conduct remote supervision through web browsers and mobile equipment

### **EDGE CROSS**

An open software platform in edge computing from Japan which Edgecross Consortium members build together and realize FA and IT harmonization beyond the framework of companies and industries (Launch planned for Spring 2018)

- Collect data from each facility equipment irrespective of vendor or network
- Realize real-time feedback to the production site by conducting data analysis and diagnosis close to the production site
- Coordinate seamlessly between FA and IT systems
- Structure systems based on needs by utilizing various different applications

Promote intelligent manufacturing for “Made in China 2025” through utilizing IoT in manufacturing by introducing e-F@ctory

#### ■ Support establishment of the Changshu Innovation Center for Green & Intelligent Manufacturing in the Changshu New & High-tech Industrial Development Zone

- Concluded a strategic partnering agreement with Changshu city Jiangsu province in 2016
- Supported setting up an e-F@ctory exhibition corner in the Changshu Innovation Center for Green & Innovation Manufacturing



Strengthen e-F@ctory through collaboration with partners and accelerate initiatives to improve productivity and quality utilizing IoT

#### ■ The 2<sup>nd</sup> FA development center in Nagoya Works (Completed construction Jul. 2017)

- Set up a development/ design environment to strengthen product capabilities of the FA equipment which are components of the e-F@ctory, and to strengthen collaboration in products, including those of partners, in the e-F@ctory Alliance
- Built a co-development room for FA equipment operation verification with partners

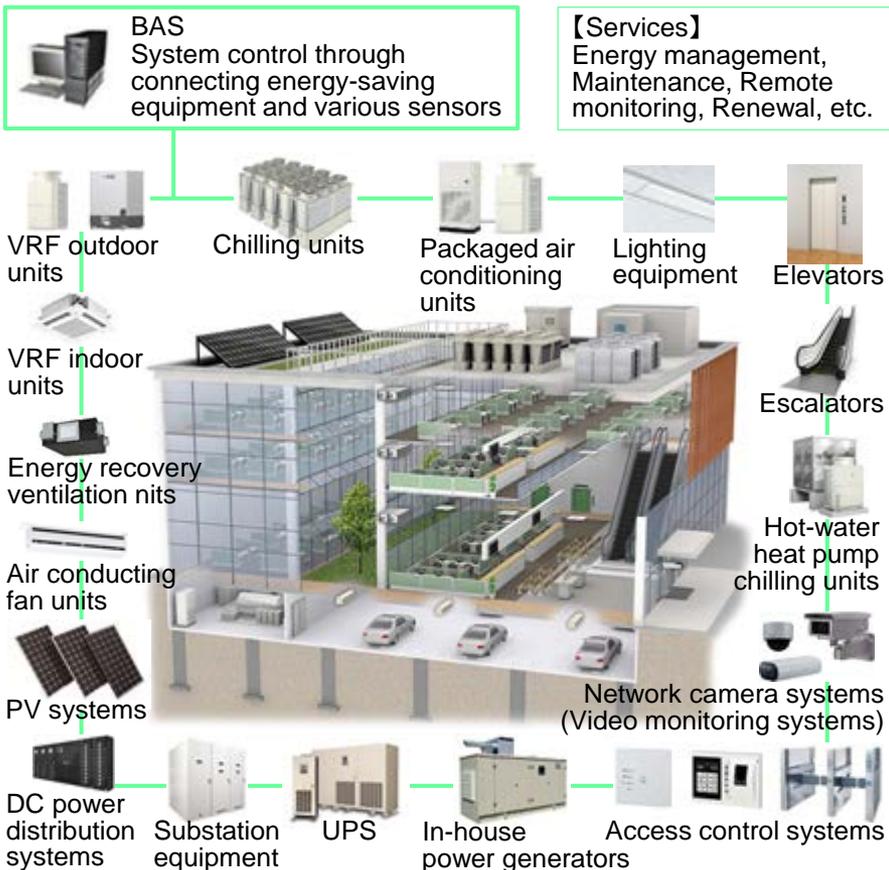


## 8. Technology Synergies and Business Synergies

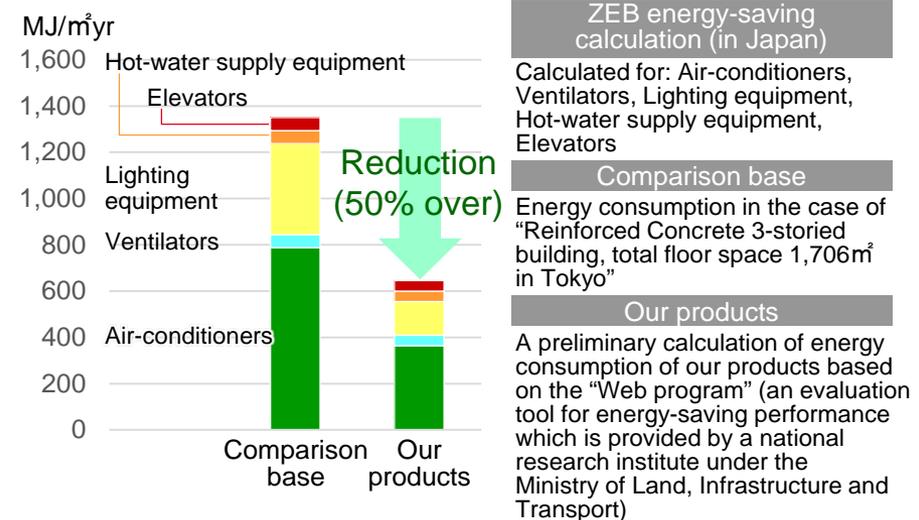
### (4) Value Creation through Realizing Energy-Savings in Building Facilities

Contribute to realizing ZEB (net Zero Energy Building) by providing products/ systems/ services across several business areas

A centralized response for increased efficiency in energy use is possible, including ensuring security and BCP measures



- Registered as a ZEB Planner (May 2017)
- Energy-savings amount (%) of our products (to which ZEB energy-saving calculations are applied)



#### Air-Conditioning system

#### Example of installing in Passive Houses

Contribute to energy-savings by adopting VRF to the world's tallest Passive House (New York, Cornell University) (plan for completion 2<sup>nd</sup> half of FY2017)

To improve energy-saving performance, demonstration experiments are taking place in the Air-Conditioning and Refrigeration Works engineering building (completed Mar. 2016)

- Increase efficiency and control energy-savings of multi-air-conditioning systems/ chillers, etc. for buildings
- Efficient operating control of compressor by shifting the evaporating temperature of refrigerant during cooling times



\*BAS: Building Automation System, BCP: Business Continuity Plan, UPS: Uninterruptible Power Supply, VRF: Variable Refrigerant Flow

# 8. Technology Synergies and Business Synergies

## (4) Value Creation through Realizing Energy-Savings in Building Facilities

Examples of orders received	A	B
<b>Consulting</b>		
ZEB facilities consulting	○	○
<b>Products/ Systems</b>		
■ Energy-saving		
Air-Conditioning	○	○
Ventilation	○	○
Lighting	○	○
Elevators	○	○
■ Energy-creation/ Energy-storage		
Solar power generation	○	○
Power conditioner for EV	-	○
■ Substations (AC/ DC)		
Substations	○	○
DC distribution	-	○
■ Security		
Video monitoring	○	○
Access control	○	○
■ Energy Management		
BAS	○	○
<b>Services</b>		
Energy management	○	○
Maintenance/ Renewals	○	○

ZEB facility/ system/ service for Shirasagi Denki Kogyo

- Reduce 70.1% against the standard primary energy consumption amount through product lines with high energy-saving functions

Standard Primary Energy Consumption amount  
The total converted calorific value of the energy consumed by facilities and equipment whose amount is determined by METI in accordance with the buildings' structures, etc.



(Architectural illustration)

Comparison: Standard primary energy consumption



▲70%    ▼51%    ▲19%

Combination of our air-conditioning, ventilation, lighting, elevators, and other companies' ventilation system utilizing geothermal energy

Using solar power generation

- Apply low-medium voltage DC distribution network system (D-SMiree®)
  - Realize an effective way to utilize renewable energy by connecting solar power generated electricity and storage batteries which are DC power sources as DC, and by combining that with charge/ discharge control of storage batteries
- Also support security and BCP measures (solar power generation/ EV collaboration)
  - Introduce a power conditioner for EV (SMART V2H), where combination of electricity from solar power generation system, EV, and the grid, can be used
- Support energy management of the building after completion in one-stop
  - Visualization of energy-saving and creation through the introduction of a BAS
  - Provide support from the optimization of coordination control of each facility to daily operations, through maintenance services

# 8. Technology Synergies and Business Synergies

## (5) Value Creation through Initiatives for Automated Driving

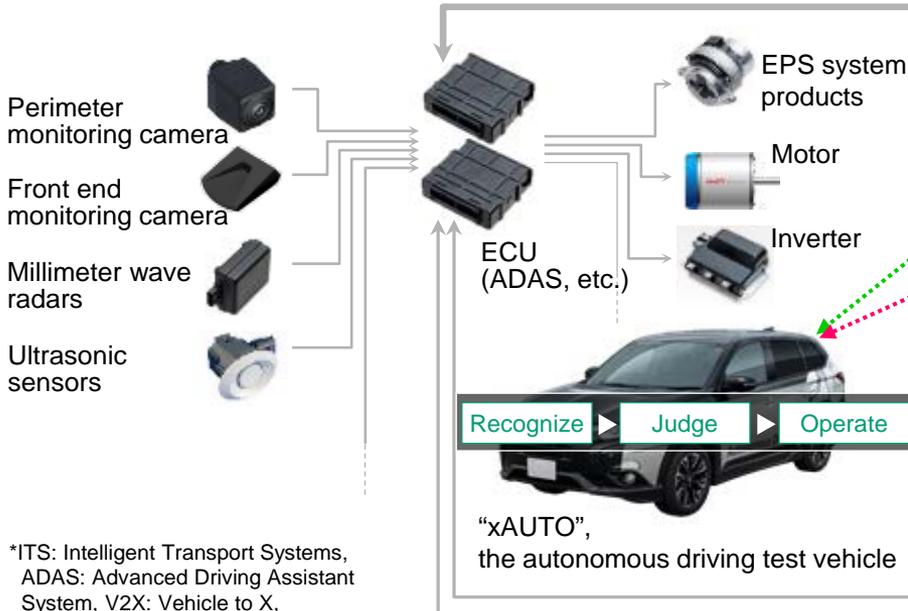
Contribute to realizing a safe and comfortable automated driving society from both “autonomous driving systems” and “vehicle-infrastructure cooperative systems”

### Autonomous driving systems

Combination of sensing technology and vehicle control technology

A system which enables autonomous automated driving by combining automobile mounting devices such as those for control, perimeter surveillance, and out-of-vehicle information utilization

- Recognize and judge the surrounding environment of the automobile and anticipating movements through high quality surveillance sensors and sensor fusions
- Through high-precision vehicle movement control technology, realize safe and comfortable automated driving



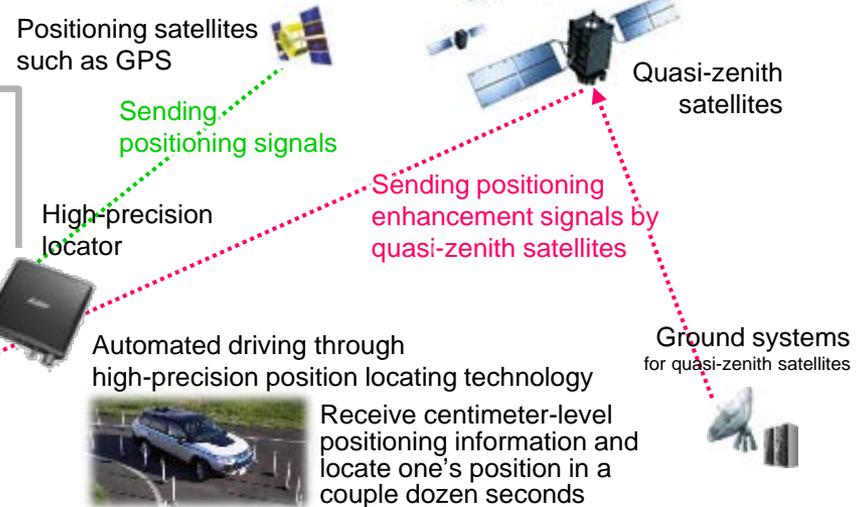
\*ITS: Intelligent Transport Systems, ADAS: Advanced Driving Assistant System, V2X: Vehicle to X, DSRC: Dedicated Short Range Communication

### Vehicle-infrastructure cooperative systems

Utilizing information infrastructure such as quasi-zenith satellites and ITS

A system which utilizes information from outside the vehicle, such as satellites, through out-of-vehicle information utilization devices

- Locate vehicle's position with centimeter-level precision, utilizing high-precision positioning and map creation technology



- Obtain real-time information on the road condition through road-vehicle and inter-vehicle linked communication



# 8. Technology Synergies and Business Synergies

## (5) Value Creation through Initiatives for Automated Driving

### Autonomous driving systems

### Vehicle-infrastructure cooperative systems



Combination of autonomous driving systems and vehicle-infrastructure cooperative systems  
 Experimental driving of “xAUTO”, the autonomous driving test vehicle

- Conducted driving experiment on highways (since May 2016)
- Started driving experiment using the CLAS (centimeter-level augmentation service) signals from a quasi-zenith satellite (since Sep. 2017)

#### Initiatives for next-generation driving-assistance to realize an autonomous driving society

#### Initiatives for global application of high-precision positioning and high-precision maps



EMIRAI4

Developed the concept car “EMIRAI4” which consolidates the developments in the three areas of autonomous driving/ electrification/ connectivity

#### ■ Install the most recent HMI technology in the cockpit

- Support safe, secure and comfortable driving by combining the high-precision locator and the AR corresponding head-up display



#### ■ Develop wide-angle camera-type driver monitoring system

- Assist safe driving by simultaneously recognizing persons in the drivers' and the front seats and sensing their conditions

#### ■ Utilize safe and secure lighting

- Illuminate the movement of the car, such as opening and shutting the door, on the road
- Show the movement of the autonomous driving car by the body lighting



#### High-precision positioning

- Developing automobile receiver chip responding to CLAS through development collaboration with u-blox (Switzerland) to expand utilization of quasi-zenith satellite system
- Launched Sapcorda Services which delivers highly accurate GNSS position augmentation services with Bosch/ Geo++/ u-blox (Aug. 2017)
- Formed alliance with HERE (Netherland) towards mutually utilizing the high-precision positioning technology (Oct. 2017)

#### High-precision 3D mapping

- Increased capital investment in Dynamic Map Planning Co., Ltd. (DMP, established Jun. 2016) (Jun. 2017)
  - DMP shifted from a planning company to an operating company, Dynamic Map Platform Co., Ltd.
  - DMP agreed to start discussion on specification collaborating with HERE (Netherland)
- Commissioned to conduct “Making and developing prototypes of dynamic maps, and establishing center functions and updating methods” and “Implementing and managing large-scale verification experiments” of SIP (Aug. 2017)
- Developing automated mapping technology and extraction of transitions technology for efficient development and maintenance of mapping data

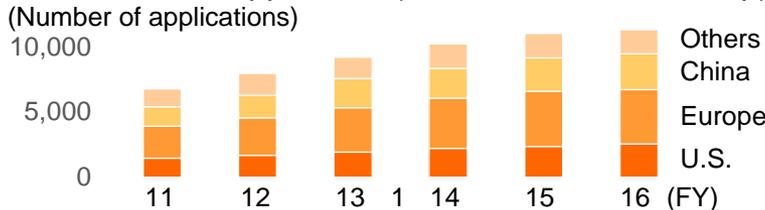
\*AR: Augmented Reality, SIP: Strategic Innovation Promotion Program, GNSS: Global Navigation Satellite System

# 9. Intellectual Property Activities Supporting Business Competitiveness

Patent PCT application ranking	#4 globally
World Intellectual Property Organization (WIPO)	Top among Japanese companies
Patent registration numbers ranking	#3 in Japan
Japan Patent Office (JPO)	
Design registration numbers ranking	#2 in Japan
Japan Patent Office (JPO)	
Patent asset size ranking (all industries)	#1 in Japan
Patent Result Co., Ltd.	

\*PCT: Patent Cooperation Treaty  
 \*Statistics of WIPO/ JPO: Jan. 1- Dec. 31, 2016,  
 \*Statistics of Patent Result: Apr. 1, 2015- Mar. 31, 2016

## Overseas Patent Application (Mitsubishi Electric Group)



## VP-X series, high-efficiency turbine generator

Realize the world's largest power generating capacity and size reduction by indirect hydrogen coolers



- Good Design Award 2014
- JEMA Platinum Award 2016 (65<sup>th</sup>) for Electric manufacturing achievement
- JIIC (Japan Institute of Invention and Innovation) Chairman Award 2016 National Commendation for Inventions

**Patent rights: Cooling technology enabling compactness**  
 High efficiency fans, Flat cooler, Cooling structure, Insulating material

**Design rights: A "reliable" design which suits high-efficiency power generators**

## The world's fastest elevator

In addition to being the world's fastest, realized further safety and the world's top class riding comfort/ quietness/ energy-savings



Developed technology for a 1,230m/ min. (73.8km/ hr.) ultra high speed elevator

※As of Dec. 2016 (Own company research)

## Group of intellectual property rights: Technology to realize the world's fastest speed/ riding comfort/ quietness

- Technology to enhance driving and control accuracy
  - Compact traction machine
  - Control system
- Technology to realize extraordinarily long travel
  - New traction wire rope
- Technology to reduce vibration and noise for more riding comfort
  - Active roller guide
  - Streamed car fairings
  - Air pressure control device
- Technology to ensure added safety
  - Multi-stage hydraulic telescopicbuffer
  - Duplex safety gears
  - Direction changeable speed governor

## 10. Strengthen Business Competitiveness

### 【Investment targets for business competitiveness】

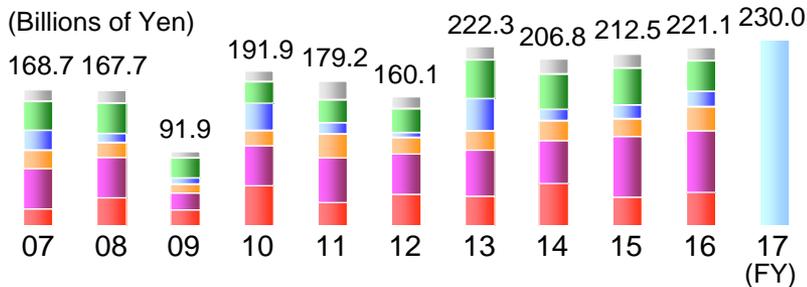
- Businesses where fruits of investments can be realized in a short period of time, and where market growth can be captured
- Businesses where performance fluctuation is small and certainty for growth is high

#### Focused Investment in Growing Businesses

##### Strengthen resource allocation to Growth Drivers

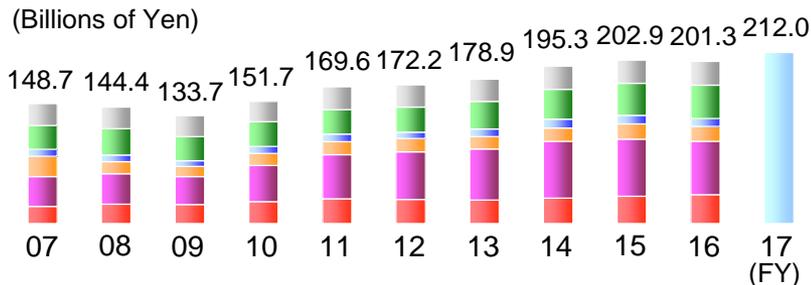
###### ■ Capital Investment

Continue with a high level of capital investment



###### ■ R&D

Balance short-, medium-, and long term development investments



#### Strengthen Business Portfolios

##### Constantly review and refresh business portfolio

- Reallocation of business resources to promising areas through regeneration of businesses
- Continuous creation of new businesses which underpin future growth

### Growth contributing collaboration and M&A

- Supplement missing parts (products/ technology) essential for business expansion
- Secure distribution-/ service-network (supply chain) in entering new regions/ markets
- Acquire new customer bases in order to strengthen business foundations



# 11. Future-oriented R&D for Continuous and Stable Growth

2017 2020 2030 2040

## Mega Trends

- Advancement of informatization
- Shift in population structure
- Rapid urbanization
- Delay in measures against climate change and energy conservation
- Changes in world affairs  
(Terrorism, Monopolization of energy)

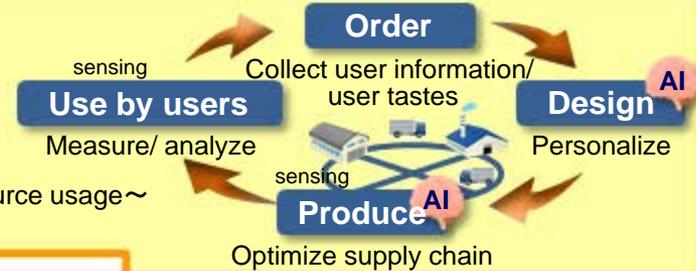
### Challenges

- Diversifying needs
- Aging advanced countries
- Traffic jams in cities
- Global warming/ PM2.5
- Energy shortage
- Natural disasters
- Man-made threats

## IoT

### People and environment friendly manufacturing

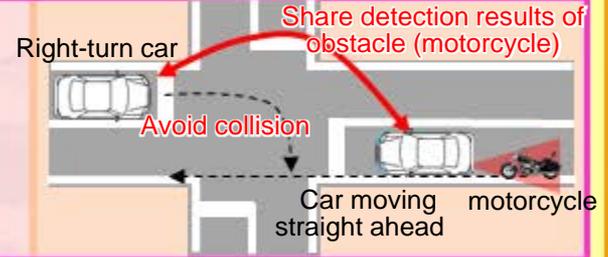
~by evolving sensing and AI, respond to diversifying user needs with minimal resource usage~



## Smart mobility

### Automated driving system by inter-car cooperation

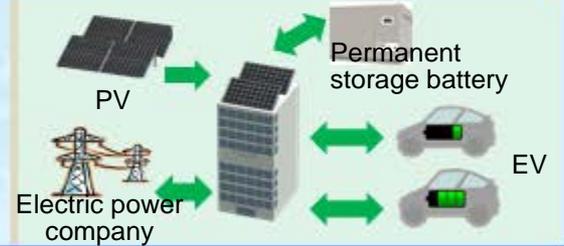
~share information through inter-car communication on obstacles at blind angles~



## Comfortable space

### Reduce electricity cost while maintaining a comfortable space

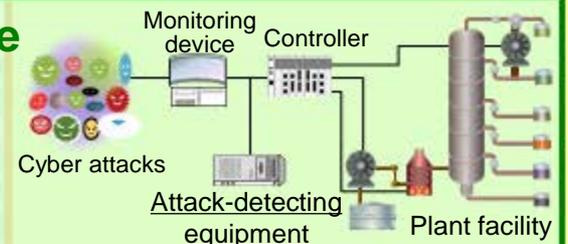
~taking into account the EV operation plan, optimize electricity use by using EV as a storage battery~



## Safe and secure infrastructure

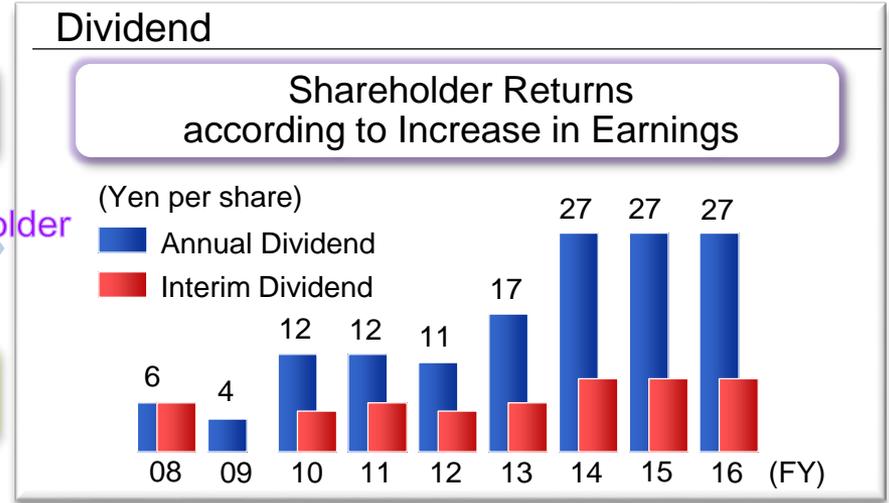
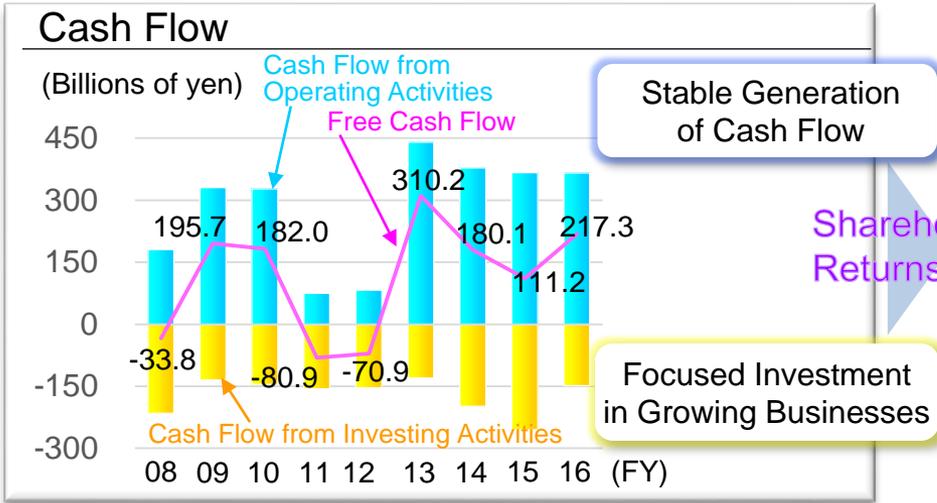
### Detecting/ protecting from cyber attacks

~by reducing processing volume to 1/50 from conventional systems, detect attacks to critical infrastructure on a real-time basis~

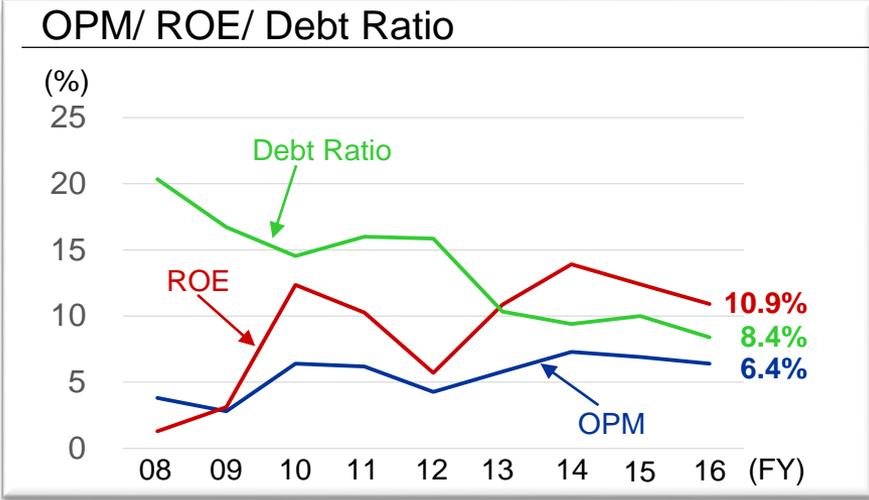


Electronic Devices

## 12. Greater Corporate Value Value Creation Based on a Sound Financial Position



Sound Financial Base



【Growth Targets to be Achieved by 2020】

**OPM** 8% or more

Enhance earning power by realizing investment results, and creating additional value through technology synergies and business synergies

【Management Targets to be Continuously and Stably Achieved】

**ROE** 10% or more

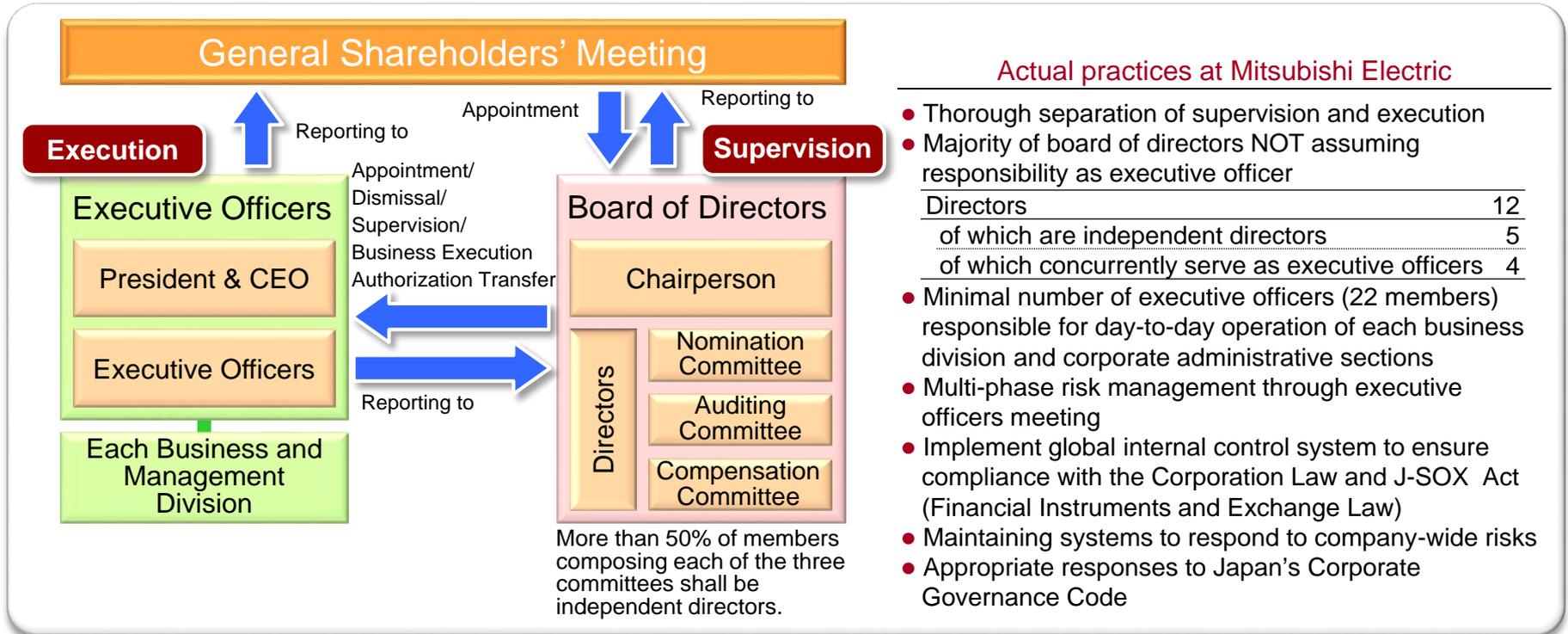
Continuous improvement of ROE through improvement of ROIC (Mitsubishi Electric version) of each business units

**Debt Ratio** 15% or less

The debt ratio target, “15% or less,” represents the Company’s financial discipline, which will allow the Company to secure the financing capability to raise necessary funds for further, greater investment.

## 13. Corporate Governance

In June 2003, Mitsubishi Electric became a company with a committee system (currently: nomination committee system company) and separated the supervisory and executive functions of management, to further continue with the promoting flexibility of operations and transparency of management



Appropriate response to revisions of legislation and other external factors

Appropriate disclosure to shareholders and other stakeholders

**Greater Corporate Value**

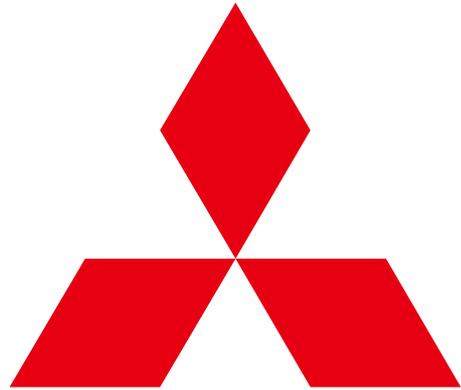
# *Changes for the Better*

## Cautionary Statements

The expectation of operating results herein and any associated statement to be made orally with respect to the Company's current plans, estimates, strategies and beliefs, and any other statements that are not historical facts are forward-looking statements. Words such as "expects," "anticipates," "plans," "believes," "scheduled," "estimated," "targeted," along with any variations of these words and similar expressions are intended to identify forward-looking statements that include but are not limited to projections of revenues, earnings, performance and production. While the statements herein are based on certain assumptions and premises that the Company trusts and considers to be reasonable under the circumstances to the date of announcement, you are requested to kindly take note that actual operating results are subject to change due to any of the factors as contemplated hereunder and/or any additional factor unforeseeable as of the date of this announcement.

Such factors materially affecting the expectations expressed herein shall include but are not limited to the following. As such, additional factors may arise at any given time.

1. Any change in worldwide economic and social conditions, as well as laws, regulations, taxation and other legislation
2. Changes in foreign currency exchange rates, especially yen/dollar rates
3. Changes in stock markets, especially in Japan
4. Changes in balance of supply and demand of products that may affect prices and volume, as well as material procurement conditions
5. Changes in the ability to fund raising, especially in Japan
6. Uncertainties relating to patents, licenses and other intellectual property, including disputes involving patent infringement
7. New environmental regulations or the arising of environmental issues
8. Defects in products or services
9. Litigation and legal proceedings brought and contemplated against the Company or its subsidiaries and affiliates that may adversely affect operations or finances
10. Technological change, the development of products using new technology, manufacturing and time-to-market
11. Business restructuring
12. Incidents related to information security
13. Occurrence of large-scale disasters including earthquakes, typhoons, tsunamis, fires and others
14. Social or political upheaval caused by terrorism, war, pandemic by new strains of influenza and other diseases, or other factors



**MITSUBISHI  
ELECTRIC**

*Changes for the Better*