

MOVE THE WORLD FORWARD

**MITSUBISHI
HEAVY
INDUSTRIES
GROUP**

Defense Business Strategy Briefing

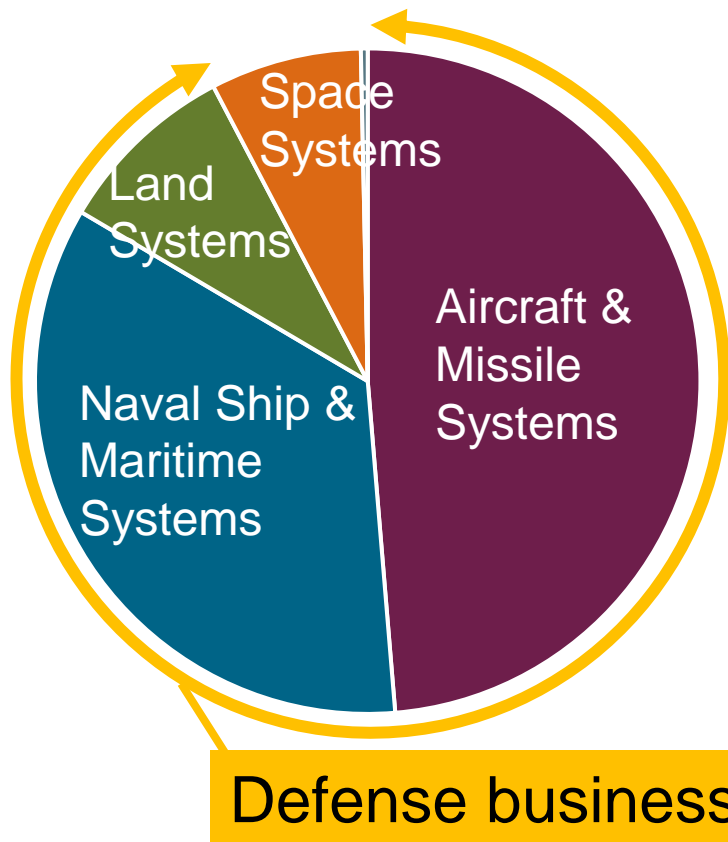
November 22, 2023
Integrated Defense & Space Systems
Mitsubishi Heavy Industries, Ltd.

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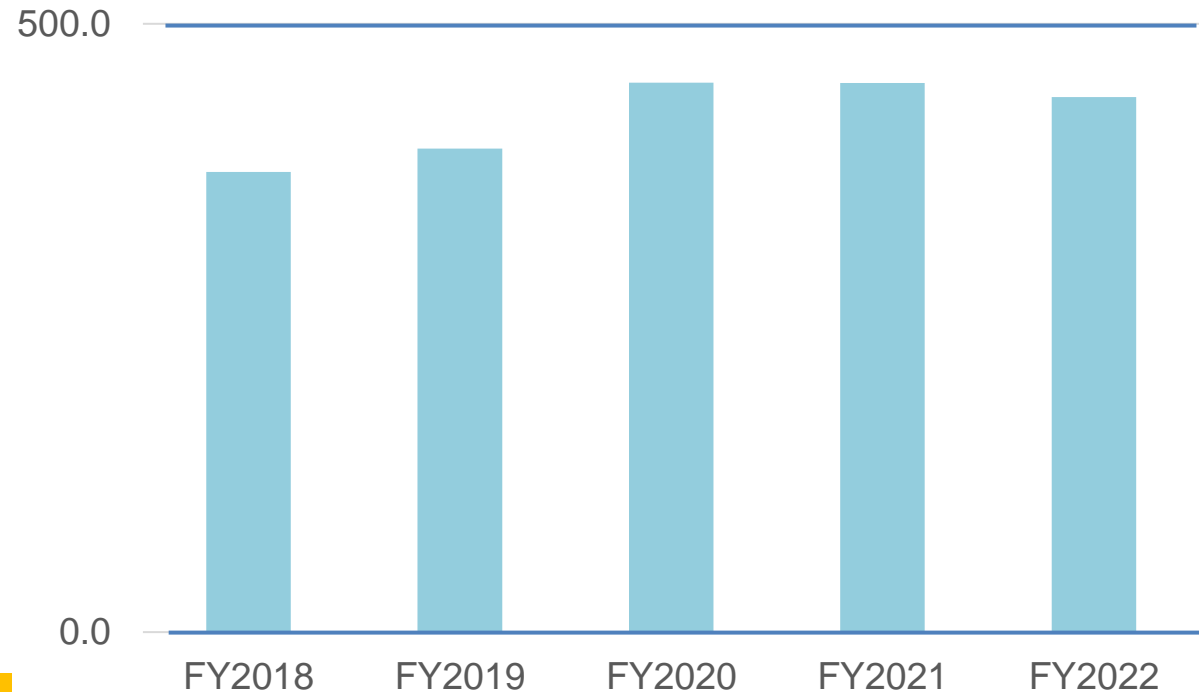
1. Overview of Defense Business: Revenue

- MHI Defense business revenue has historically trended around just under ¥500 bn

FY2022 Defense & Space Revenue ¥474.9 bn

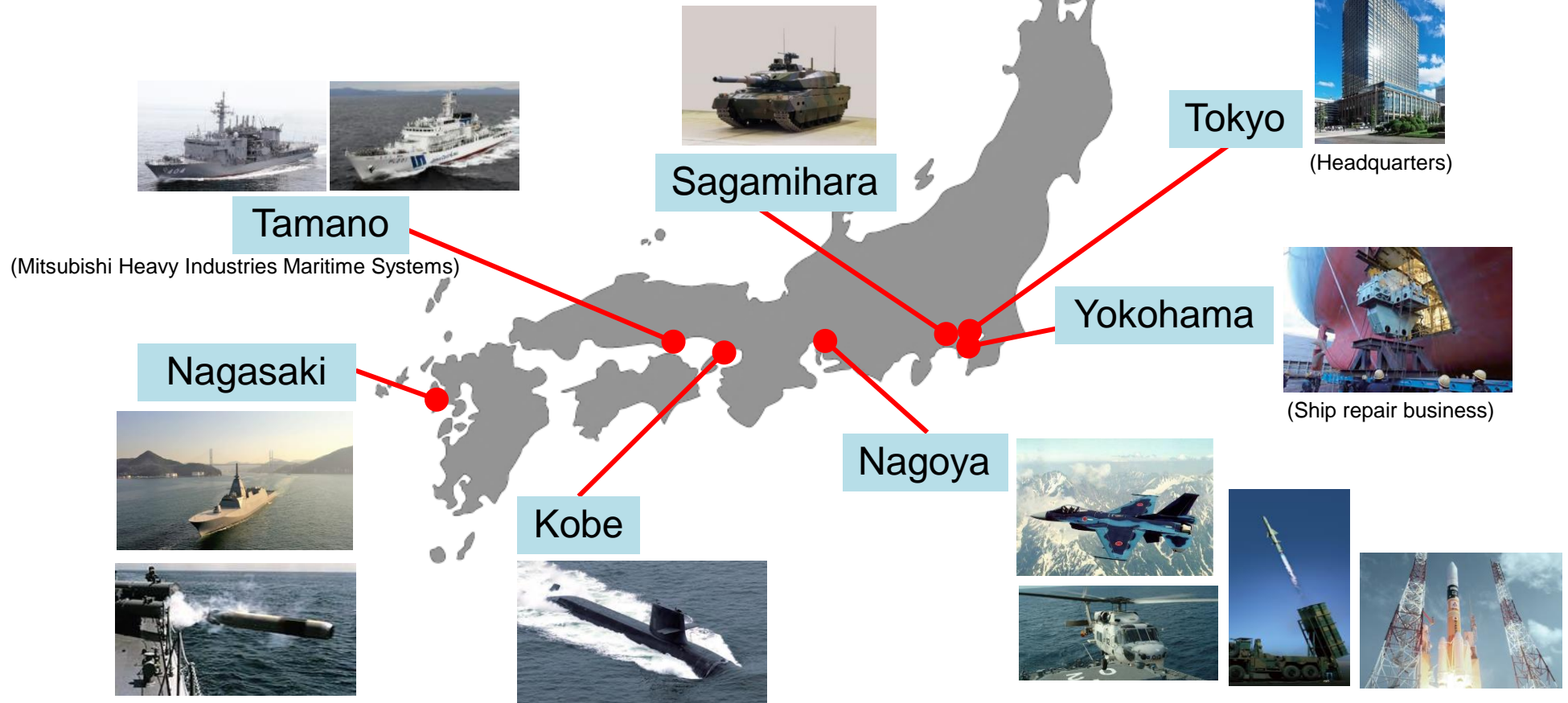


Defense Business Revenue (bn yen)



1. Overview of Defense Business: Organization and Manufacturing Bases

Integrated Defense & Space Systems
Planning & Administration Department
Advanced System Programs Department
Aircraft & Missile Systems Division (Nagoya)
Space Systems Division (Nagoya)
Land Systems Division (Sagamihara)
Naval Ship & Maritime Systems Division (Nagasaki, Kobe, Yokohama, Tamano)



1. Overview of Defense Business: Main Products in Aircraft & Missile Systems

Fighter Jets

F-15J



F-2



Next-Generation Fighter Aircraft



Next-Generation Fighter Aircraft concept art (Source: Japan Ministry of Defense)

Helicopters

UH-60JA Multi-Mission Helicopter



SH-60K Patrol Helicopter



UH-60J Rescue Helicopter



Next-Generation Patrol Helicopter



Missiles

PATRIOT



Type-12 Surface-to-Ship Missile (12SSM)



Upgraded 12SSM



Hyper Velocity Gliding Projectile



Source: "Overview of FY2023 Defense Budget" (Japan Ministry of Defense)

Hypersonic Missile



SM-3



New Areas

Laser Systems



Unmanned Aerial Vehicles



In production
Under R&D

1. Overview of Defense Business: Main Products in Naval Ship & Maritime Systems

Surface Ships

Frigates



Naval Ship Technology Development Center



Auxiliary Ships



Governmental Ships



Logistics Support

Naval Ship Support Center



Technical Logistics Support Center



Torpedoes & Shipboard Systems

Torpedoes



Vertical Launching Systems



Submarines

Submarines



Submarine Technology Center



Unmanned Underwater Vehicles



- In production
- Under R&D
- Facilities

1. Overview of Defense Business: Main Products in Land Systems

Tracked Vehicles

Type 10 Main
Battle Tank



Type 11 Tank
Recovery Vehicle



Source: Japan Ministry of Defense

Common Platform-
Tracked/Armored
Personnel Carrier Variant



Future Amphibious
Technologies



(Concept art) Source: Japan Acquisition,
Technology & Logistics Agency website

Wheeled Vehicles

Type 16 Maneuver
Combat Vehicle




Heavy Wheeled
Recovery Vehicle (B)



Photo shows prototype

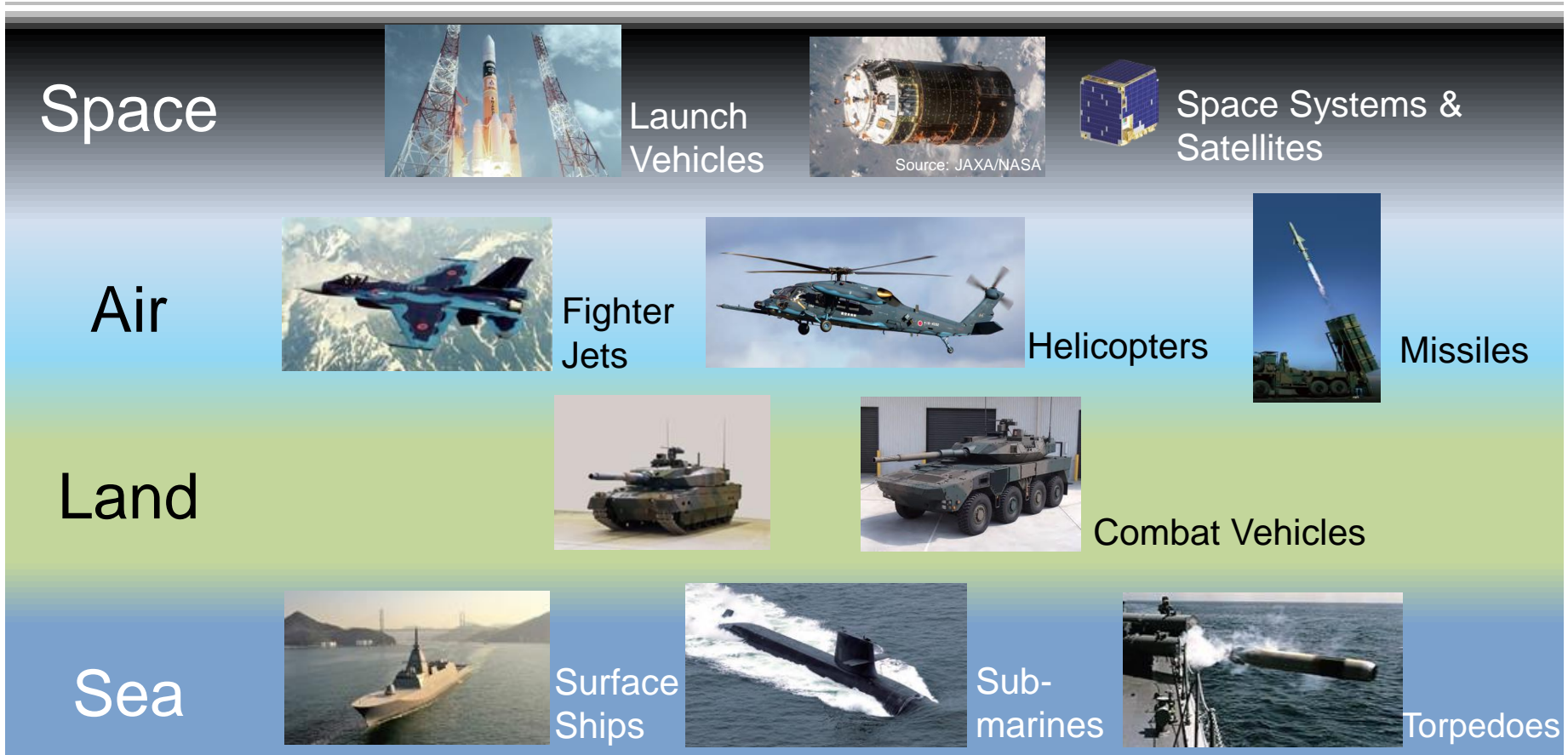
Type-12 Surface-to-Ship
Missile (carrier)



 In production
 Under R&D

1. Overview of Defense Business: Comprehensive Capabilities in Land, Sea, Air, and Space

- Providing total solutions in Defense & Space, contributing to national security and space use



Space

- Launch Vehicles
- Space Systems & Satellites

Air

- Fighter Jets
- Helicopters
- Missiles

Land

- Combat Vehicles

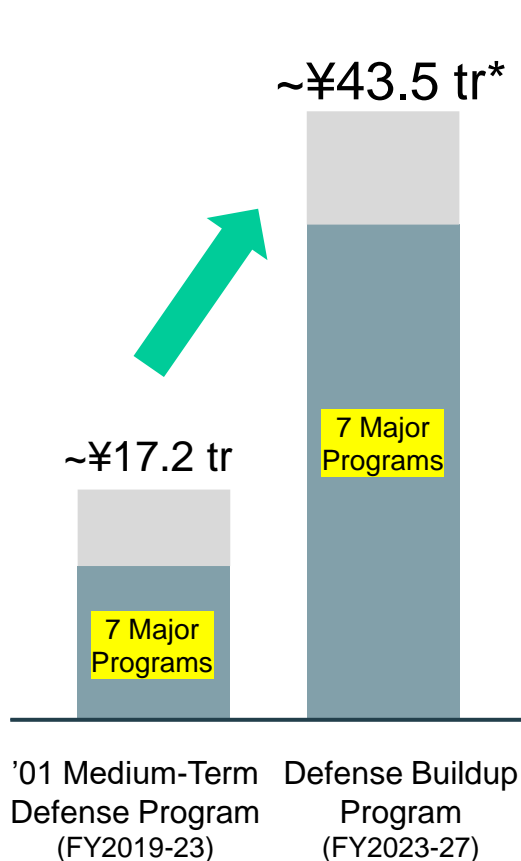
Sea

- Surface Ships
- Submarines
- Torpedoes

2. New Japan Defense Buildup Program and MHI Initiatives

- In response to growing momentum toward strengthening national defense, the Japan Defense Buildup Program has been significantly expanded
- Within seven major programs, MHI is supporting Japan with comprehensive capabilities in land, sea, air, and space

Defense Buildup Program



7 Major Programs	Stand-off Defense Capabilities
	Integrated Air and Missile Defense Capabilities
	Unmanned Defense Capabilities
	Cross-domain Operation Capabilities
	Mobile Deployment Capabilities/Civil Protection
	Command and Control/Intelligence-related Functions
	Sustainability and Resiliency
Reinforcing Defense Production Base	
Research and Development	
Improvements to Bases	
Training Costs, Fuel, Others	

*Source: "Medium-Term Defense Program (FY 2019 – FY 2023)" and "Defense Buildup Program" (Japan Ministry of Defense)

MHI Initiatives

Stand-off Defense Capabilities

- Incl. Upgraded 12SSM, Next-Generation Fighter Aircraft

Integrated Air and Missile Defense Capabilities

- Incl. PATRIOT (MSE missile) production

Unmanned Defense Capabilities

- Unmanned Ground/Underwater/Aerial Vehicles
- Coordination with Next-Generation Fighter Aircraft

Cross-domain Operation Capabilities

- Capabilities in the Cyber Domain
- Capabilities in the Space Domain

Mobile Deployment Capabilities

- Next-Generation Fighter Aircraft, Amphibious Vehicles

Command and Control/Intelligence-related Functions

- Stand-off Operation Plan

Sustainability and Resiliency

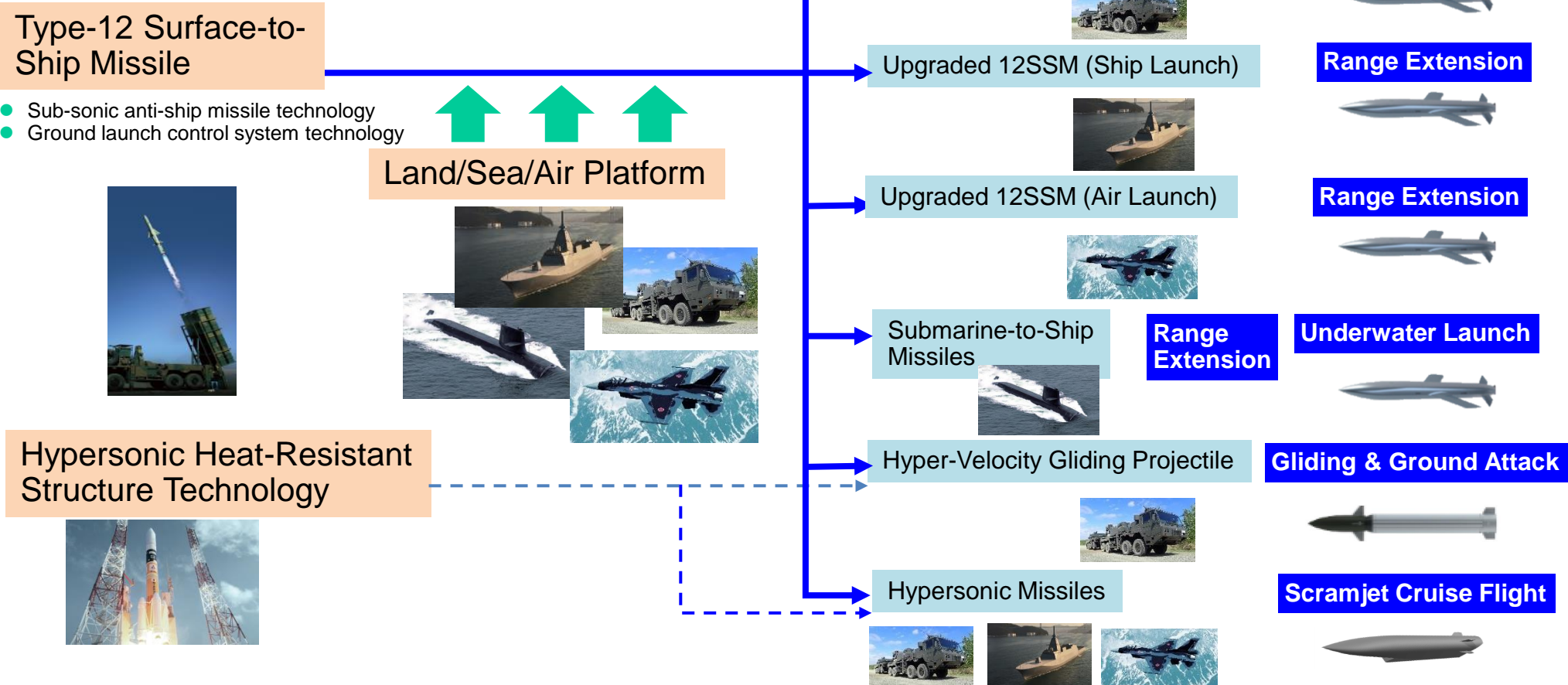
- Improvement of equipment availability



- **Stand-off Defense Program**
- **Integrated Air and Missile Defense Program**
- **Unmanned Defense Program**
- **Global Combat Air Programme**
- **Space Domain Program**

3. Main Programs and Initiatives: (1) Stand-off Defense Program

- Developing program leveraging MHI's Type-12 Surface-to-Ship Missile technology
- Evolving sub-sonic missiles into supersonic and hypersonic missiles



3. Main Programs and Initiatives: (2) Integrated Air and Missile Defense Program

- Developing program by advancement of MHI integrated air defense missile technologies through joint development with US
- Contributing to improvement of integrated air and missile defense capabilities

PATRIOT Missile Production



Source: Lockheed Martin

PATRIOT Missile Production (continued)



Source: Lockheed Martin

Reliably continue production

SM-3 Missile Japan-US Joint Development & Production



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SM-3 Missile Japan-US Joint Production (continued)



*

Reliably continue production

Construction of 5 Aegis System Equipped Vessels (ASEV)



Source: Japan Maritime Self-Defense Force

Develop New ASEV



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Currently under preliminary design

Western-Pacific Missile Defense Architecture Study ('88-'91)

Joint Japan-US Development of Glide Phase Interceptor



MHI concept art

Japan and US discussing concept

*By MHI based on "DEFENSE of JAPAN 2025" (Ministry of Defense)

3. Main Programs and Initiatives: (3) Unmanned Defense Program

- Building up autonomous operation and control technologies in aircraft, missile, and underwater equipment areas
- Developing products to meet growing need in Defense business for unmanned ground, underwater, and aerial vehicles

Autonomous Fighter Jet



Unmanned
Aerial Vehicles
(UAV)



Fighter Jet-UAV Coordination

Extended Sustained Flight

AI

Missiles



Unmanned
Underwater
Vehicles
(UUV)



Underwater Patrol

UUV Control

Underwater Equipment



Unmanned
Ground
Vehicles
(UGV)



Ground Patrol

Uneven Ground
Obstacle Avoidance

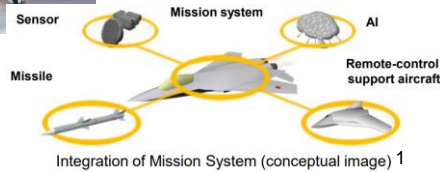
3. Main Programs and Initiatives: (4) Global Combat Air Programme

- Developing program with MHI proprietary fighter jet development and unmanned vehicle technologies
- Contributing to joint development among Japan, UK, and Italy leveraging many years of experience

Fighter Jet Development Technology



- T-2/F-1
- F-2
- X-2



Experience with International Joint Development



Source: JAXA/NASA

Unmanned Vehicle Technological Capabilities



Global Combat Air Programme

Characteristics

- 6th-generation fighter
- Multirole
- Network Combat
- Unmanned Vehicle
- Coordination
- Stealth



Next-Generation Fighter Aircraft concept art
(Source: Japan Ministry of Defense)

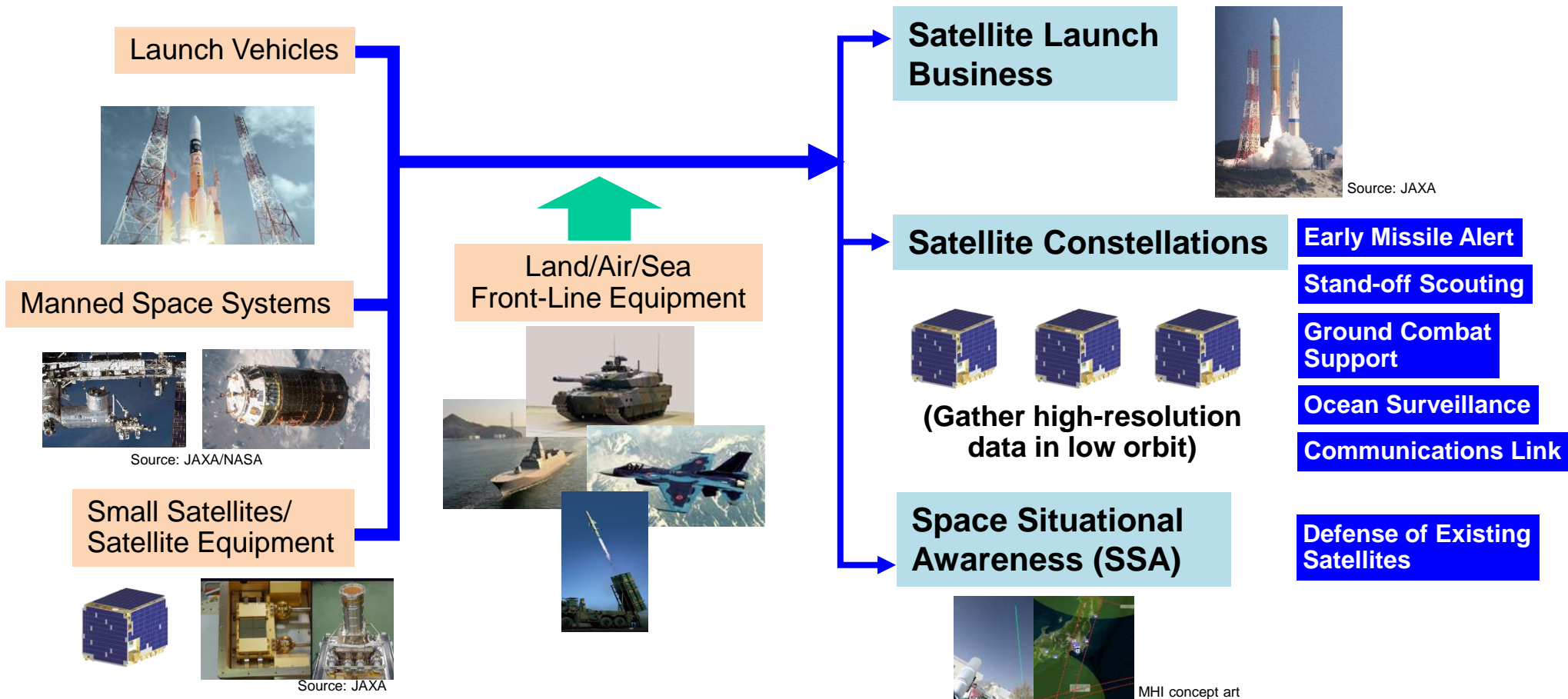
Status

- Under preliminary design among Japan, UK, and Italy
- Discussing division of labor among governments
- Planning expansion of development facility in preparation for start of full-scale development (Komaki South Plant)

¹ Source: "Overview of FY2019 Defense Budget" (Japan Ministry of Defense)
² By MHI based on "DEFENSE of JAPAN 2023" (Japan Ministry of Defense)

3. Main Programs and Initiatives: (5) Space Domain Program

- Our space assets (including communications, navigation, and information gathering capabilities) are essential for operation of land, sea, and air equipment
- Contributing with satellite launches, satellite constellation building, and space situational awareness (SSA)



4. Impact of New Defense Industry Policies

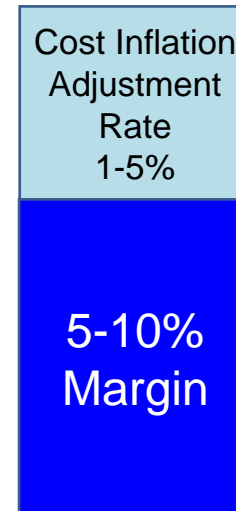
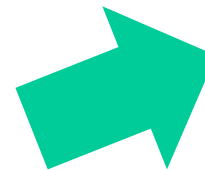
- The Japan Ministry of Defense has issued new policies with the goal of maintaining and strengthening Japan's defense production and technological bases
- With advent of policies increasing defense contractor profit margins, new investment has become possible, driving expectations for continued development of business activities

Japan Ministry of Defense New Defense Industry Policies

● Improved margins	● Strengthening of industrial security
● Manufacturing process improvement support	● Strengthening security of sensitive technology
● Measures for companies exiting industry	● Promoting equipment export
● Revitalization of defense industry	● FMS streamlining

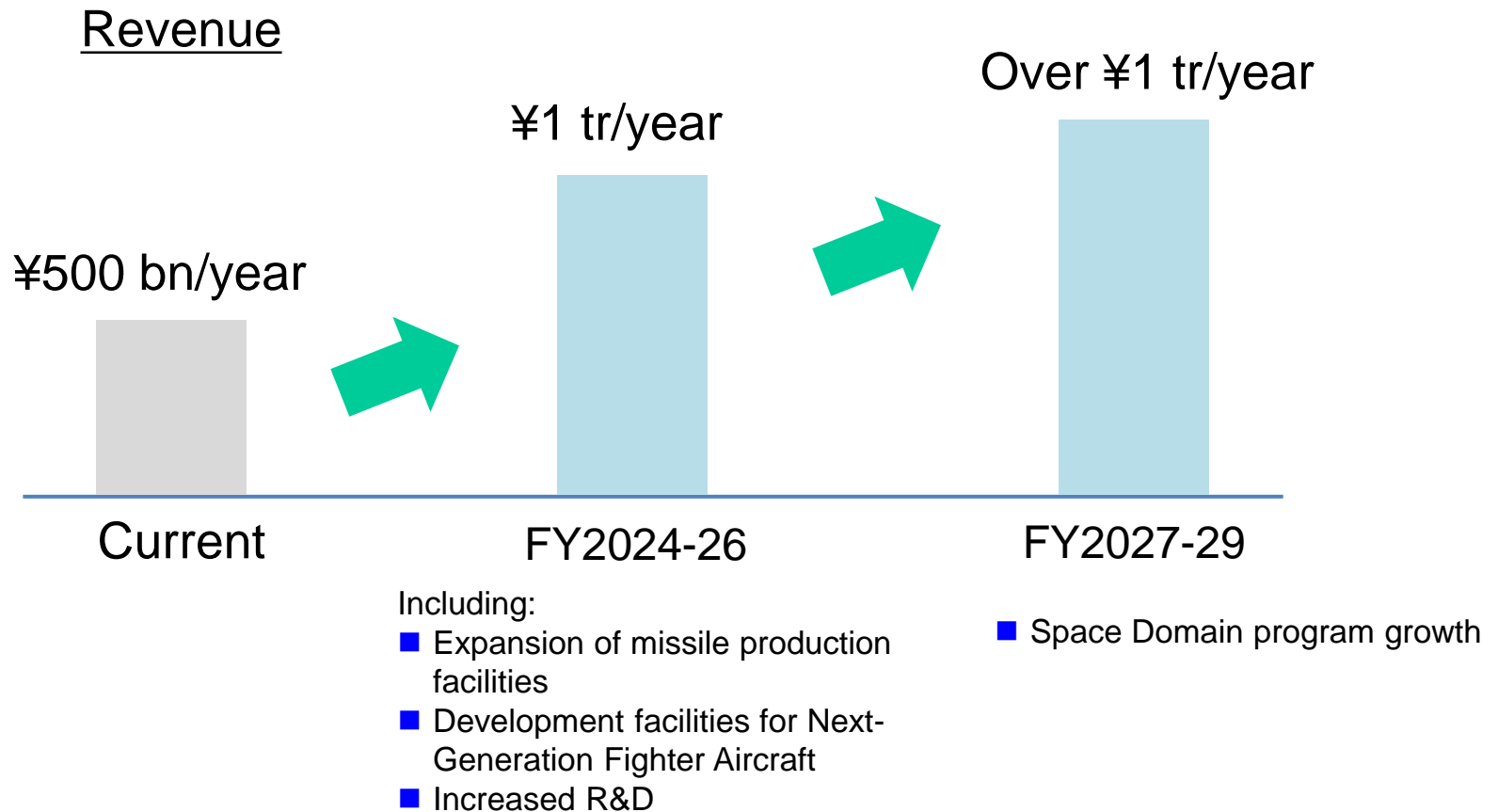
Future Margins

Current Margins



5. Business Plan

- For many years, revenue levels trended around just under ¥500 billion
- Forecasting revenue to more than double due to significant expansion of Japan Defense Buildup Program
- Will actively invest in facilities expansion and R&D needed for business growth



- MHI's mission is to contribute to the realization of a safe and secure world through our businesses
- Forecasting strong activity in Japan's defense industry for the medium to long term due to the expansion of the Japan Defense Buildup Program
- Will steadily increase resources to enable revenue growth

