2021 Medium-Term Business Plan (MTBP)
(FY2021 – 2023)

October 30, 2020
Seiji Izumisawa, President and CEO
To begin…

- **Issuing 2021 MTBP six months early**
  - Due to the COVID-19 impact, adverse changes in the thermal power business environment, and a strategic change in commercial aviation, we have decided to make a full update to 2018 MTBP with the publishing of 2021 MTBP.

- **Main points of 2021 MTBP**
  - Rapidly return to and strengthen profitability
  - Clear direction for strong growth going forward

- **Return to and strengthen profitability**
  - In addition to recovering from COVID-19 impact, address challenged businesses, decrease SG&A and achieve 7% business profit margin in FY2023.

- **Opening up growth areas**
  - Focus primarily on Energy Transition and New Mobility & Logistics, invest 180 billion yen during 2021 MTBP into these areas, expand new businesses to 1 trillion yen by FY2030.
Contents

Ⅰ. MHI Group Vision
Ⅱ. 2021 MTBP Positioning & Targets
Ⅲ. Measures for Commercial Aviation Systems
Ⅳ. Plan to Strengthen Profitability
Ⅴ. Developing High Growth Businesses
Ⅵ. Summary
Ⅰ．MHI Group Vision
MHI Group Mission

Integrate cutting-edge technology into expertise built up over many years to provide solutions to some of the world’s most pressing issues and provide better lives.

Core strengths

- Infrastructure systems that support our modern lives
- Defense products that protect us on land, at sea and in the air
- Space and deep sea systems that open up unknown parts of our world and universe
- High performance, high reliability products
  - High temperature, high speed, high pressure
  - Complex and large-scale structures and systems
  - Optimized control of large-scale systems

Global Issues & Trends

- Climate Change
- Shrinking working population
- Higher volume and complexity in logistics
- New types of threats like cyber attacks
- Electrification, intelligence and digitalization
- Shift in value from ownership to usage

MHI Group’s Key Focal Themes

- Realize a carbon neutral world
  - Upgrading of current infrastructure
  - Decarbonization and diversification of fuels
  - CO₂ conversion and usage
  - Air conditioning and chilling with natural refrigerant

- Improve quality of life
  - Smart and networked machinery systems
  - Automation of logistics
  - Electrified and intelligent mobility and industry

- Build a safer world
  - Integrated defense
  - Cybersecurity
Drastically increase our corporate value through the primary growth engines of Energy Transition and New Mobility & Logistics while managing our portfolio.

**Business Areas & Scale**
(in hundred million yen)

- **Energy & Environment**
  - Work toward a carbon neutral 2050, by driving forward the energy transition through collaboration across internal disciplines, and externally.

- **Infrastructure**
  - Combine strengths in existing businesses and intelligent systems to expand our business into high growth areas like mobility and logistics, e.g. CASE, cold chain and electric components.

- **Aircraft, Defense & Space**
  - Aircraft and Space: Expand business areas
  - Defense: Integrated defense systems across land, sea, air and space, unmanned and minimally manned technologies, and cybersecurity.

**FY20**

- **Aircraft, Defense & Space**
- **Infrastructure**
- **Energy & Environment**

**FY23**

- **Aircraft, Defense & Space**
- **Infrastructure**
- **Energy & Environment**

**FY30**

- **Aircraft, Defense & Space**
- **Infrastructure**
- **Energy & Environment**

Hydrogen, CCUS etc.

- **Energy & Environment**
  - 3,000

- **New Areas**
  - 7,000

**CCUS**: Carbon dioxide Capture, Utilization and Storage
**CASE**: Connected, Autonomous, Shared and Electric
Ⅱ. 2021 MTBP Positioning & Targets
Fundamental Principles of 2021 MTBP

Rapid transition to leap forward in 2024 MTBP and path to achieving TOP

1st half of 2010s
- Business scale expansion through M&As
- Structural reforms

2015&18MTBP
- Revenue growth to 5 trillion yen
- Strengthen financial foundation
- Ongoing structural reforms

2021MTBP (FY21–23)
- Return to & strengthen profitability
- Accelerate growth

2024MTBP
- Grow new businesses areas
- Achieve TOP

Return to profitability
(Business profit margin 7%)
- Reduce fixed costs, improve productivity
- Increase after-sales service ratio
- Reduce SG&A and headcount

Accelerate growth
- Drastic resource re-allocation
- Strengthen investment into growth areas
- Strengthen cooperation within and outside the Group

Strengthen shared foundation
- Strengthen foundational core technologies
- Digitalization

Order intake
(Excluding SpaceJet, etc.)

Revenue

EBITDA margin

Interest-bearing debt

Challenges we are facing
- Decline in order intake since FY14 → Accelerate growth
- Lower profit since FY15 → Return to and improve profitability
- Reduce interest-bearing debt → Maintain financial stability

TOP: Triple One Proportion, ratio among three management factors: net sales, total assets, and market value.
### FY2023 Targets

#### Profitability
- Business Profit Margin 7%
- ROE 12%

#### Growth
- Create new businesses worth 100 billion yen in revenue through strengthened investment in growth
- Expand to 1 trillion yen in revenue in FY30

#### Balance Sheet Financial Stability
- Total assets turnover 0.9
- Maintain interest-bearing debt level

#### Dividend
- Record-high level of dividend per share

---

ROE: Return On Equity
## 2021 MTBP Targets – Financial indicators over time

<table>
<thead>
<tr>
<th></th>
<th>FY2018</th>
<th>FY2020</th>
<th>FY2023</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>4.1</td>
<td>3.7</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Business profit margin</strong></td>
<td>5%</td>
<td>1%</td>
<td>7%</td>
</tr>
<tr>
<td><strong>ROE</strong></td>
<td>7%</td>
<td>2%</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td>5.1</td>
<td>4.8</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Interest-bearing debt</strong></td>
<td>0.67</td>
<td>0.95</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td>1.7</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>D/E ratio</strong></td>
<td>0.4</td>
<td>0.8</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Equity ratio</strong></td>
<td>34%</td>
<td>25%</td>
<td>33%</td>
</tr>
<tr>
<td><strong>Dividend per share</strong></td>
<td>150 yen</td>
<td>75 yen</td>
<td>160 yen</td>
</tr>
</tbody>
</table>

(In trillion yen)
2021 MTBP Targets – Capital allocation plan

- Strengthen operating cash flow by improving profitability, continue to monetize through asset management
- Shift investment away from SpaceJet and into priority growth areas (energy transition, new mobility & logistics)

<table>
<thead>
<tr>
<th>2018 MTBP (Total 3 Years)</th>
<th>2021 MTBP (Total 3 Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash-in</td>
<td>Cash-out</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regular operating Cash flow</strong></td>
<td><strong>Growth Areas 800</strong></td>
</tr>
<tr>
<td>7,200</td>
<td></td>
</tr>
<tr>
<td>SpaceJet</td>
<td><strong>Growth Areas 1,800</strong></td>
</tr>
<tr>
<td>3,700</td>
<td></td>
</tr>
<tr>
<td>Expand</td>
<td><strong>Expand 2,000</strong></td>
</tr>
<tr>
<td>1,600</td>
<td></td>
</tr>
<tr>
<td>Profit-focused, others</td>
<td><strong>Profit-focused, others</strong></td>
</tr>
<tr>
<td>3,100</td>
<td>2,800</td>
</tr>
<tr>
<td>Debt financing</td>
<td><strong>Debt repayment 900</strong></td>
</tr>
<tr>
<td>1,400</td>
<td></td>
</tr>
<tr>
<td>Dividend</td>
<td><strong>Dividend 1,400</strong></td>
</tr>
<tr>
<td>1,300</td>
<td></td>
</tr>
<tr>
<td>Asset management, etc.</td>
<td><strong>Asset management, etc.</strong></td>
</tr>
<tr>
<td>2,500</td>
<td>1,200</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Unit: 100 million yen
Ⅲ. Measures for Commercial Aviation Systems
Commercial Aviation Systems Strategy under 2021 MTBP

• Covid-19 is temporarily depressing market, but long-term growth expected

1. Aero Structures
   In preparation for market recovery expected from 2024, MHI will increase production efficiency and drive forward new technology development to participate in future global aircraft programs

2. Commercial Aircraft
   Expanding commercial aircraft business is MHI’s long-term goal
   ① SpaceJet
   Given current development status and market conditions, we have no choice but to temporarily pause the majority of SpaceJet activities, except for TC documentation. We will work to review where we stand, make improvements, and assess a possible program restart.
   ② CRJ (MRO)
   Expand resilient MRO business and utilize commercial aircraft business know-how

Aero Structure Business (Tier 1)
- Build high performance organization
- Develop new technologies
- Undertake efforts to participate in future international aircraft programs

Commercial Aircraft Business
<table>
<thead>
<tr>
<th>SpaceJet</th>
<th>CRJ (MRO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporarily pause M90 development activities (Continue TC documentation activities)</td>
<td>Utilize MRO foundation and commercial aircraft know-how as TC holder</td>
</tr>
<tr>
<td>Review, make improvements, and assess possible program restart</td>
<td>Expand MRO business areas</td>
</tr>
<tr>
<td>Leverage aircraft development knowledge</td>
<td>Develop MRO for non-CRJ aircraft</td>
</tr>
<tr>
<td>Utilize human resources and know-how in Defense</td>
<td>Secure synergies across Commercial Aviation Systems</td>
</tr>
<tr>
<td>Share aircraft know-how and customer network with SpaceJet</td>
<td>Conduct FS for CRJ aircraft upgradoing</td>
</tr>
</tbody>
</table>

Plan Components

Global Passenger Demand Forecast
- Passenger demand recovery forecasted for around 2024
- MRO demand recovery expected to precede that of new aircraft

Global MRO Market Forecast
- Long-term growth market
- (*) 2019=100% base year demand

Long-term Growth Market

Plan Components

1. Advance International Cooperation Efforts
2. Secure synergies across Commercial Aviation Systems
3. Expand MRO business areas
4. Conduct FS for CRJ aircraft upgrading
5. Utilize MRO foundation and commercial aircraft know-how as TC holder
6. Leverage aircraft development knowledge
7. Review, make improvements, and assess possible program restart
8. Temporarily pause M90 development activities (Continue TC documentation activities)
9. Build high performance organization
10. Develop new technologies
11. Undertake efforts to participate in future international aircraft programs
12. Utilize human resources and know-how in Defense

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Ⅳ. Plan to Strengthen Profitability
Plan to Strengthen Profitability (1/4)

Execute various measures to achieve 7% profit margin

Path to improve business profits (in 100 million yen)

<table>
<thead>
<tr>
<th>Category</th>
<th>FY2019</th>
<th>FY2020 (Forecast)</th>
<th>FY23 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Profit Margin</td>
<td>@4 tr yen revenue (excl. SpaceJet/ extraordinary causes)</td>
<td>@3.7 tr yen revenue (excl. Extraordinary causes)</td>
<td>@4 tr yen revenue</td>
</tr>
<tr>
<td>Impact of COVID-19</td>
<td>△950</td>
<td>△1,200</td>
<td>700</td>
</tr>
<tr>
<td>Impact of SpaceJet cost minimization</td>
<td></td>
<td></td>
<td>1,200</td>
</tr>
<tr>
<td>Impact of COVID-19 Recovery</td>
<td>2,150</td>
<td></td>
<td>900</td>
</tr>
<tr>
<td>① SpaceJet cost minimization (costs to be reported in commercial aviation systems)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>② Impact of COVID-19 Recovery</td>
<td></td>
<td>2,800</td>
<td></td>
</tr>
<tr>
<td>③ Growth of existing businesses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>④ Countermeasures/Structural shift</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>⑤ Cost reduction of SG&amp;A*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*SG&A: Selling, General Admin Expenses
## Plan to Strengthen Profitability (2/4)

### Overcoming COVID-19 Impact

<table>
<thead>
<tr>
<th>Measure 1: Minimize SpaceJet Costs</th>
<th>SpaceJet</th>
<th>Business Environment Outlook</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>+120 billion yen</td>
<td>• Real aerospace recovery likely in or after FY24</td>
<td>• Minimize SpaceJet Costs</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measure 2: Recover from COVID-19 Impact</th>
<th>Commercial Aviation</th>
<th>• Recovery of narrowbody aircraft will lead to faster recovery of CRJ and aeroengine businesses</th>
<th>Reduce fixed costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>+70 billion yen</td>
<td>CRJ</td>
<td></td>
<td>Drive forward manpower saving and automation during COVID period</td>
</tr>
<tr>
<td></td>
<td>Aero Engines</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business</th>
<th>Environment Outlook</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbochargers</td>
<td><em>Recovery to Pre-COVID levels expected by FY23</em></td>
<td>Optimize overseas production bases</td>
</tr>
<tr>
<td>Engines</td>
<td></td>
<td>Prepare for market recovery by improving productivity</td>
</tr>
<tr>
<td>Car Aircon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logistics Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HVAC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Plan to Strengthen Profitability (3/4)

Grow existing businesses and solve pre-COVID challenges

Measure 3: Grow existing businesses
+20 billion yen

Measure 4: Address challenged businesses, structural transformation; (including portfolio optimization)
+30 billion yen

Measure 5: Reduce SG&A
+40 billion yen

<table>
<thead>
<tr>
<th>Business</th>
<th>Business Environment Outlook</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics Equipment</td>
<td>• Quick recovery from COVID impact</td>
<td>• Proactively invest in environment-responsive and automation technologies</td>
</tr>
<tr>
<td>HVAC</td>
<td>• Growing market in environment-responsive and automation technologies</td>
<td>• Big shift to services</td>
</tr>
<tr>
<td>Steam Power</td>
<td>• Steep reduction in new-build coal power plants</td>
<td>• Reduce fixed costs</td>
</tr>
<tr>
<td>Environmental Plants</td>
<td></td>
<td>• Reorganize and integrate organization and bases</td>
</tr>
<tr>
<td>Metals Machinery</td>
<td>• COVID has frozen customer investment, competition is growing and profitability hit</td>
<td>• Shift to services to stabilize profits</td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td>• Eradicate losses in EPC projects</td>
</tr>
<tr>
<td>Commercial Ships</td>
<td></td>
<td>• Strengthen marine engineering business</td>
</tr>
<tr>
<td>Machine Tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HQ Corporate</td>
<td>• Aim for 20% reduction in SG&amp;A</td>
<td></td>
</tr>
<tr>
<td>Business Units &amp; Group Companies</td>
<td>• Improve work processes, integrate organization, reduce headcount</td>
<td>• Diversify employment formats, reduce external expenditure</td>
</tr>
</tbody>
</table>
Plan to Strengthen Profitability (4/4)

Reduce workforce in line with business environment and embark on significant shift in workforce deployment

**Global**
- Reduced workforce due to lower production in steam power, metals machinery, turbochargers, logistics equipment, HVAC, commercial aerospace etc. (around 2,000 jobs)

**Domestic**
- Reallocate around 3,000 of workforce due to expected reduction in steam power, commercial aerospace, commercial shipping
- Undergoing program to reassign workforce to growth areas, transfer to organizations outside of Group (approx. 1,000 in H1 FY20)

**Thermal Power**
- 2020: Increase
- 2024: -20% decrease

**Commercial Aviation**
- 2020: Increase
- 2022: -50% decrease

**Commercial Ships**
- 2020: Increase
- 2022: -25% decrease
V. Developing high growth businesses

Energy Transition
New Mobility & Logistics
Expansion of Services Businesses
Cybersecurity & Security
Technological Foundation to Support Growth Areas
MHI Group will use its technological strengths to lower and capture CO₂ emissions and achieve a carbon neutral 2050

Decarbonization and electrification of mobility, residential and industry

Decarbonization of energy supply

Carbon free fuel supply

CO₂ capture and conversion

※Scenario based on 1.5°C scenario to achieve carbon net zero globally by 2050 (Developed by MHI based on IEA, IPCC etc. data)
Energy Transition (2/3)

Combine MHI Group’s wide-ranging products and technologies to make carbon neutrality a reality

Decarbonization and Electrification

Making a carbon neutral world a reality

Mobility
- Electrification
- CO₂ Free Fuels

Residential
- Electrification
- Energy saving

Industry
- CO₂ Reduction
- Maintain economics

EMS·VPP Services
EMS: Energy Management System  VPP: Virtual Power Plant

Fuel Supply (new area)
- Zero CO₂ Hydrogen, Ammonia Production & Storage

- Electrolysis
- Steam reforming
- Thermal cracking
- Methane reforming
- Methane cracking

Hydrogen, Ammonia

Electricity

Heat

CO₂

Clean Fuels, Chemicals

Surplus Power

Heat

Carbon Capture
- Capture, Transportation
- Storage

CO₂ Conversion
- Convert into industrial materials
- Chemicals
- Clean fuels

Capture CO₂ from diverse sources and convert to valuable resources

Decarbonization of Energy Supply
(strengthen current area)

Increase efficiency and performance of conventional thermal power

Expand renewables

Stabilization through storage

Use nuclear to lower CO₂ emissions

Balance decarbonization and stable supply energy

Balance decarbonization and stable supply energy

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Energy Transition (3/3)

New measures to achieve carbon neutrality

Measures

- Develop efficient production technology (including venture investment)
- Build value chain
- Build out business based on our lead as global No.1 in volume of CO₂ captured
- Build out products and develop conversion technology
- Develop and test world’s first pure hydrogen fueled advanced gas turbine

CO₂ free hydrogen, ammonia production and storage

CO₂ Capture and Conversion

Increase Efficiency and Performance of Thermal Power (Hydrogen Gas Turbines)
Deliver new value by systemizing diverse products leveraging digitalization and AI
Open up new areas in mobility and logistics through cross-functional collaboration led by Growth Strategy Office

Logistics, Thermal & Drive Systems
- Logistics
- Automated Warehouses
- AGV/AGF
- Natural Refrigerant Chillers

Plants & Infrastructure Systems
- ITS
- Mechanical Parking Lots
- Environmental Testing Equipment
- Railways, Shipping

Energy Systems
- Thermal Energy Management
- Power Generation Equipment

Aircraft, Defense, Space
- M&S
- Defense Systems
- Shipping, Aircraft

External resources

Electric Component Business

Growth Strategy Office

Infrastructure to support CASE*

CASE: Connected, Autonomous, Shared and Electric
AGV: Automated guided vehicle
AGF: Automated Guided Forklift
M&S: Modeling and Simulation
Realize a seamless fusion between multiple systems by leveraging analytics technologies (M&S: Digital Twin), supported by real data accumulated through logistic & environmental equipment businesses.

Incorporate expertise from external resources, create safer & more secure services through intelligence, and contribute to a more sustainable environment.

1. **Real Data**
   (Grasp the functional, characteristic, performance limits)

2. **Modeling and Simulation Technologies**
   - Automated Logistics System
   - Natural Refrigerant Chiller
   - Support Real Data
   - Seamless fusion between systems

3. **AI Technologies**
   - Thermal Energy Management
   - Digital Twin
   - Foundation of AI Learning
   - Operational Recommendation
   - External Resources

**Cold Chain**
(logistics that preserves value)
- Secure Quality of Food & Medicine
- Energy Saving
- Reduce Losses across Logistics Chain

Knowledge of merchandise conditions to maintain quality
Expansion of Services Businesses

Leverage Digital Transformation (DX) to increase service business portfolio

Strengthen common platforms

Advanced DX examples within MHI Group

**Operation Support**
- Efficiency improvement
- Anomaly detection

**Solutions**
- Customer portal
- Long-term maintenance proposal

**Maintenance Support**
- Advanced Predictive Analysis
- Spare parts SCM

**Steam Power**
Strengthen refurbish proposal towards carbon neutrality

**Compressor**
Strengthen global service structure

**Aero Engine**
Expand MRO businesses
Inhouse parts repair

**Metal Machinery**
Establish maintenance JVs with customers
Digitalization

**Engineering**
Strengthen incorporation of O&M in transportation

**Defense**
Upgrade & MRO businesses
Repair business for US forces in Japan

Expand services business through DX
- Establish a taskforce to aggregate expertise within MHI Group, share best practices, and promote adoption of digital tools

<table>
<thead>
<tr>
<th>Business</th>
<th>Activities</th>
<th>FY20</th>
<th>FY23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam Power</td>
<td>Strengthen refurbish proposal towards carbon neutrality</td>
<td></td>
<td>+30%</td>
</tr>
<tr>
<td>Compressor</td>
<td>Strengthen global service structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aero Engine</td>
<td>Expand MRO businesses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal Machinery</td>
<td>Establish maintenance JVs with customers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>Strengthen incorporation of O&amp;M in transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defense</td>
<td>Upgrade &amp; MRO businesses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Revenue**

- FY20
- FY23
Cybersecurity & Security

- Promote measures adapted to changes in trends in defense and space, and expand dual use for private sector

<table>
<thead>
<tr>
<th>Environment Trend</th>
<th>Measures in Defense/Space areas</th>
<th>Dual Use for Private Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leverage Space</strong></td>
<td>• Utilization of information using space becoming more sophisticated</td>
<td>• Strengthen the analytic technology of wide-area image data, “BRAINS”</td>
</tr>
<tr>
<td><strong>Defend Cyberspace</strong></td>
<td>• Cyber threats becoming more apparent • Urgent need to strengthen cybersecurity of defense equipment</td>
<td>• Develop and expand the application of “InteRSePT”, a system to monitor the operation of defense equipment and detect anomalies</td>
</tr>
<tr>
<td><strong>Utilize Unmanned Systems</strong></td>
<td>• More difficulty in securing workforce due to declining birth rate • Utilizing unmanned systems to maintain or strengthen the defense capability</td>
<td>• Develop “CoasTitan”, an integrated control system for unmanned vehicles (UAVs, USVs and UUVs)</td>
</tr>
</tbody>
</table>

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**BRAINS**

**InteRSePT**

**CoasTitan™**
Technological Foundation to Support Growth Areas

- Utilize and incorporate technologies accumulated from across broad business areas into strategic growth products by adjusting to the transition in customer needs and machinery systems.

### Energy Transition
- Energy Integration/Management, Strengthen Data Security of Machinery Systems
- Decarbonization, Carbon Recycling
- Automated/Autonomous Plant Operation

### Build a safer world
- Response to Disaster/Severe Environment by Unmanned Tech. & Data Validation
- Next Generation AGV/AGF, EV Component/Mobility

### Electrification/Intelligence
- Energy Integration/Management, Strengthen Data Security of Machinery Systems
- Decarbonization, Carbon Recycling
- Automated/Autonomous Plant Operation

### Innovations to Realize Innovation

#### New Activities to Realize Innovation

- **Innovation Promotion Research Institute**
  - Develop unconventional functions built out from cutting-edge technology

- **Yokohama Hardtech Hub (YHH)**
  - Open a “co-creation place” for start-ups to realize their ideas

- **Introduce Pivot Development**
  - Grasp market needs/opportunities quickly, break down new technical issues, develop at a speed that surpasses start-ups

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**AI/Intelligence**

**Create new value by adding digital technologies**

- Digital Twin
- Data Security
- Data Science
- Sensor Network
- IoT/AI
- Automation
- Intelligence

**Deepening tech. foundation & creating new function**

- Operate certainly and efficiently complex machineries and plants
  - 3D integrated Simulation
  - Sensing
  - Robotics

**Build unconventional functions**

- Elemental Conversion
- Catalyst
- H2 Production & Utilization
- AM Utilization

AM: additive manufacturing
VI. Summary
Summary

■ 2021 MTBP focuses on strengthening profitability, investing in and developing high growth businesses
  • Return to and strengthen profitability coming out of COVID-19
  • Invest 180 billion yen in growth areas and create 100 billion yen in new businesses

■ Energy Transition and New Mobility & Logistics represent our primary growth engines
  • Drive forward energy transition aiming for a carbon neutral 2050
  • Open and embed new business areas in mobility etc.
  • Nurture 1 trillion yen revenue in new businesses by 2030
  • Cross-functional measures led by Growth Strategy Office
Appendix

1. Energy Transition
2. Shared Foundation and Business Area
3. Energy & Environment
4. Aircraft, Defense & Space
5. Industry & Infrastructure (mass and medium lot manufacturing)
6. Industry & Infrastructure (build to order)
7. Materiality
8. TOP (Triple One Proportion)
1. Energy Transition  

Zero CO₂ Fuels

- Move beyond MHI’s existing core strength in hydrogen and ammonia usage and build an entire value chain including production.

**Primary Energy**  
- Renewables
- Vestas
- Nuclear
- Natural Gas

**Hydrogen Production**  
- Electrolysis
- Steam Reforming/Cracking
- Methane Reforming (CO₂ capture)/ Methane Cracking

**Transport / Storage**  
- Hydrogen Storage

**Usage**  
- Hydrogen GT
- Hydrogen production, storage and hydrogen gas turbine business in four Southern US states
- Zero GHG emission ships
- Hydrogen reduction in steel making

**Existing Products**

- Vestas
- HTGR development

**New Areas**

- Hydrogen Pro
- MAGNUM development
- Enertgy
- PRIMELOGS TECHNOLOGIES

GHG: Greenhouse Gas
1. Energy Transition  Carbon Capture, transport and converted usage

MHI Group is global No.1 in volume of CO₂ captured
MHI will expand its product lineup and invest in conversion technologies to expand business

Carbon Capture

2016: World’s largest Carbon Capture plant at steam power plant in Texas, USA

2020: World’s largest bioenergy with carbon capture and storage (BECCS) pilot facility with Drax, UK

As of 2020, MHI has largest global installed base market share in carbon capture

Carbon Conversion & Usage

MHI Group: 70%+ share

Expecting explosive growth

CO₂ Capture

Thermal Power
Cement Plants
Steel Plants
Factories & Waste Treatment
Commercial Facilities

CO₂ Conversion & Usage

Transport

Industrial Use
Fuel Synthesis
Valuable Resources
Underground Storage

*1: Predicted CO₂ capture vol. needed to achieve global carbon net zero at the earliest later than 2050, in accordance with the "1.5 °C Scenario"
1. Energy Transition

Renewables, energy efficiency

**Increased energy-use efficiency**

- Build energy solution provider business by combining large domestic market share in private industrial power generation and ENERGY CLOUD

**Energy Storage**

- **BESS** (Battery Energy Storage Systems)
  - US orders totaling 220MW
    - 20MW in South California,
    - 200MW in Texas
  - Roll out to other regions

- **EBLOX** (triple hybrid stand-alone power generation system)
  - Expand renewables-linked products

**Offshore Wind**

- **Strengthen Partnership with Vestas**
  - Improve competitiveness through integration of offshore and onshore wind
  - Exchange MHI’s shares in MVOW to Vestas shares, gain seat on Vestas board
  - Focus on MHI’s areas of strength
    - Japan, APAC sales JV
    - Japan production and supply chain

- **Expand into New Areas**
  - Explore joint development with Vestas in hydrogen
  - Project development for offshore wind in Hokkaido with Copenhagen Infrastructure Partners (CIP)
1. Energy Transition

Investments and CO₂ reduction track record

- CCUS (carbon recycling) and conversion to hydrogen/ammonia fuels leading to zero CO₂ emissions
- Hydrogen Gas Turbines are catalyst for hydrogen demand (GT400MW = 2 million FCVs)

**CO₂ Reduction**
Increase efficiency and performance of current thermal power

<table>
<thead>
<tr>
<th>Technology</th>
<th>Emissions Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced ultra-supercritical IGCC Development</td>
<td>-20%</td>
</tr>
<tr>
<td>Boiler Tech Development Ammonia, Biomass Co-firing</td>
<td>-20%</td>
</tr>
<tr>
<td>JAC class Advanced GT Development</td>
<td>-65%</td>
</tr>
</tbody>
</table>

**CCUS (Carbon Recycling)**
Decarbonization through fuel conversion

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Emissions Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal + CCUS</td>
<td>-90% or more</td>
</tr>
<tr>
<td>Hydrogen GT Development</td>
<td>Hydrogen-fired GT</td>
</tr>
</tbody>
</table>

**Technology Timeline**

- 2020: T-Point 2 64% GTCC (2020 operation)
- 2030: Continued investment toward Zero CO₂ emissions

*1: Based on CO₂ emissions of sub critical pressure coal fired boiler
1. Energy Transition

Reducing CO₂ emissions with nuclear

- Drastically reduce CO₂ emissions from power generation sector by restarting existing nuclear power plants and building new ones
- Stable and high volume production of Hydrogen with High Temperature Gas Cooled Reactors (HTGRs)

Zero CO₂ Power

Zero CO₂ Hydrogen

Restart existing nuclear power plants

Maintain readiness new build nuclear power plants

Production of Hydrogen with HTGRs

CO₂ emissions during hydrogen production
Steam Reforming
Electrolysis, Cracking

ZERO CO₂

-60% reduction (from current)

50% 75% Base

2020 2030 2040 2050

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2. MHI Group Shared Foundation & Business Areas

- Accumulate technologies, expertise and personnel cultivated across a broad range of businesses in shared foundation
- Businesses will leverage strengths of the shared foundation to drive growth based on their respective strategies

1. Group Management
   - Mission, vision, values
   - Strengthen responsibility, authority and organization

2. Technology
   - Centralize and develop technologies and knowhow
   - Drive forward digitalization

3. People
   - Increase diversity
   - Increase mobility

4. Financial Base
   - Acceleration of re-allocation of resource
   - Improve and maintain financial soundness

Corporate Culture
3. Energy & Environment

- Balance profitability and growth potential to adjust portfolio and achieve a carbon neutral world by 2050
- Maximize global foundation and resources within Mitsubishi Power across MHI Group

<table>
<thead>
<tr>
<th>Business</th>
<th>Market Trend (5-10 years)</th>
<th>Main Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTCC</td>
<td>Demand expected to remain stable, generate new value with hydrogen gas turbines</td>
<td>Develop and test high efficiency and alternative fuel converted gas turbines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upgrade equipment for bolstered servicing (high temperature parts of GTs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test autonomous operation at T-Point 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase profitability by reducing costs</td>
</tr>
<tr>
<td>Nuclear</td>
<td></td>
<td>Support domestic restarts, fuel cycle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Development of next-generation reactors, current reactors (HTGRs, small size etc.)</td>
</tr>
<tr>
<td>Aero engines</td>
<td>Shift Resources Increase synergies</td>
<td>Maximize Mitsubishi Power resources</td>
</tr>
<tr>
<td>Marine machinery</td>
<td></td>
<td>• Strengthen internal production capability</td>
</tr>
<tr>
<td>Compressors</td>
<td></td>
<td>• Strengthen services business</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Develop mechanical drive systems in Oil &amp; Gas</td>
</tr>
<tr>
<td>Steam Power</td>
<td></td>
<td>Optimize productivity of boiler factories amidst large drop off in new builds</td>
</tr>
<tr>
<td>Air Quality Control Systems</td>
<td></td>
<td>Focus on services, expand menu of low-carbon solutions</td>
</tr>
</tbody>
</table>

**Business Scale**

- FY20
- FY23

**New Area**
### 4. Aircraft, Defense & Space

- Maintain and expand dominant position in Defense & Space business, proactively develop new technologies
- Expect longer-term drop in aircraft market due to COVID-19, strengthen organization for future growth

#### Business scale

<table>
<thead>
<tr>
<th>FY20</th>
<th>FY23</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Defense & Space

- Market Trend (5-10 years):
  - Maintain and expand domestic existing and peripheral areas
    - Start development of next-gen fighter
    - Move to operations of H3 rocket
  - Overseas business rollout using joint development and transfer of domestic equipment (government-linked)
  - New tech to build a safer world
    - Cybersecurity
    - Unmanned surveillance
    - Wide-range image data processing

#### Commercial Aviation

- Market Trend (5-10 years):
  - Tier-1 Aerostructures
    - Personnel saving and automation technologies to increase profitability
    - Reorganize base and supply chain
    - Change processes and increase automation
  - MRO Business
    - Drive forward PMI, synergies
    - Prepare for post-COVID growth
### 5. Infrastructure (Mass and Medium Lot Products)

- Recover from COVID crisis quickly and increase investment in growth businesses

<table>
<thead>
<tr>
<th>Business Scale</th>
<th>Business</th>
<th>Market Trend (5-10 years)</th>
<th>Main Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY20 FY23</td>
<td>Logistics Equipment</td>
<td>Strengthen sales strategy from Japan and US to include Europe and APAC (Reorganize sales network, launch new products)</td>
<td>Expand solutions business</td>
</tr>
<tr>
<td></td>
<td>HVAC Car Aircon</td>
<td>Expand B2B business (Regionally matched product lineup)</td>
<td>Expand environmentally friendly products including natural refrigerant Build global business around electric compressors</td>
</tr>
<tr>
<td></td>
<td>Engines Turbochargers</td>
<td>Cut fixed costs in response to fall off in market due to COVID</td>
<td>Invest in growth markets and technologies based on current well-managed businesses</td>
</tr>
</tbody>
</table>
6. Infrastructure (Build To Order Business)

- Respond to change in market environment after COVID, and make structural improvements to increase profitability

<table>
<thead>
<tr>
<th>Business Scale</th>
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<th>Market Trend (5-10 years)</th>
<th>Main Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY20</td>
<td>Environmental Equipment</td>
<td>Invest in growth markets and technologies based on current well-managed businesses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Machinery Systems</td>
<td></td>
<td>Portfolio management and shift in human resources</td>
</tr>
<tr>
<td></td>
<td>Engineering Metals Machinery</td>
<td></td>
<td>Organizational and base reorganization adapting to the market circumstances</td>
</tr>
<tr>
<td></td>
<td>Commercial Ships Machine Tools</td>
<td></td>
<td>Strengthen risk management for large projects</td>
</tr>
<tr>
<td></td>
<td>Machine Tools</td>
<td></td>
<td>Shift resources to “Energy Transition”</td>
</tr>
</tbody>
</table>

| FY23           | Environmental Equipment | Invest in growth markets and technologies based on current well-managed businesses |
|                | Machinery Systems  |                           | Portfolio management and shift in human resources                          |
|                | Engineering Metals Machinery |                     | Organizational and base reorganization adapting to the market circumstances |
|                | Commercial Ships Machine Tools |                     | Strengthen risk management for large projects                              |
|                | Machine Tools     |                           | Shift resources to “Energy Transition”                                     |
### 7. Merging Non-Financial and Financial – Materiality

#### Defining Materiality for MHI Group
- Streamlined and analyzed the issues which MHI Group should prioritize to deal with, from both a “Social perspective” (e.g. recent rising focus on SDGs and climate change), and “Our perspective” (MHI Group’s vision). Through dialogue with stakeholders, the Materiality that MHI Group should tackle have now been defined.
- Materiality progress will be monitored by mid- to long-term “targets” and “KPIs” set as milestones, and by linking business activities and non-financial indexes. In addition, we will communicate with a broad range of stakeholders our contribution to building a sustainable world.

<table>
<thead>
<tr>
<th>Materiality</th>
<th>Social Issues</th>
<th>SDGs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>① Provide energy solutions to enable decarbonized world</strong></td>
<td>Mitigate climate change, Reduce GHG emission, Stable energy/electricity supply</td>
<td>Improve energy efficiency, Popularize renewable energy, Promote 3R*/circulation economy</td>
</tr>
<tr>
<td><strong>② Transform society through AI and digitalization</strong></td>
<td>Promote AI/digitalized society, Enhance productivity to react to labor shortages, Update outdated facilities</td>
<td>Enhance transportation safety/convenience, Decarbonize mobility, Diversify transportation needs, React to increased logistics</td>
</tr>
<tr>
<td><strong>③ Build a safer and more secure world</strong></td>
<td>National security by defense, Adapt to climate change, Enhance function/durability of infrastructure, Rationalize infrastructure</td>
<td>Interfere with cyber attacks on industrial systems / IoT, Prevent pandemics &amp; take appropriate measures</td>
</tr>
<tr>
<td><strong>④ Promote diversity and uplift employee engagement</strong></td>
<td>Nurture/secure workforces, Respect human rights, Promote diversity</td>
<td>Enhance labor productivity, Labor safety &amp; hygiene, Promote health management</td>
</tr>
<tr>
<td><strong>⑤ Enhance Corporate Governance</strong></td>
<td>Corporate governance, Comply with law/international order</td>
<td>Fair competition/business compliance, Grasp overall corporate risk/management, Timely disclosure</td>
</tr>
</tbody>
</table>

*3R: Reduce, Reuse, Recycle
“TOP” is MHI Group’s overall management Key Performance Index (KPI) to evaluate the balance among value provision to customers, business foundation, and evaluation from society, aiming the equal balance -1:1:1- among three management factors: net sales, total assets, and market value.

- **Value to customers through business activities**
  - Contribute to solve social issues through business activities
  - Execute business strategy
  - Revenue growth rate

- **Evaluation from society**
  - Non-financial index
    - Materiality KPI (set ahead)
  - Financial index
    - Profit (ROE/EBITDA etc)
    - SAV (ROIC・WACC)

- **Social Issue**
  - (ESG/SDGs)

- **Total Asset**

- **Revenue**

- **Market Value**

- **Business Foundation**
  - Allocate resources, optimize business portfolio, Enhance performance of workforce & Balance Sheet
MOVE THE WORLD FORWARD