

Asia Clean Energy Forum 2026  
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# Technology solutions for SMRs and large-scale nuclear projects

**IHI**

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**IHI Corporation**

# Company Overview

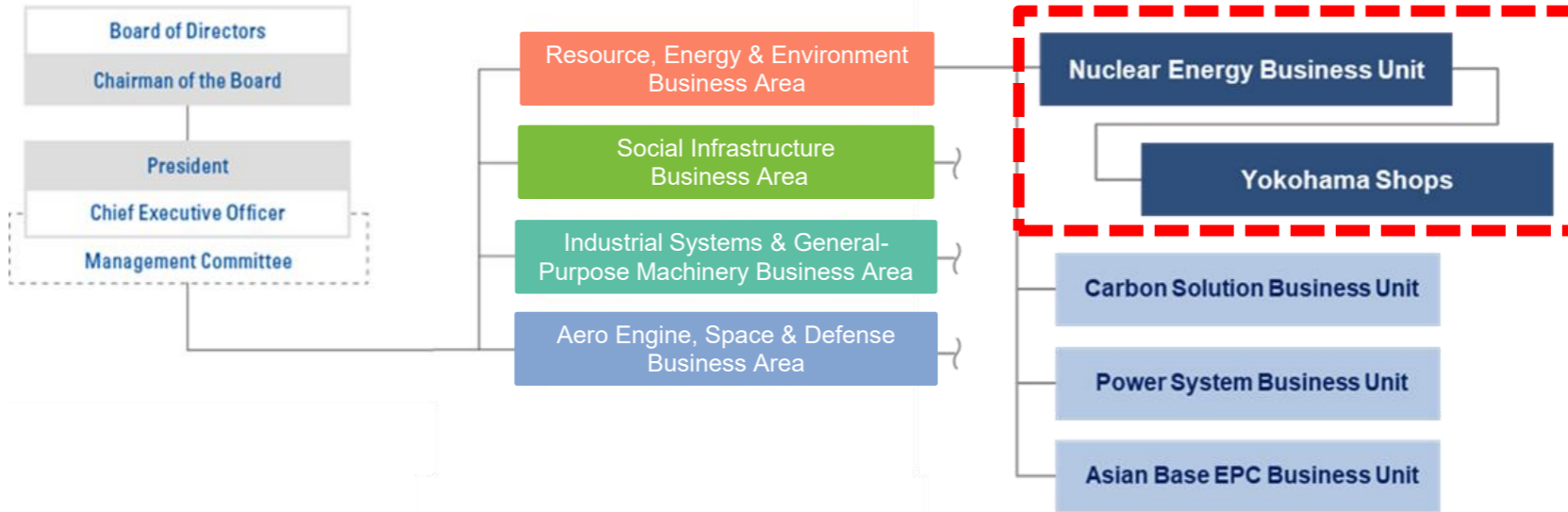
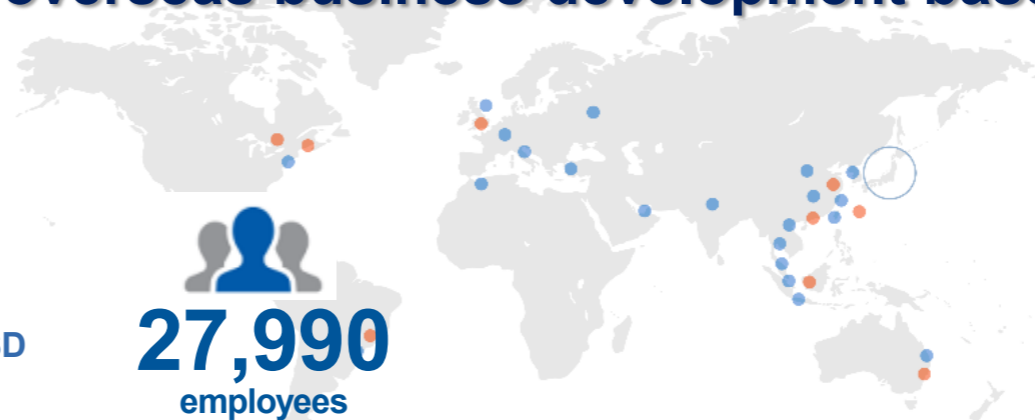


## IHI is a global company with 20 overseas business development bases.

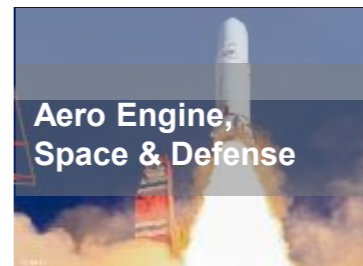
Year of establishment  
**1853**

Revenue (Consolidated)  
Approx. **12** billion USD

**27,990**  
employees  
(consolidated)



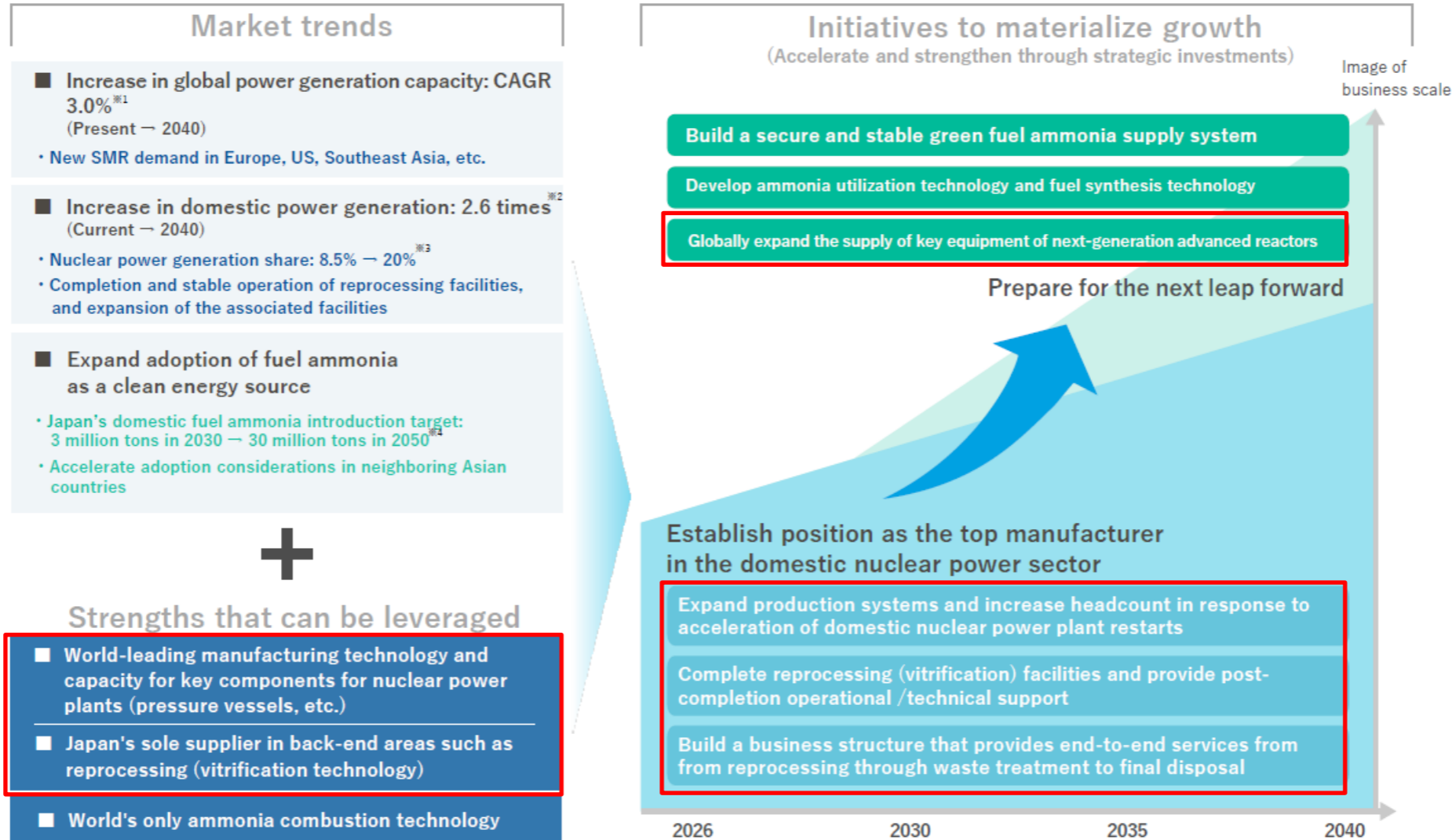
**4**  
Areas of expertise



# IHI Growth Scenario Toward 2040 - Energy

(from IHI's "Management Overview – Roadmap toward Medium - to Long -Term")

Contribute to carbon neutrality and energy security in Japan and globally by advancing and expanding clean energy business centered on nuclear energy and the fuel ammonia value chain.



※1 Source : World Energy Outlook 2025 (IEA) 、 ※2・3・4 Source : The 7th Strategic Energy Plan (Agency for Natural Resources and Energy)

# IHI Nuclear Business for Total & Global Solutions



- Track Record in Nuclear field - for 70 years
- One Stop Supply Chain - Engineering to Installation
- Solution for Nuclear Lifecycle - New Build to Back-End

## NPP Components & Engineering

**BWR**



Reactor Pressure Vessel

Supply key component & System Engineering

**PWR**



Containment Vessel



Structural Module

[Photo Source: Southern Nuclear Operating Company Website] <https://vogtlegallery.georgiapower.com/>

## Operation & Maintenance



Primary Piping Replacement



Inspection Service

## Advanced Reactor/Small Modular Reactor

**SMRs**

### NuScale SMR

- Investment by the Japanese team
- Joint technology development

*Establishing collaborative relationships with multiple SMR developers*

### Advanced Reactors

#### ARC-100



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#### X-energy

- MOU to advanced manufacturing collaboration

## Nuclear Fuel Cycle Plant

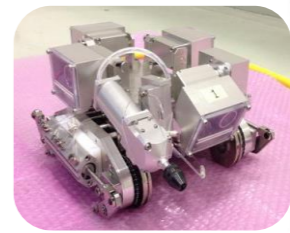


Source: Atomic Energy Society of Japan

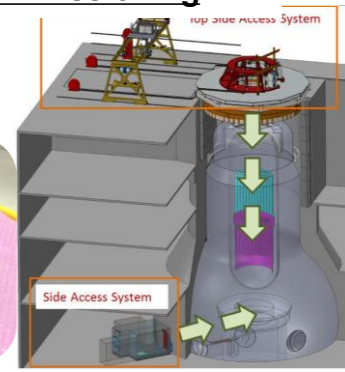
HLW Vitrification & Storage Facility

## De-Contamination & De-Commissioning

Source : Proceedings of WM2015, Fukushima Inspection Manipulator - 15485



Remote Equipment



Fukushima Fuel Debris Retrieval

Source : Proceedings of WM2016, Conceptual Study of Fuel Debris Retrieval System for Fukushima Daiichi Reactors - 16111

# Technology solutions for SMRs and large-scale nuclear projects

**IHI provides technology solutions as an engineering & manufacturing company of key components for both SMRs and large-scale nuclear projects.**

## Technology Development

- Materials / Manufacturing Technology development
- Modularization and Construction Methods
- Seismic Safety

## Establishing a Common Technology Platform

- Manufacturing Workforce Development
- Quality Assurance (QA) System Establishment
- Supplier Development
- Localization

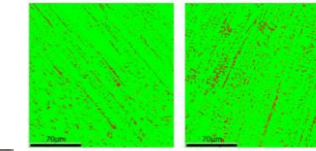
# Technology Development

## Materials Development

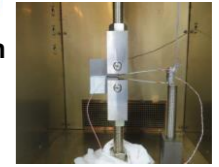
- Develop and test new materials and welding consumables
  - Evaluation under specific service and environmental conditions
- ⇒ **Build a test database and choose the best materials and conditions for each product**



Welded test piece



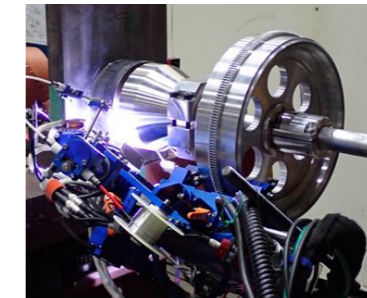
Sigma phase evaluation



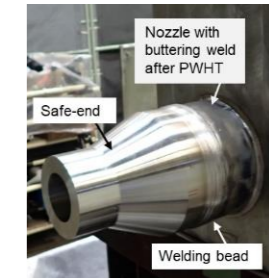
Fracture toughness test

## Manufacturing Technology Development

- Develop welding and inspection methods
  - Design and build special welding and inspection equipment
- ⇒ **Final verification of technologies and equipment using mock-up tests**

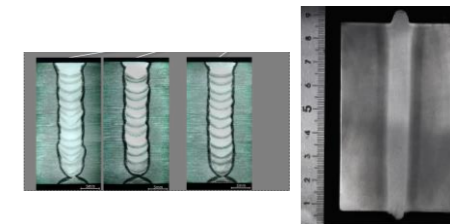


Butt Welding



## Application of Advanced Manufacturing Technologies

- Laser welding, electron-beam welding, 3D printing
  - Automation and robotics
- ⇒ **Improve productivity and keep quality more consistent**



Laser welding, electron-beam welding

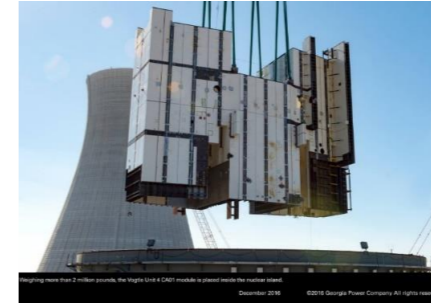
# Technology Development

## Modularization and Construction Methods

- Standardized modular construction enables continuous production and shorter schedules
- Steel module quality is key to overall plant construction

⇒ **Apply lessons learned and keep design, fabrication and construction closely linked**

⇒ **Use mock-up fabrication to develop designs for easier manufacturing and installation**



【Photo Source: Southern Nuclear Operating Company Website】  
<https://vogtlegallery.georgiapower.com/>



【Photo Source: IHI Website】  
[https://www.ihl.co.jp/all\\_news/2025/resources\\_energy\\_environment/1201461\\_13752.html](https://www.ihl.co.jp/all_news/2025/resources_energy_environment/1201461_13752.html)

## Seismic Safety

- In earthquake-prone countries like Japan and many Asian nations, seismic safety is a critical issue
  - Introducing reactors developed overseas may require redesign of plant buildings, etc.
- ⇒ **Optimize seismic design and reinforcement, with seismic isolation as one option**

### Ex. Seismic reinforcement of building

- Truss structure on roof
- Wall thickness optimization
- Additional Seismic Walls
- Reactor Module Support Modification, etc.



### 【Reference Technology】 Floating Seismic Isolation System (FSIS)

【Photo Source: WNN】  
<https://www.world-nuclear-news.org/Articles/Japan-demonstrates-floating-seismic-isolation-syst>

# Establishing a Common Technology Platform

## Manufacturing Workforce Development

- Secure and train people with the skills needed for future nuclear equipment projects
- Eliminate safety and quality risks from inexperienced staff.

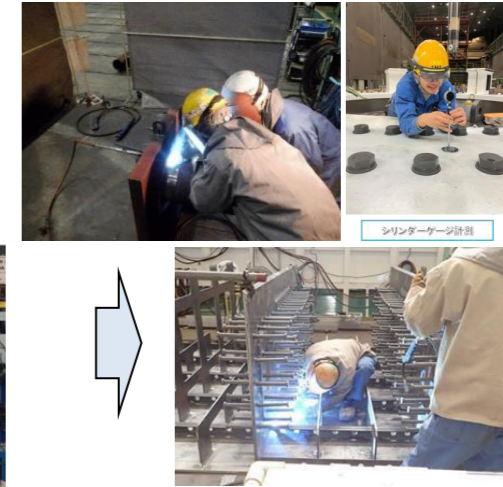
⇒ **Maintain a strong workforce that can support nuclear projects and keep improving its skills**

IHI Technical Training Center



Elemental Skills Training

⇒ Verification through Mock-up Production



## Quality Assurance (QA) System Establishment

- Use quality management systems that meet international nuclear standards (e.g., ASME, NQA-1)

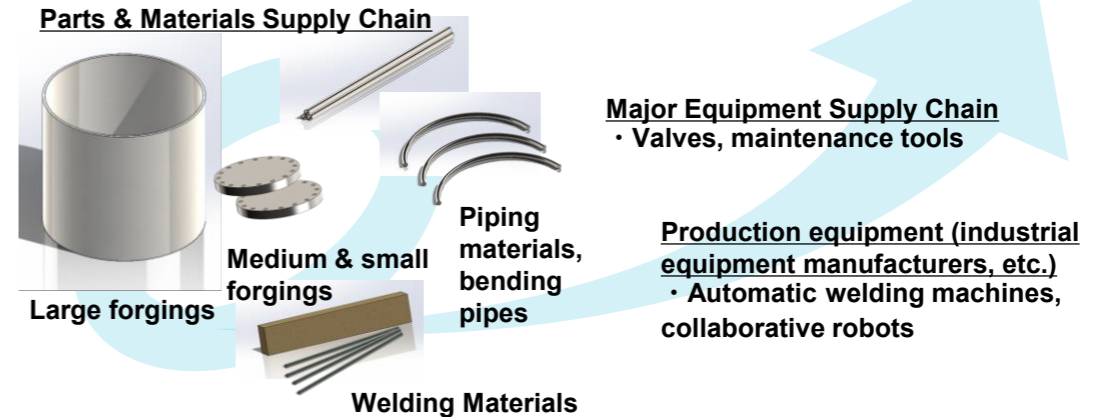
⇒ **Build a nuclear-specific QA system step by step**  
(Example: qualifying our boiler factory as a nuclear product manufacturing plant)

# Establishing a Common Technology Platform

## Supplier Development

- Nuclear projects rely on a wide supply chain
- Co-develop and test technologies with suppliers

⇒ **Create chances for suppliers to join real projects and strengthen their skills and capacity**

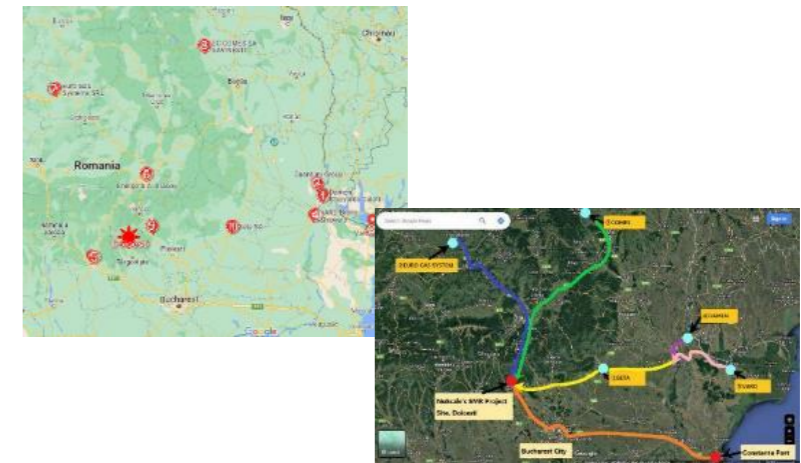


## Localization

- In Asia, nuclear manufacturing needs cooperation between global suppliers and local industry
- Build long-term partnerships and gradually shift work to local companies by capability

⇒ **Establish such collaborative, phased delivery frameworks early to build sustainable local nuclear manufacturing capability.**

### Potential Local Manufactures Surveyed



**Logistics Survey to the Power Plant**

- SMRs and large-scale nuclear power are both essential to Asia's clean energy transition and energy security.
- From IHI's perspective as an engineering and manufacturing company for key nuclear components, we have introduced several technology solution examples – including materials and manufacturing technology development, modular construction, high-seismic design, workforce development, QA, supplier development, and localization.
- We believe that these technology solutions can contribute to the safe, reliable, and efficient deployment of SMRs and large-scale nuclear projects in Asia.

# IHI

**Realize your dreams**