44th Fusion Power Associates Annual Meeting
December 19-20, 2023, Washington DC, USA

EnableFusion : New Korean Fusion Startup

"Staged Approach to Fusion Energy"

December 19, 2023

GS Lee, D. Choi and EnableFusion Team

EnF (Energy and Fusion) Homepage:
http://www.EnableFusion.com

Fusion Energy Development in Korea

☑ Based on the Korean National Fusion Energy Promotional Law

- Succeed the KSTAR Project (1995-2007 Construction; 2008~ Operation)
- Joined Member of the ITER Project (since 2007 for Construction)
- Initiated Korean Fusion DEMO Plant Design Activities (2023~ present)

☑ Korean Industries participated in Publically Funded Fusion R&D

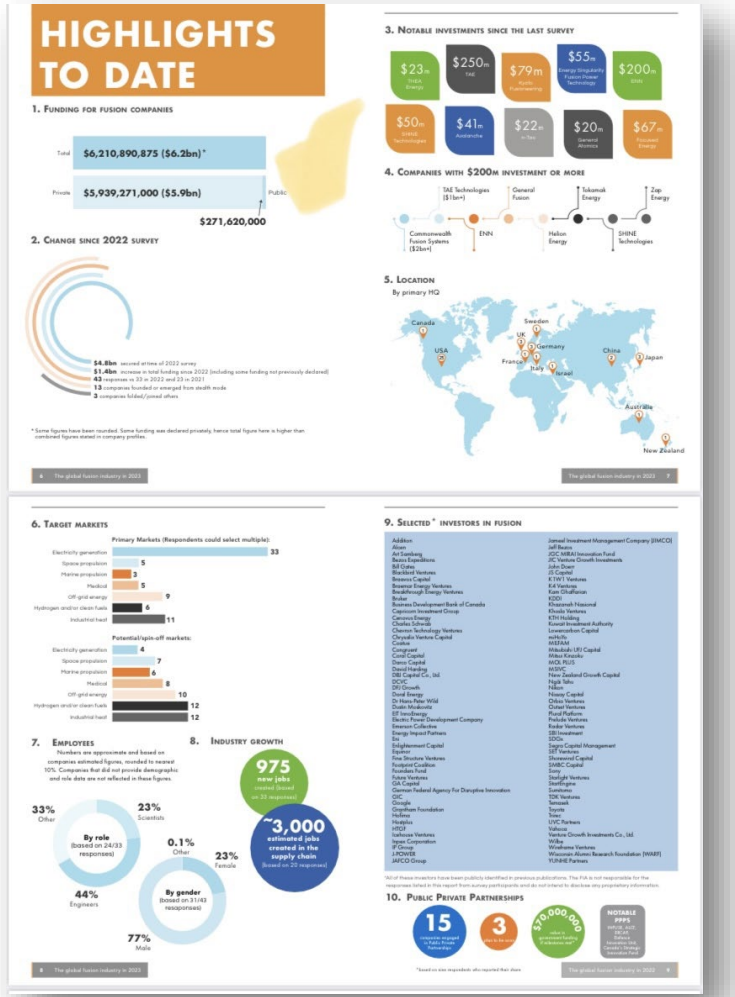
- Major Korean Industries (e.g. Samsung, Hyundai, Doosan, etc.)
- Mid-size Korean Industries (e.g. KAT, DawonSys, etc.)
- Many Small Scale Businesses

☑ Formed a High Quality, Cost Competitive and Field Experienced "Fusion Supply Chain Platform" for Fusion Energy Commercialization by Private Sector

☑ EnableFusion Mission : Bringing clean, safe, and sustainable fusion energy to the world as a digitally-driven platform for innovative fusion engineering and industrial solutions

Fusion Energy Commercialization

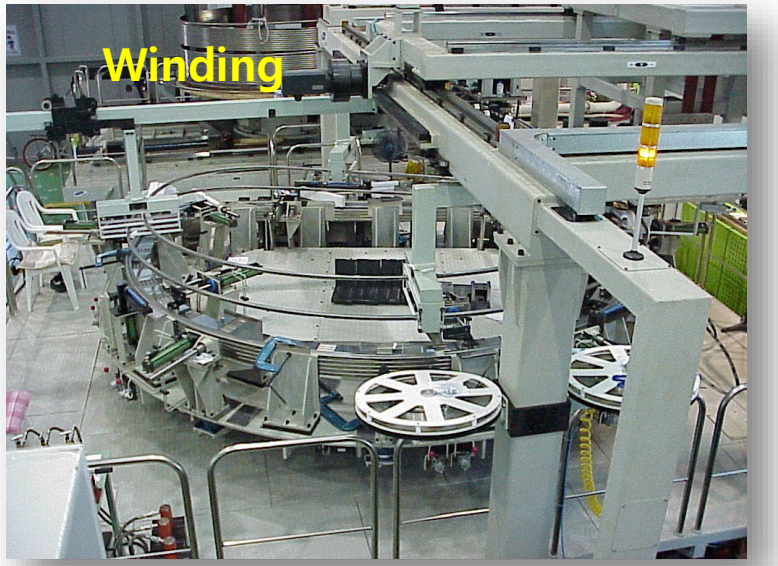
- Establishment of “Privately Funded Legal Entity” named “EnableFusion” through consolidating the established “Korean Fusion Supply Chain” within the Digital Manufacturing Platform.
- Providing “Construction Design and Manufacturing Drawings” in accordance with the Engineering Design of Innovative Fusion Industries.
- Manufacturing and Delivering crucial Components, Sub-systems and full Systems to “Fusion Developers” across the globe.
- Collaboration with Startups for successful fusion energy commercialization for Win-Win Partnership

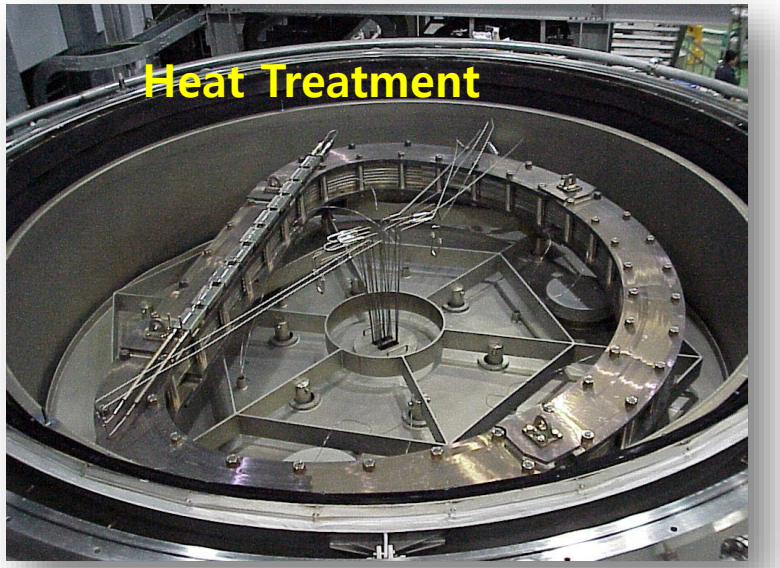


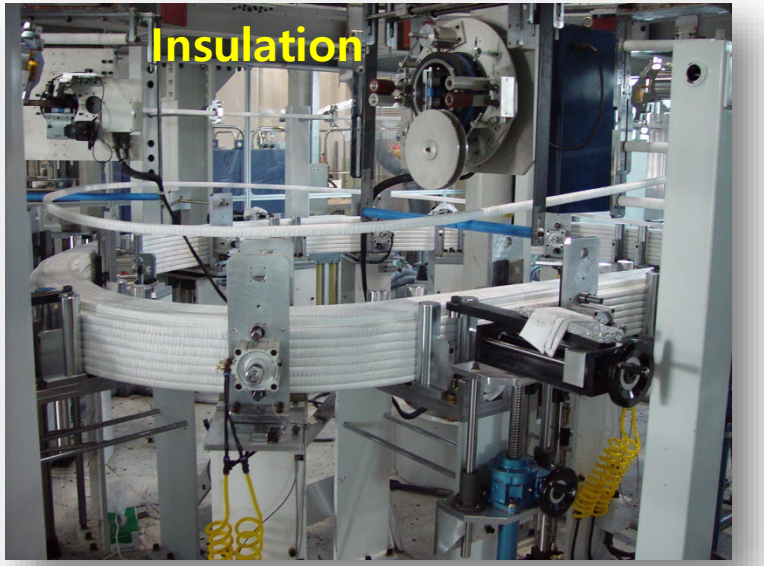
Credit: FIA

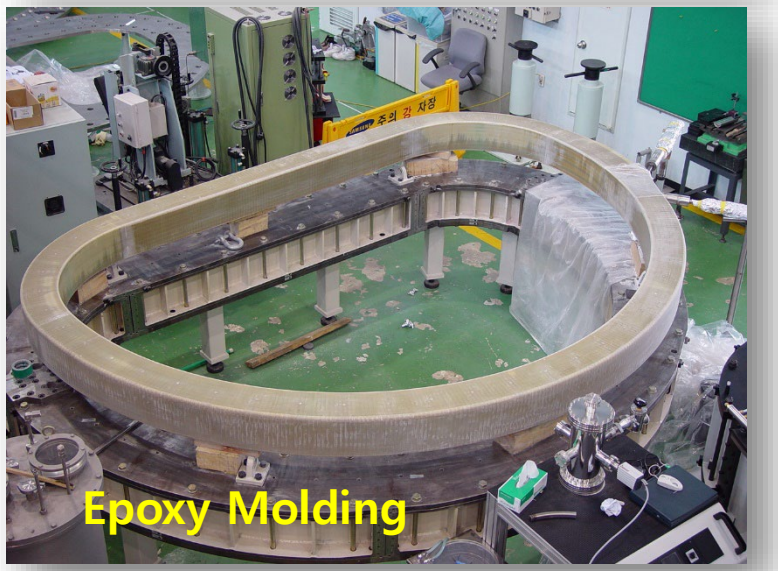
KSTAR Construction Experience with Korean Industries

KSTAR SC Magnet Manufacturing





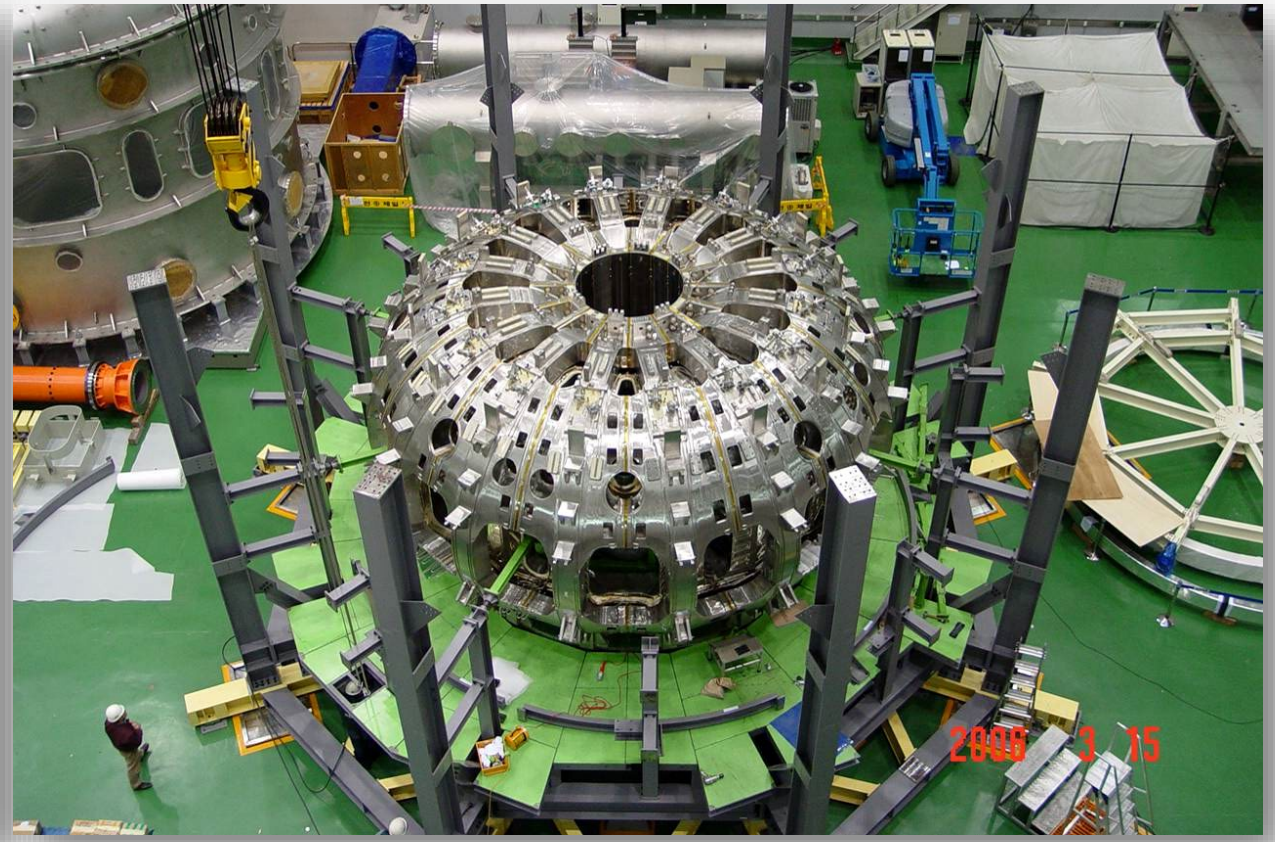




The KSTAR TF magnet are installed

KSTAR Assembly Tools

KSTAR VV and VVTS are installed in TKM Pit

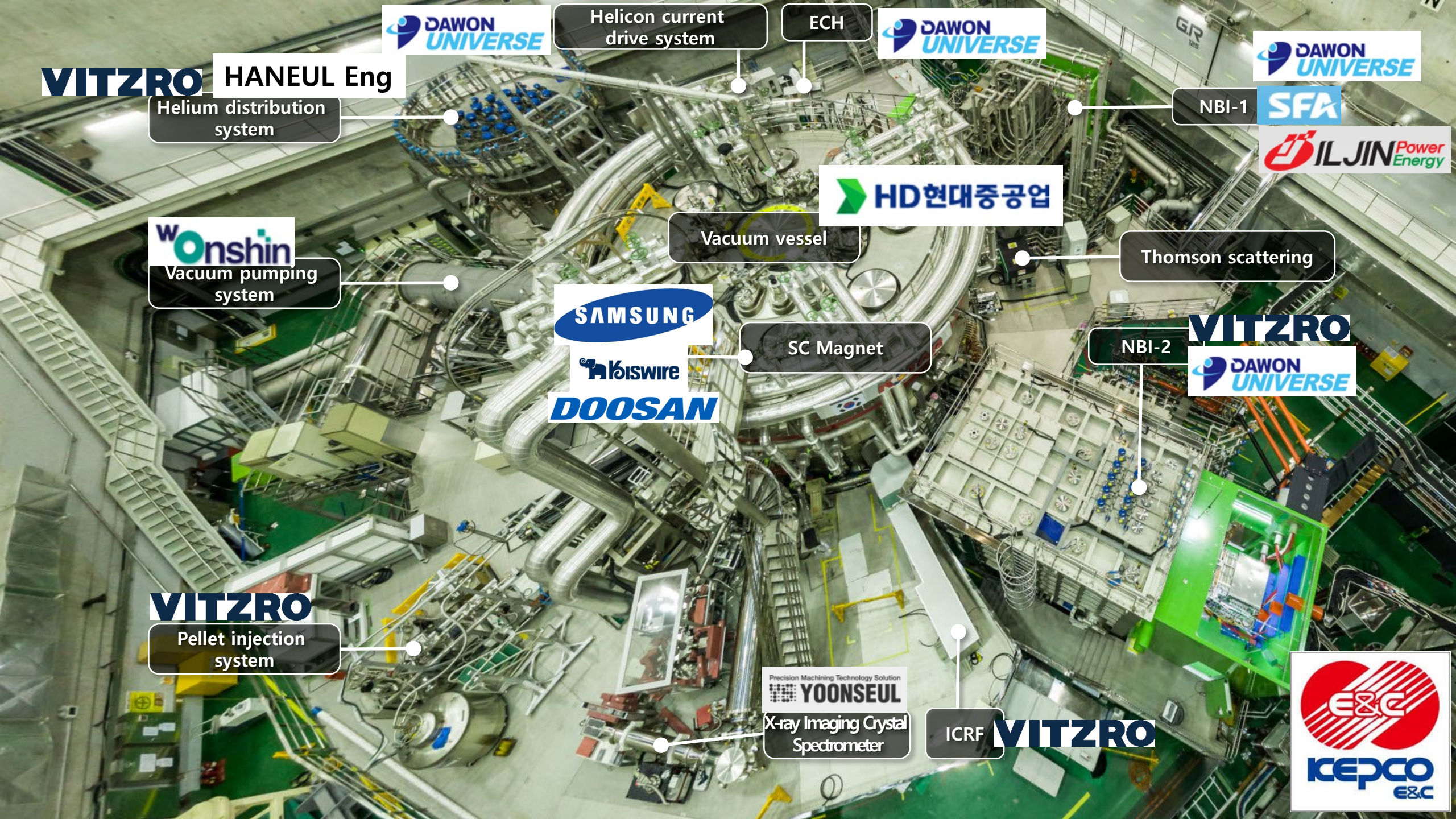


KSTAR TF magnet are installed

KSTAR Construction completed in 2007

☑ KSTAR succeeded Construction: First Plasma in 2008

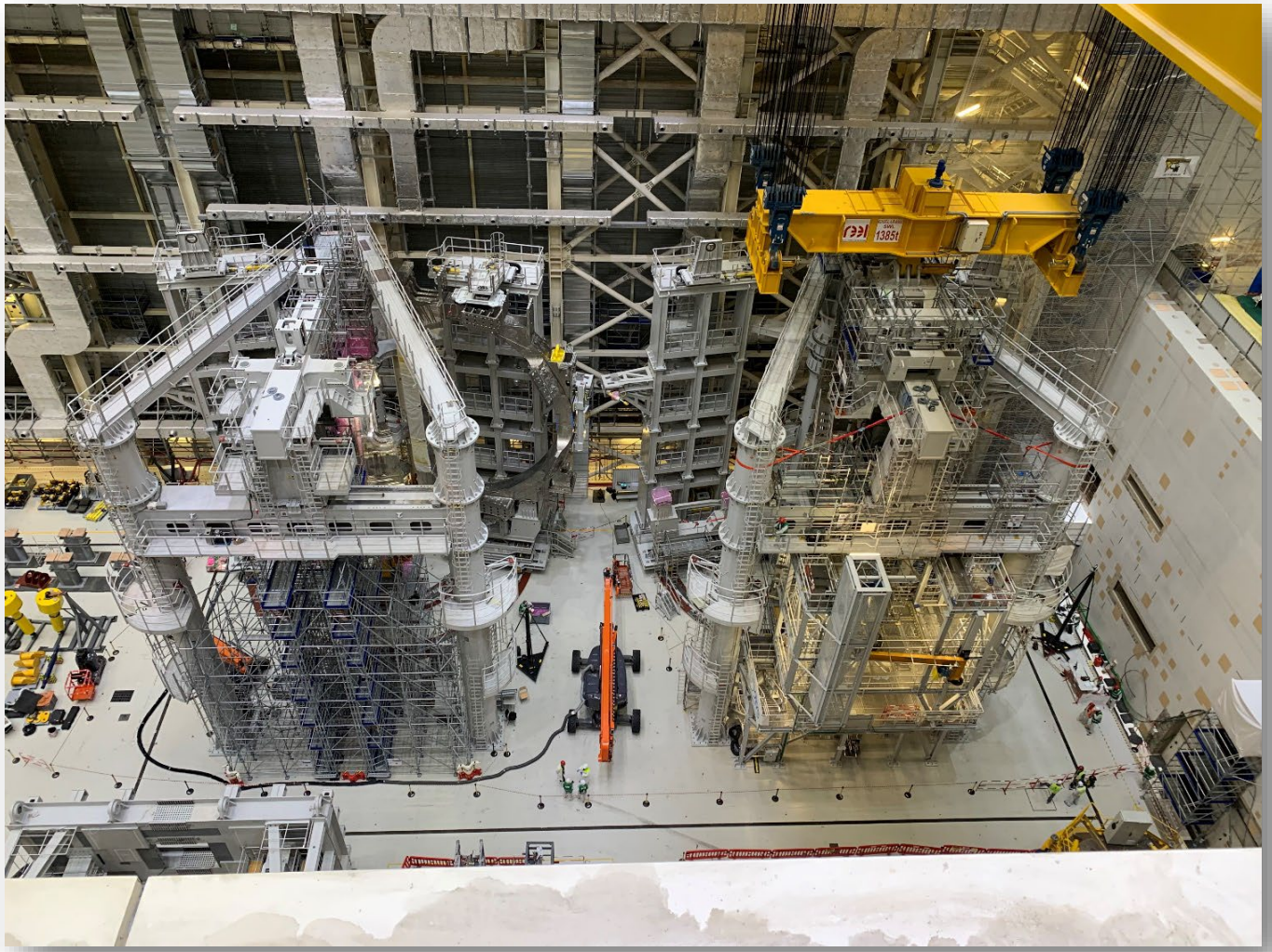

posco DX
DAWON UNIVERSE
Power supply
VITZRO
Motor generator
Helium storage
SAMSUNG
Coolant facility
Tokamak building
Diagnostic
VITZRO
DAWON UNIVERSE
NBI
Main building
NFRI
Helium facility
NBI-2
SAMSUNG
SAMSUNG SDI
Control room

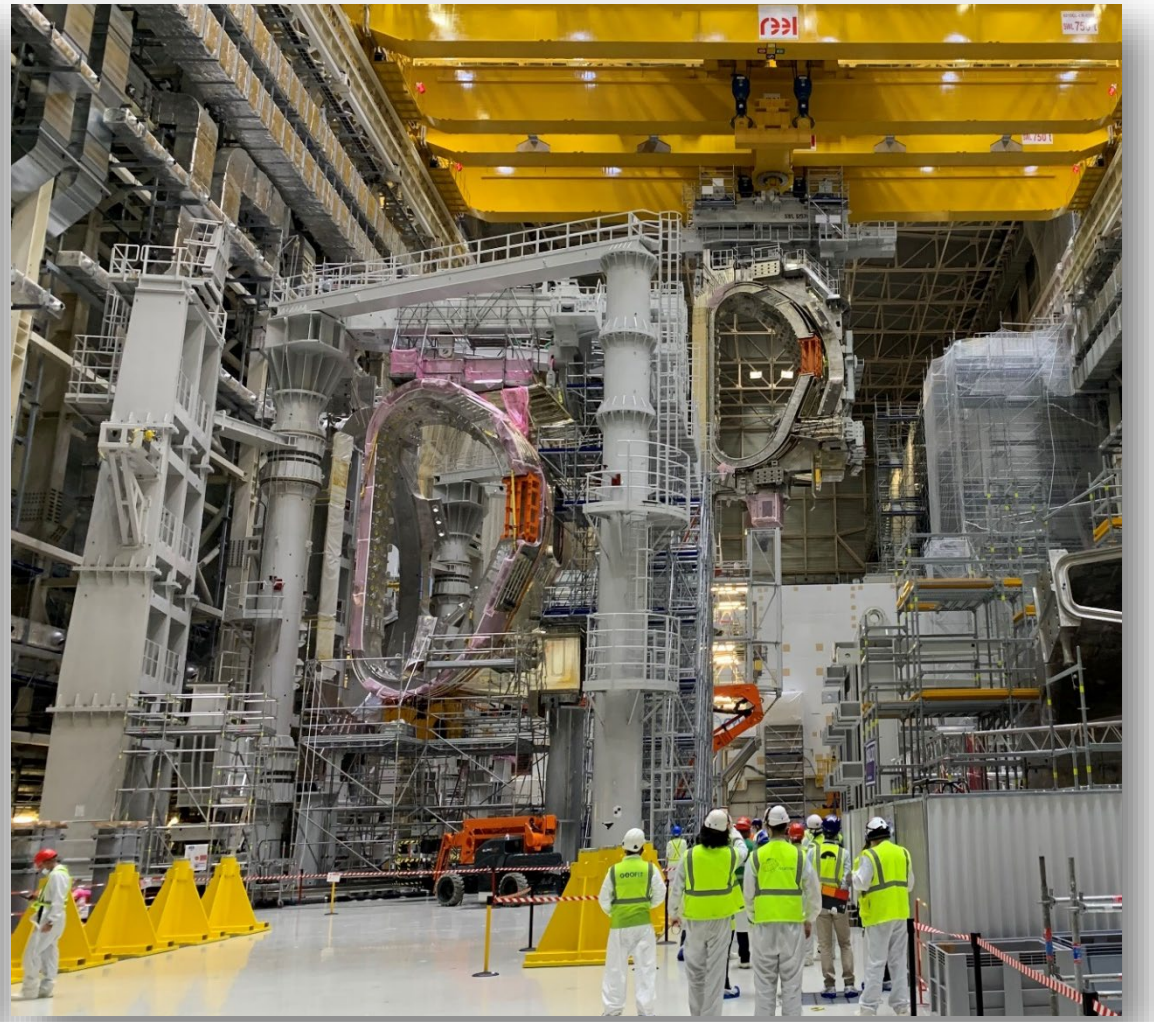

DAWON UNIVERSE
Helicon current drive system
ECH
DAWON UNIVERSE
DAWON UNIVERSE
VITZRO
HANEUL Eng
Helium distribution system
NBI-1
SFA
ILJIN Power Energy
HD현대중공업
Vacuum vessel
Thomson scattering
Wonshin
Vacuum pumping system
SAMSUNG
KISWIRE
DOOSAN
SC Magnet
NBI-2
VITZRO
DAWON UNIVERSE
VITZRO
Pellet injection system
Precision Machining Technology Solution
YOONSEUL
X-ray Imaging Crystal Spectrometer
ICRF
VITZRO
E&C
KEPCO E&C

ITER Procurement Experience with Korean Industries

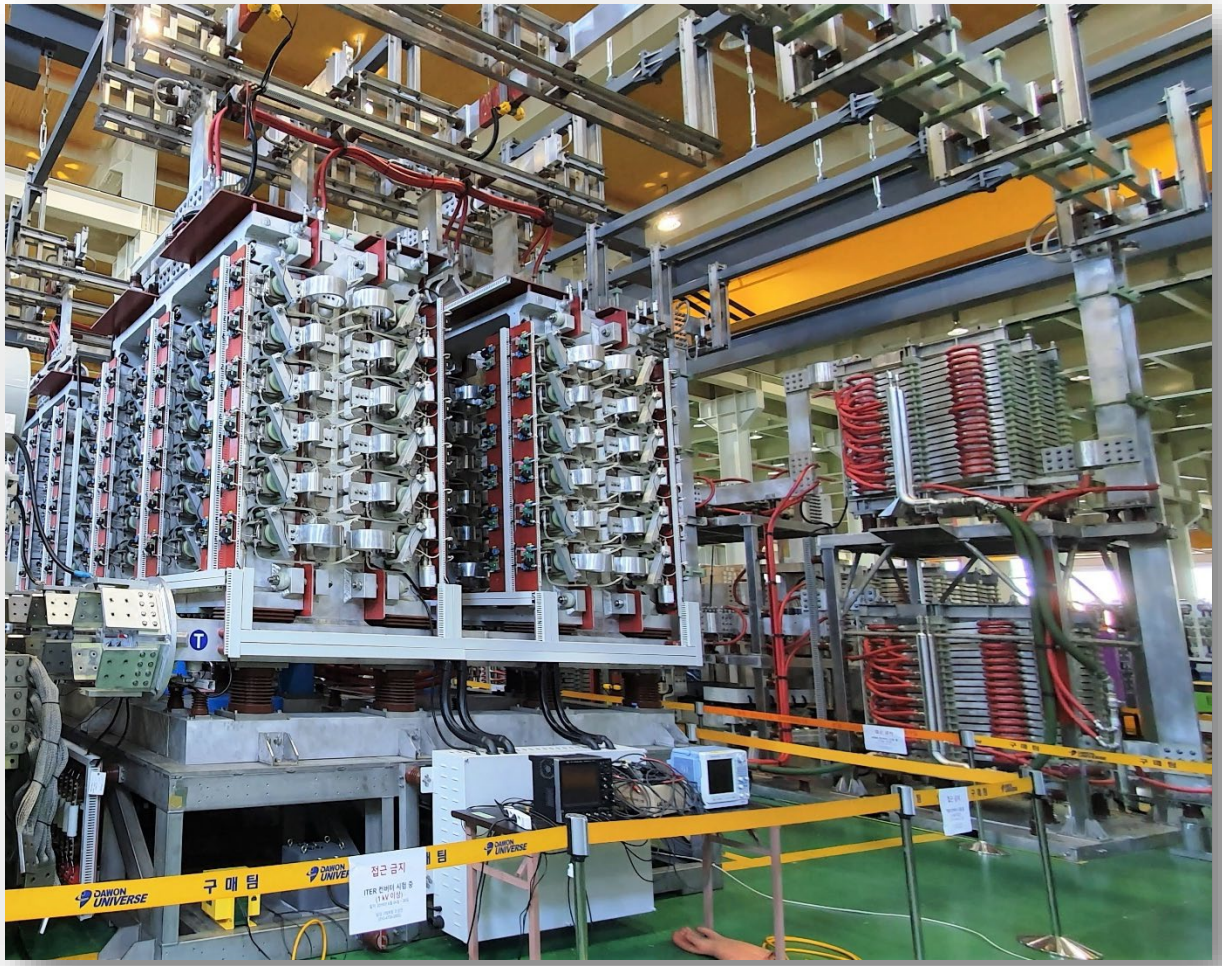
ITER Thermal Shield

ITER Sector Sub-assembly Tool





ITER Magnet Power Supply



ITER Tokamak Assembly

Korean Industry in Fusion Supply Chain

Major Participating Companies in ITER and KSTAR Projects (a few examples)

	Company	Field
1	HD Hyundai Heavy Industries	Structure Design & Fabrication (Vacuum Vessel, Magnetic Structure, Cryogenic Vessel...)
2	Doosan Enerbility	Design and manufacture of Superconducting magnet structures
3	Samsung SDS	Plant operation system design and manufacturing
4	Mobis	Device operation system design and manufacturing
5	KAT	Superconducting strands and conductor design and manufacturing
6	Dawonsys	Power supply design and manufacturing
7	Wonshin Industrial	Auxiliary equipment design and manufacturing (heating equipment)
8	Haneul Engineering	Auxiliary equipment design and manufacturing (medium-sized structures)
9	BITZTROTECH	Auxiliary equipment design and manufacturing (electromagnet, plasma facing wall...)
10	EM KOREA	Assembly equipment design and fabrication
11	Eugene MS	Assembly equipment design and manufacturing
12	SamHong Machinery	Thermal shield and medium-sized structure design and manufacturing
13	SeAH CSS (POSCO SM)	Special material production
14	KEPCO E&C	Design integration, quality and project management

Fusion Engineering Platform for Fusion Energy Development

Fusion Engineering Platform (FEP), which connects Fusion Developers and Fusion Manufacturers through a digitally-driven platform to solve mutual problems in Fusion Energy Commercialization

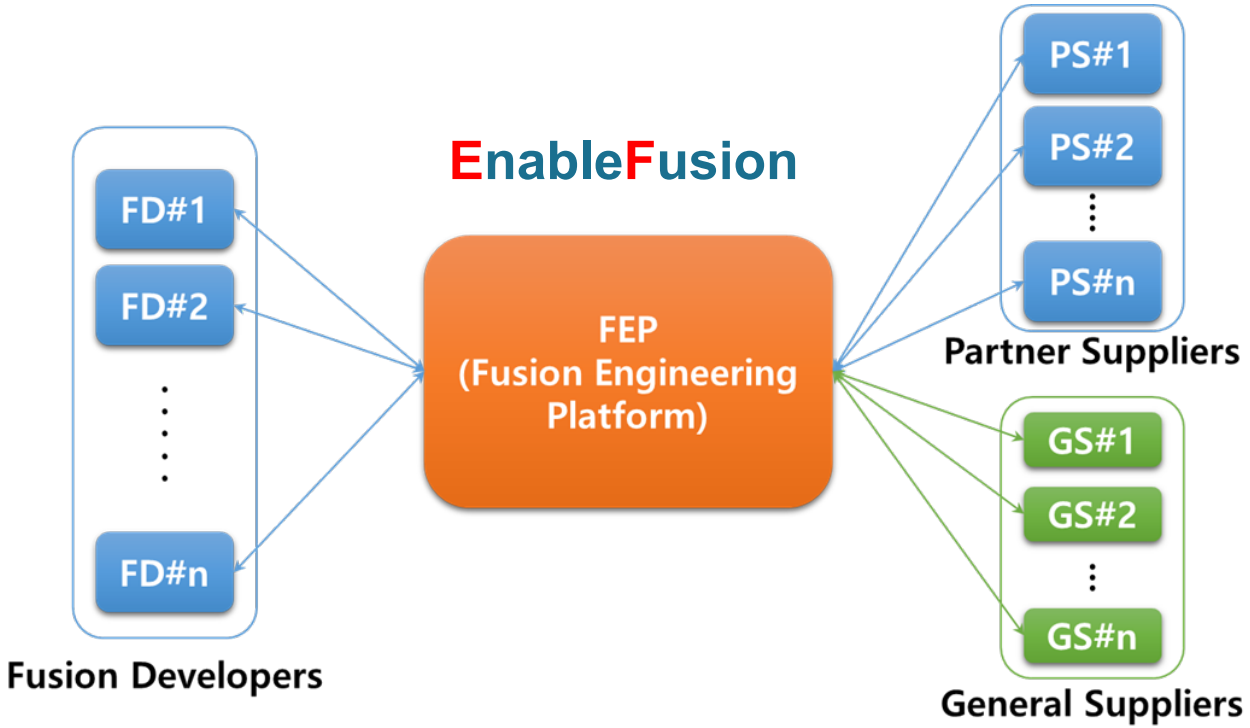
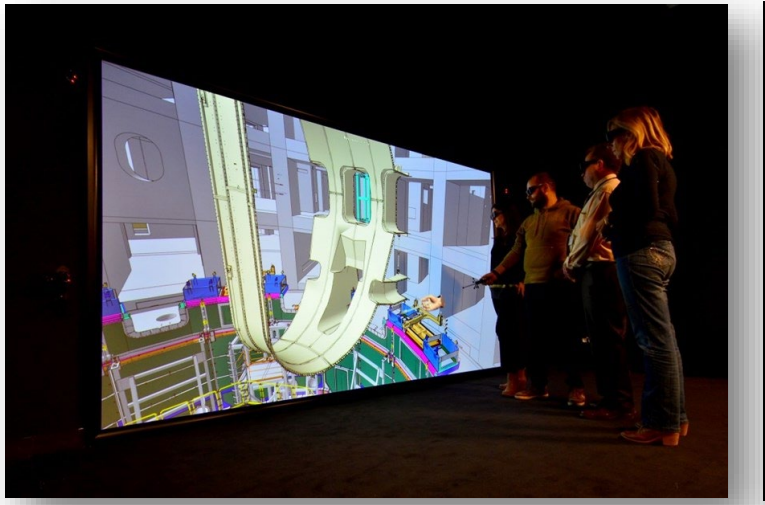


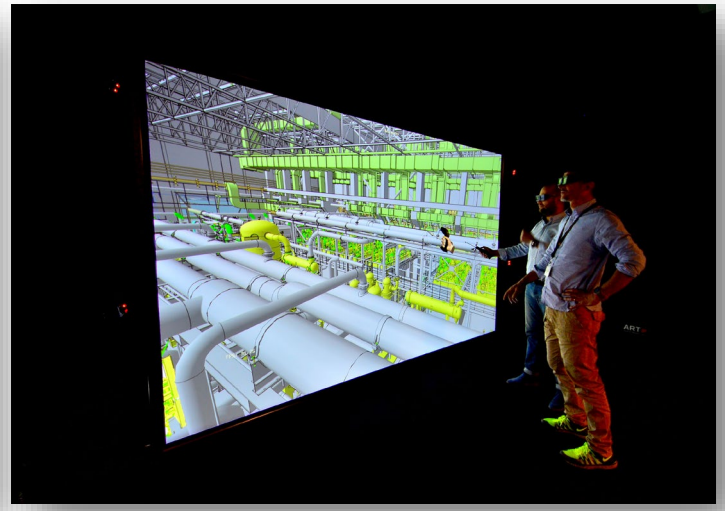
Figure: Asset Leveraging Structure in the EnableFusion

Digital Innovation Platform for Fusion engineering and design

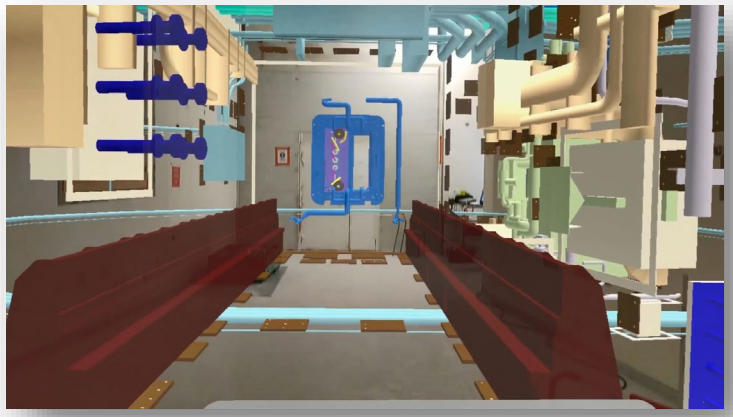
- ITER case exemplifies the potential of digitally-driven manufacturing and, when paired with Korea's robust high-quality manufacturing, the resulting synergies could be significantly advantageous.



Virtual Room → VR



\+ AR → MR + Robotics



Korean ICT High-tech with AI such as GPTs

Leadership Team

Key Executives

✓ **Management : Co-founder, Dr. DooWhan Choi**

- President, POSCO DX and President, Korea Telecom (KT)
- Chairperson of Governing Commission, Growth Ladder Fund of Korean Government
- Startup and IPO success experience

✓ **Strategy and Technology : Co-founder, Dr. Gyung-Su Lee**

- ITER Deputy Director-General (DDG/COO)
- KSTAR Project Director
- Vice-Minister, Science, Technology and Innovation, Ministry of Science and ICT (MSIT)
- President, National Fusion Research Institute, Republic of Korea

Business and Technical Advisors

✓ **Management** : Dr. Oh-Jun Kwon (former Chairperson of POSCO), Professor Min Young Lee (Seoul National University, former CEO of Korea Venture Investment Corp.)

✓ **Technology** : Professor Yongseok Hwang (Seoul National University), Professor Wonho Choe (KAIST), Professor Emeritus Hyeon K. Park (UNIST), Dr. Ki-Jeong Jeong (ITER Korea Director-General)

Summary

EnableFusion :

Build fusion plant with high-quality Korean supply chain

- **EnableFusion Mission**: Bringing clean, safe, and sustainable fusion energy to the world as a digitally-driven platform for innovative fusion engineering and industrial solutions.

- **Digitally enabled fusion supply chain**, coupled with Korea's top-notch manufacturing, has the potential to revolutionize fusion energy commercialization across the globe.