MOVE THE WORLD FORWARD MITSUBISHI HEAVY INDUSTRIES GROUP

Carbon Dioxide Recovery (CDR) Technology

March 4, 2025

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Mitsubishi Heavy Industries India, Pvt. Ltd.

About Mitsubishi Heavy Industries (MHI) group

Foundation 1884

Number of Group Companies (consolidated) 259
As of September, 2024

Number of Employees (consolidated) 77,778
As of September, 2024

Order Received 6,684.0 billion yen
April, 2023 - March, 2024

Revenue 4,657.1 billion yen
April, 2023 - March, 2024


Gas Turbine


Jet Fighter


Space Rocket


Ship


Chemical Plant


Transportation System

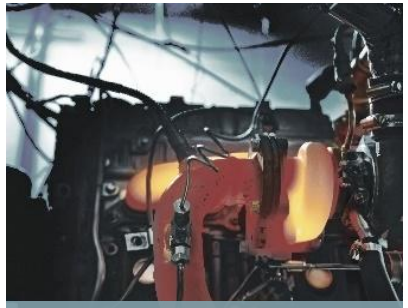

CO_2 Capture (CDR)


Waste-to-Energy


Metal Machinery


Aero Engine

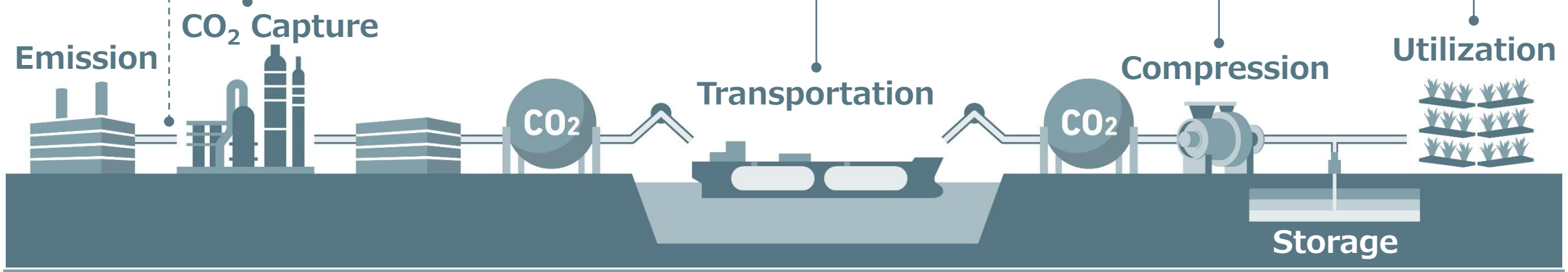

Compressor


Turbocharger

MHI Group's CDR Value Chain

MHI group has core technologies essential for CDR including CO_2 capture, transportation and compression, which aims to provide one-stop CCUS solution service.

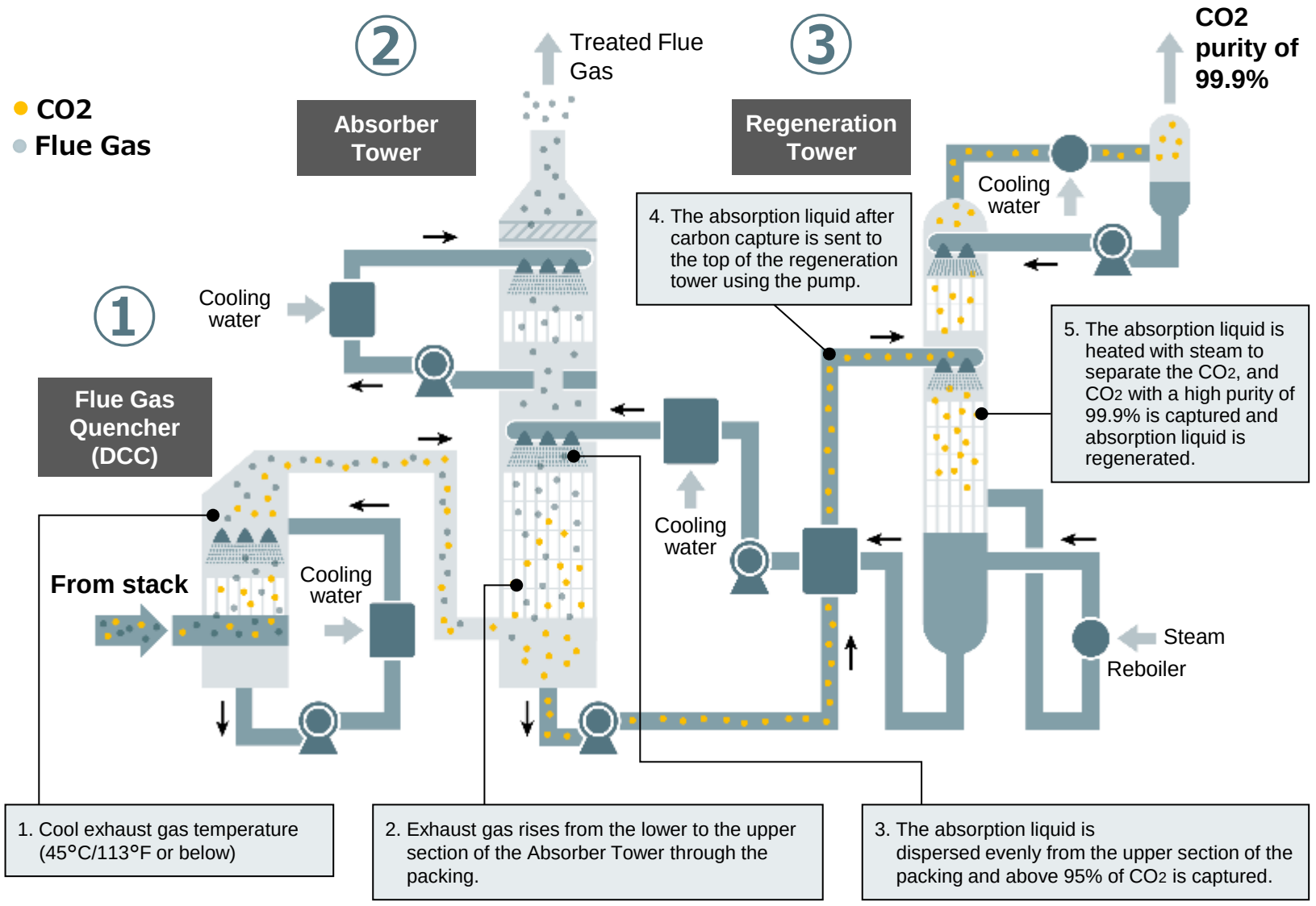
Air Quality Control Systems (AQCS)



Technology with World's Top Share –KM CDR Process™

KM CDR Process™

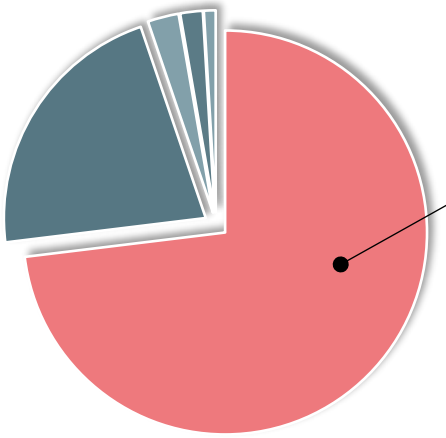
- KM CDR Process™ = ***Kansai Mitsubishi Carbon Dioxide Recovery Process***
- Amine-based technology
- Capable of capturing more than 95% CO_2 from combustion gas (depending on source)
- Automatic load adjustment control (ALAC)
- Amine filtration and purification systems
- Tower design capability for even gas/liquid distribution



Technology with World's Top Share –KM CDR Process™

World's top share
- KM CDR Process™

- Higher reliability & knowledge
- ✓ More **than 70% global market share** for capturing carbon from flue gas as commercial
- Easy operation and maintenance
- Proven record
  more than 30 years in-house R & D and experience
- **The world's largest commercial scale** post combustion carbon capture plant (Petra Nova 4,776t/d)



World's top market share for post-combustion CO_2 capturing by chemical absorption method as commercial

MHI (KM CDR Process™)

- Solvent: Amine (Liquid Absorption)
- Carbon capture rate from flue gas: **95% or more**
- Captured CO_2 purity: **99.9% or more**
- Market share of our technology (approx. 3.9 Mt/year) applied to CO_2 capture from exhaust gas (approx. 5 Mt/year)





MHI's CO_2 Capture Technology - Commercial Experience

18 commercial deliveries worldwide (4 supply record in India)

2022 Russia
1,200 t/d

2024 Bangladesh
240 t/d

2024 Italy
89 t/d

2017 Japan
283 t/d

2023 Japan
0.3 t/d

2009 Bahrain
450 t/d

2022 Japan
0.3 t/d

2014 Qatar
500 t/d

2005 Japan
330 t/d

2010 UAE
400 t/d

2010 Vietnam
240 t/d

2011 Pakistan
340 t/d

1999 Malaysia
210 t/d

2016 U.S.A (Petra Nova)
4,776 t/d

2012 India (Vijaipur)
450 t/d

2006 India (Phulpur)
450 t/d

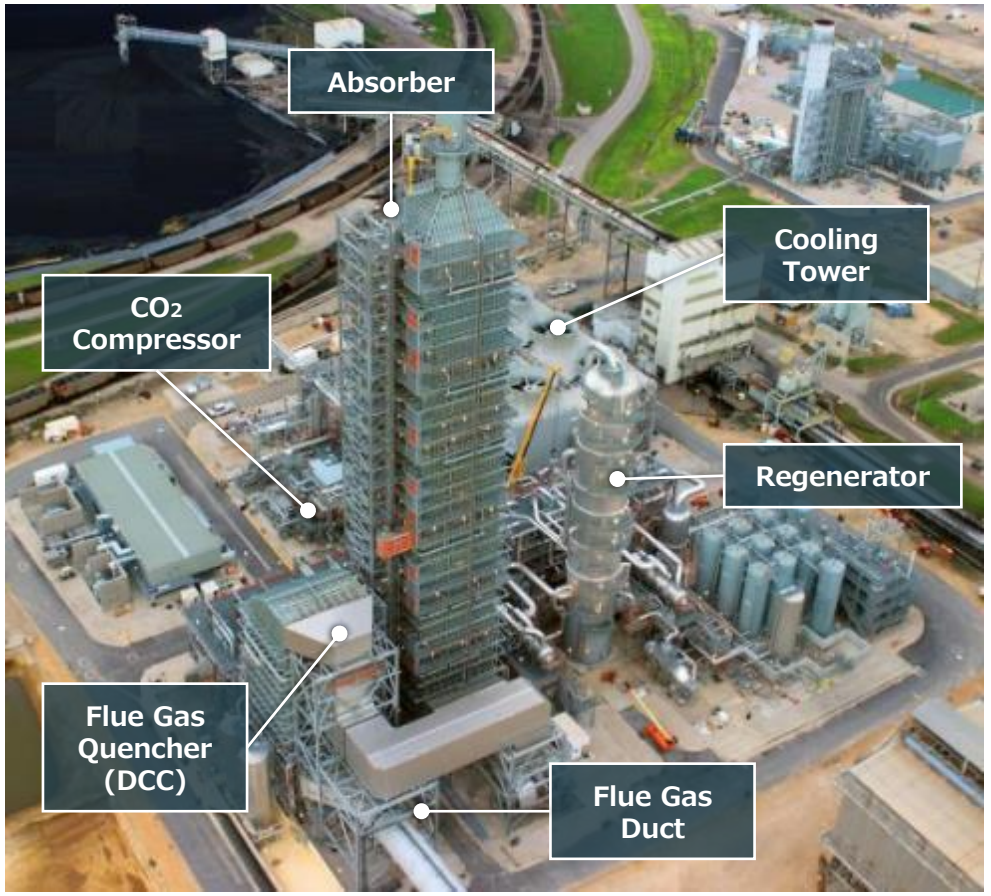
2009 India (Kakinada)
450 t/d

2006 India (Aonla)
450 t/d

The World's Largest Post-Combustion Carbon Capture Plant - Petra Nova Project

- MHI delivered the world's largest carbon capture plant adding-on to 610MW coal fired power plant, in 2016
- Captured CO2 is used for EOR (Enhanced Oil Recovery)
- Supported by DOE (U.S. Department of Energy) grant program (CCPI* Round 3) and Japanese government finance (JBIC / NEXI)

Project owner	Petra Nova - partnership between NRG Energy and JX Nippon Oil & Gas Since 2022, full ownership under JX Nippon Oil & Gas
Plant location	NRG WA Parish Power Plant (Thompsons, TX)
Contractor	Consortium of MHI / The Industrial Company (TIC) (MHI: Engineering and Procurement/TIC: Construction)
Plant scale	240 $MW_{equivalent}$
CO_2 capacity	4,776 t/d (1.4 Mt/y)



Carbon Capture Plant

*Clean Coal Power Initiative
*U.S. Department of Energy "W.A. Parish Post-Combustion CO_2 Capture and Sequestration Project Final Environmental Impact Statement Volume I" (Feb, 2013), DOE/EIS-0473

Source: Press Release by MHI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HEAVY INDUSTRIES