Built on more than a century of innovation, Doosan Babcock is a specialist engineering company delivering diverse and innovative full life-cycle engineering and support services to Global clients across a range of industry sectors.

**Thermal & Distributed Power**
- OEM New Build and Retrofit, Servicing and Optimising Plant Output, Project Management and Heat and Power Solutions Servicing

**Oil, Gas, Petrochemical & Pharmaceutical**
- Project Management, Asset Integrity Management, Optimising Plant Output and Servicing

**Nuclear Power**
- New Build, Operational Plant Support, Outages and Maintenance, Plant Life Extension and Innovation, Decommissioning and Waste Management

**Asset Management**
- Strategic Consultancy, Asset Performance Management, Critical Component Replacement, Testing and Equipment Qualification, Asset Integrity Management

Working collaboratively with our clients, our extensive experience ensures we consistently provide them with advanced and cost effective technical solutions and long term value.
Full Project Lifecycle Support Services

✓ EPC Projects (Retrofit, Upgrade, New Build)
✓ Project Management and Controls
✓ Multidisciplinary Engineering
✓ Detailed Design, Design Safety, Maintainability
✓ Constructability Optimisation
✓ Concept, Feasibility & FEED Studies
✓ Procurement and Subcontract Management
✓ Construction Management
✓ Fabrication and Manufacturing
✓ Construction Execution
✓ Completions and Commissioning
✓ Asset Management – Technology Based Solutions
✓ Maintenance Management and Execution
✓ Shutdown / Turnaround Planning & Management
✓ Shutdown / Turnaround M&P Execution

New Build & Start-up → Early Life Operation → Mid Life Operation & Asset Life Extension → Decommissioning
Areas of Focus – Energy Transition

Focus Areas

Technology Development
- Research activities – EU/UK Collaborative, TL
- Product Development activities relating to the commercialisation of distributed energy systems and technologies for Doosan

Consultancy
- Consultancy to customers on energy systems
- EU/UK government funded consultancy on new technologies
- Feasibility Studies, FEED

EPC
- Engineering & procurement and Construction of distributed energy systems

- Battery Energy Storage Systems
- Microgrids/Community Grids
- NG & Hydrogen CHP Fuel Cells & Gas Engines
- Carbon Capture Utilisation & Storage
- Energy Networks – DSR, Freq
- Power to X
- Energy Storage – LCAS, Thermal
- Waste Heat Recovery

Hydrogen Energy Systems (MEFC, CHP, Storage)
# Doosan Carbon Capture Technology History

## 30 years of experience in carbon capture

### Oxyfuel

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>160KW_t at Doosan ERTF</td>
</tr>
<tr>
<td>2008</td>
<td>ERTF Oxyfuel Conversion</td>
</tr>
<tr>
<td>2009</td>
<td>40MW_t OxyCoal Burner at Doosan CCTF</td>
</tr>
<tr>
<td></td>
<td>Commercial CCS Market</td>
</tr>
<tr>
<td>2020 onwards</td>
<td></td>
</tr>
</tbody>
</table>

### Post Combustion Capture (PCC)

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>University of Regina development of PCC</td>
</tr>
<tr>
<td>2000</td>
<td>Boundary Dam PCC donated to University for research</td>
</tr>
<tr>
<td>2003</td>
<td>UoR’s ITC completed</td>
</tr>
<tr>
<td>2008</td>
<td>Doosan invest into HTC Purenergy taking 15% &amp; exclusive rights to PCC technology</td>
</tr>
<tr>
<td>2009/10</td>
<td>ERTF converted to PCC Test Facility</td>
</tr>
<tr>
<td></td>
<td>Ferrybridge CCPilot100+</td>
</tr>
<tr>
<td></td>
<td>FEED Studies</td>
</tr>
<tr>
<td>2020 onwards</td>
<td>Commercial CCS Market</td>
</tr>
</tbody>
</table>
Doosan’s Amine Based Post Combustion Carbon Capture Technology

Postcombustion capture (absorption process)
Doosan’s Oxyfuel Technology

Oxyfuel (O₂/CO₂ recycle) combustion capture

- Steam turbine
- Boiler
- Cooling water
- Steam condenser
- Oxygen
- Fuel
- Recycled flue gas (CO₂ and water vapour)
- Fly ash
- Gypsum
- Mechanical energy
- Sulphur removal
- CO₂ compressor
- Cooler and condenser
- Water
- Nitrogen
- Mechanical energy
- Air separation
- Air
- Electricity
- Bottom ash
CCUS – Demonstration Projects

Performance of Doosan’s amine based post combustion capture technology demonstrated on a wide range of fuels and different plant configurations

**ERTF, 1 tonne/day CO₂ Capture Capacity**
- Commissioned in 2010
- Ability to test wide range of coals and other fuels
- High degree of flexibility and accuracy to test wide range of solvents

**Ferrybridge 100 tonne/day CO₂ Capture Capacity**
- Largest post carbon capture demonstration plant in the UK
- Long-term testing and validation of process and solvent performance
- Evaluated transient conditions and process control
- Extensive monitoring

**Doosan’s Role**
- Engineer
- Procure
- Construct
- Commission
- Operate (2 years)
CCUS – CCPilot100+ Project Execution

Simulation & modelling → P&IDs & engineering → 3D modelling

Column fabrication & delivery → Construction

Doosan Babcock provides full EPC capability