# Selective Catalytic Reduction

**Application**

**Power Plants and Industrial Boilers**

NO\(_x\) reduction

**Benefits**

- Reduction of NO\(_x\) emissions
- Extension of fuel range
- High availability
- Increase in operational flexibility
- Low pressure loss

**Technical Data**

**Type:**
- Selective Catalytic Reduction
- With honeycomb catalyst
- With plate catalyst

**Selective Non-Catalytic Reduction**

**Emissions:**
- NO\(_x\) < 50 mg/m\(^3\) (STP)
- NH\(_3\) slip < 1 mg/m\(^3\)
  (under high dust conditions)

**Fuel Type**

- Bituminous coal
- Heavy fuel oil & residues
- Waste
- Lignite
- Co-firing of biomass

**Scope of Supply**

- Consultancy
- Process engineering
- EPC for SCR installations
- Optimization concepts
- Adaptation of boiler water-steam cycle
- Adaptation of heating surfaces
- Optimization of flue gas distribution and NH\(_3\) injection (CFD simulations)

---

**SCR Shell Wesseling**

Retrofitted SCR for Low NO\(_x\) Emissions
# Selective Catalytic Reduction of NOx

<table>
<thead>
<tr>
<th>Scope</th>
<th>Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept Design Study: Assessment, comparison and selection of feasible NOX reduction technologies and concept engineering for a total of 10 bituminous coal fired power stations</td>
<td>Eskom Enterprises, Johannesburg, South Africa</td>
</tr>
<tr>
<td>Know-how transfer, design tools and training for DeNOx (SCR) for bituminous coal-fired power plants, South Africa</td>
<td>Eskom Enterprises, Johannesburg, South Africa</td>
</tr>
<tr>
<td>License and know-how transfer agreement for catalytic DeNOx system, China</td>
<td>Guizhou XingYun Environment Protection Co., Ltd., Guiyang, China</td>
</tr>
<tr>
<td>Owner’s engineer for 3 SCR installations, modification of 5 steam generators, 75 t/h, 110 t/h, 150 t/h, Refinery Residues, Oil and Gas, Mineral Oil Refinery Oberrhein (MIRO), Germany</td>
<td>MIRO, Karlsruhe, Germany</td>
</tr>
<tr>
<td>Engineering and supply for retrofit of a SCR-DeNOx plant, 200 t/h, Heavy Fuel Oil and Low-Pressure-Gas, Shell Rheinland Refinery, Germany</td>
<td>Shell Deutschland Oil GmbH, Wesseling, Germany</td>
</tr>
</tbody>
</table>

Legend:
- PS – Power Station
- PF – Pulverized Fuel
- CHP – Heat and power plant
- SCR – Selective Catalytic Reduction
- STP – Standard Temperature and Pressure
- HRSG – Heat Recovery Steam Generator
- FGD – Flue Gas Desulphurization
- CFB – Circulating Fluidized Bed
- ESP – Electrostatic Precipitator