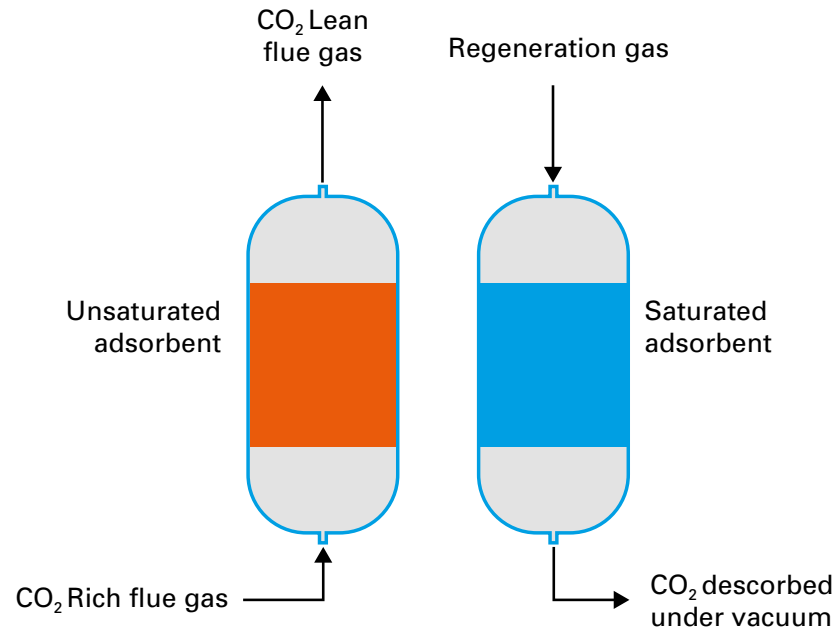
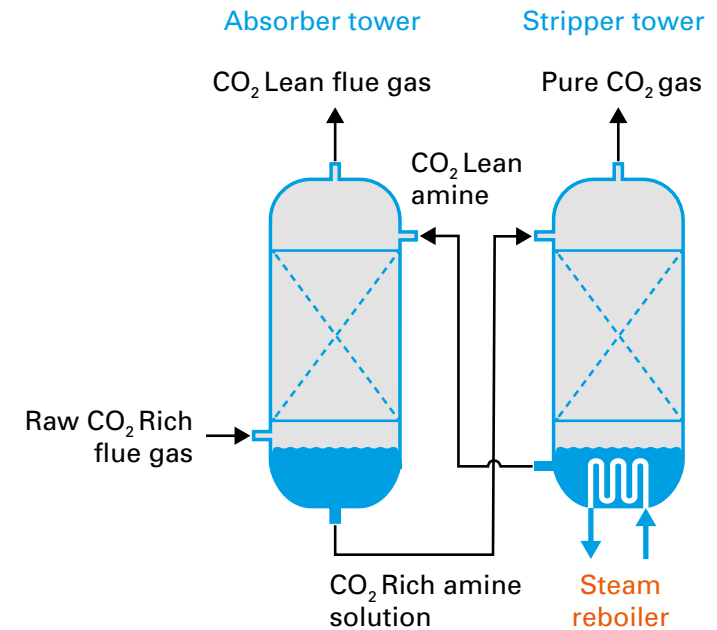


# Established Carbon Capture Technology – VSA and Amine Solvent



Change-over valves alternate the regeneration gas & the flue gas flow from one bed to the other.



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## VSA – vacuum swing adsorption

|                                                              |                                                                            |
|--------------------------------------------------------------|----------------------------------------------------------------------------|
| Separation principle                                         | Adsorption                                                                 |
| Specific energy demand                                       | 1.7 GJ/t <sub>CO<sub>2</sub></sub> (mostly power)                          |
| Typical temperature                                          | 40°C                                                                       |
| Typical pressure                                             | Cycling between moderate pressure and vacuum                               |
| Typical CO <sub>2</sub> removal                              | < 90 %                                                                     |
| Typical CO <sub>2</sub> purity                               | < 95 %                                                                     |
| Typical plant size (tonnes per year CO <sub>2</sub> removal) | > 1,000 - 500,000                                                          |
| Technology maturity level                                    | Commercial with some demonstrations, eg Air Products Port Arthur SMRs, USA |

## Amine Solvent with tower contactors

|                                                              |                                                           |
|--------------------------------------------------------------|-----------------------------------------------------------|
| Separation principle                                         | Absorption                                                |
| Specific energy demand                                       | 3 GJ/t <sub>CO<sub>2</sub></sub> (mostly heat from steam) |
| Typical temperature                                          | 40 - 60°C in absorber, 120°C in stripper                  |
| Typical pressure                                             | Ambient to 30 bar                                         |
| Typical CO <sub>2</sub> removal                              | > 90 %                                                    |
| Typical CO <sub>2</sub> purity                               | > 99 %                                                    |
| Typical plant size (tonnes per year CO <sub>2</sub> removal) | 40,000 - 4,000,000                                        |
| Technology maturity level                                    | Commercial from many suppliers                            |