The raw biogas enters the absorber column

The raw biogas enters the absorber column without any pre-cleaning directly from the gas storage. The biogas is washed with a watered-down amine solution, where the CO_2 (and other acidic gases such as H_2S) are absorbed into the amine solution. This process is pressureless, eliminating the need to compress the heavy CO_2, and the methane is only compressed to the needed pressure. When the gas leaves the absorber column, the biogas has been upgraded to biomethane. After upgrading, the gas is polished in an active carbon filter before being compressed to the needed pressure for the gas grid. The gas is then dried and cooled before the final injection to the gas grid.

Pumped to desorber column

After the amine solution has absorbed the CO_2 from the biogas, it is pumped into the desorber column (stripper column). The amine solution is heated, typically by the boiler which supplies heat to the biogas plant. By heating the amine solution CO_2, H_2S, and steam will leave the desorber column. The amine is then pumped back to the absorber column and is ready to absorb CO_2 and H_2S again. In this way, the amine solution is used in a closed circuit, and the amine consumption is minimal.

Heat recuperation

The heat from the boiler, which leaves the desorber column along with the CO_2 and steam, can be recuperated. Typically, it is possible to recuperate 30-40% of the added heat at about 80-90°C, depending on the feed temperature. Likewise, it is possible to recuperate the middle temperature from the amine cooling at 50-60°C – typically 40-50% is recuperated at this point. If recuperation from the compressors is added, it is possible to achieve >90% heat recuperation with an amine-based upgrading plant by Ammongas.

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