

FLASHCO₂ TECHNOLOGY



CO₂ RECOVERY PLANTS (PSA OFF-GAS)

Medium-rich CO₂ streams (PSA off gas), generated from various syngas processes typically found in refineries and petrochemical complexes, is a new alternative for production of food grade CO₂.

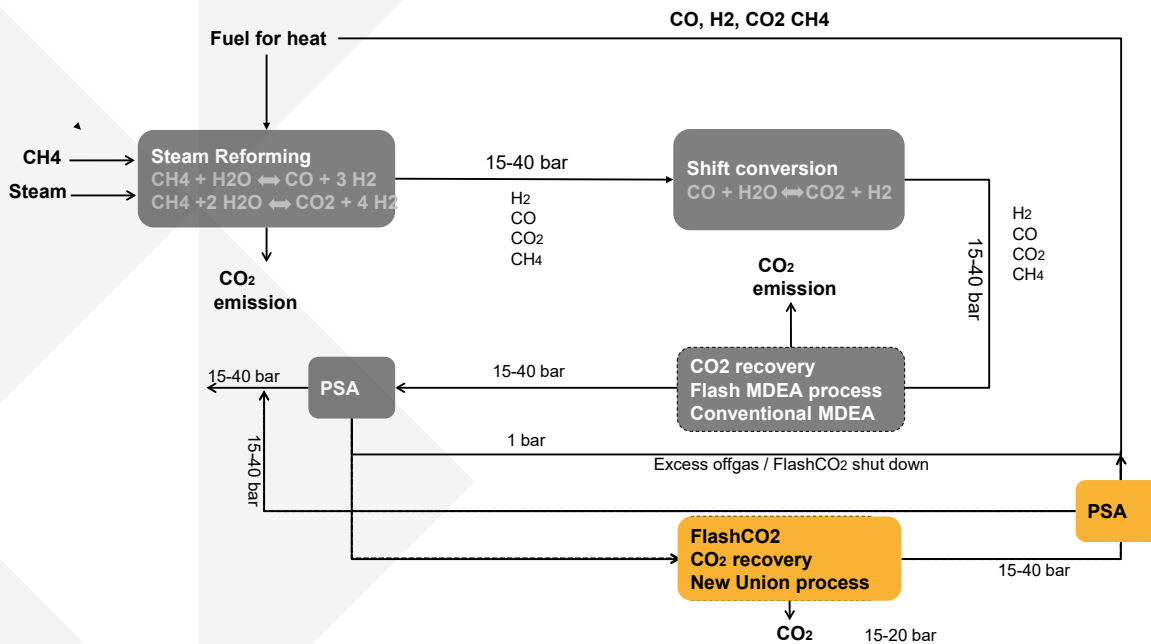
By utilising an innovative process of combining conventional physical absorption by means of chilled MeOH and CO₂ liquefaction technologies, the FlashCO₂ process eliminates the requirement for steam stripping while keeping power consumption at an attractive level.

The overall CO₂ recovery of the FlashCO₂ unit is 92%, 12% more than the minimum required 80%.

The potential benefits of using FlashCO₂ technology for the removal of CO₂ from hydrogen plants compared to Amine technology are:

FLASHCO₂ ADVANTAGES

- When using the FlashCO₂ technology, total output from hydrogen production can be boosted to 115% at a low cost
 - FlashCO₂ technology represents a large-scale option for long-term CO₂ emissions reduction
 - Can reduce greenhouse gases emitted from fossil fuel-based plants
 - Liquid CO₂ can be produced at low cost
 - Units can be stand-alone
 - Other valuable fuel gas products can be recovered from the CO₂ process.
 - Liquid CO₂ can be produced at high purity/high value levels and at food grade quality at low cost.
 - No effluent treating is required
 - No liquid or solid chemical waste
 - No steam consumption (flash regeneration of MeOH solvent)
 - Low energy consumption (typically 1GJ/ton CO₂)
- Already installed plants shows that FlashCO₂ technology provides a range of advantages, making it a very attractive solution for CO₂ capture from hydrogen plants in both the short and long term



CO₂ Recovery Plant
Standard Sizes
(PSA off-gas):

0,5 - 25 t/h

- other sizes available on request.

CO₂ RECOVERY PLANTS (PSA OFF-GAS)

The FlashCO₂ technology is a patented process which has been developed for use on Hydrogen plants and steam reformers. The raw gas used is off gas coming from the PSA and is considered a medium purity raw gas with a typical CO₂ concentration of up to 50%.

FlashCO₂ is developed in order to meet the constraints of installing CO₂ recovery plants on Hydrogen plants

One of the challenges is getting access to LP steam, and to cope with the cost. A typical MDEA plant is consuming 1 ton steam per ton liquid CO₂ produced. Another challenge is that CO₂ recovery, based on MDEA, requires complex changes

to the existing Hydrogen plant and installation in an ATEX zone, license providers might be reluctant to approve changes in the process.

These two challenges were the main drivers when we made the process design for FlashCO₂, and accordingly we have made an "end-of-pipe" solution where we take the off gas from the PSA to enter our plant.

There is no steam consumption. In principle the plant can be placed outside the fence of the Hydrogen plant. One of the real benefits is, that the plant optionally can recover up to 10% extra high quality Hydrogen by installing an additional PSA.

Steam methane reforming is considered the leading technology for generation of Hydrogen.

The reformer is converting methane and steam to syngas that consists of mainly hydrogen and carbon monoxide.

Steam reforming is followed by syngas heat recovery that incorporates shift conversion to increase the Hydrogen yield.

Finally a Pressure Swing Adsorption (PSA) Unit purifies the raw hydrogen by adsorption CO, CO₂, and CH₄ gasses.