

In the oil production industry, many governments are imposing tighter regulations and oversight on natural gas flaring—the practice of burning off natural gas in an open flame during oil production—due to the CO₂ emissions that are released into the atmosphere. To comply with these regulations, oil and gas operators are turning to natural gas liquid (NGL) recovery. To meet this demand for cleaner oil and gas production, companies like *The Dow Chemical Company* (DOW) have developed enhanced NGL recovery technologies that enable operators to not only reduce CO₂ emissions but also get the most from our natural energy resources and capitalize on the value offered by NGLs.

What is Flaring?

During oil and gas production, gas streams containing NGLs are sometimes created as a byproduct. This natural gas needs to be either treated or disposed of. All too often, oil companies choose to burn these NGLs off by flare instead of treating and selling the natural gas. Furthermore, flaring is particularly bad for the environment as it releases CO₂ emissions into the air. Lastly, these NGLs have market value which is literally going up in smoke.

Unfortunately, billions of cubic meters of natural gas are flared annually at production sites around the world, wasting valuable energy resources and releasing millions of tons of CO₂ into the atmosphere. Recovering, rather than flaring, natural gas resources from oil and gas production can help reduce the waste of a natural resource that can be used to support a country's economic growth. Natural gas has the lowest carbon intensity of all fossil fuels and can, for example, serve as a cost-effective source of electricity supply for grid-based systems with fluctuating supply and demand.



NGL Recovery at Work

In the past, NGL capture was an extensive and expensive process that required a low-temperature refrigeration unit to separate the liquid products from the gas stream. These separation technologies required a significant capital investment and had a substantial electricity cost.

Today, *UCARSORB™ NGL Adsorbents* from Dow are enabling operators to capture these valuable NGLs from streams and sell them in a cost-effective manner, allowing oil companies to get additional profit out of their operations while providing them with a more environmentally friendly option for small-scale gas treatment.

UCARSORB™ NGL Adsorbents technology works by running untreated gas through a bed of small polymeric beads that capture the NGLs. *UCARSORB™ NGL Adsorbents* selectively recover the NGLs being targeted for the operator and minimize the removal of less-desired compounds like water, CO₂, and lighter NGLs. Because this NGL recovery process requires minimal operator intervention, capital and operating expenses are substantially lower compared to previous recovery techniques. Typically these systems can be quickly deployed and are relatively portable.

NGL Recovery in Kazakhstan

Kazakhstan exports a majority of its oil to other countries. Unfortunately, the country ranks 11th on the World Bank's top 30 flaring countries (2013-2015). NGL recovery is particularly attractive in Kazakhstan because the government heavily regulates flaring by taxing producers who choose to flare.

An R&D consortium run by *Parasat* and *TechSol Engineering* is planning a project to increase NGLs recovery efficiency and capitalize on the value of recovered gas by using Dow's NGL Adsorbents. The pilot testing and commercial scaling of this project will commence in an oilfield near Kyzylorda, Kazakhstan. The NGL recovery system is projected to process approximately 130,000 SCM/day of gas and produce 20-30 mT/day of NGLs. *Parasat* may be able to sell the NGL for around \$200/mT, allowing the company to recover its financial investment relatively quickly. The consortium is looking to introduce this technology at more fields in Western Kazakhstan to create more value for the operators.

With the *UCARSORB™* system in place, *Parasat* will be able to improve the quality of gas treatment for power production while reducing their rate of natural gas flaring. This will effectively lower greenhouse gas emissions while increasing efficiency and reducing maintenance. Ultimately, by combining gas power generation with Dow's *UCARSORB™* technology, *Parasat* should be able to eliminate the use of flaring in Kazakhstan.

Enhancing Oil and Gas Operations

In conclusion, Dow is committed to improving the environment and helping oil and gas producers extract as much value as possible. Dow has been at the forefront of gas treating science and technology for more than 65 years. Furthermore, Dow is a leading provider of chemistry and technologies which remove contaminants from gas streams.

Dow's global network of process engineers supports plants which are designed in one geographic area and installed in another. With Dow, operators benefit from our applicable knowledge to help meet gas treating requirements and reduce capital investment and operating costs. From computer simulations to hands-on operations support and analytical evaluations, Dow experts provide the oil and gas industry with customized solutions based on individual needs.