# Zero Emissions Dehydrators

NaturalGas EPA POLLUTION PREVENTER

Partner Reported Opportunities (PROs) for Reducing Methane Emissions

PRO Fact Sheet No. 206

**Applicable sector(s):**

■ Production ■ Processing ■ Transmission and Distribution

**Partners reporting this PRO:** Kerr McGee Corporation

**Other related PROs:** Reroute Glycol Skimmer Gas, Pipe Glycol Dehydrator to Vapor Recovery Unit

| | |
|---|---|
| Compressors/Engines | ☐ |
| Dehydrators | ■ |
| Pipelines | ☐ |
| Pneumatics/Controls | ☐ |
| Tanks | ☐ |
| Valves | ☐ |
| Wells | ☐ |
| Other | ☐ |

## Technology/Practice Overview

### Description

Conventional glycol dehydrators can have substantial methane emissions from the venting of still column vapors and leaks from gas-driven glycol circulation pumps. Zero emissions dehydrators reduce these emissions by using electric power for pumps and re-using still column vapors for fuel.

Zero emissions dehydrators are designed to collect all condensable components from the still column vapor and use the remaining non-condensable still vapor (methane and ethane) as fuel for the glycol re-boiler. A water exhauster is used to yield high glycol concentrations without the use of a gas stripper. Electric driven circulation pumps are used in zero emissions dehydrators instead of gas-driven pumps to further reduce methane emissions.

**Methane Savings: 31,400 Mcf/yr average per application**

### Costs

Capital Costs (including installation)

☐ <$1,000 ☐ $1,000 – $10,000 ■ >$10,000

Operating and Maintenance Costs (annual)

☐ <$100 ☐ $100-$1,000 ■ >$1,000

### Payback (Years)

■ 0–1 ☐ 1–3 ☐ 3–10 ☐ >10

### Benefits

The primary benefits include reduced re-boiler fuel expenses and reduced maintenance costs. Reduced methane emissions are a secondary benefit of installing a zero emissions dehydrator.

### Operating Requirements

Zero emissions Dehydrators require electric utilities or an engine-generator set.

### Applicability

Zero emissions Dehydrators can be newly installed or existing glycol dehydrators can be retrofitted with zero emissions technology.

## Methane Emission Reductions

The methane emission savings are based on a conventional dehydrator processing 28 MMcf/day (million cubic feet per day) with a glycol circulation rate of 4 gpm (gallons per minute). The zero emissions dehydrator eliminates emissions from glycol circulation pumps, gas strippers, and the majority of the still column effluent.

## Economic Analysis

### Basis for Costs and Savings

A conventional dehydrator of similar size shows losses of 5.95 scf (standard cubic feet) per gallon of glycol that is circulated with a Kimray pump at 4 gpm. The conventional dehydrator also has gas losses of 4 scf per gallon of glycol that is circulated through the gas stripper. The zero emissions dehydrator avoids these gas losses by eliminating the use of Kimray pumps and gas strippers. It is reported that condensate is also recovered from the still column vapor at 2.88 gal/hr (gallons per hour) while the non-condensable vapor is used to fuel the glycol re-boiler in the zero emissions dehydrator.

### Discussion

Capital costs of a zero emissions dehydrator are similar to installing a conventional dehydrator with a thermal oxidizer. Retrofitting existing dehydrators is possible through modifications of gas stream piping and the use of a 5 kW engine-generator for electricity needs. Higher operating costs associated with electricity use are easily offset by glycol re-boiler fuel savings and saleable condensate recovery available with a zero emissions dehydrator.