



Install Compressors to Capture Casinghead Gas



Technology/Practice Overview

Description

Casinghead gas collects in the annular space between the tubing and casing of an oil well. Typically casinghead gas is vented to the atmosphere when the wellhead pressure drops below gas sales line pressure. If the well produces sufficient casinghead gas, it may be economical to collect this gas for sale, instead of emitting it. One Partner reported installing compressors to capture casinghead gas and pump it into a sales gas pipeline.

Operating Requirements

Implementing this activity cost-effectively requires sufficient gas and electricity at wellhead.

Applicability

Oil wells that produce a significant

volume of casinghead gas.

Methane Emissions

Casinghead gas varies widely in production rate, pressure, and composition. One Partner reported installing four compressors and capturing 225 Mcf per day of methane (total 675 MMcf per year associated gas).

Economic Analysis

Basis for Costs and Emissions Savings

Methane savings of 32,850 Mcf per year are based on recovering 180 Mcf per day of associated gas containing 50 percent methane, by installing a 30 horsepower electric rotary compressor capable of delivering gas into a 100 psig sales line.

Capital cost is estimated at \$12,500, with installation assumed to be 1.5 times equipment cost. Therefore, total

- Compressors/Engines
- Dehydrators
- Directed Inspection & Maintenance
- Pipelines
- Pneumatics/Controls
- Tanks
- Valves
- Wells
- Other

Applicable Sector(s)

- Production
- Processing
- Transmission
- Distribution

Other Related PROs:

Connect Casing to Vapor Recovery Unit, PRO No. 701

Economic and Environmental Benefits

Methane Savings

Estimated annual methane emission reductions *32,850 Mcf per compressor*

Economic Evaluation

Estimated Gas Price	Annual Methane Savings	Value of Annual Gas Savings*	Estimated Implementation Cost	Incremental Operating Cost	Payback (months)
\$7.00/Mcf	32,850 Mcf	\$244,600	\$31,250	\$7,350	2 Months
\$5.00/Mcf	32,850 Mcf	\$174,700	\$31,250	\$7,350	3 Month
\$3.00/Mcf	32,850 Mcf	\$104,800	\$31,250	\$7,350	5 Months

* Whole gas savings are calculated using a conversion factor of 94% methane in pipeline quality natural gas.

Additional Benefits

- Increased hydrocarbon production due to less backpressure from the casinghead gas

Install Compressors to Capture Casinghead Gas (Cont'd)

implementation costs are estimated to be \$31,250. O&M costs are primarily electricity, and are estimated to be \$7,350 using the following formula:

$$O\&M = \text{engine horsepower} * OF * 8,760 \text{ hours/yr} * \text{electricity cost}$$

where the price of electricity is assumed at \$0.075 per Kwh, and the operating factor (OF) at 0.5.

Discussion

This technology has a quick payback when sufficient gas can be captured. The primary justifications for implementation include the additional revenue from sales of captured gas as well as the increased well productivity. Although there will be increased O&M costs, the additional income resulting from the sales of recovered casinghead gas will offset the costs.

Methane Content of Natural Gas

The average methane content of natural gas varies by natural gas industry sector. The Natural Gas STAR Program assumes the following methane content of natural gas when estimating methane savings for Partner Reported Opportunities.

Production	79 %
Processing	87 %
Transmission and Distribution	94 %