

Install Electric Compressors



Partner Reported Opportunities (PROs)
for Reducing Methane Emissions

PRO Fact Sheet No. 105

Applicable sector(s):

Production Processing Transmission and Distribution

Compressors/Engines
Dehydrators
Pipelines
Pneumatics/Controls
Tanks
Valves
Wells
Other

Partners reporting this PRO: Amerada Hess Corporation, U.S. E&P; Chevron (now ChevronTexaco); Columbia Natural Resources; El Paso Field Services; Marathon Oil Company; Ocean Energy, Inc. (now Devon Energy); South Carolina Electric and Gas Company

Other related PROs: Convert Gas Driven Chemical Pumps, Install Electric Starters

Technology/Practice Overview

Description

Gas-fired engines are often used to run compressors, generators, and pumps. In some operations, part of the produced gas stream is used to power these engines. Methane emissions result from leaks in the gas supply line to the engine, incomplete combustion, or during system upsets. The majority of the gas from a "system upset" comes from compressor blowdown emissions and is the same for both gas engine and electric motor driven compressors.

Partners reported that installing electric motors in place of gas-fired units can decrease gas losses. Electric motors reduce the chance of methane leakage by eliminating the need for fuel gas, require less maintenance, and improve operational efficiency.

Operating Requirements

An electrical power supply is needed to implement this technology.

Applicability

Remote facilities with an available electrical power source and high compressor maintenance cost may be good candidates for this technology.

Methane Emissions Reductions

Methane emissions savings are based on an emissions factor of 2.11 Mcf per year per horsepower. Partners have reported methane savings ranging from 40 Mcf per year up to 16,000 Mcf per year.

Methane Savings: 6,440 Mcf per year

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

Reducing methane emissions was an associated benefit of the project.

Economic Analysis

Basis for Costs and Savings

Methane emissions reductions of 6,440 Mcf per year apply to the replacement of one 3,000 hp reciprocating engine.

Discussion

Installing an electric motor in place of a gas driven engine will increase operational efficiency, reduce maintenance costs, and yield significant methane savings. The capital costs and the electricity costs, however, are higher for an electric motor compared to those for a gas driven engine. The savings from maintenance costs relative to the cost of energy will not be justified unless the engine is at the end of its economic life.