



Emission Reductions and Operational Improvements using electric pumps

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Eliminate chemical pump methane venting and optimize chemical usage



- Using alternative powered pumps with smart controllers
 - Eliminates venting from pneumatic pumps
 - Chemical dosing can be controlled more accurately.
 - More reliable
 - Improved Safety



Eliminate venting from pneumatic pumps & pipeline depressurizations



- Pneumatic pumps use fuel gas as a primary driver
- Fuel gas is primarily methane
- Methane is 25 times potent than CO2
- Typical pump injecting 20 LPD vents ~6,500 m3/year equivalent to 93 tonnes of CO2 annually.
- Gas saved continues down the sales line



Eliminate venting from pneumatic pumps



Typical pump setup pumping methanol to prevent hydrates and de-waxing chemical

FieldName	SurfaceLocation	Chemical	Manufacturer	Model	WellType	GasType	PistonOD	InjectionKPA	InjectionPoint	StrokeLength	StrokesMinute	LPD	gas vented m3/day	Gas vented m3/h	CO2e per year
Pouce Coupe		Methanol	TXT	S100	Gas	Sweet	.5	2051	Pipeline	1	30	138.9298338	57.2459629	2.385248454	308.4069005
Pouce Coupe		De-waxer	TXT	S100	Gas	Sweet	0.25	2051	Pipeline	1	12	13.89298338	25.98076956	1.082532065	139.9687979

- Methane reduction and carbon credit generation can be significant
- Carbon credit generation can offset additional costs
 - Depending on the jurisdiction credits can be sold into a compliance or the voluntary market
- Credit generation can be used to report a verified and audited emission reduction



Chemical Accuracy



- Pneumatic pumps typically rely on a mechanical switch and valves to control rates
 - Hard control accuracy with a valve controlling rates
 - Tendency is to over inject wasting valuable chemical
 - Pressure changes in fuel gas change pump rates
 - Pump rates are based on gas flow through a valve changes in pressure increase or decrease chemical
 - Improper chemical injection can lead to pipeline hydrates forming or lines freezing



Reliability



- Pneumatic pumps typically rely on a mechanical switch and valves to control rates
 - Rich/dirty fuel gas
 - Can plug valves
 - Clog switches
 - Damage internals in pump
 - Pump failures can lead to well shut downs and pipeline blockages
 - hydrates – pipeline depressurizations
 - freeze ups
 - paraffin build up
- etc.



Safety



- Gas released from pipe line depressurizations and pump venting.
 - Inside building
 - Leads to LEL issues
 - Exposure issues
 - Outside building
 - Exposure of personnel, livestock, general public

