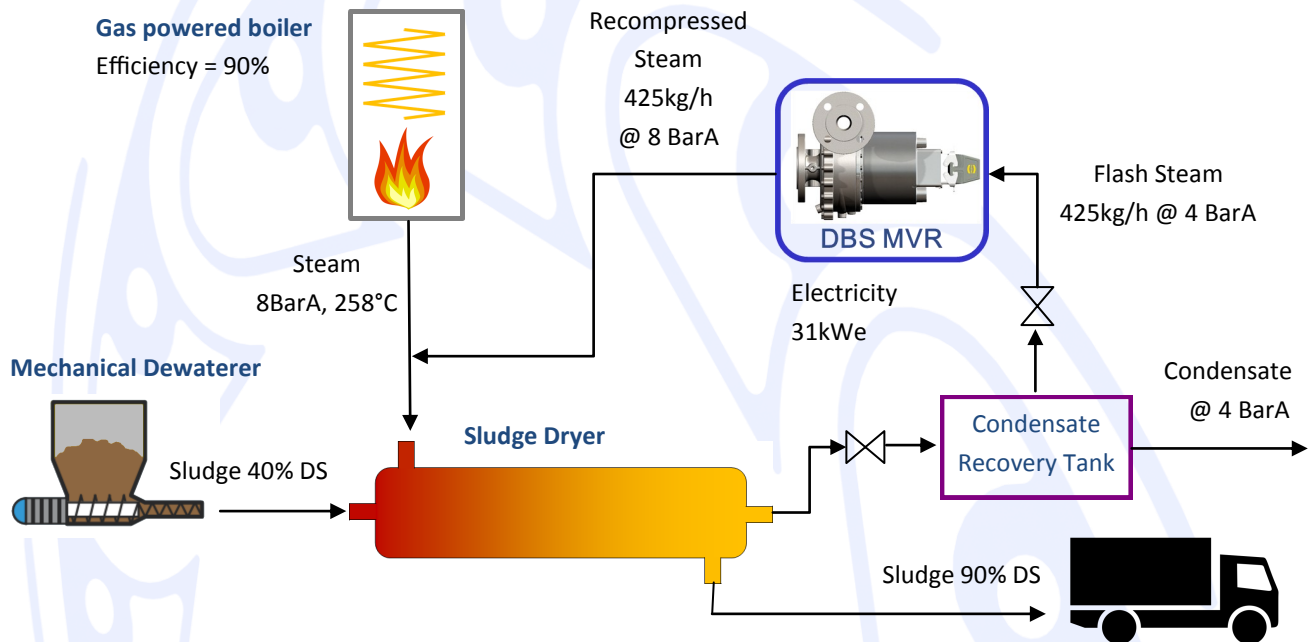


Steam Compressor Application: Sludge Dryer

Significant Annual Cost Savings of over GBP £54,000!



Dewatered sludge consisted of approximately 40% Dry Solids (DS). The only commercially viable method of increasing that to the generally accepted level of 90% DS is by drying. This is achieved by heating the sludge using steam. Traditional systems use a gas boiler to create steam at the correct temperature and pressure. However by flashing the condensate at the end of the process and compressing the resulting steam, it is possible to reduce the load on the boiler. The economic benefits of this process are outlined below.

Compressor Side			Calender (process) Side		
Inlet Pressure	Bar	4	Inlet Pressure	Bar	8
Inlet Temp	°C	143.6	Inlet Temp (condensate)	°C	171
Outlet Pressure	Bar	8	Inlet Enthalpy	kJ/kg	722
Outlet Temp	°C	258	Outlet Temp	°C	258
Flow Rate	kg/h	425	Outlet Enthalpy	kJ/kg	2,967
Electrical Power	kWe	31	Change in Enthalpy	kJ/kg	2,245
			Heat Delivered	kWt	265
Coefficient of Performance (CoP): 8.5					
Costing:					
Cost of electricity to drive the compressor for 8,000 hours: GBP £23,460*					
Cost of natural gas to deliver heat directly for 8,000 hours: GBP £77,460*					
Net savings per year: GBP £54,000					

Notes: Cost of electricity: 0.0946 £/kWh*. Cost of natural gas: 0.02856 £/kWh* These costs are based on report published by the UK Department of Energy & Climate Change (Q2, 2013)