CONTINENTAL CONTROLS CORPORATION

GRUPO CABRICK
Energía que Fluye

Gas Substitution System

CCC's GSS uses our existing proven technology

VM 350

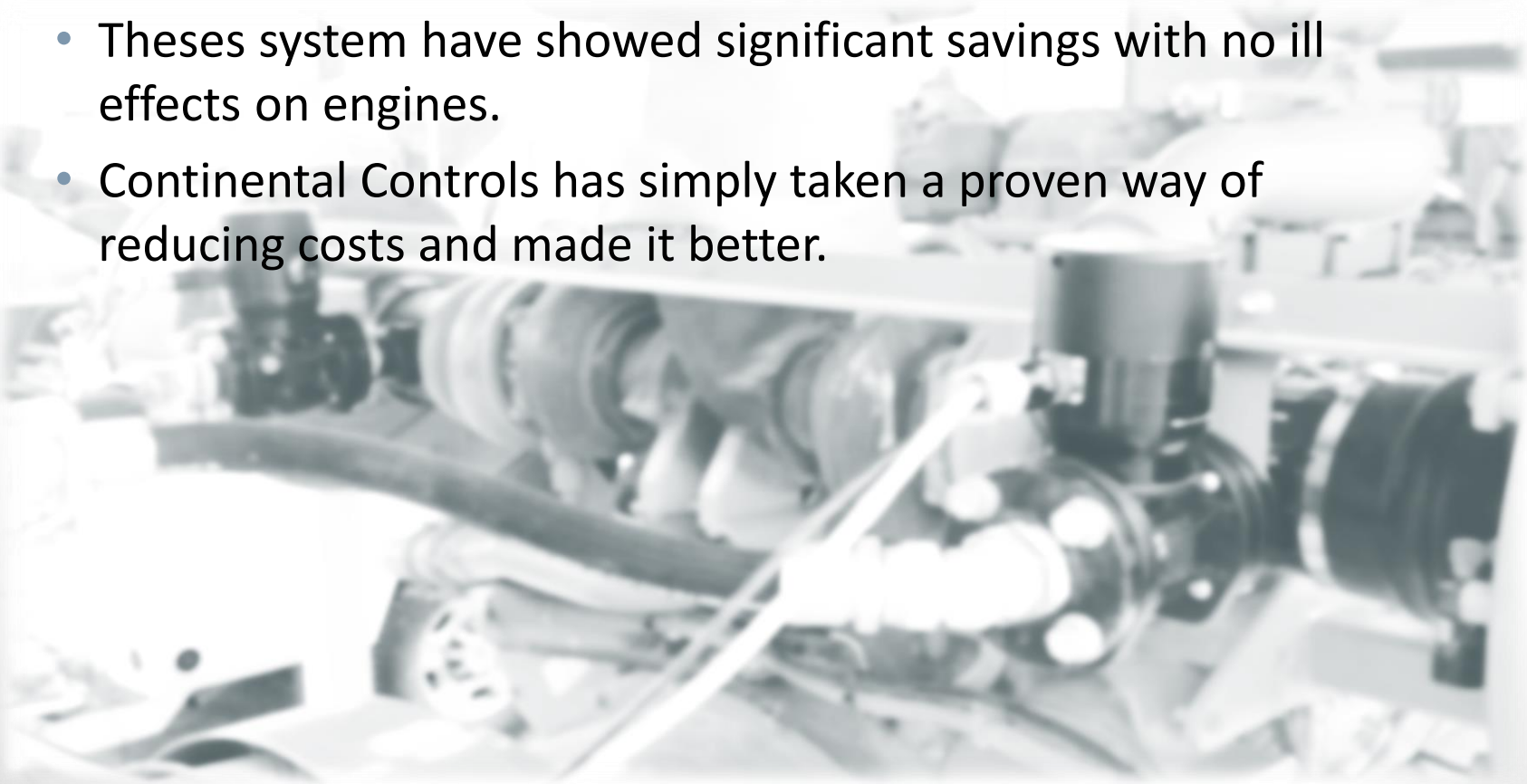
EGC 4

GV 1

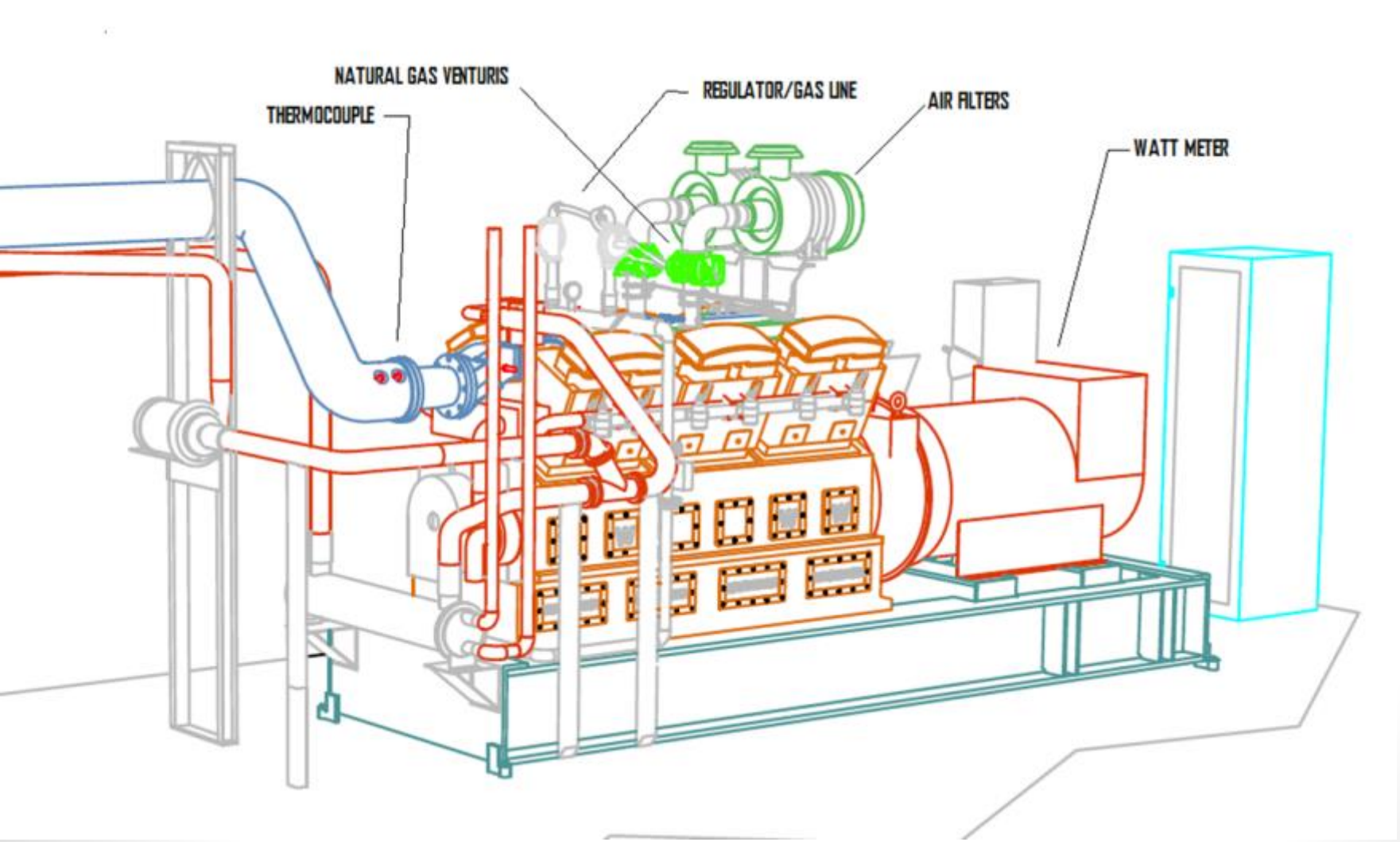
ECV 5

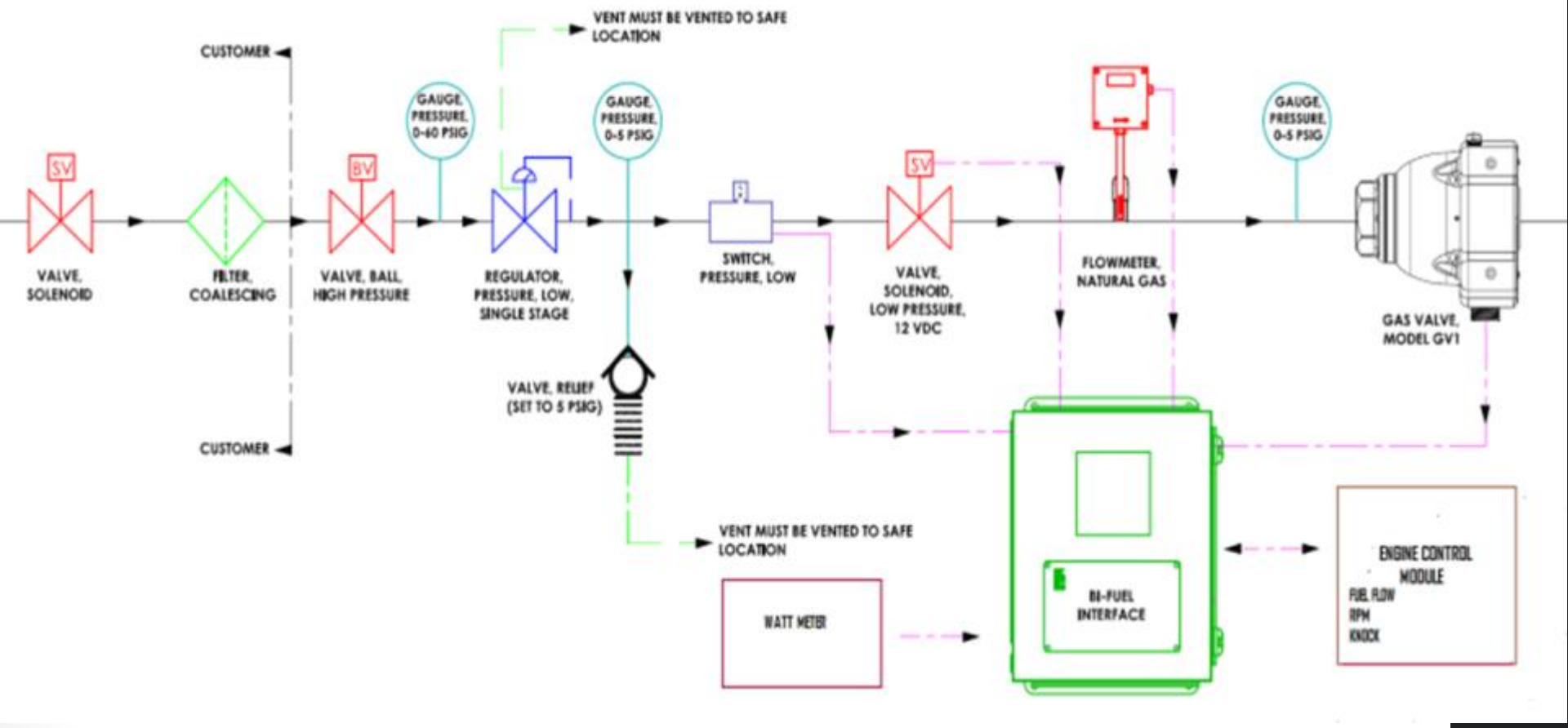
Diesel/Gas Substitution is a proven concept

- Other manufactures have been installing similar systems on engines for years.
- Theses system have showed significant savings with no ill effects on engines.
- Continental Controls has simply taken a proven way of reducing costs and made it better.



GSS Overview





OUR GAS TRAIN

Our Equipment: VM350

- Replaces Mechanical Carburetor and Improves Air / Fuel Mixing
- No Moving Parts Reduces Maintenance
- Consistent Fuel Manifold Pressure at all Loads Enhances Air Fuel Ratio Control
- Less Pressure Drop Than with Traditional Carburetor

Our Equipment: ECV5

- Full Authority Fuel Valve
- Fully Automatic Air/Fuel Control
- On Board Diagnostics

Our Equipment: GV1

- Full Authority Fuel Valve add articles
- Works with PLC or Third Party AFR Controls
- Long Lasting – Low Maintenance
- Low Cost

Our Equipment: EGC4

- Replaces Mechanical Carburetor
- Integrated Fully Automatic Air Fuel Ratio Control
- Improved Air and Fuel Mixing
- On Board Diagnostics
- Fast and Accurate Control

Their Equipment: GTI

Fuel Mixer

Power Screw

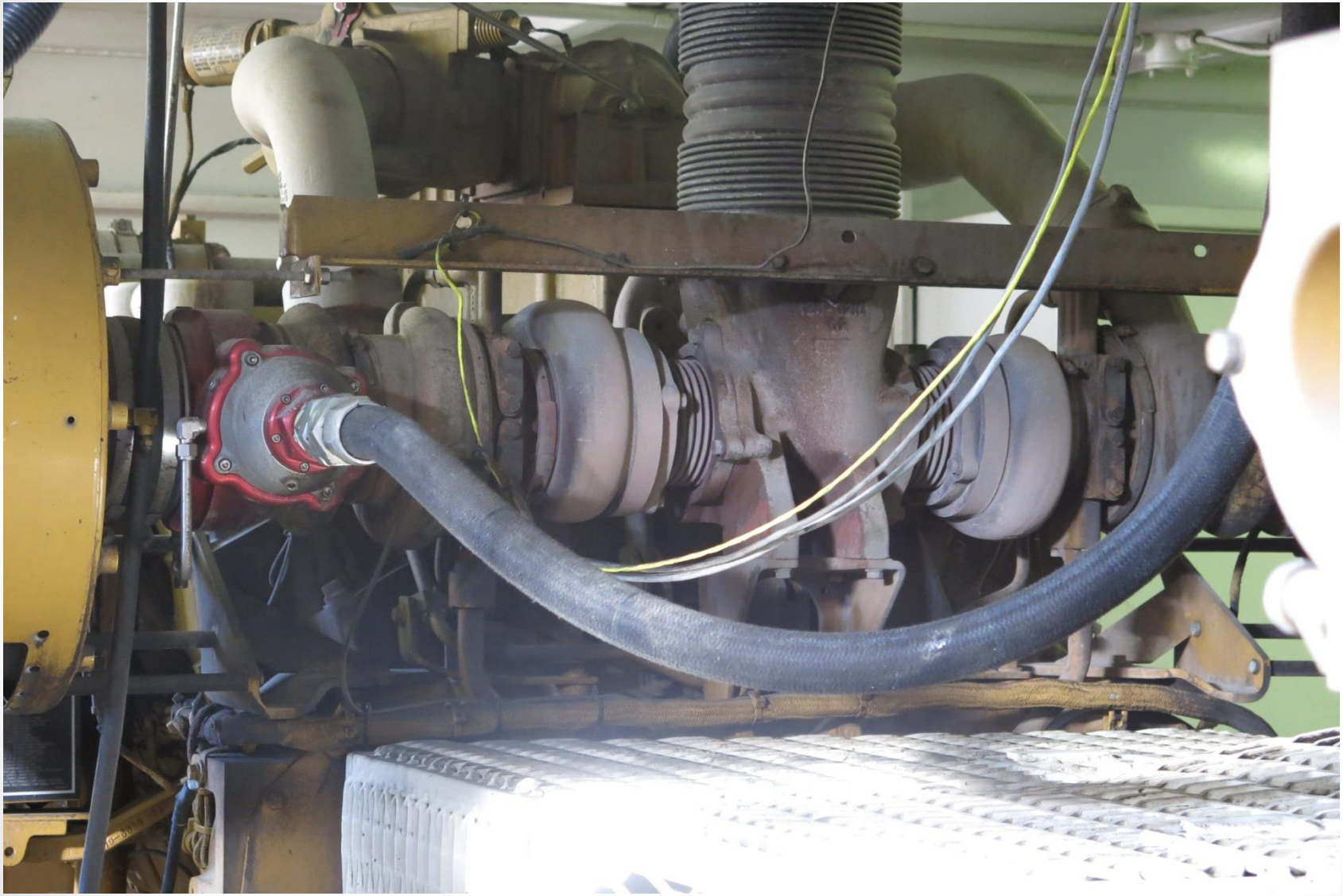
Dungs Fuel Train

Why we do it better…

- We schedule the amount of gas to the engine based on fuel flow, and we exhaust temperature limit.
- We can provide higher levels of substitution.
- Our competitors are simply gas on, or gas off, without proportional control.
- We interface directly with the engine ECU.
- Improved control/and information resulting in better mixing.
- We eliminate engine knock and uneven fueling.

Cummins N-14 Generator

Cat C-15




FINNING
CAT
CAT

Caterpillar 3516 TA

Caterpillar 3208 NA

Detroit Diesel 2000

Detroit Diesel Series 60

System Interface

- Load in KW
- Diesel fuel flow
- Gas fuel flow (optional)
- Substitution rate.
- Exhaust temp.
- RPM
- Alarms

Benefits

- We control the amount of substitution based on fuel flow.
- Better control, higher rate of substitution at lower loads. – Save more money.
- Better load response.
- Lower particulate pollution.
- No reduction in power.
- Significant fuel cost savings.

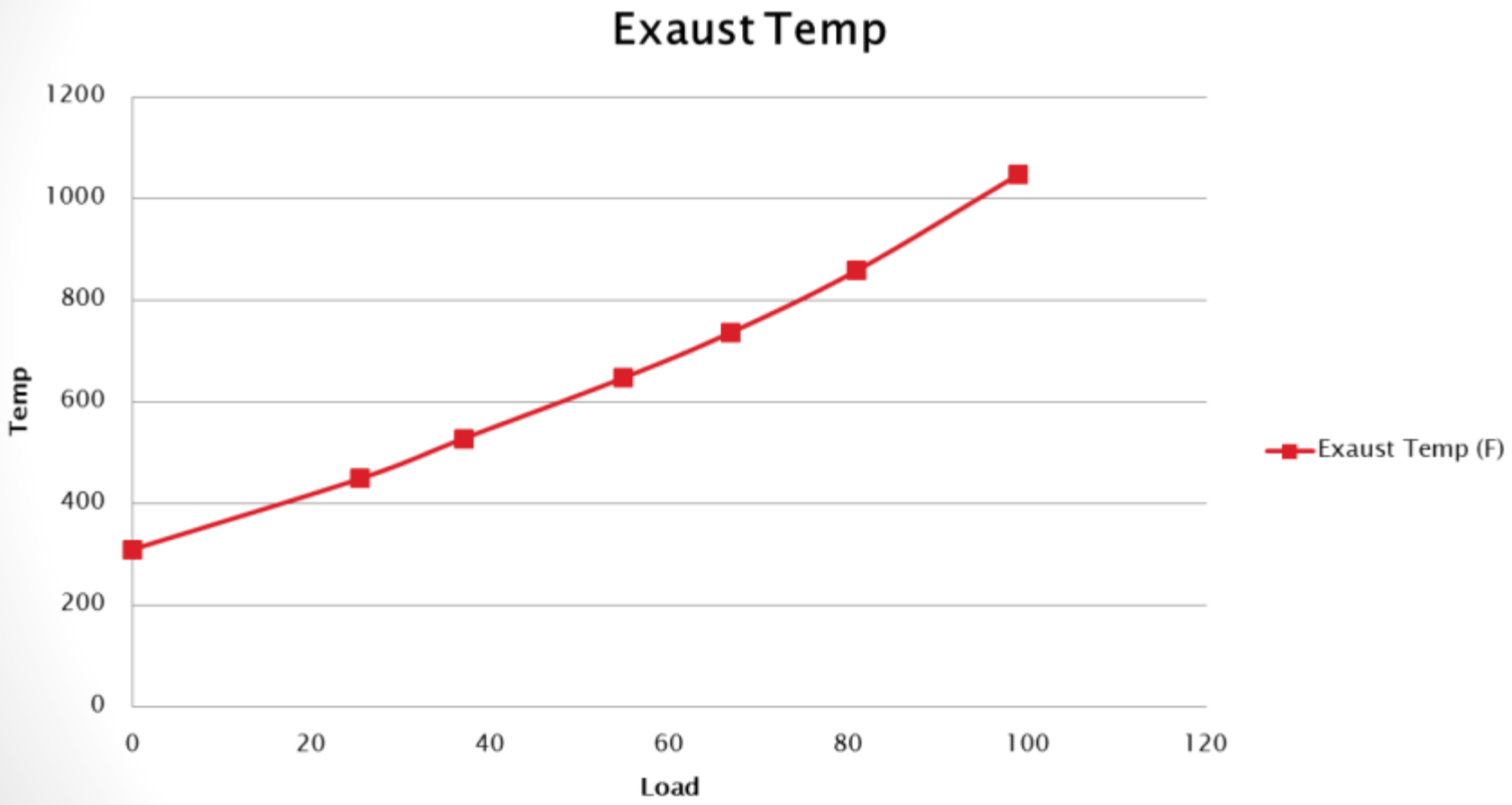
Equivalencies

- One liter of diesel has the same heating value as one cubic meter of natural gas.
- 36,500 btu per liter
- One Gallon of diesel has the same heating valve as 140 cubic feet of natural gas
- 138,700 btu per gallon

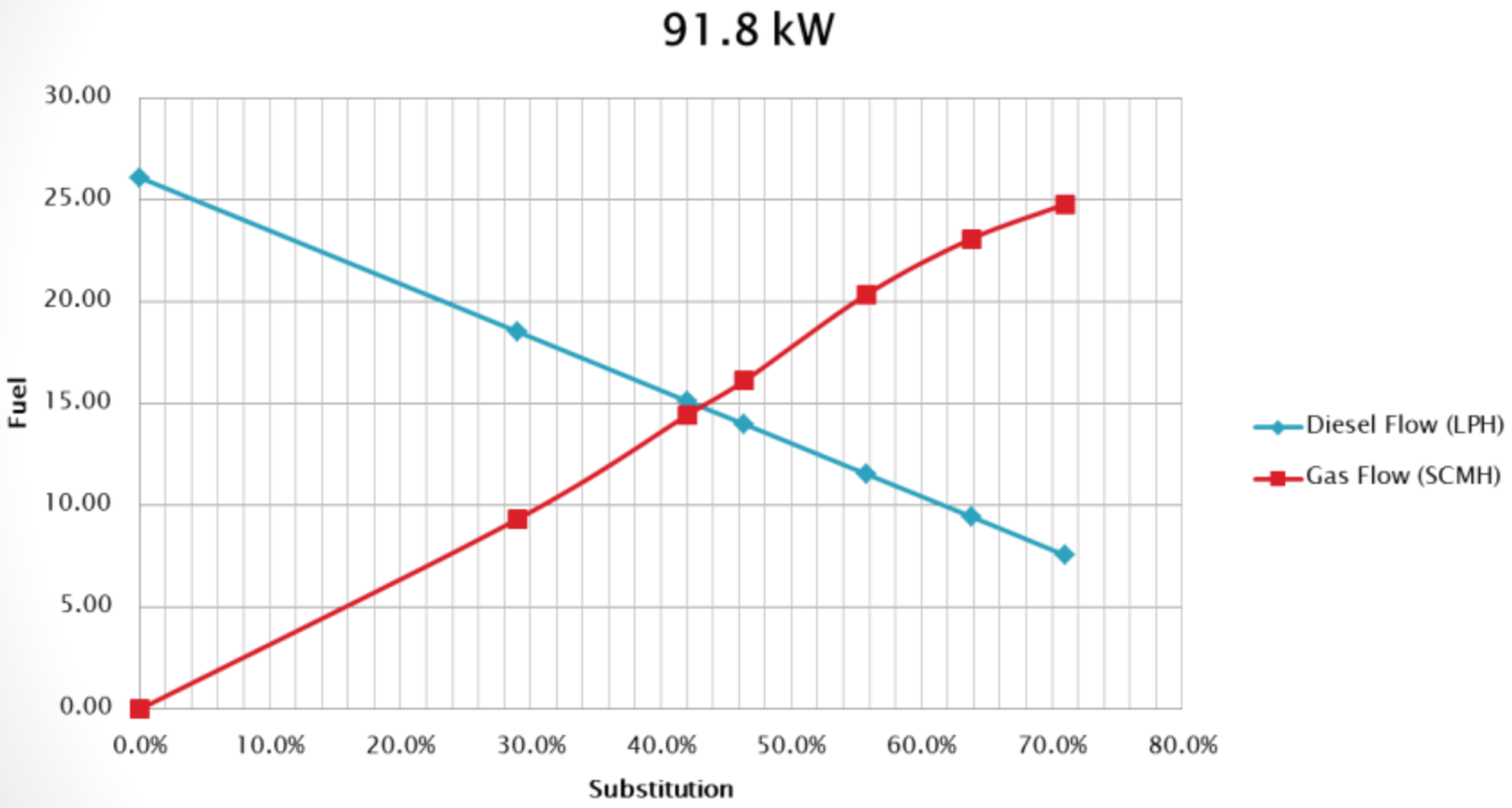
Equivalencies

- Price per gallon of diesel: $4.21
  http://205.254.135.24/oog/info/gdu/gasdiesel.asp
- Price per 1000 cubic feet of gas: $5.00
  http://205.254.135.24/dnav/ng/ng_pri_sum_dcu_nus_m.htm
- Equivalent price of natural gas: $0.70 per gallon. $5.00 * .14

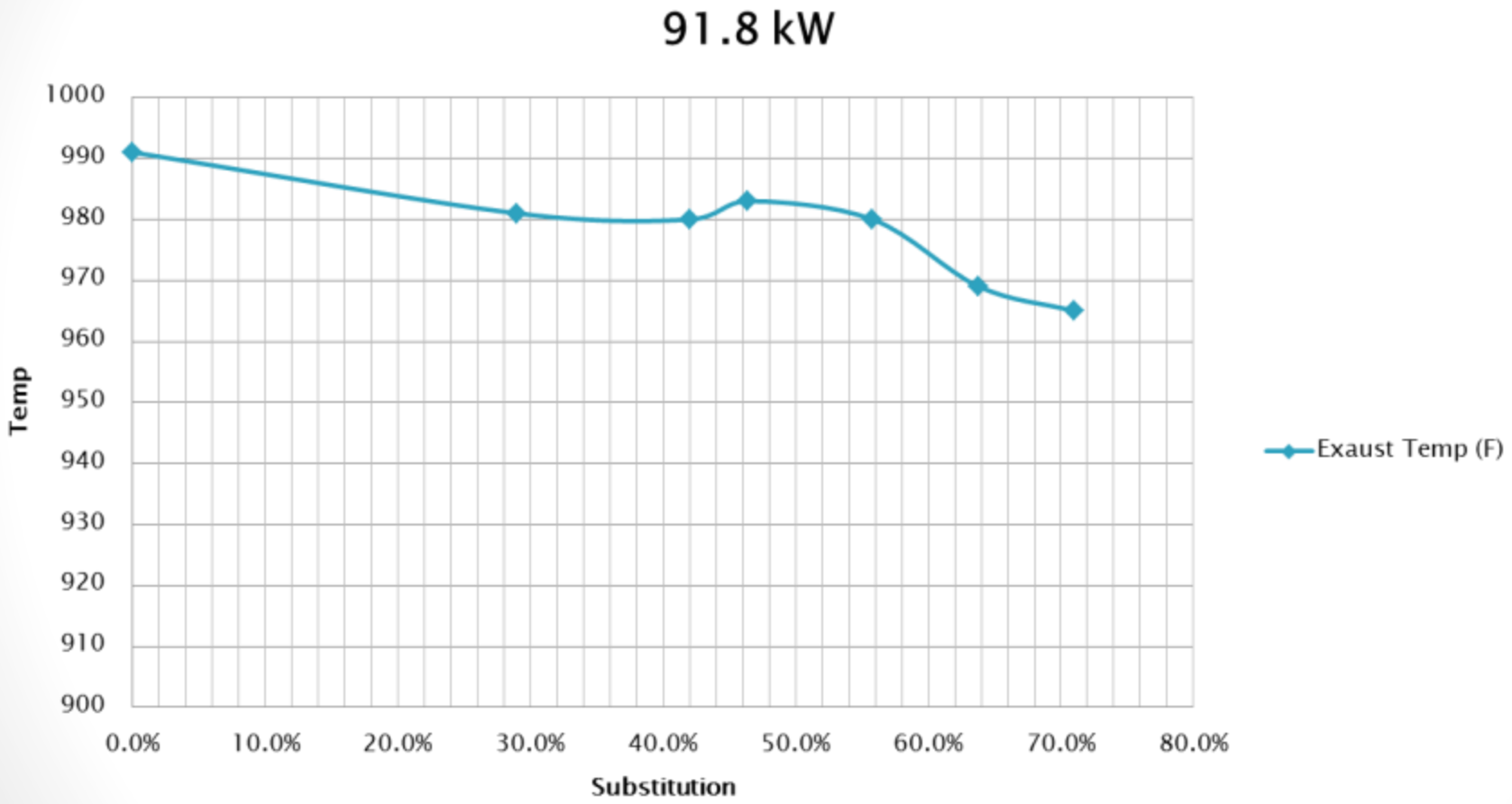
Testing: Exhaust Temp



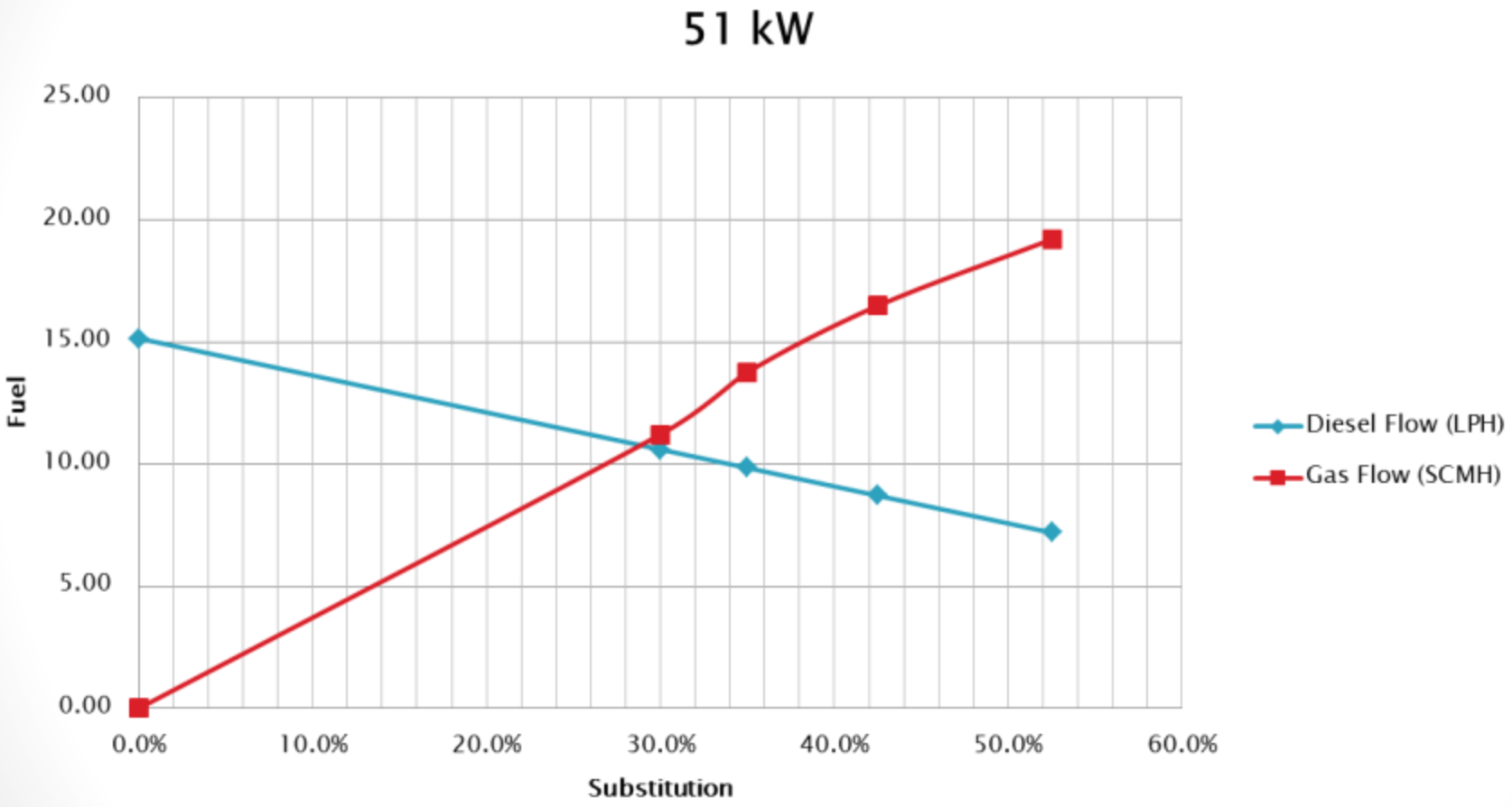
Substitution Rate 91.8 kW



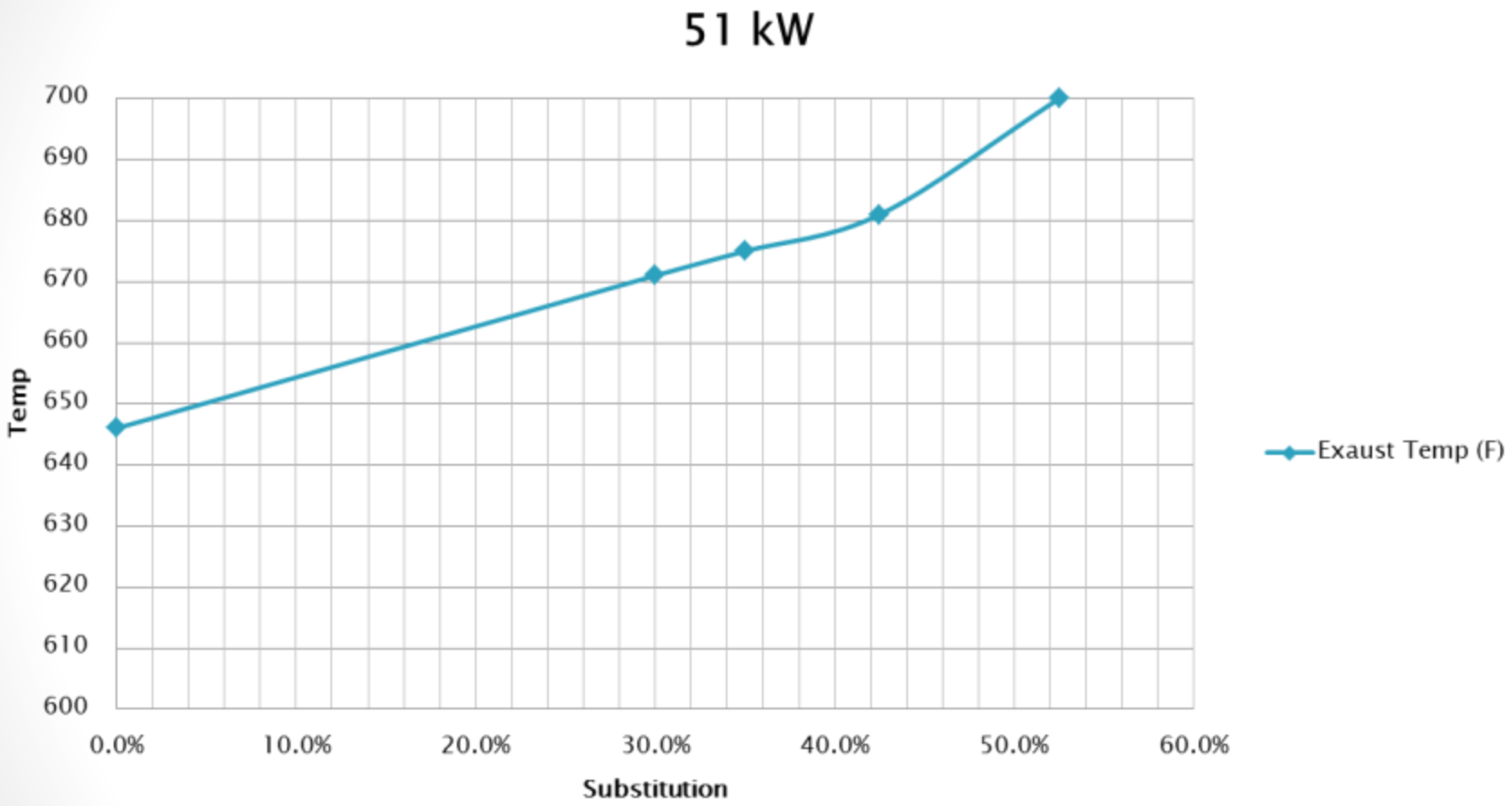
Exhaust Temp 91.8 kW



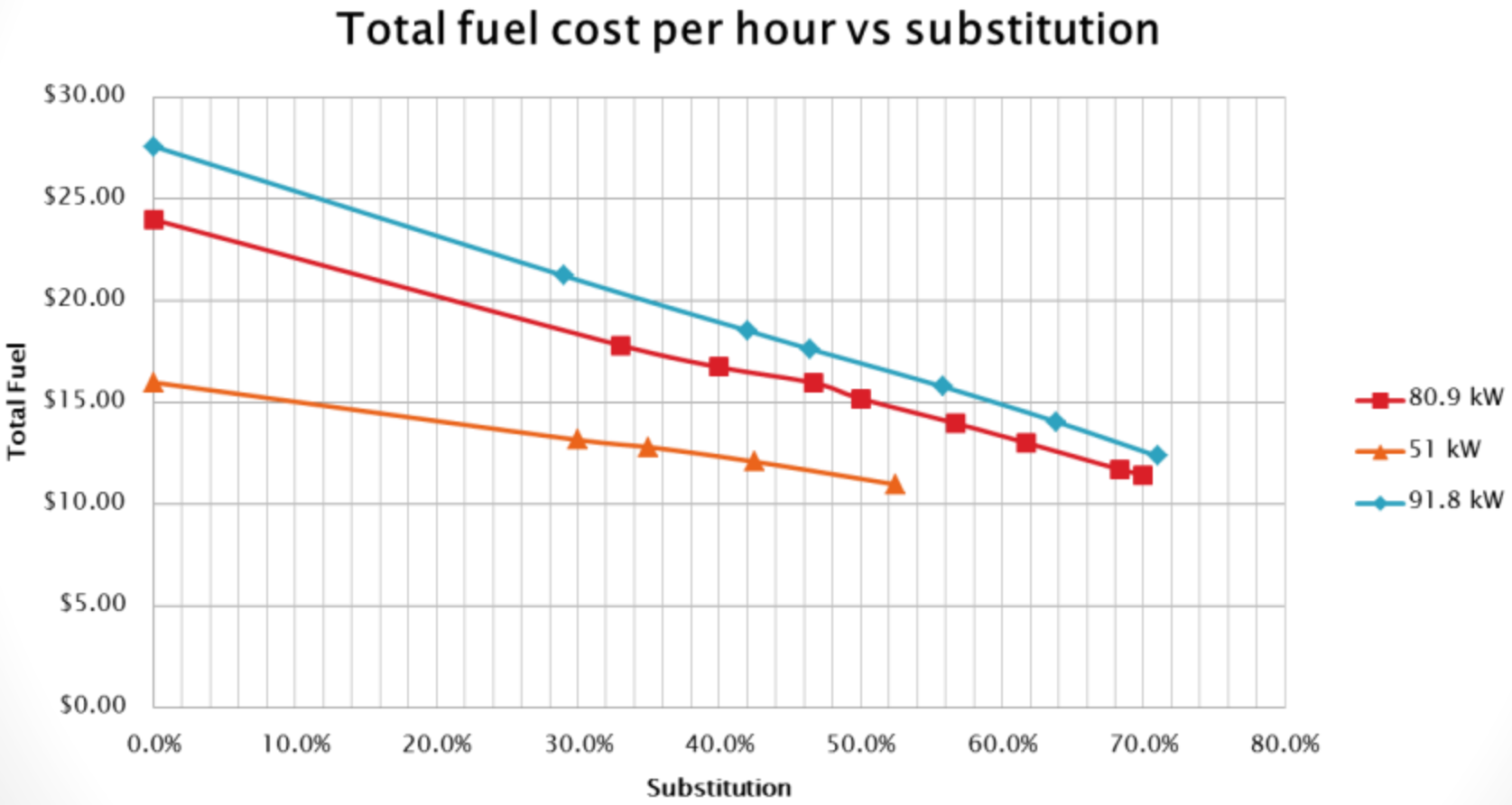
Substitution Rate 51 kW



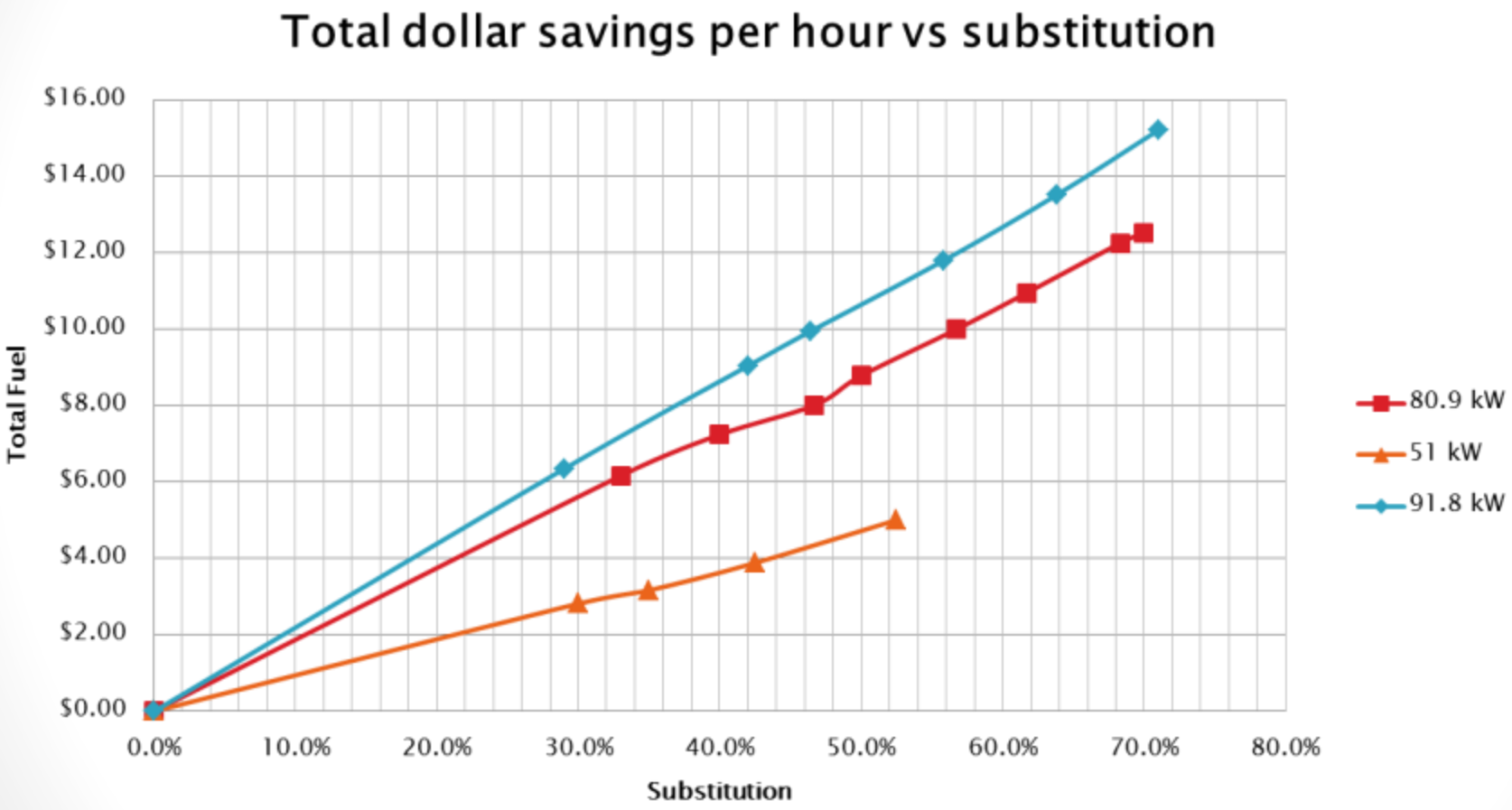
Exhaust Temp 51 kW



Fuel Costs


Total fuel cost per hour vs substitution
$30.00
$25.00
$20.00
$15.00
$10.00
$5.00
$0.00
Total Fuel
0.0%
10.0%
20.0%
30.0%
40.0%
50.0%
60.0%
70.0%
80.0%
Substitution
80.9 kW
51 kW
91.8 kW

Savings


Total dollar savings per hour vs substitution
$16.00
$14.00
$12.00
$10.00
$8.00
$6.00
$4.00
$2.00
$0.00
Total Fuel
0.0%
10.0%
20.0%
30.0%
40.0%
50.0%
60.0%
70.0%
80.0%
Substitution
80.9 kW
51 kW
91.8 kW

CONTINENTAL CONTROLS CORPORATION

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