



# MMD PowerPro™ Generators

## How would you like to reduce fuel cost by 75%?

### Hybrid Dual Fuel

Reducing costs on a strict budget is a critical part of any business. We must utilize all resources available. Our generators can help you do just that. Our PowerPro Hybrid Generator can utilize a byproduct resource — natural gas. Using natural gas reduces the fuel consumption by up to 75% on our units.<sup>1</sup> As a result, because of its decreased run-time, machine maintenance is also extended.<sup>2</sup> MMD PowerPro Generators are already powered by a fuel-saving diesel engine that can be paralleled to meet varying load requirements.

Diesel Fuel Savings — HDF 150kVA (based on an estimated \$3.00 per gallon diesel cost)

Consider this: A 60Kw load on 100% diesel uses approximately 4.2 gph, or 100.8 gallons per day, and 3,024 gallons per month. That's a monthly cost of \$9,072 per month in fuel.

The same unit running at 68% natural gas/32% diesel, on the same load, burns approximately 1.4 gph, or 33.6 gallons per day, and 1,008 gallons per month.

The new monthly cost of fuel is \$3,024. **That's a savings of \$72,576 per year to both customers and rental companies.**

Using parallel units, the savings comes out about the same, as the single load is shared between two units. For many well-site applications, the units "roll over": one unit runs for 12 hours, then the other unit starts, parallel's in, and then the first unit "unloads," drops off, and sits in standby. **The fuel savings is still 67% and each single unit only runs for 12 out of 24 hours, doubling maintenance intervals.**



**Natural gas starting and showing diesel use at 4.2 Gallons per hour.**



**Dual fuel system operating showing gas use percentage at 71.93% and diesel use at 1.8 gallons/hour (same load).**



**Approximately the same readings using a FLOWSCAN meter installed in the fuel lines of the generator.**



**Parallel Control Module showing current load (46Kw).**



**Parallel Control Module showing current diesel use while running in HDF mode.**



**Can be run as a regular diesel unit when natural gas is unavailable.**

### HDF Usage Comparison

Based on Units running 8000hr/year and constant load; Assumes diesel cost @ \$4.00 /gal. Calculations based on HDF150 — 150Kva/120Kw Generator

Kw Load	Standard Diesel - Non Hybrid			50% Substitution			60% Substitution			70% Substitution		
	Gal/Hr. Usage	Est'd Diesel Use	Est'd Annual Cost	Gal/Hr Usage	Est'd Diesel use	Annual Savings	Gal/Hr Usage	Est'd Diesel use	Annual Savings	Gal/Hr Usage	Est'd Diesel use	Annual Savings
50	4.00	32,000	\$128,000.00	2.00	16,000	\$64,000.00	1.60	12,800	\$76,800.00	1.20	9,600	\$89,600.00
60	4.30	34,400	\$137,600.00	2.15	17,200	\$68,800.00	1.72	13,760	\$82,560.00	1.29	10,320	\$96,320.00
70	4.70	37,600	\$150,400.00	2.35	18,800	\$75,200.00	1.88	15,040	\$90,240.00	1.41	11,280	\$105,280.00
80	5.30	42,400	\$169,600.00	2.65	21,200	\$84,800.00	2.12	16,960	\$101,760.00	1.59	12,720	\$118,720.00
90	5.90	47,200	\$188,800.00	2.95	23,600	\$94,400.00	2.36	18,800	\$113,280.00	1.77	14,160	\$132,160.00
100	6.50	52,000	\$208,000.00	3.25	26,000	\$104,000.00	2.60	20,800	\$124,800.00	1.98	15,600	\$145,600.00
110	7.10	56,800	\$227,200.00	3.55	28,400	\$113,600.00	2.84	22,720	\$136,320.00	2.13	17,040	\$159,040.00
120	7.80	62,400	\$249,600.00	3.90	31,200	\$124,800.00	3.12	24,960	\$149,760.00	2.34	18,720	\$174,720.00
130	8.60	68,800	\$275,200.00	4.30	34,400	\$137,600.00	3.44	27,520	\$165,120.00	2.58	20,640	\$192,640.00

1 Measured over a time frame of week/month.  
2 When used in parallel rollover setup.

For units operating parallel, the usage and savings is based on total load shared. For individual calculations, check the COMAP Display, and reference "Fuel Rate."

\* Units must be setup based on gas content.

\*\* Contact MMD's Engineered Solutions Department for jobsite specification assistance.

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### MMD Equipment

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# MMD PowerPro™ Generators Hybrid Dual Fuel Parallel Case Study

## Technical Scope

Utilize two MMD PowerPro Dual Fuel Hybrid Generators in parallel rolover operation, taking advantage of onsite natural gas supply to reduce overall diesel consumption. Use mix percentage beyond standard 50% natural gas substitution — with up to 75% substitution. Program generators to alternate automatically every six hours to keep engine hours balanced (rollover mode).

## Validation Site

Crude Oil Transfer Station – South Texas, USA — March 2015

## Equipment

- Two MMD PowerPro SDG150S Dual Fuel Hybrid Generators — converted to parallel operation and utilizing Comap control systems
- Parallel load panel (supplied by customer)
- Natural gas line (provided by site operator)

## Setup

Two HDF generators were parked and tied into the parallel load panel, and also attached to the onsite natural gas supply line. Units were set up and paralleled before applying load.

## Onsite Operation

Upon powering up and full check out, a single unit was pulling a varying load from 46kw up to 90kw and diesel consumption hovered between 4.2 and 4.6 gallons per hour (as confirmed by a Flowscan meter as well as the fuel flow meter on the Comap genset controller).

Upon application of the gas supply, the system responded properly, operating with a peak of 71.93% natural gas substitution, and a nominal operating value of approximately 61.25% substitution. During this time the fuel consumption dropped to 1.6 gallons per hour – confirmed on the Flowscan meter as well as the Comap fuel flow display.

Units inspected one week later were found to be handling loads while operating in HDF mode and switching over every six hours as programmed. Units were manually placed into full parallel without issue or loss of gas/diesel mixing.

***Units were changing every six hours without issue. No DTC trouble codes were presented. Both unit's history files were pulled and compared to non-HDF units. No abnormalities were presented. Units were continuing to handle varying loads, while running under full Dual Fuel mode.***



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