$nanO_2$® Nabors South Texas Case Study

Objective

Reduce the emissions impact of the drilling operations, by improving the fuel efficiency of dual fuel power generation systems in South Texas.

Solution and Testing Procedure

The $nanO_2$ fuel enhancer was deployed in South Texas to validate the effectiveness of $nanO_2$ on a dual fuel system. The baseline for this test was recorded while using dual fuel.

The accurate ratio of $nanO_2$ was added to the fuel each time the rig received a delivery.

Using kilowatt per gallon (kWh/gal) as the standard key performance indicator (KPI) to evaluate the rig's efficiency, fuel usage and engine load were monitored. Fuel usage was recorded daily from tank level readings, which was crosschecked with indicated fuel delivery. Engine power data and number of online generators were captured by rig controls, then the data was analyzed and displayed to monitor fuel usage and engine performance.

Results

Testing resulted in a 5.4% increase in fuel efficiency over the baseline, saving 2,918 gallons of diesel over the 40 days that used $nanO_2$.

The 2,918-gallon fuel savings equates to an estimated reduction of 29.9 metric tons of CO_2e*. This does not take into consideration the additional reduction in other types of emissions resulting from $nanO_2$ that have been observed but were not a part of this case study.

$nanO_2$ was successfully used with a dual fuel system. No known operational issues were identified during the field trial, verifying $nanO_2$'s compatibility with dual fuel.

Conclusion

The $nanO_2$ fuel enhancer was determined to be compatible with dual-fuel systems. $nanO_2$ successfully reduced the rig's environmental impact by decreasing CO_2e emissions from a dual fuel power generation system and it was effective at increasing the fuel efficiency of these systems.

Sources:
**Based on 2021 EPA GHG emission Factors. CO_2e (equivalent) is calculated by including the GWP of CH_4 and N_20 of diesel to standard CO_2 Diesel Fuel Emissions.*
***Not on dual fuel in between these dates*

Case Study Details

Location: South Texas

Timeframe:

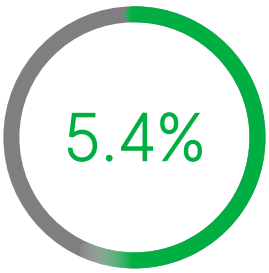
- Baseline: 03/06/22-03/17/22
- $nanO_2$: 04/15/22-05/17/22, 06/04/22-06/14/22**

Test KPI: kWh/gal

Rig Spec: Land Rig

Power Generation (4): CAT 3512

Results Overview



Increase in Fuel Efficiency

Metric Ton's of CO_2e* Saved