CASE STUDY

EverGreenEnergy™

Battery Energy Storage System (BESS) Increases Rig Fuel Efficiency and Reduces Greenhouse Gas (GHG) Emissions

20%
Reduction in diesel consumption

14%
Increase in natural gas substitution

12%
Reduction in GHG emissions

CASE STUDY OVERVIEW

An operator was initially using a bi-fuel rig that consumes diesel and natural gas in the engines to produce electricity. In consultation with Precision Drilling and based on an offset analysis, the operator deployed a Battery Energy Storage System (BESS) in the rig to improve its fuel efficiency and reduce GHG emissions.

Our Battery Energy Storage Systems take on high transient loads inherent in drilling operations while also increasing the average loads on the generators and reducing the number of generators required to run a drilling rig. The system recharges its batteries during periods of low rig demand and uses predictive algorithms and machine learning to automatically turn generators on and off while ensuring all operations on the rig have immediate required power (See Figure 1).

BESS PERFORMANCE RESULTS

The use of a BESS decreases the number of generators online, and the engines run more efficiently at a higher load. As a result, the natural gas substitution rate and fuel efficiency have increased significantly. Similar load profiles in various operations were considered to calculate the diesel savings and GHG reduction. The highlights of the results are:

- **During Drilling:** Up to 30% reduction in diesel consumption and 15% less GHG emissions (See Figure 2)
- **During Tripping:** Up to 38% reduction in diesel consumption and 14% less GHG emissions (See Figure 3)

Overall, diesel consumption is reduced by 20% increasing the natural gas substitution rate by 14%. As a result, GHG emissions are reduced by 12%.

CONCLUSION

The Battery Energy Storage System allowed the engines to run more efficiently, which resulted in a 20% reduction in diesel consumption and 12% less GHG emissions.

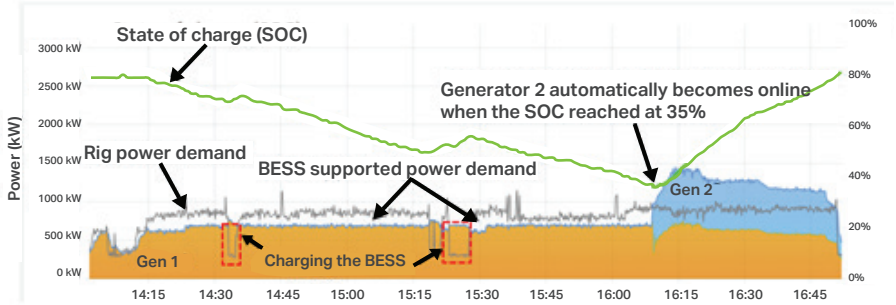

FIGURE 1

The rig consumes power from the BESS until the battery state of charge reaches to 35% when the second generator becomes online to handle the rig demand.

USING BESS IN DRILLING

30%
Reduction in diesel usage

15%
Reduction in GHG emissions

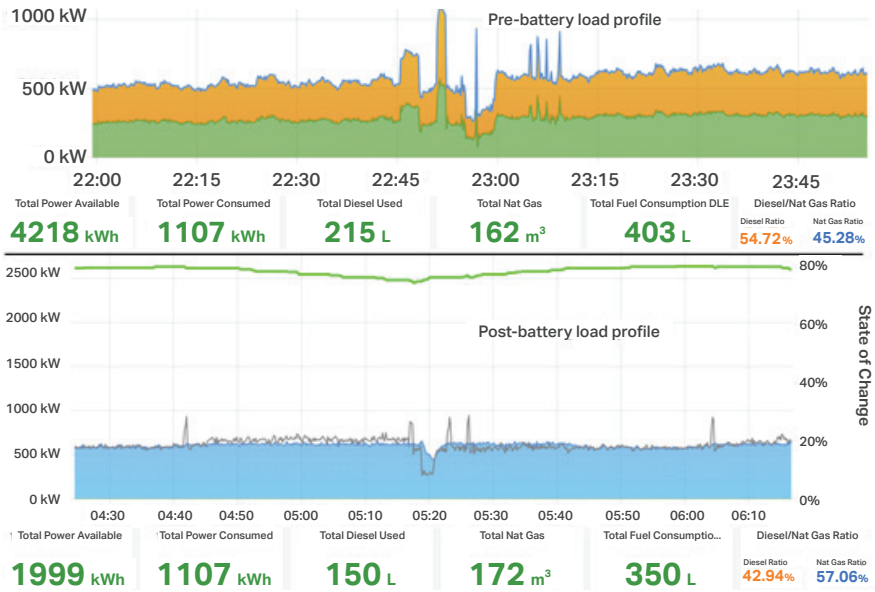

FIGURE 2

Figure 2 compares two similar load profiles for pre-battery and post-battery drilling. Engine load is increased from 26% to 55% which allowed increased natural gas substitution.

USING BESS IN TRIPPING

38%
Reduction in diesel usage

14%
Reduction in GHG emissions

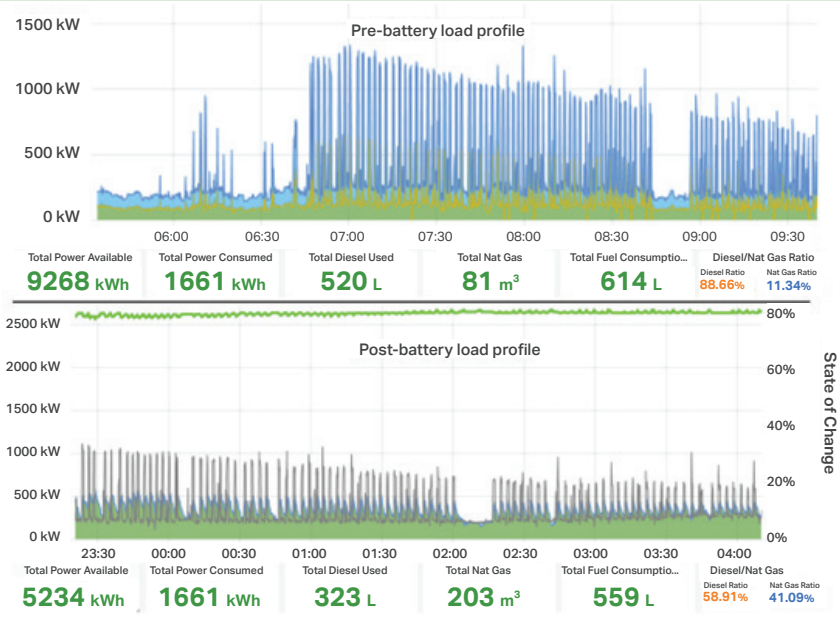

FIGURE 3

Figure 3 compares two similar load profiles for pre-battery and post-battery tripping out. Engine load is increased from 18% to 32% which allowed increased natural gas substitution.