**GHG Reduction from Cranes based on Hybrid-Electric Crane Acquisition**

**April 21, 2023 e-mail from Doug Eli, Frontier Energy**

Here is quickly what we’re seeing just based on the fuel consumption on page 5, showing 195 g of diesel/kWh at full load. It comes out to about 31% savings on CO2 emissions and 44% savings on utility cost if this is hooked up to the grid and directly using electricity rather than burning diesel.

Below is a run down of the number using diesel density of 7 lb/gal and the same CO2 and costing conversions we used in the report.

|  |  |
| --- | --- |
| 195  | g diesel/kWh |
| 3175.15  | g diesel/gallon diesel |
| 0.061414421  | gal diesel/kWh |
|  |  |
| 0.000625 | Ton CO2 using diesel per kWh of energy output |
| 0.000433 | Ton CO2 using electricity per kWh of energy output |
|  |  |
| $0.196 | using diesel per kWh of energy output |
| $0.110 | using electricity per kWh of energy output |
|  |  |
| 31% | savings of CO2 emissions |
| 44% | savings of $ |

These are just based on using diesel versus using grid power to power this unit. There would be more savings if the baseline is an existing crane that may already be at the port which would be less diesel efficient that this Kone example.

As mentioned, lets touch base early next week to see if this helps and if we could provide more assistance.

Thanks,

Doug Eli, *CEM*

Energy Engineer

Frontier Energy | Minnesota Office

763-222-3039

deli@frontierenergy.com