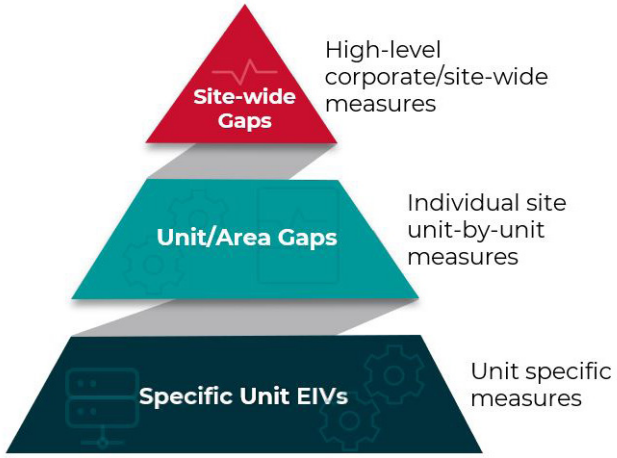
CASE STUDY



Savings up to of USD 700,000/Year for Offshore Caribbean Platform

Global energy company benefits from energy efficiency audit of mature complex

Key Benefits

- Savings up to USD 700,000 /year
- Reduce CO_2 emissions by 19%
- 5% long-term sustainability savings

Background

- Offshore platform in the Caribbean
- Mature facility
- Pilot program to increase energy efficiency

KBC Solution and Results

- Comprehensive energy audit and report
- Gap Analysis to identify areas of inefficiency
- Safety and reliability improvements
- Energy management roadmap

Client Challenge

A global energy company has several offshore oil and natural gas production platforms in the Caribbean Sea. Some of the facilities were getting on in age. They had concerns on their energy efficiency and footprint.

The complex is effectively a power island. Although the platform has a diesel generator for back-up purposes, it essentially generates all its own electrical power. Burning fuel gas in gas turbines and engines generates the power for the platform.

The operator estimated that their total CO_2 emissions from their offshore operations were approximately 308,000 tons. This consisted of 2% emissions from diesel oil combustion, 23% from the combustion of production natural gas, and 75% from gas flaring.

They are committed to reducing energy consumption and greenhouse gas emissions from their offshore production platforms. They approached KBC to carry out a pilot energy audit of one of their facilities.

The Solution

For the basis for the analysis, KBC chose a two-week period of stable platform operation. During the base case period, 5,256 BPD of oil and 4,786 BPD of water were pumped to shore. KBC consultants spent three days offshore and one day at the head office reviewing the design and operation of the offshore platform.

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They used a technique called 'Gap Analysis' to identify the areas of inefficiency and to quantify the contribution of each in the overall platform productivity.

The complex had high energy consumption due to inefficient equipment (e.g. Gas Turbine), Inefficient operating practices (leaking valves), and high gas lift rates due to the age and condition of the field. While maturity is an unavoidable issue, it still had a significant energy penalty. The Energy Intensity of the complex was 8.9 GJ/t, much higher than the industry best practice of between 1.5 and 3.2 GJ/t.

To reduce the Energy Intensity from 8.9 GJ/t to 2.9 GJ/t would require a considerable amount of investment. For example, a new Gas Turbine would have to be installed. However, KBC identified some low investment projects which, if implemented would reduce the platforms Energy Intensity from 8.9 GJ/t to 6.9 GJ/t. This is equivalent to reducing CO_2 emissions by 19% or by about 58,000 klb per year.

The gas turbine and flare were the biggest consumers of fuel gas on the platform, accounting for about 98% of the total consumption. To make significant reductions in energy consumption, KBC recommended that the operator concentrate efforts in these two areas. Since power generation only accounts for 2% of the total fuel consumption, projects that reduce electric power consumption would have a small impact upon the overall energy performance of the platform.

Results

KBC identified over a dozen projects with a total savings of USD 700,000/year.

To sustain the operator's efficiency, KBC provided a roadmap for implementing an energy management program. By doing do, the operator could reduce energy consumption by an additional 5% over the long term.

For a couple of projects, KBC produced data sheets to help reduce the amount of water sent to shore. Around 50% of the liquid pumped ashore was produced water. The annual cost to the company for treating this water is more than USD 1 million.

The operator can export any fuel gas that the complex saves and increase revenue by around USD 660,000/year.

In addition to providing a detailed energy savings report, KBC also identified a list of operational improvements which were critical for the safe and efficient operation of the platform. For example, areas of corrosion and non-functioning instrumentation and controls which could threaten production.

KBC assigned the projects into four different project types: energy saving, safety, reliability, and produced water. They also ranked the projects from low priority to high priority, noting how much, if any capital investment is necessary and the potential savings the operator could expect.

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