



Conducting an Energy Audit of a Production Plant and an Investigation into Possible Improvements for Energy Efficiency

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Introduction:

This study involved conducting an energy audit to analyse the energy performance of a production plant and identify areas for reducing energy consumption and green house gas (GHG) emissions whilst conserving energy and costs.

The motivation behind the project was to improve energy efficiency and sustainability of the plant. This is important because the issue of energy efficiency is a growing subject amongst businesses because of its immediate impact on production costs and its significant impact on environmental sustainability.

Project Aims:

- Identify what energy is used, where it is used, how much is used and how much it costs.
- Assess existing patterns of energy consumption.
- Relate energy inputs and production outputs.
- Highlight energy wastage.
- Implement measures requiring no, marginal or major investment for energy conservation and efficiency.

Methodology:

Phase One

Determining type of audit appropriate and setting goals, objectives, and possibilities. Gather data including consumption data, equipment inventory, fuel types, patterns of consumption and effect of weather on consumption.

Phase Two

Conduct a walk-through survey of the plant and achieve five key aims. Furthermore, an opportunity to gather additional information about individual processes and reviewing information on energy use. Using a checklist to stimulate questions about energy practises for each individual process or sub-system.

Phase Three

Data collected from phase one and two assessed to determine overall operations, existing energy patterns and costs. High energy consumption processes identified, along with energy saving measures. All information collected used to evaluate different uses of energy and establish a breakdown of consumption.

Phase Four

Identify and develop cost-effective energy saving measures to reduce energy consumption, whilst maintaining the same or better operating and climate conditions, or improving these conditions with no change in energy consumption.

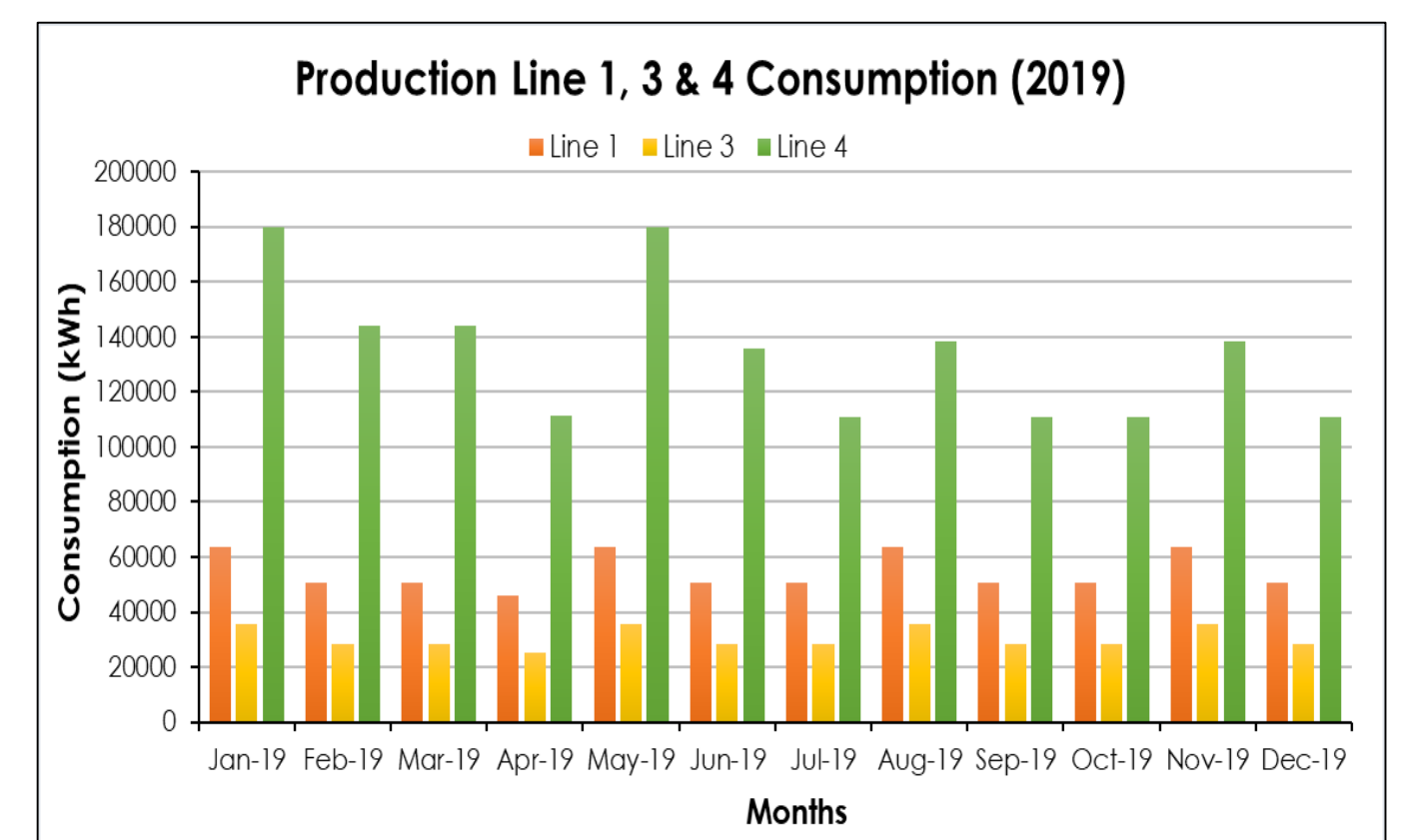
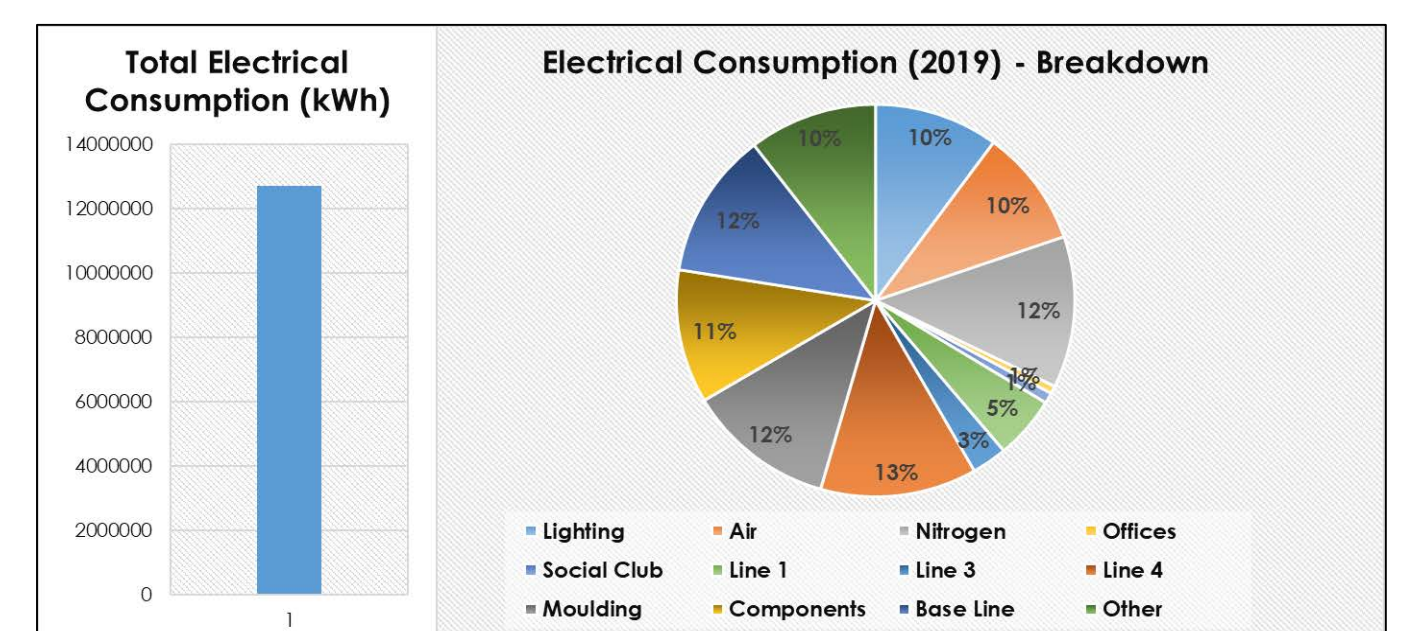
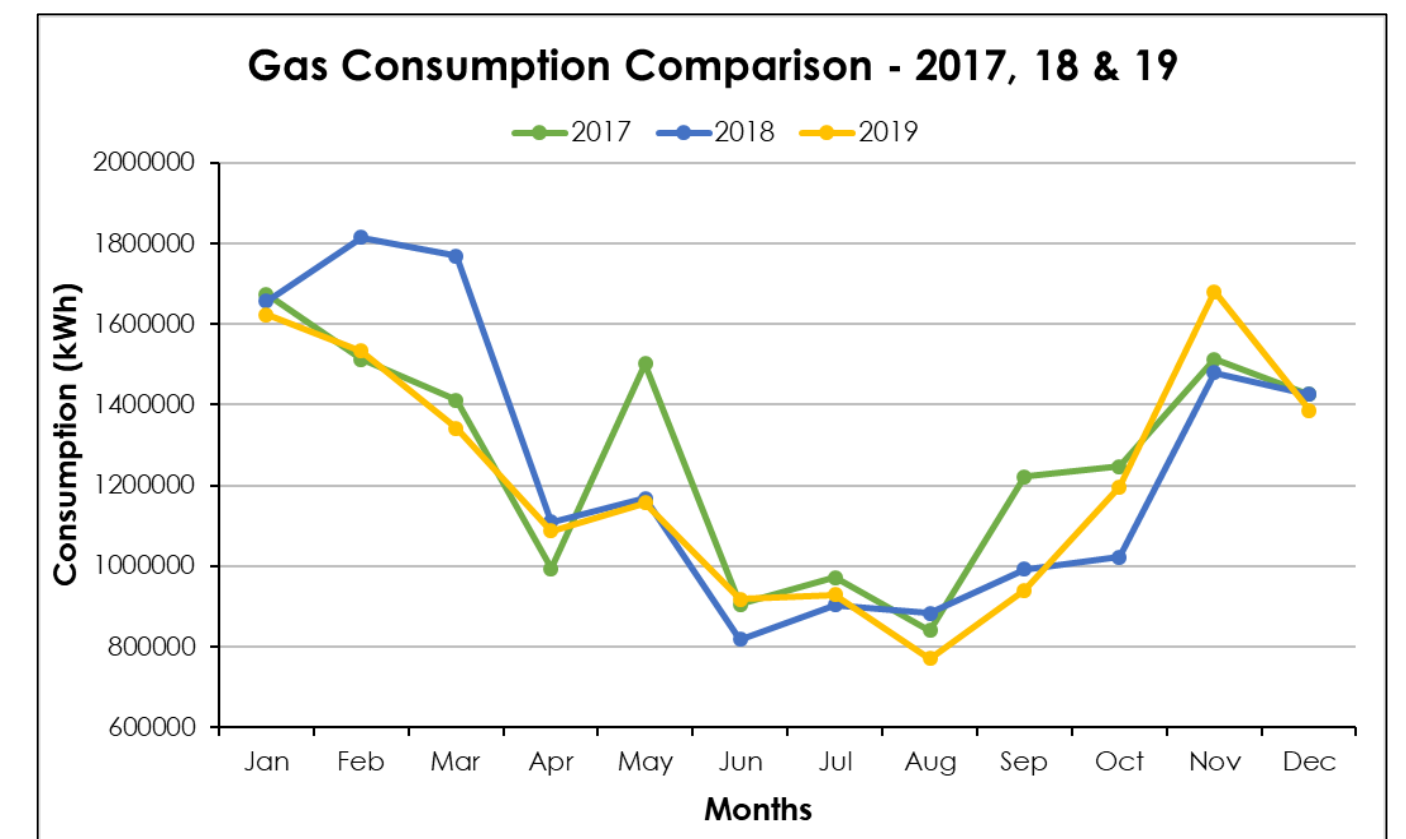
Results:

Results represent energy consumption, running cost and GHG emissions and a breakdown of fuel consumption throughout the plant.

	Energy Consumption		Running Cost		GHG Emissions
	(kWh/Year)	(%)	(£/Year)	(%)	(Tonnes/Year)
Electricity	14,736,345	49%	1,781,624	59%	5,181
Gas	15,218,132	51%	1,217,451	41%	2,803
Total	29,954,477	100%	2,999,075	100%	7,984

	Energy Consumption		Running Cost		GHG Emissions
	(kWh/Year)	(%)	(£/Year)	(%)	(Tonnes/Year)
Electricity	14,110,413	48%	1,705,949	59%	3,994
Gas	15,043,708	52%	1,203,497	41%	2,767
Total	29,154,121	100%	2,909,446	100%	6,761

	Energy Consumption		Running Cost		GHG Emissions
	(kWh/Year)	(%)	(£/Year)	(%)	(Tonnes/Year)
Electricity	12,719,300	47%	1,537,763	57%	3,251
Gas	14,564,446	53%	1,165,156	43%	3,723
Total	27,283,746	100%	2,702,919	100%	6,974



Conclusions:

The aim of this thesis was to conduct an energy audit to analyse the energy performance of a production plant and identify areas to reduce energy consumption and GHG emissions whilst conserving energy and costs. Through the implementation of energy efficient technologies and practises. The project involved supervised site visits to understand operations and working environment, along with what energy was being used, where it was being used, how much was being used and how much it costs. Assessing areas of the plant such as production lines, tool rooms and components and press shop, and energy consuming equipment, for instance, lighting, heating, electric motors and compressors.

