



Topic

Measurement and Analysis Change Habits to Achieve Improved Efficiency

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Rising energy costs, carbon taxes, and achieving the EUs fast approaching 20% carbon reduction target for 2020 regulation leaves responsible businesses with significant challenges. The corporate vision of many businesses is focussed on sustainability and reducing impact to the environment in response to legislation and the green consumer expectations.

How the world has changed

An advertisement from time magazine in 1962 for a gasoline supplier emphasises how the world has changed and that we have taken huge steps forward in our understanding of how our actions are affecting our environment. The headline, positioned under a photo of Taku Glacier in Alaska reads "each day we supply enough energy to melt 7 million tons of glacier!" Who could ever imagine that a company would equate its energy sales to its ability to melt ice glaciers in Alaska. The narrative continues... This giant glacier has remained unmelted for centuries yet the energy we supply could melt it at the rate of 80 tons per second.

Thankfully we have taken strides forward to redress the behaviours of the past and we would hope to continue to effect and to be proponents of change by looking for ways to reduce our energy consumption

Energy efficiency is a pre requisite in ensuring future success

There are many approaches to improving the efficiency of refrigeration plants including reducing cooling requirements, making appropriate equipment selection and changing operating conditions to reduce the overall temperature lift. However, one of the most substantial savings is achieved by monitoring and analysing the actual operating parameters of the plant when it is running. Too often the best designed plant is not achieving its optimum COP or anywhere near it

because the plant is not properly monitored when it is in operation.

Changing the way we think

The introduction of smart metering in domestic properties was rolled out to provide the user with complete transparency on how they are consuming and being charged for energy. The expectation is that the consumer becomes more focussed on their spending when it is clearly displayed with a running counter of use and that it will produce a change in their consumption habits. The recent introduction of a smart meter into my home produced a remarkable change in habits. My husband observed the significant increase in electricity use when the tumble drier was in operation and for the first time in 22 years he wanted to be involved in how we deal with our laundry.

A similar approach is required on a larger scale for industrial and commercial applications. Owners and operators need to be provided with good information on how they are consuming energy. Only then can they focus on the area where they need to make changes and improvements. Although there are many systems available that can collect data the difficulty, until recent developments in analysis tools, was in finding a software which could put the collected data under meaningful analysis as well as offer advice on operational inefficiencies.

Star Technical Solutions (STS) identified a requirement for an energy management and plant optimisation service for refrigeration equipment and has developed Ethos, a system to fulfil this function.

Mind the gap

One of the ground breaking features of Ethos is its capacity to analyse the measured data to identify the gap between how the plant is performing and how it should or could be

performing and provides 'insights' into how the gap can be closed out. It will continually monitor the plant to identify the gaps as soon as they emerge. Monitoring of salient parameters with simultaneous pertinent analysis to produce advice on energy reduction measures for the customer or plant operator has traditionally been a major challenge within the industry. Ready access to this kind of information, along with guidance to what it means has been substantially absent on refrigeration plant until this point. This is therefore a welcome addition to the range of energy efficiency products available for refrigeration systems.

Performance At A Glance

Just like the domestic smart meter the plant operator needs to be able to assess performance at a glance. It is important to provide information such as is shown on this dashboard illustration. The dials and graphs convey site data in a clear and concise manner and data can be viewed in real time. Important system metrics such as system capacity, current load and COP are easily accessed. The track spending function makes it easy to see how much energy and money is being spent.



Active Insights

Insight	Created	Resolved	Status	Achieved Savings	Missed Savings	Estimated Annual Savings	View	Add	Review
Low Stage Compressor Sequencing	6/11/2016		0	£2156	£1022	£4228	[View]	[Add]	[Review]

Completed Insights

Insight	Created	Resolved	Status	Achieved Savings	Missed Savings	Estimated Annual Savings	View	Add	Review
Condenser Non Condensable Buildup	11/9/2017	22/11/2016	*	£4668	£312	£12164	[View]	[Add]	[Review]

profiling necessary for demand side management of the electricity supply.

Insights

Without a data monitoring service it can be very difficult to determine when equipment is not performing optimally. Often equipment will operate for long periods before action is taken. By quickly identifying and fixing inefficiencies potential savings can be maximised. The information that is now available to operators is illustrated on the insights page from the dashboard. It identifies an inefficiency in the system eg compressor sequencing and an estimate of the annual savings available by actioning the insight. As a further incentive to action the insight live counters begin to count up as soon as the Insight is resolved. These display how much you have saved so far and what you have missed.

Take Control

Energy consumption is a large operating expense for many businesses and a focus on reducing energy use through the addition of an energy management system has the potential to produce significant cost savings.

Deployment of an effective energy management system to a refrigeration plant can provide energy savings in the order of 10 to 30% with little capital investment involved.

An energy management service provides the necessary information to give total control over performance and efficiency.

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