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ENERGY CHALLENGE

CASE STUDY

Somers Forge, Halesowen. Electrical Energy Waste Reduction Programme

Somers Forge is a long established West Midlands company offering forgings from 2 kg to 45 tonnes. The forge operates a range of modern equipment including a 4000 tonne draw-down hydraulic press with integrated manipulators, 1200 and 500 tonnes presses and a range a traditional forging hammers. A comprehensive machining facility is also located on site with finishing lathe capacity up to 23 meters.

Somers are long standing CBM members and joined the Energy Challenge project in order to identify potential areas of energy saving. The ever increasing increases in energy prices, particularly electricity, have driven the sector to seek to better understand energy consumption patterns with a view to eliminating waste. Energy efficiency gains have become a requirement for all metal forming companies that have entered into Climate Change Levy Agreements (CCLAs) with the Secretary of state through the sector organisation the CBM.

Companies within the sector are extremely energy intensive and in most cases energy costs represent a large proportion of overhead costs.

Somers recognised that in order to remain competitive in this world market the forge must not only meet the energy saving requirements set in the CCLA, but must seek to exceed these requirements significantly. This requirement is driven by two main developments. Firstly the sector energy reduction targets have been increased significantly. In order to maintain a rebate on the amount of levy costs paid to the government, the site must save a significantly large amount of energy each year compared to the targets set in the original agreements some 5 years ago. Secondly, industrial energy supply prices are spiralling upwards.

Energy costs are set to rise to around £2million per annum for the site.

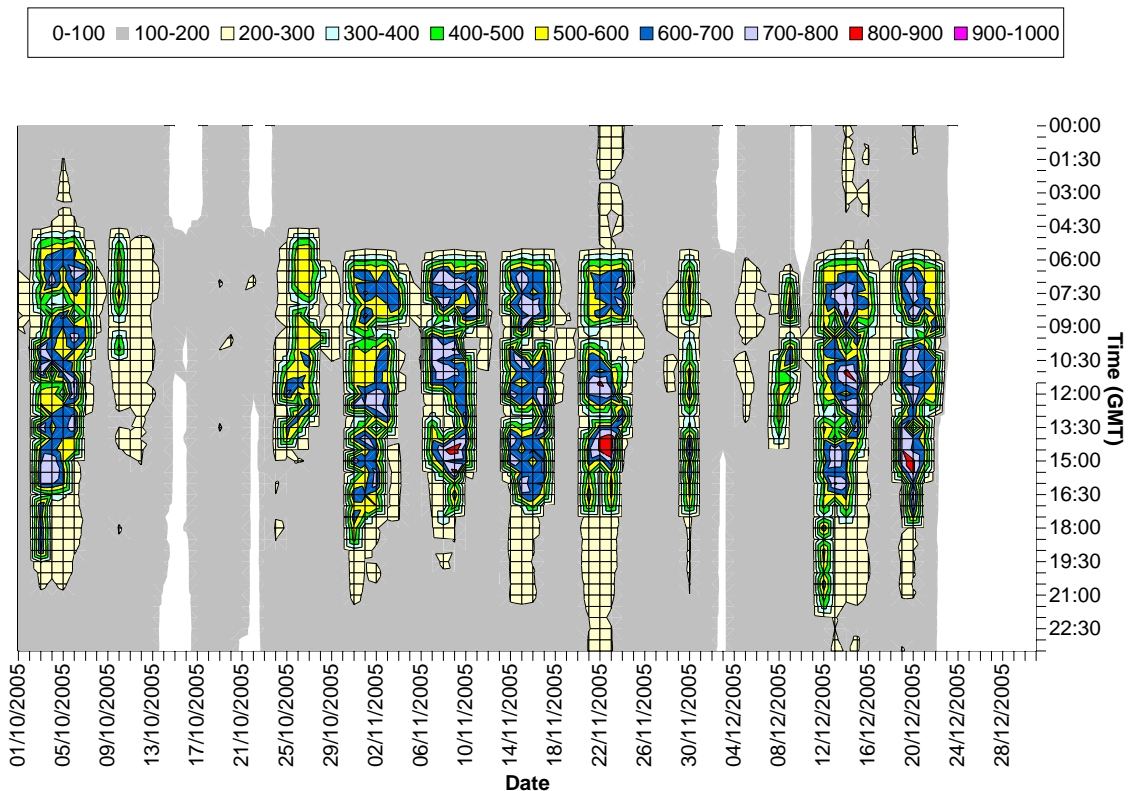
Following an initial examination of the patterns of energy consumption on site it was decided that initial focus would be upon electrical energy consumption. This makes up a large proportion of annual energy cost. Furthermore, it was agreed that initial efforts to improve energy efficiency would concentrate on low or no cost measures to eliminate waste on site.

An energy team was formed consisting members with a range of knowledge and expertise. These included Directors, engineers, financial controllers and team leaders and operators form the major items of equipment in operation on site. External assistance was supplied by Pro Enviro consultants.

Initially the team sought simply to understand the way in which electrical energy was used on site. An exercise was carried out whereby the 30 minute electrical energy consumption data was analysed using a format that allows large amounts of often complex data to be visualised simply and effectively. After the first two meetings the team had the knowledge to look at the profiles and start to identify areas of electrical energy waste.

A typical electrical energy consumption profile for one of the large presses in operation on site

Electrical Power Consumption per 30 Minute Period (kWhr)



The chart is a representation of 3 months of 30 minute electricity consumption data for a single metered electrical energy supply. Date is shown along the bottom axis with time of the day shown on the vertical axis on the right hand side. The various colours represent different levels of electrical energy usage during the day. White and grey areas denote lower consumptions with blues and reds showing higher consumptions. A usage of 1000 kWhr per 30 minute period equates to a demand of 2000 kW.

Once the team had developed an understanding of how to interpret this information a number of simple experimental exercises were carried out. These involved some personnel time but no other costs were involved.

The team developed a protocol for simple "SWITCH OFF" days that would be carried out on Thursdays (a typical full production day). All personnel on site were informed of the date for the switch off day and were asked to keep a record of the periods of production of every item of plant on site in a common format to allow careful analysis later. A poster campaign was put into effect to remind all staff and a consultant from Pro Enviro was on site to observe and to answer any questions that arose.

The philosophy for the switch off days was very simple – if an item of plant or equipment is not absolutely required for production or safety reasons then SWITCH IT OFF. The objective was also simple – save as much electrical energy as possible. The assumptions made were very simple – if energy can be saved by switching off on a "test day" then it can probably be made every day.

During the initial two switch off days (one on November 2005 and one in February 2006) 30 minute electrical consumption data was recorded, operation all plant and equipment was carefully recorded and equipment and systems switched off if possible. Production was not effected.

The Results

Analysis of the actual 30 minute consumption data for the days in question was carried out and reported to the team.

The results were encouraging and unambiguous.

There are three supplies on site

Supply 1 (presses and hammers)

Average normal day use	6891 kWhr
Usage on Switch off day	5493 kWhr
Reduction is	1397 kWhr or 20.29 %

Supply 2 (small supply)

No statistical differences observed in this supply

Supply 3 (Large press)

Average normal day use	18927 kWhr
Usage on Switch off day	16951 kWhr
Reduction is	1976 kWhr or 10.44%

Total reduction on switch off day 3373 kWhr

Total Potential Annualised Reduction 809,500 kWhr

Using 5p per kWhr as an indicative figure this equates to £40,476 per annum.

Conclusions

The analysis of patterns of electrical energy consumption enabled the energy team to better understand the energy "footprint" for the site in relation to the operation of significant items of plant and equipment.

A well organised, promoted and monitored switch off day has proven that there is potential to achieve at least £40,000 per annum without effecting production or safety systems.

Increased awareness of the need to eliminate energy waste has allowed savings to be maintained.

Using the energy footprint, the team have identified other non-productive use and now plan to extend the exercise overnight to try to significantly reduce electrical energy consumption between the hours of 20:00 and 07:00. A total reduction target of £100,000 has been agreed for low cost and no cost measures.

The plant, equipment and methods in use at Somers have many similarities with other UK metal formers so that the simple waste elimination methodology can be disseminated and used at other locations.

The savings identified and proven will allow the site to exceed CCLA targets to achieve lower bills and give the potential for entry into the emissions trading scheme.

Information

www.energychallenge.co.uk

www.somersforge.com

www.proenviro.com