Industrial Energy Efficiency Project in South Africa

Case Study – EnMS

Company name	**Feltex Automotive Trim**
Sector	**Automotive Component Supplier**
Year joined IEE Project	**2012**
Year of interventions	**2013 to 2014**
Contact person	**Mr Pooben Naidoo**
Key focus areas of intervention	**Process Electricity Usage**

1. BACKGROUND

1.1 Company profile

Feltex Automotive Trim Ltd is a leading supplier of a wide range of quality automotive acoustic and trim components, including main floor carpets, dash insulators, trunk package, engine and passenger compartment insulators, parcel shelves and wheel arch insulators. The KZN plant is located in Jacobs, Durban South, and the company employs some 370 employees at this location.

One of the major process thermal loads comprises the *Taca* moulding section, wherein fibre sheets are layered, heated and formed under pressure using hydraulic presses. Temperature control on this equipment is by contactor and the resulting fumes are extracted via hood and extractor fan systems. The floor carpet manufacturing sections utilise a pre-heating section, followed by product layering and pressing. The final press mouldings are water cooled via the centralised chiller system and heating is applied by electric elements which are generally arranged in a horizontal heater-bank. Various products are trimmed using one of several modern high-pressure water-jet cutting units, which are fully enclosed and automated.

Compressed air for the area is served via a centralised compressor system which is shared with other business units on the same site. Lighting is provided by fluorescent tubes, although opaque IBR sheeting has successfully been applied to assist with daylight provision.

1.2 Project conception

As part of the NCPC-SA Resource Efficiency and Cleaner Production programme, the site had commissioned a walk-through energy audit during February 2012. The overall purpose of the audit was to assist Feltex to characterise their overall energy usage, identify significant energy users (SEU's) within their processes and to identify potential opportunities for the reduction and more efficient use of energy within the plant. The audit also identified the need to address Energy Management Systems (EnMS) and practices and a recommendation was made to strengthen the EnMS capabilities of the organisation. It was this recommendation, and the realisation of the accompanying potential benefits of having a sustainable energy performance management tool, that prompted Feltex to progress and develop its EnMS through the IEE programme.

1.3 IEE capacity building programme

The organisation's Company Engineer was nominated EnMS champion and candidate for the IEE Expert Level Training, commencing in 2012 and successfully completing the program in November 2013. The programme was instrumental in giving weight and visibility to the ongoing Energy Management initiative, and significantly contributed to the company quickly drafting their Energy Policy early on into the EnMS journey. Top management commitment and endorsement of the policy at the highest level was a key benefit of this.

2. KEY ACHIEVEMENTS

Key findings table -

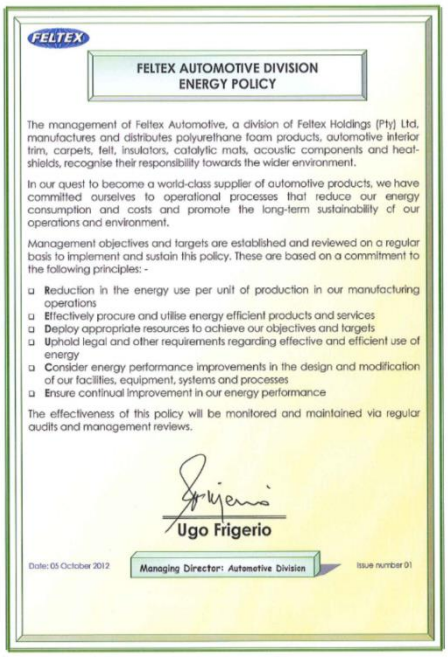
Implementation Period	**2013 to 2014**
Number of projects	**6**
Energy savings in KWh	**1,070,000 kWh per annum**
Payback period in years	**<12 months**
GHG Emission Reduction (ton CO_{2e})[1]	**1,024 tonnes CO_2 equivalent**

The technical projects implemented are summarised as follows:

System	System Intervention Overview	Energy Saved per annum
Taca moulding section presses	• **Thermal insulation of the press housings to minimise unnecessary heat wastage to atmosphere.**	**140 000 kWh**
Autoline press and chiller systems (two projects)	• **Insulation of the heating plate on the Autoline press system to minimise unnecessary heat loss to atmosphere.** • **Insulation of suction-side pipework on the Autoline chiller system.**	**18 500 kWh**
Lighting retrofit	• **Undertaking a lighting retrofit under an Energy Performance Contract.** • **Replacement of dated T12 fitting with T8 equivalents, more appropriate switching arrangements and optimal use of natural daylight where possible.**	**732 000 kWh**
Compressed air programme	• **Optimising compressed air usage by employee awareness and reduction of consumption at point-of-use.** • **Undertaking compressed air system improvements, such as leakage reduction.** • **Compressor replacement.**	**44 100 kWh**
Switching off unused equipment	• **Switching off any unnecessary electrical loads, such as pre-heating sections within Trim.**	**135 400 kWh**

[1] SA Grid kWh to CO2 Conversion Factor set at 0.957 as per the 'Journal of Energy in South Africa' – Vol. 22 No 4; November 2011.

3. IMPLEMENTATION OF AN ENERGY MANAGEMENT SYSTEM



FELTEX

FELTEX AUTOMOTIVE DIVISION
ENERGY POLICY

The management of Feltex Automotive, a division of Feltex Holdings (Pty) Ltd, manufactures and distributes polyurethane foam products, automotive interior trim, carpets, felt, insulators, catalytic mats, acoustic components and heat-shields, recognise their responsibility towards the wider environment.

In our quest to become a world-class supplier of automotive products, we have committed ourselves to operational processes that reduce our energy consumption and costs and promote the long-term sustainability of our operations and environment.

Management objectives and targets are established and reviewed on a regular basis to implement and sustain this policy. These are based on a commitment to the following principles: -

- Reduction in the energy use per unit of production in our manufacturing operations
- Effectively procure and utilise energy efficient products and services
- Deploy appropriate resources to achieve our objectives and targets
- Uphold legal and other requirements regarding effective and efficient use of energy
- Consider energy performance improvements in the design and modification of our facilities, equipment, systems and processes
- Ensure continual improvement in our energy performance

The effectiveness of this policy will be monitored and maintained via regular audits and management reviews.

Ugo Frigerio

Date: 05 October 2012 — Managing Director: Automotive Division — Issue number 01

The first step to implementing the EnMS was the drafting and adoption of a company Energy Policy. A concise and relevant Energy Policy is a critical aspect of the EnMS Planning Phase.

This document demonstrates commitment to the programme at the highest level, and lends impetus to the process going forward. For Feltex this Policy is a statement of commitment to energy as a corporate goal and comprises a clear and concise statement of strategy targets, timelines and action plans.

Having agreed upon the scope and boundaries to be addressed within the EnMS, the next important task of Planning was the identification and formalisation of the site's Energy Team. This involved the assignment of responsibilities to individuals who were given a clear mandate regarding utility efficiency and energy management. Roles and responsibilities were agreed in documentation which listed all tasks associated with implementing and operating the Feltex EnMS.

These records are living documents in which each task has details of how often it occurs, where documents are filed, who is responsible for the task and their level of authority.

It was agreed at an early stage that targeted training would become mandatory for all energy end-users. The process included a training needs-analysis and a skills assessment prior to deciding upon the exact structure and content. It was important to compile and deliver training in the most appropriate and stimulating manner for all groups. For example, machine operators receive fundamental energy cost awareness training, including basic efficiency training such as the importance of switching off and the cost of compressed air, etc. Technical personnel are exposed to targeted technical training dealing with specific energy savings techniques and technologies.

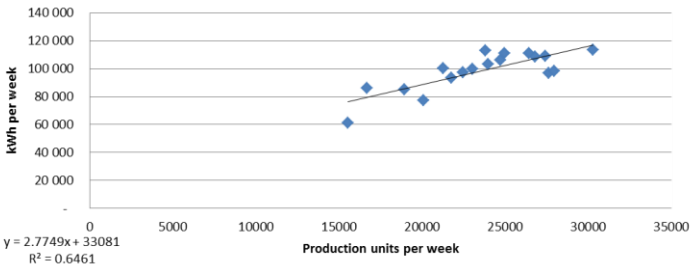
4. IMPLEMENTATION CHALLENGES

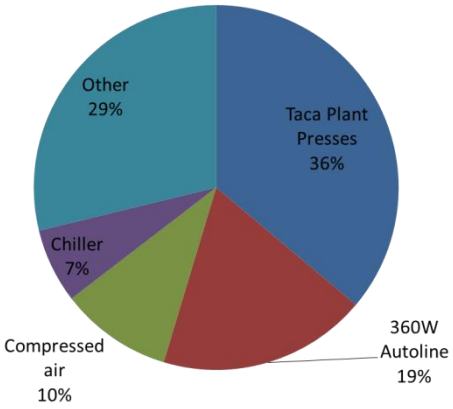
When compiling quantitative baselines and undertaking performance measurement activities, Feltex periodically needs to compare its utility usage against some key driver which is the primary influence upon the level of utility usage.

In order to do so, the Energy Team considered sub-metering the utility supplies into various areas, or Departments, which could be targeted against drivers specific to each. At the outset of the EnMS programme the development of a realistic performance baseline eluded the Energy Team, and the cost of additional metering was a limiting factor.

However, with the implementation of more rigorous meter reading procedure and a specific weekly production monitoring initiative, the relationship between energy usage and production could be modelled using regression analysis techniques.

It is important to emphasis the value of effective performance measurement of energy saving initiatives. Without firm evidence to back-up the success of an efficiency project, it is unlikely that a similar plan will obtain the go-ahead from Management in future.





5. FUTURE PLANS

The implementation of the EnMS within the Trim division has been a successful undertaking, gaining support from senior management and operational staff alike. The Energy Champion's priority for the immediate future will be to maintain the programme and expand it to additional divisions within the Feltex group of companies. This will involve the re-assessment of metering arrangements, expansion of scope and boundaries, and a possible realignment of the Energy policy at the time of its planned review. Additional technologies and energy using processes will be identified and assessed as part of this undertaking, and their savings potential will be prioritised using Significant Energy User methodologies.

6. LESSONS LEARNED

The following messages and learnings have been emphasised as key to Feltex through the EnMS programme:

- Leadership support at all levels of the programme is prerequisite;
- It is important to involve people from a wide range of backgrounds and skill-sets within the Energy Team;
- The analysis of key data (production data and energy data) is vital in the identification of opportunities;
- Many opportunities exist for energy savings at very little or no cost to implement.

Furthermore, it is vital to link the business case to key business drivers and to highlight any additional benefits that the company may derive through the uptake of energy management best practice. As follow-on to this principle, it is equally important to broadcast the proven positive outcome of projects in order to gain support for further initiatives going forward.