

Global Energy Management System Implementation: Case Study

South Africa, ISO 50001

Aberdare Cables

International cable manufacturer Aberdare Cables has come out tops in a UK government sponsored energy audit.



Driven by Powertech 



In 2015, the proud Stanford Road Site Energy team became one of the few companies in South Africa to receive ISO 50001 certification. (Left to Right: Siphokazi Jacobs, Group Sustainability Officer; Heather McEwan, Rhino Lighting MD; Lance Castignani, Energy Champion; Andrew Rist, Group Sustainability Manager.)

Case Study Snapshot

Industry	Power Cable Manufacturing
Location	Standford Road, Port Elizabeth, Eastern Cape, South Africa
Energy Management System	ISO 50001
Product/Service	Electrical cables
Energy Performance Improvement (%)	Circa 16.5%
Annual energy cost savings	Circa R1.5 million
Cost to implement	Circa R300 000
Payback period	5 months

Business Benefits Achieved

The adoption of an Energy Management System has benefited Aberdare's Stanford Road facility in not only achieving its targeted 10% energy reduction, but has also provided assurance to the internal data management system that has been developed.

Further to this, this system has helped catalyze the growth of an energy conscious culture as key individuals now know and understand the full impact of total energy use.

Initiatives implemented, such as weekend shutdowns, oven timers, demand controllers and changing much of lighting throughout the plant have helped save the company more than R 1.5 million in the past year.

"The company's new energy management system, which is referred to and accredited as ISO 50001, sets about "creating an operating framework and deliverables that assure all stakeholders that a Company's efforts are supported throughout, focused on absolute savings and that an underlying tone of continual improvement toward energy efficiency exists", "

—Andrew Rist, Group Sustainability Manager

Company Profile

Aberdare Cables, a member of the Powertech Group, is a leading African cable manufacturer and has been in existence since 1946. The company manufactures an extensive range of electrical cables for application in power generation, transmission and distribution; infrastructure (rail, ports, and airports); petrochemical; mining as well as building and construction. It has four manufacturing sites and seven customer service centers in South Africa and offshore operations in Mozambique, Portugal and Spain.

The Stanford Road site is situated in Port Elizabeth in the Eastern Cape Province and it specializes in the production of low and medium voltage power cables. In total the Stanford Road Plant employs an average of 400 individuals, the majority of these working shifts. The roofed factory area on the site is approximately 40000sq.m.

Its energy sources include, Liquefied Petroleum Gas, Diesel and Paraffin with the majority of its carbon footprint being generated by its Heavy Furnace Oil and electricity consumption. The total energy used on average for the year 2014 FY was 24 385 451 kWh.

Business Case for Energy Management

Around the world, key role players are starting to recognize the severe effect their businesses have on the environment. In response, most businesses are undertaking initiatives to understand and bring about a reduction in their Carbon related impact. This has certainly been a key driver for Aberdare to not only establish a Sustainability function but to also get ISO 50001 certified. As an international company, ISO 50001 is seen as proof that we as a business and not only concerned with cable quality and cost, but also with the energy consumed in making every meter of our product. We are setting ourselves apart from our competitors by leading the way, our intention is to have our remaining South African facilities certified by the end of the year

and to then move on to Spain, Mozambique and Portugal.

Another fundamental driver is the price of electricity per kWh. When compounded annually the effect of this on business profitability is alarming and all indicators point to this getting worse going forward. Relief is however possible in the form of several government initiatives which reward energy in industry through tax reduction. Aberdare is currently engaged with a specialist to accredit its data through Sanas and has registered its reduction initiatives with Sanedi. It looks forward to the relief that 12L can offer for completed improvements and the possible benefit that 12I could offer going forward.

The ISO 50001 Standard emphasizes that energy reduction is not only an electrician's job but a team responsibility. Every department is to be involved in not only setting the standards but also in the process of ensuring that every energy source is probed, every status quo is challenged and that all agreed objectives are realized.



(Left to Right: Siphokazi Jacobs, Group Sustainability Officer; Heather McEwan, Rhino Lighting MD; Lance Castignani, Energy Champion; Andrew Rist, Management Representative.)

Keys to Success

- Sound Teamwork
- Reliable and accurate data
- Top management involvement and commitment

EnMS Development and Implementation

The very first challenge that surfaced in the development and implementation of the EnMS at Standford Road was the lack of experience in refining our system to suit what was required by the Standard. The assistance afforded to the team by PSEE, our two consultants and the Tenneco Automotive played a major role in the success of this journey.

Energy Teams

An energy task team was established in 2014 and it consists of 9 individuals from different departments in the company. This team is led by the site energy champion, Lance Castignani alongside the Management Representative, Andrew Rist.

The team meets once a month during which they discuss the action plan items, past month's consumptions, audit results and possible energy losses. Twice a year the team presents a full progress report to top management during the management review meeting.

With the help of the Private Sector Energy Efficiency (PSEE) assigned consultants, Heather McEwan and Martin Viljoen who had extensive experience with Energy Management systems, the journey to getting certified was easier than expected. The Company has been working on Energy Efficiency for many years and had in fact completed a lot of the requirements through these actions.

Energy Review

With the use of the UNIDO tool, it was possible to analyze our energy sources and we found that of the five identified energy sources, HFO and Electricity out of accounted for 98% of the total usage. For the purposes

of focusing improvements it was decided that the business would deal with electrical consumption first as it was by far the larger consumer and would be easily related back to all employees.

Analysis into this found that there were five significant energy users (SEU) that accounted for the largest portion of the electricity used on site. Two EnPi's were confirmed via regression analysis. These were then discussed in the Management Review. For information, these are a correlation of kW/Production ton and kW/ Attended man hours.

The regression analysis also provided a formula to calculate future energy consumption figures against a budget.

Without the accurate energy data which we had been collecting for the past 3 years, the process of analysis would have been far more difficult.

Development of skills

On the 9-11 June 2015 all energy team members across the three South African sites were afforded the opportunity to attend the Energy Management System Implementation (EnMS) training. The same group also attended the Fundamentals to Energy Management Training on the 23 – 25 June 2015.



In 2015, delegates from all three sites attended both The Fundamentals to Energy Management and Energy Management Systems training. These were conducted by the Energy Training Foundation.

Further to this, the energy champion conducts energy awareness training sessions for all departments in the

factory especially for those employees working on the SEU's. This training highlights:

1. What is ISO 50001
2. Energy consumption figures
3. Everyday methods of saving energy for both household environments as well as on the shop floor.

The use of professional expertise

To attain our ISO certification. Whilst we've been working on efficiency for some time, it's important to remember that our core business is making cable and not in understanding the intimate detail of energy conservation. As such, when a professional is onsite, it's an opportunity to glean as such information from them as you need. Three audits were conducted, namely an External Energy Audit, a Stage one ISO audit and the final Stage two portion of this in December 2015

Communications

Every month the energy figures are tabulated. These appear an A3 report for the Exco, are addressed in a monthly site meeting, are displayed as consumption relative to each Mini-sub around the factory and published as a site newsletter, appropriately named the "Powerline".

Steps taken to maintain operational control and sustain energy performance Improvement.

At site level all initiatives are trailed for a period of six months to a year during which the team ensures that all trained is conducted. This allows for smooth transition between pilot project phases to standard operating procedure. An example of this is the Turn-off procedure, where all machines that are not in use at any point in time (Weekends or public holidays etc.) are turned off. This is especially focused on the machines and the air compressor. This initiative over a weekend can save the company about R30000.

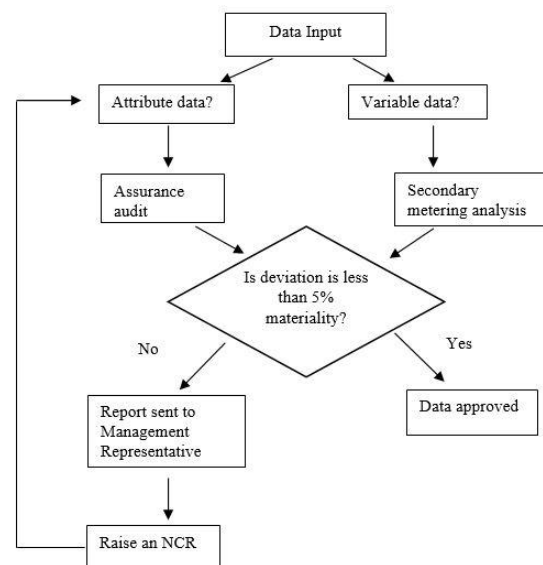
Through the compilation of standard operating procedure or works instruction and training, operations

are controlled and sustained especially that of significant energy users.

Approach used to 1) determine whether energy performance improved and 2) to validate results

During the Management review it was agreed upon that the regression analysis method is the best suited for measuring the sites energy performance. The expected demand formula was derived using 2013/4 as the base years. The difference between the expected demand based on production tons and the actual kWh consumed is thus then the savings for that month. Sufficient metering is still an action plan item there are some areas that cannot be measured accurately.

The figure below shows the process of data assurance conducted. Recently purchased power meter will ensure the accuracy and validity of all our variable data.



Cost benefit Analysis

The organizations involvement with the PSEE project has allowed for us to be relieved from a lot the financial strain of this project. It is important to note that the organizations key motivating factors are namely;

1. Opportunity to create a culture of energy awareness not only on site but that continuous to the employee's individual households.

2. The pending tax and legislative regulations that are to force companies to start paying great attention to their consumption.
3. Government rebate and relief measurements that have been put in place as a means to assist companies with energy driven capex justification.

“The PSEE program seemed a fortuitous opportunity to utilize part funding from the British government and involve professional energy consultants Rhino Lighting to coach us and bring both comparability and assurance to our energy saving efforts.”

—Andrew Rist, Group Sustainability Manager

Lessons Learned

As expected, the Stanford Road Energy Team encountered a few barriers along its journey. The current metering plan for instance proved to be an obstacle due to a number of machines within a department being connected to a single sub-station. This meant the team wasn't able to measure the individual energy consumed by each different machine. Whilst this is important going forward, the practicalities of the required spend involved meant that these have had to be noted as actions to be addressed. Fortunately, the ISO Standard is supportive of continual improvement and allows for such occurrences, so long as they fall into an action plan.

As mentioned it is the organizations plan to ensure that the Gauteng and Pietermaritzburg sites also gets awarded ISO 50001 certification by the year end. This will have its challenges but there is a lot of synergy between

sites and we hope to leverage on these. Two of the SEU's at Stanford Road for example will be shared at the other sites.

Future plans

The Stanford Road site is currently investigating alternative energy sources, namely CSP and possibly wind generated power. These have not yet been finalized and will only be introduced if determined to be truly sustainable. Our aim is to introduce initiatives that are fully industrialized, failure to do so will taint the energy efficient culture we are trying to grow with nonbelief. Getting this right is essential.

Long Term goals

Whilst it would be good to be in a position to state our long term goals, the fact is that energy efficiency is in a state of continual flux and as such difficult to commit to. Continual improvements in technology, governmental support, reliance on fossil fuels, electricity costs and exchange rates are only a few of the influencers to be considered. We don't yet have all the answers, we are however on track and trying to balance ethical decision making with costs effectiveness.

“Well done to all involved at Aberdare Cables, especially the Stanford road operation, this is a true indication that through perseverance unlimited achievements are possible!”

- Neil Kayton, Powertech CEO

Through the Energy Management Working Group (EMWG), government official's worldwide share best practices and leverage their collective knowledge and experience to create high-impact national programs that accelerate the use of energy management systems in industry and commercial buildings. The EMWG was launched in 2010 by the Clean Energy Ministerial (CEM) and International Partnership for Energy Efficiency Cooperation (IPEEC).

For more information, please visit www.cleanenergyministerial.org/energymanagement.

