Reducing costs and increasing energy efficiency

In today’s tough economic climate, all organisations are pushing harder to find cost savings. At the same time, many are under pressure to comply with the latest environmental legislation and wish to reduce their carbon footprint.

By focusing on energy efficiency you can do both: reduce your impact on the environment whilst also improving your bottom line. Our team of energy efficiency specialists is helping many organisations to do exactly that.

Early financial dividends
Our experience has shown that most industrial, commercial and public sector organisations can reduce their energy consumption by between 10% and 30%. Typically, the investment to achieve those reductions will be paid back within three years.

Since making the initial investment can be a barrier for some, we help by offering financial as well as energy saving solutions. This means you can put in place energy efficiency measures without any upfront capital investment. For the initial period, the financing is structured such that any capital costs are offset against reductions in utility bills, after which you reap the full financial benefit.

A breadth of benefits
As well as reducing your energy and utility costs, our energy specialists have the expertise to help you lower your emissions, comply with latest regulations and improve your overall sustainability. In achieving these goals, we also help many organisations to enhance their operational flexibility, increase their productivity and, by improving their environmental credentials, to strengthen their brand and reputation amongst key stakeholders.

A systematic approach
Too often, energy audits fail to deliver the promised dividends. Sometimes the audit captures only a few of the potential energy saving opportunities, and often the follow-through is ad hoc: projects are implemented in a piecemeal way without a clear focus on priority areas, and so the bigger benefits never materialise. Our systematic approach ensures we overcome these barriers.

The first step entails our energy specialists carrying out a comprehensive energy audit to provide you with a clear and unbiased evaluation of your site. We identify all major energy saving opportunities and estimate the costs and benefits of each potential project, so you can prioritise those areas most worth tackling.

Most organisations can reduce their energy consumption by between 10% and 30%

The second phase involves implementing the tools, automation and software systems that will measure and monitor what’s happening on your site, so that you can validate the savings you’re making. The final phase sees the installation of the products and solutions designed to deliver the energy savings.

With access to the largest portfolio of sustainable technology solutions in the world, Siemens is ideally positioned to maximise energy, cost and carbon reductions. But we’re not simply looking for opportunities to supply our own products and technology; our primary goal is to identify all energy saving opportunities for our customers.
Basic energy audits use a standard template and follow a rigid formula. Designed to extract only limited information, and often with an overly heavy focus on policies and procedures, they deliver limited returns despite raising expectations.

Our approach is very different. Our comprehensive audits are carried out by accredited specialists with sector-specific expertise who can provide authoritative information and advice. All of the information we gather and collate is supplied electronically using our unique ‘Energy Navigator’ tool. Unlike a hard copy report, the Navigator allows customers to manipulate the data to produce their own calculations if they wish, and to later transfer the data into their energy management systems.

Our feedback report provides you with a summary of each energy saving project we’ve identified, including costs and energy and carbon saving calculations. We also identify no-cost and low-cost energy saving opportunities, and consider longer-term strategies for reducing emissions such as renewable and low carbon technologies.

A comprehensive audit
The scope of our audit can include:

**A detailed analysis of historical energy and utility consumption**
By analysing past energy profiles and consumption patterns we can identify problem areas and prime targets for reduction.

**A review of energy management processes and procedures**
We help customers to set the right energy management strategy and to put in place processes and procedures to deliver long-term, sustainable success.

**An evaluation of the optimum metering solutions**
Common problems are not enough – or too much – information. We evaluate the metering and software tools used for measuring and monitoring energy usage and look at whether they are generating the right reports and information.

**The energy, water and utility balance**
In large plants in particular it’s important to know where resources are being used. We therefore identify the specific utility consumption of all the main consuming loads on site.

**A consideration of effluent costs and treatment**
We look at effluent discharge and emissions to air – how to reduce effluent and emissions and also how to improve the quality of any residual discharge.

**A commentary on the utility tariff structure**
Given today’s complex tariff structures, we check whether our customers are paying too much or could benefit from variable charging rates during the day.

**An evaluation of process energy optimisation**
We look not only at equipment but the effectiveness of processes to optimise usage. Process improvements often provide substantial additional benefits.

**Requirements for specific regulatory compliance**
We look at what our customers need to do to comply with latest regulations, such as the Carbon Reduction Commitment Energy Efficiency Scheme (CRC EES) and Climate Change Agreements (CCA).

**A power quality survey**
We evaluate the quality of the power supply to site, which if inadequate can cause power losses, equipment malfunctions and substantial associated costs.

**Drive train programme**
As typically the largest consumers of electricity within a plant, motors are an important area of focus. To maximise savings we also carry out a complete ‘drive train’ analysis which encompasses the equipment the motors are driving.

**Assessing carbon footprints**
Where required, our calculations will establish the carbon footprint of your site or of specific products, in accordance with standards such as PAS 2050.

**Advice on meeting standards**
We can recommend the best route to achieving standards such as BS ISO 50001, the newly published energy management standard.

**Guidance on Display Energy Certificates (DECs)**
For some organisations, including those open to the public, the display of energy certificates is mandatory. An increasing number of organisations are also now producing voluntary DECs. We guide organisations through the steps they need to take to determine which energy classification appears on their certificate.

**Advice on energy management resources**
We can identify whether you have sufficient in-house resources to deploy an energy management strategy. If necessary, we can help by supplying expert energy managers on short or long term contracts.
By analysing past energy profiles and consumption patterns we can identify problem areas and prime targets for reduction.
Measuring and monitoring energy usage
The ability to measure and monitor what’s happening on your site, by collecting the right data in the right way, will mean you can highlight problems areas and identify quick payback opportunities. Often we find that it’s the low cost actions that bring about some of the largest savings, but without the tools to analyse your energy usage you won’t necessarily know what those actions are. Having the right measurement and monitoring systems in place will also provide data to validate the savings you’ve made as a result of investing in energy saving solutions.

Although all organisations have primary fiscal meters telling them how much electricity or gas they’re using, many have limited sub-metering and so lack valuable intelligence about the energy used by individual parts of their operation. Our wide range of metering solutions covers electricity, gas, water, oil, emissions and effluent as well as intelligent level sensing and condition monitoring systems.

Metering itself won’t save you money, but having the right systems, software and reports will. In addition to providing metering solutions, our strength is in connecting them together and ensuring they generate the information you need.

Implementing energy saving products and solutions
As well as having the skills and knowledge to carry out a comprehensive energy audit and to advise you on measurement and monitoring systems, we’re also the ideal partner to then manage the implementation of the products and solutions that will deliver the energy savings. By thoroughly understanding our customers’ environments and working closely with them, we’re able to keep any disruption to a minimum and ensure the smooth introduction of new technology.

Solutions such as building energy management systems, factory automation solutions and process control systems will all deliver significant cost reductions. Sophisticated energy management, automatic monitoring and targeting, and enhanced tariff management control can all be achieved.
through automation solutions and building control technologies from Siemens. We have a wide portfolio of products – from high-efficiency motors, gearboxes and variable speed drives through to low energy lighting and intelligent lighting controls – all designed to reduce energy costs and ensure a rapid investment return.

Having looked at minimising your energy consumption, you may want to consider renewable and low carbon technologies. Although compared to energy efficiency solutions they offer a slightly longer payback period (unless you opt for Siemens financing, in which case the payback can be significantly reduced), they should be considered as part of a longer-term strategy for reducing carbon emissions as well as hedging against future energy price increases and improving security of supply. We can offer you expertise in areas including inverters for solar power, energy from waste systems (such as anaerobic digestion or advanced pyrolysis), biomass, combined heat and power systems, water treatment and rainwater harvesting, ground and air source heating, and micro-generation schemes.

Specialist expertise
Our customers operate in many different industries, from the food and beverage, aerospace and pharmaceutical sectors to water, steel and aggregates. We also work with commercial organisations as well as with schools, hospitals and the public sector. Their needs are very diverse, and they want to work with people who have an in-depth appreciation of their business.

Our team of specialists is drawn from many different industrial and commercial backgrounds to guarantee just that. We know that to deliver maximum value to our customers, we need to appreciate the day-to-day challenges they face and speak the same language. Saving energy often entails optimising processes, and to optimise a process you have to understand it – which is why many of our energy specialists have a process engineering or manufacturing background. Using the correct expertise multiplies the savings and ensures the sustainability of energy efficiency solutions.
The table below features a selection of client projects where Siemens have already carried out energy audits. This shows cost savings averaging 15%, in return for an investment which is typically paid back in two years. If you opt for a Siemens financial solution then the payback is instant, because any capital investment is offset against reductions in utility bills.

<table>
<thead>
<tr>
<th>Project</th>
<th>Annual energy spend</th>
<th>Total investment</th>
<th>Annual savings identified</th>
<th>Savings as % of energy spend</th>
<th>Payback in years</th>
<th>CO₂ savings (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel manufacturer</td>
<td>£25,714,285</td>
<td>£5,400,000</td>
<td>£1,800,000</td>
<td>7%</td>
<td>3.0</td>
<td>9,760</td>
</tr>
<tr>
<td>International airport</td>
<td>£16,842,105</td>
<td>£4,800,000</td>
<td>£3,200,000</td>
<td>19%</td>
<td>2.1</td>
<td>22,000</td>
</tr>
<tr>
<td>Pharmaceutical manufacturer</td>
<td>£2,525,000</td>
<td>£2,149,049</td>
<td>£707,000</td>
<td>28%</td>
<td>3.0</td>
<td>7,854</td>
</tr>
<tr>
<td>Confectionery manufacturer</td>
<td>£1,452,380</td>
<td>£301,000</td>
<td>£305,000</td>
<td>21%</td>
<td>1.0</td>
<td>3,000</td>
</tr>
<tr>
<td>Modern hospital complex</td>
<td>£1,311,913</td>
<td>£1,234,735</td>
<td>£557,821</td>
<td>43%</td>
<td>2.2</td>
<td>3,181</td>
</tr>
<tr>
<td>Food manufacturer</td>
<td>£1,259,112</td>
<td>£615,381</td>
<td>£442,583</td>
<td>35%</td>
<td>0.9</td>
<td>3,810</td>
</tr>
<tr>
<td>Defence manufacturer</td>
<td>£930,731</td>
<td>£116,700</td>
<td>£93,073</td>
<td>10%</td>
<td>1.2</td>
<td>554</td>
</tr>
<tr>
<td>Large C19th listed office building</td>
<td>£723,807</td>
<td>£257,000</td>
<td>£223,040</td>
<td>31%</td>
<td>1.2</td>
<td>1,108</td>
</tr>
<tr>
<td>Historic listed castle</td>
<td>£352,648</td>
<td>£184,189</td>
<td>£92,842</td>
<td>26%</td>
<td>2.0</td>
<td>565</td>
</tr>
<tr>
<td>Office block on manufacturing site</td>
<td>£207,812</td>
<td>£47,880</td>
<td>£39,666</td>
<td>19%</td>
<td>1.2</td>
<td>252</td>
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<tr>
<td>3-year old school (built under Building Schools for the Future programme)</td>
<td>£193,560</td>
<td>£5,500</td>
<td>£54,798</td>
<td>28%</td>
<td>0.1</td>
<td>557</td>
</tr>
<tr>
<td>1960s office block</td>
<td>£114,601</td>
<td>£53,501</td>
<td>£24,198</td>
<td>21%</td>
<td>2.2</td>
<td>78</td>
</tr>
<tr>
<td>Modern sports centre</td>
<td>£18,398</td>
<td>£4,850</td>
<td>£2,532</td>
<td>14%</td>
<td>1.9</td>
<td>13</td>
</tr>
</tbody>
</table>
We know that to deliver maximum value to our customers, we need to appreciate the day-to-day challenges they face and speak the same language.
The Siemens Energy Health Check (EHC) and EHC Plus schemes are examples of holistic and systematic site analyses. The process evaluates 22 key aspects from monitoring and reporting, plant and equipment through to people and processes.

Based on data from almost 2,500 site reviews, the results from the EHC database reveal that the average site achieved a 2 rating (see key below). Typically, these sites can save 15 - 20% of their entire site utility consumption.

Whilst less than 3% of sites achieved the maximum score, this analysis identifies the most cost effective upgrade path for all of the sites involved.
Our credentials

**No 1 in the Dow Jones Sustainability Index**
Siemens has been ranked the most sustainable company in its industry for the fourth time in a row. In the Dow Jones Sustainability Index (DJSI) – the sustainability rating established by Dow Jones and SAM – Siemens has again taken first place in the Diversified Industrials category. Siemens has now been honored by the DJSI twelve times in a row for its sustainable activities.

**No 1 in the Carbon Disclosure Project Leadership Index**
The latest Carbon Disclosure Project report puts Siemens top of a list of multinational companies that are leaders in their efforts to tackle climate change.

**Holder of the Carbon Trust Standard**
Siemens was one of the first hundred companies in the UK to receive the Carbon Trust Standard, an award that recognises its ongoing commitment to emission reductions.

**No 1 supplier of sustainable solutions**
Siemens saved its clients almost 300M tonnes of CO2e in 2010 with products, solutions and services from the world’s largest environmental portfolio.

**Trusted provider of financial services**
With more than 250,000 customers Siemens has arranged finance for 90 of the current FTSE 100 companies and more than 50% of NHS trusts and local authorities in the UK.
To find out more about how Siemens can help your organisation to reduce its costs, energy usage and emissions, please email us at info.industry.gb@siemens.com.