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# Commissioning an energy efficiency project

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A guide for SMEs



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# Preface

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Reducing energy use makes perfect business sense; it saves money, enhances corporate reputation and helps everyone in the fight against climate change.

The Carbon Trust provides simple, effective advice to help businesses take action to reduce carbon emissions. The easiest way to do this is to use energy more efficiently.

This guide addresses some of the key challenges faced by companies when commissioning an energy efficiency project, provides an overview of the key stages of commissioning a project and discusses how to avoid some of the most common pitfalls.

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# Introduction

## The business case for energy efficiency

Depending on the sector of your organisation, energy costs can account for up to 30% of costs to your business. Energy efficiency investments therefore can provide a significant cost saving opportunity directly improving your company's bottom line.

**A 20% cut in energy costs represents the same bottom line benefit as a 5% increase in sales for many businesses.**

In addition to the cost savings associated with energy efficiency investments, there are other benefits for your organisation. For example, energy consumption is directly linked with carbon emissions, therefore taking steps to reduce your energy consumption will lower your business' impact on the environment and can improve your business' corporate image and competitiveness.

**Despite the well documented benefits of energy efficiency for SMEs, a survey conducted by YouGov found that 60% of SME business owners do not regard energy efficiency as a priority<sup>1</sup>.**

### What are the challenges commonly faced by companies?

Commissioning an energy efficiency project can be daunting. Some of the most commonly cited reasons for not undertaking energy efficiency projects include factors such as;

- Not having the expertise within the business to know what energy saving projects to prioritise and how to take them forward to implementation
- Limited time to investigate, make the investment case and project manage a project
- Limited funds to invest in energy efficiency equipment

This guide therefore provides advice on how to carry out a successful energy efficiency project from identifying and prioritising potential areas for investment to commissioning the system and realising your energy savings.



<sup>1</sup> <https://www.scottishpower.co.uk/small-business/news/carbon-trust-partnership>

# How to Identify Energy Saving Opportunities

Look to implement no and low-cost energy saving opportunities first then prioritise investment opportunities

Identifying the most significant areas of energy consumption within your business is a vital step prior to undertaking an energy efficiency project. This will enable you to prioritise the actions you take and ensure investment is targeted towards projects which will enable the greatest energy cost savings.

## “What is not measured cannot be managed”

- Try to identify no and low-cost ways for your business to save energy and implement these first before considering the projects which require higher levels of investment. The Carbon Trust’s guide [Effective Energy Management for Business offers](#) practical advice for small and medium sized businesses looking to manage their energy usage more effectively. Here are some energy management suggestions:
- In order to identify key areas for improvement it is important to have a good understanding of your current energy consumption and utility bills. Some of the things to look for when reviewing your electricity or gas bills include:

- Are you on a fixed or flexible contract? (electricity only)
- What is your unit rate?
- What charges are you paying?
- Are your bills based on actual or estimated data? Best practice is to use actual data.
- What is your capacity allowance (electricity) or volume tolerance (gas)?
- Carry out a housekeeping walk around to establish current operating practices. This can help you to identify wasteful practices and promote the engagement of staff with energy management. It is useful to carry these out regularly at different times of day during and out of operating hours.
- If you have a smart meter which provides half hourly electricity data this can be useful in profiling your energy consumption and identifying wasteful practices. By monitoring your electricity usage when the business is closed, known as the baseload, you can see if the switch-off procedures are being effective and whether or not the timer control settings are optimised.

Having reviewed the operating procedures and energy consumption practices at your organisation it may be beneficial, particularly if your organisation does not have a great deal of energy efficiency expertise, to contract with an independent energy expert to carry out an energy assessment.

Alternatively, the office walk arounds and energy consumption measurement carried out within your organisation may provide you with enough insight into your energy consumption to identify the areas where the most significant savings can be made.

As with any business investment, it is important to consider the return on investment you can expect for your potential project. This cannot be accurately calculated until a project is fully quoted for however resources available online can often provide indications of expected payback periods.

Some of the most common investment opportunities observed through the Carbon Trust’s Green Business Fund include lighting and HVAC (heating, ventilation and air conditioning) upgrades, and more sector specific improvements such as upgrades of motors and drives, compressed air or refrigeration projects.

### Case Study - Elite Plastics Ltd

The advice given to Elite Plastics Ltd through a Green Business Fund energy assessment helped them to reduce their energy costs by 19%, equivalent to £61,000 a year.

The recommendations were:

- Manage energy as a controllable resource
- Replace existing lighting with an LED system
- Upgrade old DC motors on the extrusion lines



### Action Checklist

The first step in commissioning a successful energy efficiency project is to establish how energy is used, managed and wasted within your organisation. This can be done by carrying out an internal audit of your organisation’s everyday operations.

Assess your readiness for progressing with an energy efficiency project by completing the following tasks	
1. Do you know your current energy tariff? e.g. unit cost of energy	
2. What is your annual kWh consumption?	
3. Have you identified trends in your energy profile?	
4. What are your operating hours and how is energy use minimised out of hours?	
5. Have you identified your priority areas for investment?	
6. What energy using systems do you currently have installed? E.g. make, model, age of equipment.	
7. What timescales are you working with? Do you have a limited window for installation? Does the project need to be completed within a certain time?	
8. What is your budget?	

If it is difficult to answer these questions, you should assess whether current energy management practices are adequate. Good management of energy data is essential to support the successful implementation of energy efficiency projects.

# Going out to tender

## Choosing the best equipment and supplier to meet your needs

Once you have decided on the work you are looking to carry out, going out to tender provides an opportunity to compare quotes between different suppliers. Comparing multiple quotes enables you to consider the following:

- The proposed technology solution or system type
- The kW or wattage of the proposed system
- The quoted price
- How long it will take to complete the project
- The warranty of an installation
- Energy and carbon savings of the proposed system compared to the current situation
- The running costs of the proposed system
- The Return on Investment (ROI) of the project

It is important to remember that the cheapest quotation may not always be the most appropriate option long term. Instead, consider all of the aspects detailed above and choose the supplier which offers the best value for money and service for your individual project. Obtaining a minimum of three quotes from different suppliers is generally considered best practice.

Remember to consider the ongoing operating and maintenance costs of the proposed system as well as the initial capital and installation costs. By taking a 'Whole life costing' approach you can assess which option provides the best value for your business over the lifetime of the equipment and ensure a better return on your investment. For more information see our energy management guides .

Other aspects to take into account when choosing your supplier are factors such as whether they have experience working with businesses in your sector, the size of the business or location of their operation. This will help to ensure that their knowledge and approach best fits with your needs and that they are aware of how to minimise disruption to your business during installation. If you have limited windows of opportunity for the installation to be completed it is important that this is made clear from the outset.

Having audited a large number of projects, the Carbon Trust has typically found projects which are managed by one main contractor produce energy efficiency outcomes better aligned with the savings forecast at the outset of the project. Additionally, having one main contractor responsible for the project can make the project easier to manage providing you with greater peace of mind throughout the process. For these

reasons we generally recommend using a supplier who can provide an end to end service or will take responsibility for the management of associated subcontractors.

The Carbon Trust's Green Business Directory provides a list of Accredited Suppliers and installers of energy efficiency and renewable energy technology in the UK.

Carbon Trust Accredited Suppliers have been independently assessed by the Carbon Trust and met or exceeded criteria designed to examine their capability and have a proven track record of delivering thoughtful, well-designed energy efficient and renewable energy systems. <https://www.carbontrust.com/resources/green-business-directory/>

### Supplier Advice

- It is useful to ensure there is a member of staff available to accompany your potential suppliers on their site walk around when they come to carry out a survey.
- When your potential suppliers come to carry out the survey it is useful to have the following information for them; your current unit price for energy, the estimated run hours of the equipment you are looking to replace, the annual energy consumption of your site.

# Installing and commissioning your project

## Managing the project deliveries

To ensure a smooth delivery of a project, agree an installation plan prior to the day the supplier plans to come to site to commence installation. To help with project delivery check the following prior to start date:

- Ensure all permissions have been secured i.e. landlord, building control, planning, hot works permit, additional insurance cover.
- Will the site remain operational during the installation? If yes ensure employees are briefed on installation project and impacts i.e. if fire exits are blocked what alternative arrangements have been made, do they need to wear PPE? If there are shifts, ensure that a programme of shift briefing occurs.
- Check dependencies have been completed in good time i.e. access measurements checked and verified, remedial work required before the installation starts.
- All project roles and responsibilities are clear and there is a lead for both client and supplier should any issues need resolving or escalating.
- All building and site access is known and available when needed.
- Any areas that installers should not have access to are identified and secured e.g. rooms with safes.
- Additional security access is planned for e.g. extension on alarm settings or security guard contract visits.
- Van and delivery parking and unloading is possible or permits arranged as needed.
- Any business critical infrastructure is protected and IT systems are backed up in case of power outage.
- Supplier installation team are briefed on site health and safety policy, including daily site hazards ensuring that the equipment they bring to site meet required standards.
- Communication channels have been agreed and as a minimum a site representative has regular communication with the installation team
- Where installation spans several days check daily that the expected progress follows the plan. If tasks slip, ensure the installation plan is updated and agreed by the installation lead and site contact and communicated more widely if needed.

Even with the best planning, it is not uncommon for installations to face an unexpected barrier part way through an installation. Should this happen it is important to ensure that a revised quotation is provided by your supplier detailing the amendments to

your project if your project specification changes. This will help you to maintain a clear record of the equipment to be installed, ensure any changes to project cost are documented, and avoid any potential difficulties arising when the project invoice is issued upon completion of the install.

### Supplier Advice

- Communication is key to a successful project. Ensure that all areas of the business are fully aware of the impending work and the proposed installation time has been approved and widely communicated internally.
- Minimising the disruption of installation to your company's operations should be a top priority of your supplier. It is important to be clear from the outset regarding when would be convenient for the works to be completed. This will enable your supplier to work around you.



It may be useful to ask your supplier to recalculate your expected energy savings if the scale or specification of your project alters significantly. This will provide you with an accurate estimate to monitor your energy consumption against post implementation and enable you to recalculate the project payback period.

Common examples	
LED Lighting Projects	Solar PV Projects
<p>LED lighting projects can change across the installation period. This can be for a number of reasons;</p> <ul style="list-style-type: none"><li>- Additional fixtures have been added which were not initially included in the scope of work.</li><li>- The type of fixture being installed has changed e.g. battens are now being replaced with panels.</li></ul>	<p>Solar PV projects can often change in specification once a grid connection offer has been obtained from the relevant Distribution Network Operator in order to meet the agreed conditions.</p>



# Quality Assurance

## Managing the project handover and sign-off

Upon completion of your project your supplier should issue you a commissioning certificate alongside the final project invoice. Commissioning certificates usually require signing by both your installation engineer/supplier and yourself as the customer, and act as confirmation that the works have been installed as expected and both parties are happy with the standard of work carried out.

Prior to signing the commissioning certificate, it is recommended that you undertake a site walk around with your supplier and ensure the equipment listed on the commissioning certificate matches that installed and detailed on the quote for your project. This walk around provides an opportunity for any questions you may have about the new installation to be addressed prior to payment of the final project invoice. Similarly, during the commissioning process your supplier should demonstrate that the installation is fully complete, checked and quality assured and show you how your new system is configured and operated. For example, for an HVAC project ensure that timer and temperature control settings have been optimised for your environment to ensure your new system runs efficiently.

Additionally, in some instances commissioning certificates must be completed in order to validate the

warranty on your project. It is therefore important to ensure that all details of the project are accurately detailed in the commissioning certificate.

The diagram below provides a best practice template for a commissioning certificate.

- 1 Your company's registered name and address.
- 2 Date of installation
- 3 A full list of the equipment supplied, which matches the original quotation.
- 4 The site address where the equipment was installed
- 5 The installation engineer's printed name, signature and date.
- 6 A representative from your company's printed name, signature and date.
- 7 The equipment supplier's name and address as detailed on your project quote and invoice.

**SAMPLE SUPPLIER LTD**

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**CERTIFICATE OF COMMISSIONING**  
Certificate No : UK 2016-05-31/789

Company Customer Ltd  
The Park  
Town  
AB1 2CD

Tel: 01234 567890  
Fax: 01234 567891

Customer No: 0567 01

Date : 31ST May 2016

Description	Serial Number	Model
Sample's SAM1234 Heater Packaged System	123456	SAM1234
Flue (10m)	N/A	F10m
Heat Distribution and Summer Heat Dump	697HD	SAM58

The above equipment has been installed and commissioned in accordance to the manufacturer's specification on the date found below.

Site address \_\_\_\_\_

Engineer's Signature \_\_\_\_\_

Engineer's Name (print) \_\_\_\_\_

Date \_\_\_\_\_

Customer's Signature \_\_\_\_\_

Customer's Name (print) \_\_\_\_\_

Date \_\_\_\_\_

SAMPLE COMPANY LTD, 11 The Street, New Town, County NT1 2CY  
 Telephone: 01234 567890 Fax: 01234 567891 email: [sales@sampleltd.co.uk](mailto:sales@sampleltd.co.uk)  
 Registered Company No. 01234567 Vat Registered No: 012 3456 78

# Realising your energy savings

## Assess the actual energy savings against the anticipated savings to support your business case for further investment

Significant savings can be achieved from the installation of energy efficiency equipment. However for the savings to be maximised this must be combined with successful employee engagement and best practice. Experience shows that low cost and no-cost actions including behavioural changes can reduce energy costs by 10% or more.

Once your project has been completed it is important to continue monitoring your energy consumption, this will enable you to measure the impact on energy use that your new equipment has had and identify any potential problems with the equipment quickly.

Regular maintenance is also an important aspect post implementation to ensure the efficiency of the new system is maintained. Not only does regular maintenance of equipment such as HVAC systems improve efficiency, it can also increase the longevity of a system.

By measuring the actual energy consumption from the new system and comparing to the figures quoted by the equipment supplier you will be able to check that your equipment is performing as anticipated. Furthermore, by calculating the actual energy savings

from the project you will be able to confirm payback on the investment made. This can be very helpful in supporting the business case for further investment in energy efficiency at site or similar investment at another location and in engaging colleagues in benefits of energy efficiency.



# Your next steps

See if your business could be reducing emissions and saving money by implementing energy efficiency measures

## Step 1: Evaluate your energy consumption

- Review invoices and meter readings
- Establish current operating procedures
- Undertake regular housekeeping walk arounds to eliminate wasteful practices

## Step 2: Identify your energy saving opportunities

- Create meter reading sheets and plot energy use over time
- Measure performance against benchmarks
- Establish the most significant aspects of your energy consumption

## Step 3: Prioritise your actions

Document the potential energy efficiency investments your organisation should look to implement and set target dates for when you hope each project to be implemented. This will enable your organisation to track progress against performance and investment targets.

## Step 4: Carry out your chosen energy efficiency project

- Go out to tender for your project
- Choose the best value for money supplier
- Install your energy efficiency technology

## Step 5: Continue to manage your organisation's energy use

Enforce policies and procedures to ensure that equipment is utilised as efficiently as possible. This will help to ensure that savings realised from your project are maintained going forward.

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# Go online for more information

The Carbon Trust provides a range of tools, services and information to help you implement energy and carbon saving measures, no matter what your level of experience.

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**Website** – Visit us at [www.carbontrust.com](http://www.carbontrust.com) for our full range of advice and services.

➤ [www.carbontrust.com](http://www.carbontrust.com)

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**Tools, guides and reports** – We have a library of publications detailing energy saving techniques for a range of sectors and technologies.

➤ [www.carbontrust.com/resources](http://www.carbontrust.com/resources)

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**Events and workshops** – We offer a variety of events, workshops and webinars ranging from a high level introductions to our services through, to technical energy efficiency training.

➤ [www.carbontrust.com/events](http://www.carbontrust.com/events)

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**Our client case studies** – Our case studies show that it's often easier and less expensive than you might think to bring about real change.

➤ [www.carbontrust.com/our-clients](http://www.carbontrust.com/our-clients)

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**The Carbon Trust Green Business Fund** – is an energy efficiency support service for small and medium-sized companies in England, Wales and Scotland. It provides support through tools, guides and webinars for SMEs.

➤ [www.carbontrust.com/greenbusinessfund](http://www.carbontrust.com/greenbusinessfund)

The Carbon Trust is an independent company with a mission to accelerate the move to a sustainable, low-carbon economy. The Carbon Trust:

- advises businesses, governments and the public sector on opportunities in a sustainable, low-carbon world;
- measures and certifies the environmental footprint of organisations, products and services;
- helps develop and deploy low-carbon technologies and solutions, from energy efficiency to renewable power

[www.carbontrust.com](http://www.carbontrust.com)

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