



Implementing energy efficiency for a start-up

A Green Business Fund guide



Preface

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 outlines the opportunities for considering energy efficiency when starting new business or activity. The advice may also be helpful when moving to new premises or retrofitting an existing building. The guide has been written with SMEs in mind.

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Introduction

Embed sustainability into the business from the outset.

Start-ups have the benefit of being able to lock in energy saving practices and invest in energy efficient equipment from day one. In doing so, significant energy and cost savings can be achieved and a culture of sustainability can be embedded into a business. There is a significant business case for doing so: a 20% cut in energy costs represents the same bottom line benefit as a 5% increase in sales in many businesses. Energy costs are also predicted to rise by 36% in real terms over the next 10 years, you don't want this to hamper the growth of your business. As such, energy efficiency savings and sustainable business behaviour can make a substantial impact on the financial viability of a start-up and help young businesses get off the ground effectively.

As start-ups compete for funding, embedding sustainability into the culture of a company and subsequently pitches could also help differentiate your brand from others. In many cases, start-ups have grown quickly without thinking about sustainability, and incurred costs in changing behaviour and business operations once they are asked by either investors or legislators to tackle these issues. Furthermore, as the business grows and needs to hire staff, consider that millennials are increasingly looking to work at responsible businesses, and focusing on sustainability credentials when choosing

a suitable company. Embedding sustainability from the outset helps to present the business as future-fit and financially responsible.

This guide outlines well established, cost effective energy saving technologies and behaviour changes that can save start-ups money and energy, as well as reducing their environmental impact through good energy management, and increasing brand reputation and business viability.



Energy Policy

Start with an energy policy to send a clear message

Sustainability policies are being adopted by businesses worldwide. This is due to several factors such as an increased awareness of the impacts of climate change, declarations of climate emergencies and pressure from consumers throughout the supply chain. If implemented effectively and integrated into all areas of a business' activities, sustainability policies have the potential to create substantial emissions reductions and cost savings.

Start-ups have a unique opportunity to integrate energy efficiency measures into all areas of the business from the beginning. These measures can then grow and develop as the business does. An energy policy is a great starting point as it ensures that a start-up has a clear direction and a focused message which can easily be conveyed to future employees. An energy policy can be publicised through marketing materials such as an organisation's website, giving the business a USP and attracting a wider client base. In addition, it can be used as an opportunity to influence supply chains, ensuring businesses only collaborate with organisations who comply with their policies.

The energy policy is a short document that clearly outlines a business' ambitions for making effective energy conservation key to the organisation's values

as it grows and matures. It also helps to influence energy procurement, procurement of energy using equipment and energy usage at an early stage, enabling the right behaviours to be embedded from the start. An effective policy should be appropriate to the size and sector of an organisation and where possible supported by all members of the business. A start-up provides the unique opportunity to involve all employees in the creation of the energy policy. This is more effective than retrospectively trying to change and influence employee behaviour. Having everybody on board will increase the likelihood of the policy being effective especially when behaviour change can play a paramount role in meeting energy efficiency targets. Publicly displaying the energy goals and overall targets for employees to see and familiarise themselves with will also increase the effectiveness of the policy and create a positive public image.

Key elements include:

- A clear expression of an organisation's energy/ carbon aspirations
- Commitment to raising the energy awareness of all staff
- Commitment to regular and formal review by management

- Commitment to determine ways of reducing your energy consumption
- Commitment to consider energy consumption in all relevant decision-making
- Commitment to ensure resources are in place to meet the policy objectives
- Commitment to review relevant legislation and requirements

A weak energy policy can lead to poor energy management. Some common mistakes are:

- The statement is not actively supported by senior management
- The statement is too long
- The statement lacks tangible targets and commitments
- The statement is not updated frequently
- The statement is not supported by an action plan with the ability to deliver reductions

For examples of energy policies see our [energy management guides](#).

Establishing an energy efficient working environment

When choosing the right work space for your business consider energy efficiency and sustainability

When establishing a working environment for a start-up it is important to look at the energy efficiency of the space. This either means renting or purchasing an existing environmentally efficient space, or procuring energy efficient equipment, products and services (known as a Buy Smart Strategy).

Renting an efficient office space

Start-ups typically begin their journey either in a home office or by renting a couple of desks in a shared workspace. As they grow it is typical to move to renting a small room or office floor in a multi-tenanted building. It is preferable to establish your business in an existing energy efficient space such as those certified by the Building Research Establishment Environmental Assessment Method (BREEAM). This is a green rating that provides a framework to create healthy, highly efficient and cost-saving green buildings. The Carbon Trust runs the Low Carbon Workplace which acquires, refurbishes and rents resource efficient buildings. By managing space more efficiently through the use of shared spaces and hot desking, the total square footage required is reduced as less space is needed per person. When choosing a new work space there are a number of considerations and options.

Home office

- Insulating garden office buildings
- Heating only the room you work in

Shared work space

- Ask questions about the site's energy efficiency policy
- Determine what energy usage information is available to understand the energy expenditure by area or per desk, and is this information accessible on a regular basis

Leasing a room, floor or building

- Ask landlords to provide information regarding existing utility bills
- Check whether the landlord's sustainability policy documents are consistent with your energy policy
- If energy is supplied by the landlord, determine what energy usage information will be made available and whether submeters are installed
- Display Energy Certificates (DECs) will provide an indication of the building's energy efficiency

Other resource efficiency considerations

As well as energy, it is important to consider the sustainability of other resources, facilities and services which are managed by the landlord, such as waste, water, catering and transport. Remember to check out:

- Waste management policies and collection and recycling facilities
- What information is available to tenants regarding waste tonnages and recycling performance
- Sustainable transport options for the location and facilities such as bicycle storage or showers
- Provision of electric car charging points facilities
- Water management policies, water efficiency and water scarcity

Analysing the energy efficiency of the space and identifying improvement opportunities

As a start-up grows the business may need to move to larger premises. Whether leasing a new workspace or retrofitting an existing space, it is important to have a basic understanding of how to calculate the energy efficiency from supplier of the equipment in order to identify areas for improvement.

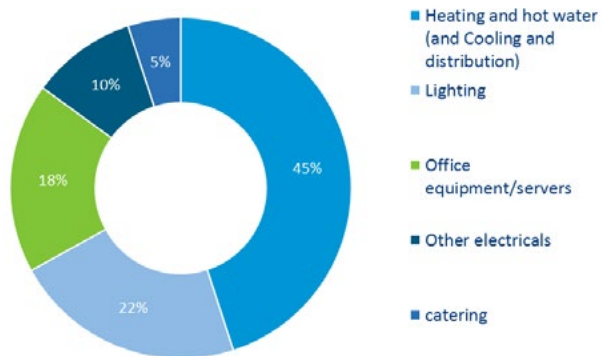


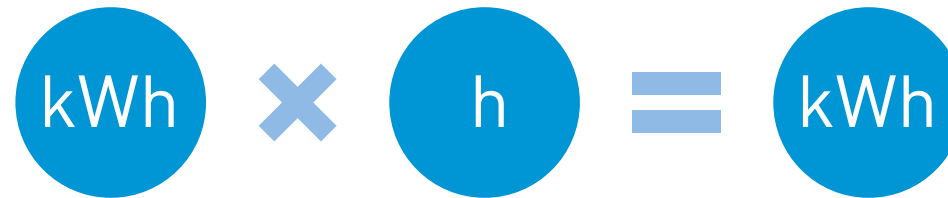
Figure 1: Breakdown of energy consumption in an average office

Most equipment only states the maximum power in watts (W) or kilowatts (kW), which may not be representative of the actual consumption. Therefore, it is useful to calculate the actual energy used in kilowatt hours (kWh). This is the common unit for measuring electricity and gas consumption. In order to calculate the energy used by a piece of equipment running at fixed power, multiply the time it is running for by the power (kW) of the system.

Calculating the energy use

For example:

A 3 kW electric heater running for two hours will use $3 \text{ [kW]} \times 2 \text{ [h]} = 6 \text{ kWh}$ of energy



To determine the energy cost of running equipment, apply the unit rate to the kWh. In the case of our 3kW heater running for 2 hours at £0.15/kWh: $6 \text{ [kWh]} \times 0.15 \text{ [£/kWh]} = £0.90$ energy cost.



Calculating carbon emissions

To work out the associated carbon emissions an emissions factor needs to be applied depending on the energy type. Electricity and other fuels all have different emissions factors. For our 3kW heater running for two hours to use 6kWh of electricity, applying the 2019 UK electricity grid average emissions factor of $0.2556 \text{ kgCO}_2\text{e/kWh}$, would produce roughly 1.53kg of carbon ($6 \text{ [kWh]} \times 0.2556 \text{ [kgCO}_2\text{e/kWh]}$). See our [carbon footprinting guide](#) for more information.

Ask prospective landlords for details of the electricity usage from billing for previous and other building tenants to analyse the existing energy usage. The equipment analysis should correspond with the billing e.g. an inefficient heating, ventilation and air conditioning (HVAC) system will show high kW hours during the winter months on an energy bill.

Retrofitting and Buy Smart Strategy

Consider sustainability and energy efficiency when making procurement decisions

Once areas for improvement have been established, a business can target retrofitting and adopt a Buy Smart Strategy. This provides the opportunity to improve energy efficiency performance and influence the supply chain. Although this may be an additional initial expense, the payback can be substantial, increasing cost and energy savings long term.

There are a few existing services available for businesses to do this effectively. The SKA Rating can be used to support businesses looking to fit out spaces in an environmentally sustainable way. This provides an online tool to help inform the fit out in line with more than a hundred 'good practice' measures covering energy and carbon emissions, waste, water, materials, pollution, wellbeing and transport. In conjunction with this, the Energy Technology List (ETL) scheme is a government-managed list of the top 25% most energy-efficient plant and machinery such as boilers, electric motors, air conditioning and refrigeration systems.

The Buy Smart Strategy and the procedures in place to manage purchasing should include:

- Reference to particular 'low energy' standards, labels, 'low energy' ratings, energy efficiency etc.

- Whole life cycle cost approach, factoring in lifetime energy and operational costs as well as the initial investments required.
- A named person who has ultimate responsibility/sign-off for the purchasing of significant energy using equipment

The Buy Smart Strategy should be integrated into an organisation's overall purchasing policy and backed by senior management. It is important that staff are trained and made aware of the requirements, the reasoning for it and how to go about the purchase of environmentally preferable goods and services. The policy should apply to all budget holders and be well communicated throughout the organisation.

Have a look at the following areas and see what changes can be made:

Insulation - retaining heat can massively reduce the run hours of an HVAC system. Therefore seal doors, windows and chimneys, improve window design and insulate pipes.

HVAC system - ensure that the HVAC system is cleaned and maintained and filters are replaced regularly especially before peak cooling or heating seasons. Controlling heating and cooling systems by just a few degrees can have a dramatic effect on energy costs. Overheating by 1°C can increase energy consumption by 8%. Businesses should ensure that the thermostat is in line with the [temperature appropriate for that space](#) and that timers are in line with a business' run hours, turning the HVAC off automatically after hours.

Lighting - switching incandescent lighting and fluorescent lighting to LEDs is an easy upgrade which has a very short payback period. Implementing tuneable lighting can also lead to large energy savings, and have the added health benefit of reducing impact on circadian rhythms. In addition, movement sensors ensure that lights are only on when needed.

Convert to cloud computing - Converting server rooms and hardware to cloud computing can result in significant energy savings. Changing desktop computers to laptops can reduce energy consumption as laptops use 85% less power.

Metering & Monitoring

Tracking your energy performance will help you reduce energy wastage and costs

It is fundamental that all organisations collect energy data. Comprehending a start-up's consumption will enable the business to identify energy wastage and better target their energy efficiency strategy. Moreover, every penny counts when it comes to getting a business off the ground, so tracking energy data will improve understanding of energy expenditure and assist in decision making. [See our supplier document which explains how to read an invoice.](#)

To manage energy effectively, accuracy is key. Often figures from utility companies can overestimate or underestimate in comparison to an organisation's actual consumption, therefore organisations should take regular meter readings rather than relying on figures provided by utility companies. The frequency of meter readings depends on the business. Monthly monitoring, which has historically been the norm, can be a blunt instrument, while fine-grained (30-minute intervals or less) can bring data overload and interpretation/analysis complexities. If possible, a minimum of weekly collection should be considered. Once a database has been established, analysis can begin. Data visualisation is an important tool for businesses. Creating simple graphs of energy consumption can help identify trends in energy usage and draw out insights. Trends in the data can often be

explained by seasonal changes such as increased heating usage in winter or air conditioning in summer. The longer the period of data collection the more effective the insights. Comparing year on year data can remove the influence of external drivers, for example it is advisable to compare data from June 2018 with data from June 2019 when weather conditions are similar. It can also be useful to benchmark a start-up's consumption against other businesses of a similar capacity. [See our benchmarking tool to compare organisations performance against market averages.](#)

These insights are only effective if they are used to inform changes to a business' energy policy, product procurement, behavioural changes or monitoring capabilities. For example, a dramatic increase in energy consumption during the winter months might signal an inefficient HVAC system in a building, or that employees are interfering with the thermostat controls. Therefore, investing in energy efficient HVAC systems or providing energy workshops to employees could bring about long term energy and cost savings.



Behaviour

Encourage good energy management behaviours from the start

When starting a business, there is an opportunity to define and shape company culture and behaviours from the very beginning. Typically, businesses could save 5% from their energy bills through behavioural measures. Start-ups are in a great position to reap the most benefits from this as essentially there are no existing behaviours to change. The simplest solutions are often the most effective and this is certainly true when it comes to energy saving. Combining behavioural measures with other elements of energy management good practice leads to an integrated approach.

As discussed above, developing a sustainability and/or energy policy is a good place to start. It provides a clear expression of an organisation's ambitions and a framework through which to achieve your goals. To embed low energy and low carbon behaviours from the start it is important to engage team members and raise awareness.

Here are some additional steps you can take to introduce good practice:

- Provide induction training for new team members on the energy and sustainability policy, raising awareness of why this is important and how individuals can contribute to achieving the business' goals.
- Ensure that team members are aware of how energy is used in the business and what steps they can take to reduce energy usage. This can be written into process or equipment operating procedures or a switch-off policy for the office.
- Allocate responsibility for energy management to individuals with clearly defined roles for controlling and monitoring energy performance.
- Develop a travel policy, encouraging low carbon options such as conference calls and the use of sustainable transport for business and commuting journeys.
- Gather employee feedback on their preferred working environment. For example, high electricity bills might result from some employees turning up the thermostat while others who prefer a cooler working environment are leaving windows open.
- Use a variety of communication channels and target your messages. Inter-organisational networks such as Slack, Yammer or Skype are good platforms to send daily reminders for energy efficient action as it is less formal and more engaging.
- Provide feedback on the effectiveness of an energy and carbon saving initiative. Inform staff how much carbon or energy cost has been saved as a result of behaviour changes.
- Incentivise employees by creating a reward system for reaching energy saving targets, such as a social event or money to invest in further improvement.
- After implementing changes and new policies businesses should analyse the successes and failures to continuously inform and improve their initiatives.



Building a sustainable supply chain

Consider environmental credentials when selecting suppliers

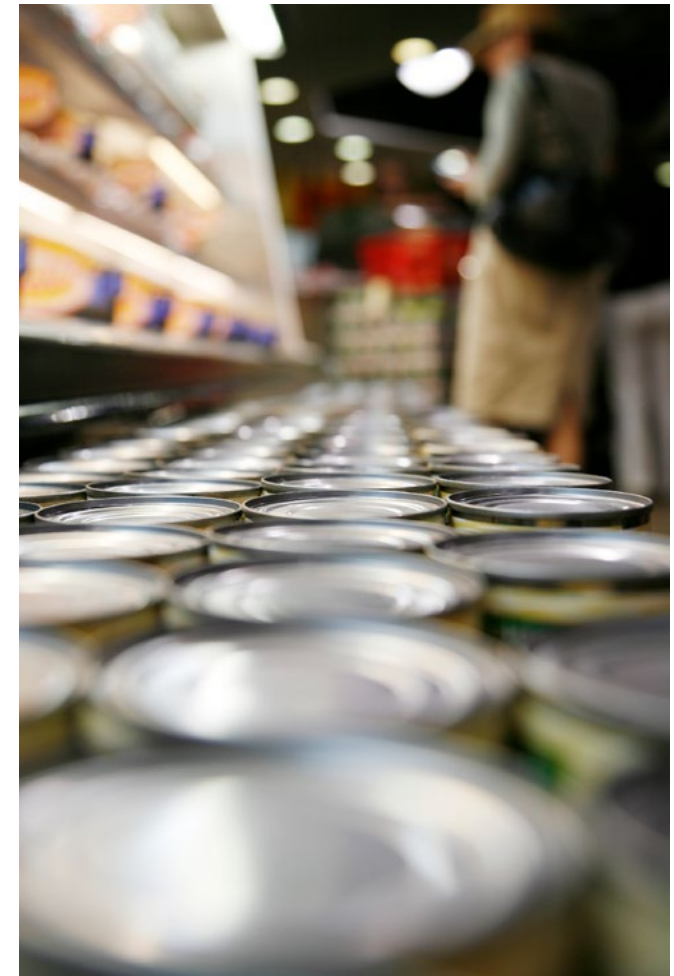
The easiest way to have a sustainable supply chain is to start with one. It is a lot more difficult to engage existing suppliers on the issues of sustainability than it is to seek out sustainable suppliers to begin with. There are specific questions you can ask suppliers when selecting them to ensure they are operating in an environmentally responsible manner. We have outlined some of these below:

- Does the supplier have an environmental management system in place, such as ISO14001, or for energy ISO50001?
- Is the supplier fully complying with environmental and energy legislation, such as ESOS?
- Does the supplier's environmental policy have a commitment to reducing the emissions of its operations as well as its products and services?
- Have they demonstrated a commitment to reduce their environmental impact?
- Has the supplier calculated their carbon footprint?
- Have they set energy and carbon reduction targets and do they report their performance?
- Do their goods or services offer you a lower carbon alternative to the market average?

If a supplier can respond to these questions and demonstrate a real dedication to reducing their carbon impact, and have a strong commitment to energy efficiency, they would make a great first supplier partnership. If this is not the case yet, but for other reasons this is the best supplier out there, perhaps you can look to adding some of the above criteria in your contract. This will signal to them that your business is contingent on their commitment to improvement.

Having these discussions from the outset as you build supplier relationships will help your business set up a resilient supply chain. As mentioned earlier, UK energy prices are due to rise significantly over the next decade. You do not want your supplier to hand these costs over to you.

Similarly, if you are providing a product or service to a larger entity that has a strong commitment to sustainability, you as a supplier might be asked the same questions. Being able to demonstrate that you are committed to reducing the environmental impact of your own operations and those of your suppliers may be crucial in winning and maintaining contracts.



Conclusion

Reap the benefits of good energy management as your company grows

Implementing the advice from this guide can support embedding good energy management at the core of a business' activities, reaping the associated benefits as the company grows and expands. A key benefit is the potential for significant energy and cost savings, creating a strong business case for implementing well established energy efficiency measures, and embedding sustainability in company culture. These savings can substantially improve the financial viability of a start-up, aiding a business to get off the ground effectively. Moreover, start-ups offer the unique opportunity to embed a culture of sustainability, influencing employees' activities in both a professional and domestic setting therefore minimising an individual's environmental impact. This culture can also be used to influence the supply chain putting pressure on other organisations to state their green credentials.



Your next steps

Embedding good energy management

Step 1: Assess what sustainability means for your business

As a start-up this is your chance to grow sustainably and embed this in the company culture as it grows. But what does sustainability mean for your business specifically? Develop a sustainability or energy policy to set clear ambitions.

Step 2: Understand your energy use

Whether selecting a new workspace or new equipment for your site, consider energy efficiency in your decision making. Check the condition and operation of existing equipment and monitor the energy consumption over a week for example to obtain a base figure against which energy efficiency improvements can be measured.

Step 3: Identify your opportunities

Compile an energy checklist. Walk round your building and complete the checklist at different times of day (including after hours) to identify where energy savings can be made.

Step 4: Prioritise your actions

Draw up an action plan detailing a schedule of improvements that need to be made and when, along with who will be responsible for them. Engage with your employees and encourage them to adopt good energy management behaviours.

Step 5: Make the changes and measure the savings

Implement your energy saving actions and measure against original consumption figures. This will assist future management decisions regarding your energy priorities. Gather feedback on the success of initiatives to inform future actions.

Step 6: Engage your suppliers

Once you know what to look for in your own business, you can engage your suppliers and ask them to do the same. Embed your principles in a procurement guide and ensure your supply chain is sustainable from the outset.

Go online to get more

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.

Website – Visit us at www.carbontrust.com for our full range of advice and services.

➤ www.carbontrust.com

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

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

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

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

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

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