

# The Business of Energy Efficiency

A paper from Carbon Trust Advisory Services

## Introduction

Large UK businesses are paying out more than £1.6bn too much on their energy bills every year because many are yet to seize the full opportunity to cut bills by around 15% through energy efficiency measures.

These savings are available through changes in behaviour and equipment and represent highly attractive returns on investment. This article examines how more businesses can unlock the full opportunity of energy efficiency using as examples the work of a number of leading companies. It also proposes that greater awareness of the true value of energy efficiency among business leaders will enable them to maximise cost savings.

## Executive summary

Analysis by Carbon Trust Advisory Services has confirmed that energy efficiency is a good financial opportunity for most companies. Our tracking of efficiency implementation by businesses we work with indicates that costs of at least £1.6bn<sup>1</sup> could be saved by the UK's large businesses<sup>2</sup>. And the investment required to seize these savings has very attractive payoffs: on average an internal rate of return (IRR) of 48% and payback within three years is on offer<sup>3</sup>.

However, despite these attractive returns, our data suggests that most companies are yet to fully exploit the cost-saving potential of basic energy efficiency measures, and on average CFOs estimate that the returns on energy efficiency are less than half of the actual returns available.

Our interviews with business leaders responsible for enacting energy efficiency provide useful examples of how leading companies are overcoming common barriers to progress on energy efficiency. The recurrent themes are: making the business case clear; creating momentum; resolving misaligned incentives; and enhancing the customer proposition.

Other companies can learn from these examples as they seek to exploit the opportunities offered by the transition to a green economy.

This document is not intended to be a 'how-to' guide on energy efficiency—the Carbon Trust has already published several guides that do this job<sup>4</sup>—but rather to function as a reminder of the value that businesses may be overlooking. We encourage readers to take a fresh look at the opportunities in their businesses.

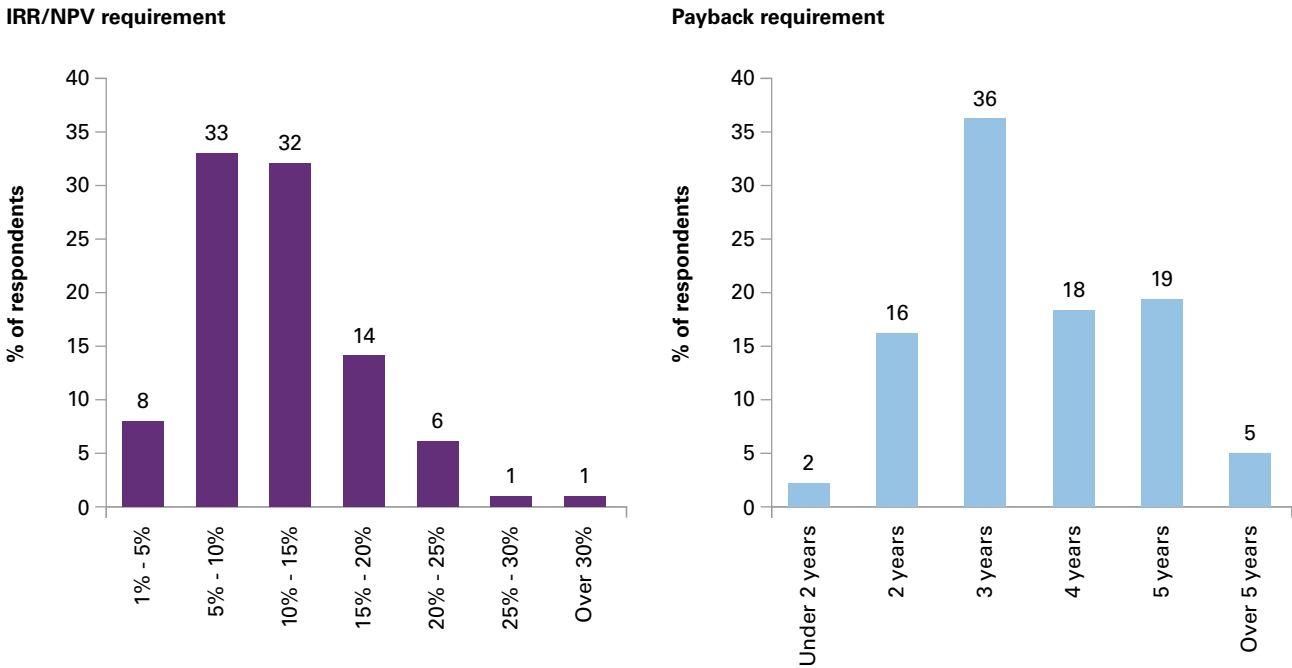
<sup>1</sup> Based on sample data from the Carbon Trust's database of energy efficiency projects, and extrapolated across all large UK businesses.

<sup>2</sup> Businesses with an annual energy bill in excess of £1m.

<sup>3</sup> Based on sample data from the Carbon Trust's database of energy efficiency projects.

<sup>4</sup> The appendix to this report lists some of these guides. Please visit [www.carbontrust.com/resources](http://www.carbontrust.com/resources) to access these guides and see all that are available.

**Figure 1** Reported IRR requirements and reported payback requirements (source: CFO survey)



### An attractive investment opportunity

A typical large organisation has the opportunity to save an average of 15% (and often more) cost-effectively on its annual energy bill. This saving is available from approaches and technologies that are well established and understood, such as lighting, heating, employee engagement and training<sup>5</sup>.

The investments required to save 15% of energy bills have an average IRR of 48%, well above the minimum requirement set by businesses, which averages 11.5%. Up to 94% of businesses have an IRR requirement of under 30% (Figure 1). Large businesses have approved projects with an average IRR of 12% in the last year, confirming that a 48% return is very likely to outperform many other business investments.

Payback is another investment parameter. The portfolio of recommended energy efficiency investments that we have developed with our business clients has an average payback of under three years. From our recent survey of CFOs, we know that this satisfies the investment requirements of eight out of ten. We also found that half of the CFOs in the survey would extend payback requirements by at least a year for IRRs in the 40-50% range.

<sup>5</sup> For a short explanation of the techniques referred to please see the appendix to this report. Renewables are not in scope.

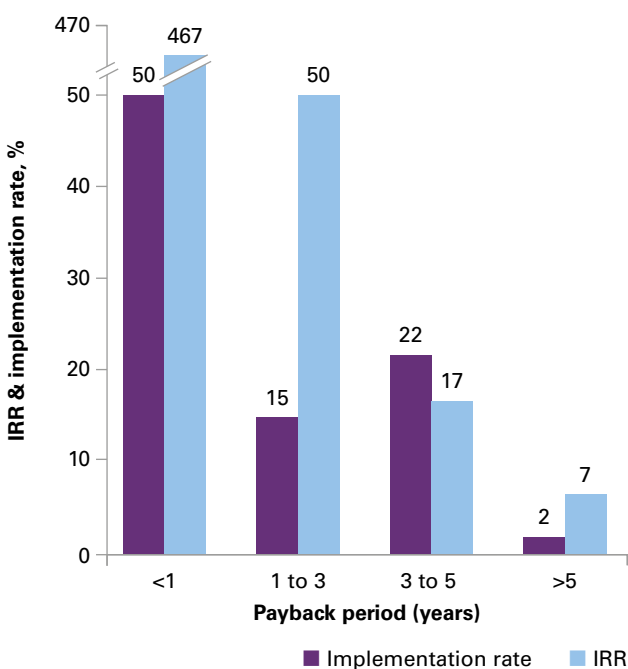
## Money is being left on the table

Despite the attractive financial returns available, our analysis of over 1,000 energy efficiency projects we have developed with clients has revealed that there is an untapped cost saving opportunity of £1.6bn per annum from energy efficiency across large UK businesses. On average, in the three years following the development of recommendations, businesses typically implement fewer than half of the saving opportunities identified. Yet many of the leading businesses that we work with implement far more, in some cases over 90% of our recommendations.

Businesses are behaving rationally by moving fastest to implement the high IRR/short payback opportunities (Figure 2), with the implemented projects having the best average IRR and payback. But the unimplemented project portfolio also has a big and quick enough return on investment for most businesses.

Our research suggests four key principles are common to companies that are most successful in exploiting energy efficiency opportunities, leaving less money on the table.

**Figure 2** Implementation rate and IRR by payback period (source: Carbon Trust database)



## Four key principles

- **Making the case:** the true value of energy efficiency is investigated, accurately determined and communicated clearly to secure finance to effect change when other business demands also require expenditure.
- **Using organisational culture and behaviour to overcome inertia:** organisational culture is aligned to energy efficiency from the boardroom to the grass roots of the organisation.
- **Resolving misaligned incentives:** innovative ways are found to overcome the split incentives as well as weaknesses in the structure of incentives and objectives within and outside of the business.
- **Enhancing the customer proposition:** business investment in energy efficiency is aligned with positively impacting the customer experience.

## Making the case

Two perceptions can shunt issues of energy and climate change down the boardroom agenda. The first of these is the perception that energy is not a material business cost, and the second is that energy efficiency offers low investment returns.

Regarding materiality, it is true that energy costs are not the highest costs faced by most businesses; other costs such as salaries and materials are generally bigger, may be more variable, and might be seen as more important to manage. Energy prices are expected to rise in the next few years, driven by the supply demand balance and regulation around climate change. In fact, Ofgem estimates that energy prices could rise by over 40% in real terms over the next decade in the UK<sup>6</sup>. And tackling energy costs also brings further benefits along in its wake, such as reducing the business risk of energy price shocks; greater staff engagement; and broader reputational benefits relating to external stakeholders. Businesses that assign value to some or all of these wider impacts are able to incorporate a 'truer' price of energy in their operations.

On the question of investment returns, the average IRR of recommendations that the Carbon Trust has made to large businesses is 48%. By way of comparison, when asked to estimate the average IRR of energy efficiency investments, the average response from CFOs in a recent Carbon Trust survey was 19%, less than half the actual rate. And 64% of respondents thought that returns are

<sup>6</sup> Based on Ofgem's report 'Project Discovery', October 2009.

less than 20%. Reviewing the actual savings opportunities and IRRs from energy efficiency investments could bring benefits for many businesses.

One company that has taken steps to fully understand the materiality of energy costs is leading restaurant and pub company Mitchells and Butlers. With help from Carbon Trust Advisory Services the company has modelled its potential energy and carbon costs over the next decade based on business growth projections and forecasts for energy and CRC costs. This revealed that the company's energy bill could double and also contribute a greater proportion of total costs (and hence profit). This analysis, alongside specific plans to save energy, persuaded the company to release substantial additional capital to its energy efficiency programme.

Broadening such an approach to account for the reputational or staff engagement benefits of energy efficiency might seem to be a step into the unknown. However, we have worked with a number of organisations to quantify these benefits. For example, Carbon Trust Advisory Services recently helped a technology services provider to establish that improving the energy efficiency of its facilities could give it a competitive advantage in its marketplace and help attract and retain customers who are concerned about their total carbon footprint. Analysis indicated that customer attrition could cost much more than the impact of energy and CRC costs. This added weight to the case for energy efficiency.

Many businesses are capital constrained and even a strong investment case does not always ensure a release of capital if there are competing projects and compelling (or mandatory) changes to be made to the core business, such as upgrades to product or service features. Leading companies are therefore finding ways of working with finite capital budgets but still effecting change. Ladbrokes is one example, and has used supplier financing options to lower the upfront capital cost of a multi-million pound equipment upgrade and improve the financial returns still further.

Another company with a solution to this issue is Eli Lilly. Lilly has established a global Energy, Waste, and Water Reduction Fund, creating a ring-fenced source of finance that operating companies can call upon to fund environmental projects. Operating companies are still expected to use their own funds in the first instance, but if capital is constrained at the local level, projects addressing energy, waste or water issues have another place to turn to. Investment criteria are still applied and this is no 'soft touch' slush fund. Nevertheless, the fund

has helped Lilly save over \$16 million a year since 2006.

In summary, companies that make a clear business case for energy efficiency internally:

- understand their total energy use and cost, now and into the future
- take a broad view of costs and benefits, for instance by assessing customer attrition risks
- assess (or refresh estimates of) realistic efficiency opportunities and their returns taking these broad views into account, and
- ensure that viable investments have access to capital.

### Using organisational culture and behaviour to overcome inertia

Tapping into the enthusiasm and problem-solving capabilities of a workforce is essential to align behaviour with a corporate goal to be energy efficient. It can also lead to new ideas emerging. The staff engagement benefits noted in the previous section are contingent on doing this well.

The flipside is that an efficiency programme that doesn't come alive outside the energy or property team will face difficulties gaining momentum and will suffer from not having many—sometimes thousands of—minds address the effort. Like all company-wide efforts at change, the key to unlocking enthusiasm and creating momentum starts with the support and commitment of top management. The stance taken by the leadership of the business is therefore either a benefit or a barrier. The making the case section above describes some ways to argue for management commitment to energy efficiency. The argument of this section is that the most energy efficient businesses demonstrate clear leadership from the top to ensure the benefits are secured.

Leadership on energy efficiency is no different from leadership on other business issues: it requires repetition and reinforcement of the message, setting—and owning—challenging objectives, cascading these objectives throughout the business, 'walking the walk', and promoting successes and progress. Examples of companies that are visibly leading from the top are Unilever, with its recent announcement from CEO Paul Polman that the company would—amongst other things—halve the environmental impact of its products by 2020; National Grid, which has an 80% footprint reduction target; and Wal-Mart, where CEO Mike Duke has announced aggressive targets such as eliminating

20 million tons of greenhouse gases from the group's supply chain by the end of 2015.

At the other end of the scale there are benefits and barriers in the day-to-day behaviour of individuals. The impact of energy-saving technologies can be critically dependent on staff behaviour and on how technology is used. This is another key benefit, or barrier.

Top-down leadership starts to address this behavioural issue; cascading objectives will focus attention, especially when backed by appropriate incentives. For example, Whitbread has incorporated performance measures related to the energy consumption of its hotels and restaurants into its annual bonus scheme for staff. The company has also given its housekeeping teams simple 'Top tips for going green' cards with advice on things they can do or look out for and which will make a difference to environmental performance.

The natural competitiveness of individuals can be used to nudge them towards desired outcomes. The Capita Group Plc developed a league table that ranks each of its sites based on their performance in carbon reduction. Telling site managers how they are doing relative to their peers and their own past performance creates a desire to act and is highly effective at motivating them to work towards energy and carbon reduction targets. Tesco is another company finding that peer comparisons are causing managers and staff to try to better their energy performance versus other stores.

So putting control in the hands of individuals can work. In certain areas, taking control away from them can also work. This doesn't have to be disempowering: movement and/or daylight sensors on lights do this and are widely accepted. Ladbroke's has gone a step further and is managing the heating controls in 2,000 stores. A control unit in each store reacts to pre-programmed opening times as well as local conditions so that stores are not being heated when they are not open. Managers have an override (for instance, if they are working outside normal hours) but in the normal course of business they don't need to worry about temperature controls. This is helping Ladbroke's reduce their out of hours energy use significantly.

In summary, the most energy efficient companies:

- see energy efficiency as a task for the entire organisation
- demonstrate leadership from the top
- set aspirational goals and keep score
- create and cascade accountability
- implement appropriate centralisation or automation of controls, and
- provide performance and peer-group feedback.

### Resolving misaligned incentives

Incentives can create barriers. For example, the 'landlord-tenant' divide occurs when changes that are the landlord's responsibility would confer benefits on the tenant (e.g. lower energy bills), leaving the tenant wanting a change but the landlord facing insufficient incentive to make it happen.

The structure of incentives and objectives in a business can also be an issue. Objective setting can ensure that the individual(s) able to control resource use are accountable for exercising this control efficiently. In the retail sector, store managers frequently have control over lighting and heating schedules and settings but may not see the cost of this in their objectives. Or different parties may have objectives pulling them in different directions. A UK retailer has found that a desire to reduce refrigerant costs was leading to sub-optimal levels of refrigerant being used, which then created an increase in energy use as the efficiency of the fridges fell. Because energy spend wasn't a budget item for the department using the refrigerant, they didn't notice the impact of their choice. Having both the energy and refrigerant budgets in one place would create the necessary alignment. Such misalignments should be addressed through direct intervention, changing incentives or creating accountabilities at a level that is able to manage the bigger picture.

Progressive businesses and landlords are increasingly working together on 'green leases' to overcome the landlord-tenant divide. The Better Buildings Partnership has developed a Green Lease Toolkit to assist landlords and tenants in this area, reflecting a positive attitude amongst landlords<sup>7</sup>. As tenancies are changed or come up for review we think it is sensible for most companies to work with their landlords to reduce energy use.

<sup>7</sup> <http://www.betterbuildingspartnership.co.uk/download/bbp-green-lease-toolkit.pdf>. Member companies include British Land, Grosvenor, Hammerson, Hermes, and Land Securities.

In another form of landlord-tenant divide, Coca-Cola Enterprises (CCE) is aware of the energy consumption of its coolers in thousands of retail stores across the country. Whilst the coolers are owned by CCE, the operating cost (including energy) is covered by the retailer. At first glance, there would appear to be little financial incentive for CCE to make its coolers more energy efficient. However, CCE has aligned its interests with those of its customers by including its cold drinks equipment within the scope of its own carbon footprint and carbon reduction strategy. With nearly 69% of its carbon footprint in Great Britain attributable to cold drinks equipment, CCE can only achieve its own carbon reduction target by improving the energy efficiency of its coolers. As a result, it is now undertaking a company-wide programme to improve the efficiency of its coolers.

To summarise, the question of incentives requires:

- the creation of incentives where there are none
- adjusting for the perverse effects in existing incentives, and
- engaging with third parties to create benefit sharing arrangements.

### Enhancing the customer proposition

Businesses are wary of changing their customers' experiences, or asking them to change their behaviour. For instance, the retail sector faces the question of whether shop doors should be open or closed, or whether lighting upgrades will cast an attractive light on the merchandise. There are no easy answers to such concerns, partly because the range and variety of situations encompassed by these concerns is so vast.

How should companies react in the face of such issues? Firstly, by standing back and considering the extent of change that can occur without impairing the customer experience at the key touchpoints, and perhaps even enhancing the experience.

Whitbread is showing that dramatic reductions in resource use are available with no negative impact on the customer experience. In fact, many guests at the company's low-carbon hotels have commented that they enjoy the opportunity to "do something for the environment without even realising that they are." Guest information highlights the steps guests can take to adjust

their behaviour and make a difference, for example, advising guests to turn off taps and to use the shower rather than the bath. The financial returns mean that there isn't a premium price at low-carbon hotels; guests are therefore getting an equivalent, but greener experience, and that creates a point of differentiation.

Where an impact is unavoidable there is opportunity in moving forward in a spirit of exploration, for instance by gathering information through pilots that allow savings and customer reactions to be assessed. The recent growth of markets for sustainable and/or Fairtrade products demonstrates that consumer tastes and attitudes can change. Leading companies will take customers on the energy efficiency journey. In the B2B sector customer reactions can be gauged more directly and with discussion about sharing the gains from any savings made.

In summary, companies can take steps to enhance the customer proposition by:

- considering instances where change may positively impact the customer experience, and act as a point of differentiation, and
- engaging with customers to understand their attitudes, and exploring ways of working together.

### Conclusion

The UK has a substantial cost and energy-saving opportunity that can be realised at attractive rates of return and using reliable techniques and mature technologies. Leading companies are demonstrating how these opportunities can be fully exploited and barriers, such as accessing capital and dealing with misaligned incentives, can be overcome.

CFOs and other business leaders who reset their expectations of value and treat the efficiency challenge as a whole-company change programme should be able to unlock significant hidden value in their businesses.

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# Appendix

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## About the research

The Carbon Trust has been advising companies since 2001 and makes detailed recommendations on energy efficiency investment to over 120 large businesses every year.

For this study we returned to businesses that received recommendations in 2006/7 and documented their progress in implementing these actions: around 1,000 separate recommendations in total. Where there were shortfalls in implementation we conducted management interviews to understand the motivations for progress and barriers that had emerged.

In addition, we commissioned research amongst 100 finance directors, chief financial officers and senior finance managers of large businesses – both Carbon Trust clients and others – to understand their attitudes and perceptions of energy efficiency investments. This research was conducted online during November 2010.

## Carbon Trust energy efficiency guides

The Carbon Trust has published various guides to many aspects of the low carbon economy, including more detailed and operational guides to implementing energy efficiency. Some of our key documents are listed below.

Please visit [www.carbontrust.com/resources](http://www.carbontrust.com/resources) to access all Carbon Trust publications.

- [Better business guide to energy saving \(CTV034\)](#)
- [An introduction to energy management \(CTV045\)](#)
- [Energy management guide \(CTG054\)](#)
- [Creating an awareness campaign pack \(CTG056\)](#)
- [Monitoring and targeting management guide \(CTG008\)](#)
- [Lighting technology overview guide \(CTV049\)](#)
- [Heating, ventilation and air conditioning technology overview \(CTV046\)](#)

## Energy efficiency approaches

Examples of our recommendations, which also comprise the scope of the analysis undertaken for this report, are set out below. Renewable energy generating technologies are not in the scope of this report or the analysis.

### Management measures

**Metering and monitoring:** such as the installation of smart meters or half hourly meters

**Policy and strategy:** policies, procedures and targets for reducing energy consumption

**Training and awareness:** staff training and induction courses

### Process change

**Process design and optimisation:** improving the efficiency of energy using processes.

### Buildings improvements

**Air conditioning and cooling:** addition of controls, use of free cooling and improved insulation.

**Building fabric:** the use of wall, floor and loft insulation and better use of natural lighting.

**Building instrumentation and control:** installation and use of building management hardware and controls.

**Lighting:** installation of additional control systems and the re-fitting of luminaires, lamps and fittings.

**Space heating:** installation of efficient boiler systems, controls and insulation.

**Equipment:** replacement of IT and other electrical equipment.



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Carbon Trust Advisory Services is a team of experts on business and sustainability dedicated to delivering large business growth through understanding and addressing the strategic issues raised by climate change. We focus on the impacts of climate change on our customers' businesses and brands; strategic and operational planning that delivers clear business benefits from early action; and maximising the cost reduction potential of our customers' resource use.

This paper was written by Matthew Wynde and Simon Lane. Matthew is a Principal and Simon is a Consultant in the Advisory Services team.

### Further information

For more information or a confidential discussion please email [businessadvice@carbontrust.com](mailto:businessadvice@carbontrust.com) or call us on +44 (0)20 7170 7000. We also welcome your comments on this paper.