Business Briefing: Energy Services in the Schools Sector
SE^2 Limited, May 2012

Introduction
Each year, schools in England spend in excess of £500 million on gas, electricity and other fuels. In 2008, energy use in English schools accounted for an estimated 4 million tonnes of carbon dioxide emissions.

What do we mean by energy services?
Energy services is a broad term with many applications. At its most general, an energy services approach:

- Commits a customer and a provider to each other over a period of time
- Reduces or removes the up-front costs of energy performance improvements for the customer
- Offers a commitment to or guarantee of benefits from improved energy performance and shares these benefits between customer and provider

The key to energy services contracts is that the customer transfers risk and responsibility to the service provider.

Some energy services approaches are geared towards certain types of technologies – eg, energy supply contracts related to combined heat and power (CHP), common in the NHS and university sectors. Other approaches look at building energy in total and offer the customer a guarantee of savings which can be achieved through any technology or combination of technologies.

Emerging models of energy services are taking into account not only the reduced fuel bills achieved by the customer but also income streams associated with renewable electricity technologies (eg, through Feed In Tariffs).

One element which seems largely absent from typical energy services models, but which is often the focus of school energy programmes, is behaviour change.

Typical funding options

Capital purchase: a traditional procurement approach whereby the customer bears the up-front capital cost, but where the purchase of equipment is linked to service contracts and maintenance.

Discount energy purchase / energy supply contracts: measures are installed, operated and financed by the provider at no up-front cost to the customer. Energy costs are capped for the duration of the contract and the provider recoups the capital outlay by signing a contract to provide energy from the system to the customer at a lower cost than their previous bills. This model is commonly used in the public sector for CHP / cogeneration projects.

Energy performance contracting: these contracts go a step further than energy supply contracts. Measures are installed, operated and financed by the provider at no up-front cost to the customer and with a guarantee of savings. Capital costs are recouped by the provider from the fuel bill savings achieved by the customer. The introduction of Feed In Tariffs and the Renewable Heat Incentive mean that revenue income can also be used to pay the provider's initial capital outlay. Guaranteeing savings means that energy performance contracting is "technology blind", finding the most cost-effective way to deliver savings.

Third party finance: where financial institutions provide loans to either the energy services provider or the customer to address up-front capital costs, guaranteed by the energy cost savings that the project will achieve. Contractual structures are likely to be similar to an energy performance contract, with an additional layer for the finance agreement.

Private Finance Initiative (PFI): many Building Schools for the Future projects were funded through a PFI approach. In general, an individual school energy services scheme is not likely to be large enough to suit a PFI set-up (ie, without the context of a rebuild or major refurbishment); larger schemes bringing together multiple schools may be more suitable.

As well as achieving savings through measures and technologies, energy services providers can reduce the cost of energy by other means, for example, greater economies in purchasing fuel, efficient plant management and

maintenance, efficient design of controls and reduced overhead requirements from a 'shared services' approach.

Commercial organisations (paying corporation tax) can also benefit from Enhanced Capital Allowances on energy saving plant / equipment. In instances where the energy services provider retains ownership of the asset, this can provide them with an extra financial benefit.

Can energy services unlock cost and carbon savings in schools?

In the early 2000s, the Energy Saving Trust ran an Energy Services for Schools programme to test different models and the energy, cost and carbon savings they might produce. The 36 schools in the EST programme achieved, on average:

- **A financial saving of £3,321 per annum**
- **Energy savings of 110,000 kWh per annum, approximately 20% over the course of a year**
- **Annual CO_2 emissions reduction of 45 tonnes (ranging from 2 tonnes to 226 tonnes)**

The payback period for measures installed across the programme was **2.9 years**, with an average cost of measures of £9,300.

Case study evidence from individual schools in Austria, Canada, Germany and the USA reports cost savings from energy services of between 20% and 40%.

Advantages of energy services in the schools sector

- Energy services can provide a quicker route to securing funding than traditional, round-based grant programmes
- Specialist energy services companies are able to identify more and better improvement opportunities
- The ESCO is motivated to capture all savings, particularly in an energy performance contract
- Contracts often include operation and maintenance; this may be useful where a school lacks these skills itself
- Fixing energy prices for the duration of the contract helps with planning and budgeting
- There is no call for up-front capital and no negative impact on running costs

Barriers to energy services in the schools sector

Project size and cost effectiveness

Small project size and, therefore, proportionately high transaction costs can make school energy services projects marginal or even commercially unviable.

The Energy Saving Trust found that energy services approaches were unlikely to be viable in single schools where energy bills were less than £50,000 per annum. Experience from Germany has found that only sites with energy bills of 75,000 €/annum are viable candidates for energy performance contracting. Small sites may need to be "bundled" together to form an economically viable project.

Procurement and organisational issues

Some legal and regulatory frameworks make it difficult to invest in energy services approaches – for example, tender processes that emphasise price or that require a fixed understanding of the costs and benefits of a contract.

More generally, there are a series of organisational factors at play which can inhibit the market:

- Complex contracting and procurement procedures, carrying high transaction costs
- Reluctance to enter into long-term contracts. Many other contracts signed by schools, for example, catering, transport and energy supply contracts, tend to have a 3-5 year lifetime, which may not be sufficient for an extensive energy performance improvement project.
- Low energy prices (often negotiated in good faith at local authority level) mean that energy is a low priority
- Budget structures and ownership, particularly the divide between capital and revenue budgets and the roles of the school, the local authority and, in some cases, a PFI provider
- Fragmentation of existing services providers, eg, gas supply, electricity supply, M&E contractors
- The number of decision makers needed in a procurement process of this length and complexity
- Uncertainty around the mechanics of debt and loans for schools
- Public procurement rules can favour lower capital cost items
- Energy services contracts (which roll capital and maintenance costs together) are difficult to specify

Lack of awareness or confidence among schools

Energy services models are not generally well-known in the schools sector (compared with, say, the health sector where they are much more mainstream). Low levels of awareness can breed uncertainty or lack of trust.

Attitude to risk

Where schools are aware of the options available, there may be an issue around their attitude to risk. Energy services schemes carry a high perceived technical and business risk ("Will we achieve savings? Will a long-term contract be flexible enough?"). Public sector customers can tend to have a preference for Government / grant funding as this is what they are used to. The World Energy Council suggests that some organisations fear outsourcing as they perceive that there is a loss of direct control over an issue. Energy investments also have to be seen in the context of other spending decisions being made in a school.

Unintended consequences

There may be a perverse incentive that savings on energy costs could influence national and local spending decisions and lead to budget cuts in future years (rather than the money saved being available for spend on frontline services).

In a time when carbon has come to have a financial value, there may be competition between private sector providers and public sector agencies to capture the carbon available from schools. Whilst some competition may be healthy (to provide schools with a choice of schemes), there is also a risk of confusion in the marketplace.

What experience tells us

Schools projects are at the boundary of cost effectiveness, and one size does not fit all

A message that emerges repeatedly is that different contract approaches are suitable for different situations. This is reinforced by evidence from Germany, where it is suggested that:

- Buildings with energy costs over 75,000 € are suitable for an energy performance contract
- Buildings with energy costs between 50,000 € and 75,000 € would be suitable for energy performance contracting if bundled together
- Buildings with energy costs below 50,000 € per year are best treated through internal commitments and management decisions, most likely supported through traditional grant routes

Aggregation can deliver cost effectiveness where there are appropriate structures to enable it

"Project bundling" is used across areas to create a stronger market for energy performance contracting.

In the US, there are many examples of school districts entering into contracts to improve a bundle of schools (eg, St Charles Parish, Louisiana and Mapleton, Colorado). A variety of funding routes are utilised (bonds, lease purchase agreements, commercial loans).

Local authorities in England are unlikely to have the same degree of influence as US school districts, which could make aggregation more challenging. However, local authorities and schools do have a common interest in carbon reduction in light of the CRC Energy Efficiency Scheme, and the dynamic between the school, the local authority and an energy services provider will need thought.

Regional purchasing organisations could offer an appropriate scale for aggregation and expertise to support procurement of energy services approaches, going beyond their traditional work on bulk purchase contracts for gas and electricity supply.

Community energy networks are a vital step in an efficient, resilient and low carbon energy system. Schools can play a useful role in providing a heat load (ie, demand for heating and hot water) during the day, supporting the economic case for shared energy sources such as CHP. In some cases, a large secondary school (especially if it has a swimming pool) can provide a cost-effective hub for a heat network and CHP plant. In other areas, the school is likely to join an existing network with the energy plant based elsewhere.

Investment in plant is more cost effective at scale, so shared energy centres offer a helpful model. Engineering and operational complexity can be removed from the school if it is part of a larger community-wide scheme.

Private sector leadership can generate greater savings

The EST's 2004 review identified that schools managed by privately-led ESCOs were more likely to consent to a package of energy efficiency measures which had a higher up-front cost but offered greater associated savings. The private sector can have a greater willingness to take on risk, coupled with a mindset by which all possible savings are identified and then rolled into the energy performance contract.

A high level of customisation can affect commercial viability

Energy efficiency projects differ from building to building. This means that the energy services contract has to be customised to a certain extent for each customer, increasing transaction costs. A 'modular' approach to service provision can help, for example, if the school has the in-house skills to look after maintenance.

Energy services can forge closer links between supplier and building users

A performance contract puts an onus on the contractor to ensure that the occupier knows how to use the building in an energy efficient manner. It can also enable the energy services company to make links to pupil engagement and educational outcomes, although this is only rarely a feature of an ESCO arrangement.

One scheme in the US (St Charles Parish, Louisiana) has seen the energy services provider taking responsibility for operating building management systems and controls, and providing detailed training to school managers to ensure that systems are appropriately used and savings are achieved.

Learning effects are starting to be seen: there are several ESCOs active in the schools market in Florida. As school district energy managers have grown more familiar with ESCO models and energy saving measures and technologies, they have become more able to specify energy savings at the outset of projects and to demand verification of savings over time.

Can energy services be effective in the schools sector?

There is good potential for energy services within the schools sector; a segmentation model according to energy spend may be an appropriate way to address the market.

Larger schools – spending in excess of £50,000 per annum on energy – should be suitable for an energy services approach on their own merits (ie, offering sufficient margin for both the ESCO and the school to receive a financial benefit). These schools are likely to be:

- Medium to large secondary schools
- Schools with swimming pools
- Schools with high energy use for other reasons (eg, specialist facilities, labs, theatres)

Schools with a lower energy spend are likely to be suitable for an energy services approach when they are part of a cluster. Clustering can be used to:

- Attain a threshold of energy spend (which is likely to be greater than £50,000 because of the higher transaction costs of working across multiple sites)
- Create a balanced portfolio of projects for an ESCO (ie, some that are highly profitable along with some that are marginal or less profitable)

There are also questions to be raised around the scope of an energy services offer for schools. Should it focus on the traditional areas of energy use (heating, lighting, cooling) or should it be expanded to include those areas of school energy use which are growing most rapidly (eg, electricity use for ICT and small power)? A wider energy services approach would provide more benefit to the school, but could present a service delivery challenge to some of the traditional energy services providers.

A report from the US noted that energy savings from traditional energy services (lighting, heating, cooling) were lower in the schools sector than in all other institutional sectors. This makes schools projects less attractive than other sectors on commercial terms and, in a market with limited providers, it could mean that ESCOs focus their resources on other sectors.

Creating demand in the schools sector should be accompanied by activities to nurture and support supply. A wider model which encompasses ICT efficiency, savings from behaviour change and wider educational links may help to enhance the commercial case for working with schools.