NHS energy management in Wales

I have prepared this report for presentation to the National Assembly under the Government of Wales Act 1998.

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The National Health Service in Wales is a significant user of energy. In 2004/2005, the 15 NHS trusts in Wales consumed more than 2.8 million gigajoules of energy across their estates, equivalent to the annual consumption of around 32,000 households, at a total cost of almost £20 million.

Following a period of three years during which trusts benefited from relatively stable and, in some cases, falling energy prices, average market prices for electricity and gas increased by around 107 and 130 per cent respectively between January 2004 and September 2005. These increases, and the generally volatile nature of the energy markets, present a challenge for energy procurement. Rising prices also highlight the need for NHS trusts to manage energy consumption effectively in order to control costs and support progress towards NHS Wales' targets for energy consumption and efficiency, as well as the United Kingdom Government's target for a 20 per cent reduction in carbon dioxide emissions between 1990 and 2010.

This report considers whether NHS trusts in Wales have been successful in controlling their energy costs over recent years and the prospects for the future. In particular, it examines whether trusts have got a good deal in their procurement of electricity and gas, and have made good progress in reducing energy consumption and improving energy efficiency.

The report concludes that NHS trusts in Wales have experienced mixed fortunes in the prices paid for electricity and gas in recent years reflecting, to varying degrees, volatile wholesale energy prices and decisions on when to procure future supplies. However, NHS trusts are struggling to achieve significant reductions in energy consumption and need to take action to further improve energy efficiency.

Electricity and gas are traded commodities with market prices subject to significant fluctuation (more than 10 per cent in a single day, in extreme cases). Therefore, the timing of energy procurement is most critical to the price obtained. However, not all energy expenditure is influenced through procurement. For example, charges for the transmission and distribution of electricity and gas supplies are determined by geographical location or levels and patterns of consumption.

The procurement of nearly all the electricity and gas purchased by NHS trusts is administered by Welsh Health Supplies, which manages contracts on trusts' behalf. In determining when to purchase future energy supplies, and to guide its overall procurement strategy, Welsh Health Supplies relies on external advice, notably from...
independent energy market analysts, although the final decisions rest with the trusts. With the benefit of hindsight, depending on subsequent market price movements the timing of Welsh Health Supplies’ purchases has produced both good results and bad results, for example when analysts’ predictions of future market trends subsequently did not materialise.

In recent years, Welsh Health Supplies has used contract extensions, rather than repeated competitive tenders, to book future electricity and gas supplies. This provides greater flexibility, and avoids the administration costs associated with a lengthy tender process. The use of contract extensions has, in most cases, enabled supplies to be booked when market prices have been at a similar or lower level than if competitive tenders had been completed to a fixed calendar, perhaps one or two months ahead of each contract renewal date.

The pattern and reliability of predicted consumption are also important factors in determining the prices obtained, because suppliers have to balance their own daily purchases and sales of energy. For low demand electricity supplies (with a maximum demand of less than 100 kilowatts) and gas supplies, the quality of consumption data to support the procurement process is limited. High demand electricity supplies, by contrast, have automated half hourly meter readings.

Price is not the only consideration in energy procurement. Supplier performance is important, and trusts may also elect to pay a premium for renewable ‘green’ electricity. From April 2005, all major hospital sites in Wales are being supplied with green electricity, at a net additional cost of around £33,000 per annum.

The most recent contracts for energy supplies have featured:

a competitive tenders based on supplier margin and administration costs only, rather than all inclusive prices;

b longer terms, aimed at reducing supplier margin and administration costs and improving quality of service; and

c flexible purchasing, whereby any amount of gas or electricity can be bought for any period at any time, as opposed to annual fixed prices.

Tendering on the basis of supplier margin and administration costs allowed the contracts to be established prior to future energy prices being booked, providing greater flexibility in the timing of purchases. However, the timing of the most recent tender processes left only one month between contract award and commencement. Welsh Health Supplies used flexible purchasing to spread the risks of buying in a (then) rising market, but earlier award of the contracts, and a longer period within which to book future energy prices, could have produced better results.

The new purchasing strategy is likely to require Welsh Health Supplies to monitor movements in market prices even more closely and make more frequent purchasing decisions. To avoid the need to agree the exact timing of each purchasing decision with the NHS trusts at short notice, Welsh Health Supplies and trusts have established an energy price risk management group to review market trends and agree target prices and periods of purchase. Despite this, there remains a risk that opportunities to take advantage of favourable market prices may be missed, particularly when key Welsh Health Supplies staff are absent from the workplace or have other workload demands. Welsh Health Supplies’ energy procurement team has...
experienced particular staffing pressures over the past year as a result of long-term sickness absence and retirements, but will, in future, be working more flexibly across the different energy supply contracts to reduce this risk. Nevertheless, the expected introduction of competition in water supplies is likely to have further resource implications, as might work being undertaken by the Welsh Assembly Government’s Value Wales team to assess the potential for wider collaboration in energy procurement across the Welsh public sector.

13 We identified errors in trusts’ electricity and gas bills which suggested a possible overcharge of as much as £59,500 across the sector in 2003/2004. More frequent price changes within the new contracts are likely to increase the risk of incorrect billing, and will place a greater emphasis on trusts to ensure that they are being charged at the correct rate for energy consumed.

NHS trusts are struggling to reduce their primary energy consumption and need to further improve energy efficiency

14 Net energy consumption across NHS trusts in Wales fell by around 5 per cent between 1999/2000 and 2004/2005, but primary energy consumption increased by 0.6 per cent against a target 15 per cent reduction by 2010. This reflects reductions in fossil fuel consumption but increasing electrical consumption, which contributes disproportionately to the calculation of primary energy consumption figures.

15 Energy efficiency is measured in terms of gigajoules per 100 cubic metres of heated space. NHS trusts have improved their energy efficiency from an average consumption of 64 gigajoules per 100 cubic metres in 2001/2002, to 57 gigajoules per 100 cubic metres in 2004/2005. Overall, 79 per cent of the estate recorded energy consumption of less than 65 gigajoules per 100 cubic metres in 2004/2005, against a target of 75 per cent of the estate by 2005 and 95 per cent by 2008. However, individually, five trusts remain well short of the 2005 target and will need to significantly improve energy efficiency to meet the 2008 target. Increasing service delivery, use of information technology and demand for air conditioning, as well as the general age of the NHS estate and extent of backlog maintenance, all present significant challenges to future reductions in consumption or improvements in energy efficiency.

16 Welsh Health Estates has concerns about the reliability of some of the energy performance data reported by trusts. Although it challenges any data that it considers to be unusual, such as large changes in reported consumption, its capacity to validate the information provided by trusts is limited. Further, the energy targets and the way they are measured may not be the most appropriate. For example, the energy reduction target can be interpreted as an equivalent reduction in carbon dioxide emissions. Because electricity procured externally on green tariffs is not counted towards emissions, trusts can achieve the target by buying green electricity, without achieving any reductions in consumption.

17 The commitment of NHS trusts, and the priority and resources allocated, to energy management varied considerably. By September 2004, only six trusts had an agreed energy policy, although these were of mixed quality. Further, although the Assembly Government required trusts to develop environmental policies and to submit their first

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3 Net consumption refers to the actual quantity of energy consumed by NHS trusts, including energy generated on site. Primary consumption is based only on energy purchased from external supplies, or as part of contract energy management arrangements, and applies a multiplying factor (of 2.6 for 2004/2005) to the electrical consumption to account for inefficiencies or losses in electricity generation and its transmission and distribution to customers.
annual energy action plans to Welsh Health Estates by April 2003, by September 2004 only 11 trusts had an environmental policy and just nine had an energy action plan. Trusts were also required to demonstrate, by August 2005, a clear commitment to the development of an environmental management system, although minimum standards for these systems were not prescribed.

18 Although charging energy costs to trusts’ central budgets provides little incentive for staff to use energy efficiently, some trusts had made considerable efforts to raise awareness of energy issues among their staff. However, three trusts had undertaken no awareness raising activity in the 18 months prior to our survey, while only seven trusts included energy issues within their induction programme for new staff. Welsh Health Estates and the Carbon Trust are together developing an energy campaign toolkit which should assist trusts’ efforts to raise the profile of energy management, building on work carried out at North West Wales NHS Trust.

19 The appointment of a dedicated energy manager can help to drive improvement and, where trusts spend more than £1 million annually on energy, such an appointment is likely to be self-financing from the savings delivered. Of the nine trusts with annual energy expenditure of more than £1 million in 2004/2005, four had established such a post at the time of our survey, although two more trusts employed staff who devoted at least 70 per cent of their time to energy management. With the exception of North Glamorgan NHS Trust, in the six trusts with annual energy expenditure of less than £1 million, no individual spent more than 15 per cent of their time on energy management.

20 A joint project between Welsh Health Estates and the Carbon Trust in Wales estimated that an additional capital investment of £3.3 million, combined with improved energy management procedures, would help NHS trusts collectively to achieve a 15 per cent reduction in primary energy consumption. Once achieved, this was estimated to yield annual energy-savings worth £2.2 million (at 2002/2003 prices). Local energy surveys conducted across the NHS estate in recent years have also identified potential efficiencies, many achievable at little or no cost, while our questionnaire survey of NHS trusts showed that certain energy-saving measures, such as automatic power down facilities on computing equipment, had yet to be extensively implemented. Action that could be taken more widely to reduce energy consumption and improve efficiency includes:

a extending the use of systems to monitor and target energy consumption, including sub-metering of buildings and automated metering technology to facilitate improved analysis of consumption patterns;

b increased use of building energy management systems to control consumption; and

c integrating energy efficiency considerations within major capital projects, maintenance programmes and the procurement of plant and equipment.

21 Although some action can be taken to save energy at no financial cost, trusts also need to invest to maximise opportunities for improved energy efficiency. Only four trusts had ring-fenced budgets for energy saving measures, and most trusts noted that energy related schemes are not a high priority for capital investment. Where energy saving schemes are supported, this is often on the basis of a short, one or two year, payback. To secure significant capital investment for energy related schemes, six trusts have entered into private sector contract energy management partnerships.
On-site generation of energy, through the application of combined heat and power or renewable technologies, offers potential savings. Hospitals are better placed than many organisations to use combined heat and power due to their consistently high demand for energy. However, in recent years financial viability concerns have limited the wider application of combined heat and power, which supplied around 8 per cent of the total electricity consumed by NHS trusts in 2004/2005.

Recent developments in renewable technologies have included the installation of solar panelling at Bronllys Hospital (Powys Local Health Board), generating around 6 per cent of the Hospital’s electricity. However, the capital cost of some renewable technologies is so high in relation to the cost savings that result that investment is unlikely unless supported by external grant funding, as was the case for Bronllys Hospital.

In contrast to England, Northern Ireland and Scotland, the Welsh Assembly Government has not developed a specific funding programme for energy-saving projects across the public sector in Wales. However, the Health and Social Care Department has now set aside specific funding as part of its Capital Investment Programme to promote investment in energy saving measures.

Recommendations

The benefits of carrying out recent competitive tenders on the basis of supplier margin and administration costs only were limited, as the timing left just one month within which to book forward energy prices. When planning future tender exercises on this basis, Welsh Health Supplies should allow a suitable lead time, of at least six months, within which to book energy prices.

The success of the new energy procurement strategy will depend, for a large part, on the continuous availability within Welsh Health Supplies of sufficient staff with appropriate expertise. Welsh Health Supplies should carry out a strategic review of its resource needs for energy procurement. The review should take into consideration the increasing financial risks in energy procurement, the consequences of not providing cover for staff absence or loss, and any move towards greater collaboration in energy procurement across the public sector in Wales.

Improved monitoring of consumption through metering offers potential benefits in terms of the procurement of energy, where more robust information on likely consumption patterns may deliver lower prices and improved information for bill checking, and the management of energy consumption. Only eight NHS trusts had developed specific systems for monitoring and targeting energy consumption. Welsh Health Supplies and Welsh Health Estates should evaluate the likely costs and benefits of the wider application of automated meter reading technology across NHS trusts in Wales, possibly on an all Wales basis, or even on a wider basis across the public sector in Wales. All NHS trusts should develop systems for monitoring energy consumption and use the information collected to target resources at potential energy-saving opportunities.

NHS trusts in Wales have made only limited progress towards meeting the Welsh Assembly Government’s energy consumption and efficiency targets. However, the appropriateness of these targets and the way they are measured are questionable. The Assembly Government’s Health and Social Care Department and Welsh Health Estates
should reconsider, in parallel with the revision of the UK-wide Energy Code for NHS buildings, the energy related targets for the NHS in Wales. In particular, they should:

a measure energy efficiency performance based on consumption by floor area, rather than by heated volume;

b not count reductions in carbon dioxide emissions from the procurement of green electricity towards the primary energy consumption target, as this reduces the incentive to achieve real reductions in consumption; and

c develop new targets for carbon dioxide emissions, on-site generation from combined heat and power and renewable energy sources, and procurement of green electricity from external sources.

v Trusts were required, by August 2005, to commit themselves to the development of an environmental management system, with most opting for the Green Dragon accreditation standard, on the basis that it offers a five level phased approach. Where trusts have adopted the Green Dragon standard, the Assembly Government’s Health and Social Care Department should clarify the minimum level of accreditation it regards as satisfactory and set a clear timetable for trusts to achieve this.

vi Staff, and to some extent patients, can make a significant contribution to improved energy efficiency through general housekeeping. All NHS trusts should re-examine the measures they take to encourage staff to use energy efficiently, building on the sorts of examples presented in this report. In particular, we recommend that all trusts explore ways of providing financial incentives to individual departments to save energy.

vii Because of their small size and relatively low levels of energy expenditure, several trusts apply only limited priority and resources to energy management. However, in the light of increasing energy prices, all NHS trusts should review their commitment to energy management. We also recommend that trusts seek opportunities to collaborate with other trusts, or other public bodies in their locality, and that Welsh Health Estates should work with other central organisations, such as the Welsh Local Government Association or the Higher Education Funding Council for Wales, to facilitate such collaboration.

viii External reviews and energy surveys in the past three years have identified opportunities for some potentially significant savings. Rising energy prices will have resulted in a shorter payback on the investment required to deliver these savings. The Assembly Government’s Health and Social Care Department, with assistance from Welsh Health Estates, should challenge NHS trusts on the extent of the action they have taken in response to external reviews and energy surveys.

ix On-site energy generation, through combined heat and power or renewable technologies, offers scope for energy savings, although financial constraints have limited their installation in recent years. Welsh Health Estates should collaborate with the Carbon Trust to review current, and potential future, applications of combined heat and power across NHS trusts in Wales, as well as renewable energy technologies. They should encourage trusts to develop business
Major capital projects provide opportunities to improve energy efficiency. **Trusts should involve their energy management lead in the planning and design of such projects.** Where the Assembly Government’s Health and Social Care Department awards capital funding for new build or major refurbishment projects, it should take steps to ensure that the energy efficiency measures set out at the design stage have been implemented.

The Assembly Government’s Health and Social Care Department has now set aside specific funding for energy-saving measures as part of its Capital Investment Programme. **The Department should establish clear energy management related criteria, which trusts would be expected to meet in order to qualify for this funding.**
Part 1: NHS trusts in Wales have experienced mixed fortunes in the prices they have paid for energy in recent years, and increasingly volatile energy prices have led to a more flexible approach to procurement.

1.1 In 2004/2005, the NHS trusts in Wales consumed more than 2.8 million gigajoules of energy across their estates, at a total cost of almost £20 million (Figure 1). Procurement of energy is more complicated than the procurement of general goods and requires specialist expertise. Electricity and gas are volatile traded commodities with market prices subject to significant fluctuation (more than 10 per cent in a single day, in extreme cases). The time at which price offers are accepted is therefore a critical factor in determining final costs. Energy buyers also have to consider issues similar to those faced when taking out a mortgage, such as how long to fix prices for (the longer the fixed period the less competitive the short term price is likely to be). To assist their decision making, energy buyers need to be well informed of projected energy price trends.

1.2 This part of the report examines:

- arrangements for the procurement of electricity and gas on behalf of the 15 NHS trusts in Wales and the factors that influence these arrangements;
- the extent to which trusts have secured competitive prices for electricity and gas since 2001; and
- the revised strategy for the procurement of electricity and gas, and its potential to secure value for money over the longer term.

**Figure 1. Energy consumption, expenditure, and carbon dioxide emissions across the NHS trust estate in Wales during 2004/2005**

<table>
<thead>
<tr>
<th>Energy type</th>
<th>Energy consumption (million gigajoules)</th>
<th>Carbon dioxide emissions (thousand tonnes)</th>
<th>Costs (£ millions, inclusive of VAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>0.8</td>
<td>71</td>
<td>8.6</td>
</tr>
<tr>
<td>Gas</td>
<td>1.7</td>
<td>95</td>
<td>9.2</td>
</tr>
<tr>
<td>Oil</td>
<td>0.2</td>
<td>16</td>
<td>1.4</td>
</tr>
<tr>
<td>Local steam and hot water</td>
<td>0.2</td>
<td>12</td>
<td>0.4</td>
</tr>
<tr>
<td>Total energy</td>
<td>2.8</td>
<td>194</td>
<td>19.6</td>
</tr>
</tbody>
</table>

**Notes**

a. These figures do not include Welsh Ambulance Services NHS Trust buildings, for which robust consumption data is not available, or the consumption of fuel for vehicles.

b. Local steam and hot water denotes supplies generated on one hospital site but supplied to another site within the same trust, or purchased back from a private company as part of contract energy management arrangements. Similar arrangements apply to some of the electricity consumed, although this is aggregated with the figures shown for electricity above.

Source: NHS Estates and Facilities Performance Management System (EFPMS) data
Welsh Health Supplies administers the procurement of most of the electricity and gas used by NHS trusts in Wales

1.3 Welsh Health Supplies administers the procurement of around 97 per cent of the electricity and 90 per cent of the gas purchased by NHS trusts in Wales. Centralised energy procurement is used increasingly in the public sector, reflecting the lack of specialist expertise within individual organisations, potential efficiencies in the procurement process and, to a limited extent, increased purchasing power. For example, the Purchasing and Supply Agency undertakes energy procurement on behalf of much of the NHS in England, and the Office of Government Commerce provides an energy procurement service to a range of public bodies across the United Kingdom. Purchasing consortia also serve many of the local authorities and higher education institutions in Wales.

1.4 During the conduct of electricity and gas procurement exercises, Welsh Health Supplies and NHS trusts work together closely (Figure 2). Welsh Health Supplies acts as the contracting authority, managing the procurement process in accordance with European Union procurement regulations and securing the best possible deal on behalf of the trusts. However, it is the trusts that are ultimately responsible for decisions on overall procurement strategy and the acceptance of price offers. Welsh Health Supplies also manages the contracts during their lifetime and helps resolve any problems between trusts and their suppliers.

1.5 Welsh Health Supplies’ energy procurement team comprises three staff, each with responsibility for the procurement of electricity, gas or oil, overseen by a utilities team leader, with additional support from a contracts manager. Our consultants described the team as well informed buyers with a considerable understanding of energy markets and established methods for procurement, although two of the most experienced members of the team have since retired.

1.6 The advice and guidance provided to trusts by Welsh Health Supplies is based on advice received from a range of sources, including independent energy market analysts and energy suppliers. Welsh Health Supplies is also a member of the Major Energy Users Council, which provides information to energy buyers across the United Kingdom and a forum for sharing experiences. Access to this type of knowledge is fundamental to sustained success in energy procurement, and it is unlikely that any individual NHS trust could commit the resources to secure it.

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4 Welsh Health Supplies is managed by Bro Morgannwg NHS Trust, although funding for its four core contracting services (energy, facilities, pharmacy, medical and surgical) is top-sliced from the NHS Wales budget and NHS trusts in Wales do not pay for the services it provides.

5 At four main sites - Neath Port Talbot Hospital (Bro Morgannwg NHS Trust), Llandough Hospital (Cardiff and Vale NHS Trust), Abergele Hospital (Conwy & Denbighshire NHS Trust) and Prince Charles Hospital (North Glamorgan NHS Trust) - some or all of the energy consumed is purchased as part of local contract energy management or Private Finance Initiative arrangements.
Figure 2. Overview of the competitive tender process for electricity and gas undertaken by Welsh Health Supplies on behalf of NHS trusts in Wales

Note

Welsh Health Supplies takes account of the views of NHS trusts and draws on external advice from market analysts, other energy buyers and energy suppliers themselves at all stages of this process, pre and post contract award.

Source: Welsh Health Supplies
Welsh Health Supplies procures gas and electricity either by competitive tender or contract extension

1.7 Welsh Health Supplies procures gas in a single contract round, while electricity is separated into two contract rounds based on the level of demand at individual sites (Figure 3). Although tendered collectively, the sites included in each contract round have historically received individual prices from suppliers, based on their consumption profiles, and trusts have been able to choose different suppliers for different sites, preventing cross-subsidisation. Therefore, while there have been economies of scale through central administration of the procurement process, the total volume of demand across the 15 NHS trusts in Wales has not directly resulted in lower prices. However, Welsh Health Supplies has been in a stronger position than individual trusts to negotiate the terms and conditions of contracts.

1.8 Purchasing within a volatile market is inevitably risky and, since 2001, Welsh Health Supplies has made frequent use of the opportunity to extend its existing contracts, where permitted to do so by European Union procurement regulations, rather than undertaking regular competitive tenders (Appendix 2). Subject to agreement with suppliers and the NHS trusts, prices for contract extensions could be booked at any time in advance of the period to which they related. Welsh Health Supplies monitored market price trends and, on the basis of advice from external market analysts, recommended the time at which prices should be booked, either to take advantage of markedly low prices or to lock out the risk of future price rises.

1.9 Welsh Health Supplies told us that it sought to obtain the best prices available for trusts, while minimising the risks faced. The use of contract extensions has been consistent with this low risk approach, enabling greater flexibility to

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**Figure 3. Profile of the gas and electricity contracts procured by Welsh Health Supplies**

<table>
<thead>
<tr>
<th>Contract features</th>
<th>Gas</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High demand sites</td>
<td>Low demand sites</td>
</tr>
<tr>
<td>Number of NHS Trust sites included (as at May 2005)</td>
<td>392</td>
<td>56</td>
</tr>
<tr>
<td>Number of suppliers servicing the contracts</td>
<td>Three suppliers</td>
<td>One supplier from April 2003 (previously two suppliers)</td>
</tr>
<tr>
<td>Approximate annual value of contracts (as at May 2005 (excluding VAT))</td>
<td>£7.9 million</td>
<td>£7.5 million</td>
</tr>
<tr>
<td>Description</td>
<td>Includes a combination of firm and interruptible gas supplies(^a)</td>
<td>The maximum electrical demand at these sites will exceed 100 kilowatts(^b)</td>
</tr>
<tr>
<td>Maximum electrical demand</td>
<td>The maximum electrical demand at these sites will exceed 100 kilowatts(^b)</td>
<td>The maximum electrical demand does not exceed 100 kilowatts</td>
</tr>
</tbody>
</table>

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**Notes**

\(^a\) Interruptible gas supplies can be cut off temporarily in order to meet the needs of firm supply customers, but consequently are cheaper. There are currently 13 sites with interruptible gas supplies, although these account for around 40 to 45 per cent of the total gas consumption.

\(^b\) These sites have automated half hourly meter readings and consumption could potentially be charged at a different rate in each half hour, reflecting fluctuations in national demand. However, NHS trusts have opted for a two rate-day and night pricing structure.

Source: Wales Audit Office analysis of Welsh Health Supplies’ records.

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respond quickly to market movements and book future prices at short notice. It has also helped avoid the uncertainty and administration associated with changing supplier, and the challenge of stimulating interest from suppliers, for whom short-term multiple site contracts can be particularly unattractive. Our consultants explained that some organisations were receiving only two offers for new contracts, usually from the incumbent supplier and one other.

1.10 Following competitive tenders, new contracts have been let for gas (from September 2004) and for high demand electricity (from April 2005). The gas tender attracted offers from four suppliers, three of which were existing NHS trust suppliers prior to September 2004. The high demand electricity tender also attracted offers from four suppliers, but only one was an existing NHS trust supplier.

Not all energy expenditure is influenced through procurement and price is not the only consideration in selecting energy suppliers

1.11 Electricity and gas costs include a range of components, some of which are fixed regulated charges regardless of the choice of supplier, being based on geographical location or total consumption. The introduction of the climate change levy, from April 2001, also added 0.43 pence per kilowatt hour to electricity costs and 0.15 pence per kilowatt hour to gas costs, although some sites can receive full or partial exemption from the levy (Appendix 3).

1.12 A procurement exercise only influences the unit energy cost, reflecting market prices at the time of tender or contract extension, and any supplier margin and administration costs. These elements might typically comprise 70 per cent of total costs before VAT for high demand electricity, 45 per cent of costs for low demand electricity, and 75 per cent of costs for gas, although the supplier margin and administration elements typically represent less than 3 per cent of total costs.

1.13 Price is an important, but not the only, consideration in selecting energy suppliers (Case Study A). Three NHS trusts rated continuity of service, and two trusts rated accurate and regular invoicing, as more important than price. Welsh Health Supplies explained that suppliers’ performance in these aspects is variable. From 2006, new European tendering rules will require Welsh Health Supplies to publish the weightings attached to criteria, such as service quality, when evaluating bids, although these criteria have always been an informal part of the decision making process.

Case Study A. Consideration of factors other than price in selecting energy suppliers

The successful supplier for the new five year high demand electricity contract from April 2005 did not offer the lowest price which, if taken up, could have saved around £90,000 per annum across the 15 NHS trusts. However, Welsh Health Supplies and the NHS trusts, following advice from external market analysts and other energy buyers, judged that the successful supplier had a better service record, and was also able to guarantee renewable ‘green’ electricity for the first three years of the contract at a lower premium than the other potential suppliers.

Source: Wales Audit Office analysis of Welsh Health Supplies’ records
Procurement of renewable ‘green’ electricity has increased in recent years

1.14 Renewable ‘green’ electricity sources include wind power, wave/tidal power, solar photovoltaics, small scale hydro generation and biomass (from forestry or crops). These result in zero carbon emissions or, in the case of biomass, are carbon neutral as the carbon emitted when burnt is equivalent to that absorbed during growth. These sources of supply have historically attracted a price premium in comparison to traditional ‘brown’ supplies from gas, coal or nuclear power stations, although they are exempt from the climate change levy.

1.15 NHS trusts are responsible for deciding whether to purchase green electricity, depending on its availability from their chosen suppliers. All NHS trust sites on the high demand electricity contract have taken up the option of green supplies from 1 April 2005, at a premium of 0.385 pence per kilowatt hour but with exemption from the climate change levy (at 0.43 pence per kilowatt hour). However because some sites have full or partial exemption from the levy, regardless of the source of supply, the net additional cost of the green supply contract across the NHS trusts will be around £53,000 per annum. North West Wales NHS Trust also has a green electricity supply for all its sites on the low demand contract.

1.16 This take-up of green electricity will help NHS trusts achieve the target for a 15 per cent reduction in primary energy consumption, or an equivalent reduction in carbon dioxide emissions, by 2010. It also represents significant progress towards the Assembly Government’s desire that all electricity used in public buildings in Wales will be supplied from green sources by 2010.

NHS trusts were generally satisfied with the energy procurement service provided by Welsh Health Supplies

1.17 In almost all cases, NHS trusts rated the competitiveness of the prices obtained by Welsh Health Supplies, its provision of information on energy market price trends or to support decisions on the award of contracts, and assistance in resolving problems with energy suppliers, as good or excellent. Their only concerns related to the tight timescales available to evaluate price offers from suppliers. However these timescales are determined by market conditions affecting all energy buyers, with offers being commonly withdrawn if the wholesale market experiences more than a 1 per cent movement in price. Requests to hold prices for a longer period may simply result in suppliers building a premium into their offer to cover the risk of market movement. Quick decisions are therefore essential and, in some cases, trusts have had to make a decision to extend a contract in less than twenty four hours, without time to firmly assess the impact on their budgets.

1.18 Following approval by the NHS Wales Procurement Board, NHS trusts have changed their financial procedures to speed up decision making, by delegating responsibility for approval of energy contracts further down the management chain than is normal for contracts of this value. Welsh Health Supplies has also recently established an energy price risk management group to agree, in advance, target price thresholds for future periods, allowing it to take advantage of favourable market prices without needing to refer back to trusts.
NHS trusts have experienced mixed fortunes in the prices they have paid for energy in recent years.


1.19 The average prices paid by trusts for electricity and gas increased sharply for 2004/2005 (Figure 4). These increases reflect the upward trend in market prices since April 2004 (Figure 5).

1.20 Seven trusts reported that the increased prices for their gas and low demand electricity supplies, which took effect in the middle of the 2004/2005 financial year, had not been reflected in their energy budgets for that year. This is despite Welsh Health Supplies having warned trusts that prices were likely to increase, and means that resources may have had to be diverted from other areas to meet energy costs.

1.21 Further significant price increases are being experienced following the competitive tender for high demand electricity supplies from April 2005 and the extension of contracts for low demand electricity supplies from October 2005, reflecting rising market prices since January 2005. For example, the average energy cost and supplier margin for high demand supplies increased by 109 per cent, to 5.8 pence per kilowatt hour, for 2005/2006. Trusts can also expect further increases in gas costs for the 2005/2006 contract period, unless market prices fall back significantly from their current levels.

1.22 It is difficult reliably to compare the prices paid by NHS trusts with those paid by other organisations, because a site's consumption profile and the timing of any procurement exercise are critical factors in the aggregated unit prices used for comparison, and no two sites are the same. Furthermore, it is often impossible to separate out, from the all inclusive unit prices, the fixed elements that are not.

Figure 4: Average electricity and gas prices (pence per kilowatt hour) paid by NHS trusts in Wales since 2001

<table>
<thead>
<tr>
<th>Contract year</th>
<th>High demand electricity supplies</th>
<th>Low demand electricity supplies</th>
<th>Firm and interruptible gas supplies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Energy cost and supplier margin only</td>
<td>All inclusive price</td>
<td>All inclusive price</td>
</tr>
<tr>
<td>2004/2005</td>
<td>2.8</td>
<td>5.1</td>
<td>1.35</td>
</tr>
<tr>
<td>2003/2004</td>
<td>2.2</td>
<td>4.0</td>
<td>0.95</td>
</tr>
<tr>
<td>2002/2003</td>
<td>2.4</td>
<td>4.0</td>
<td>0.92</td>
</tr>
<tr>
<td>2001/2002</td>
<td>2.5</td>
<td>4.1</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Notes

a. Figures are based on those sites for which prices were available in each contract year, and exclude VAT, Climate Change Levy and any premiums paid for renewable 'green' electricity.

b. The contract year runs from April to March for high demand electricity, from October to September for low demand electricity, and from September to August for gas.

Source: Wales Audit Office analysis of Welsh Health Supplies' records
influenced by the procurement process, particularly in respect of gas and low demand electricity supplies (Appendix 3). As a result, Welsh Health Supplies explained that it had been unable to obtain reliable benchmarking data in the past, and had reservations about the meaningfulness of any such comparison.

1.23 Although it is not possible to draw any firm conclusions from their findings, we nevertheless asked our consultants to compare the average prices paid by NHS trusts for their gas and high demand electricity supplies against the prices paid by a range of other public and private sector organisations for which the consultants held energy pricing data, to identify the extent of any differences in pricing. Between April 2001 and March 2005, the prices paid by NHS trusts for the energy and supplier margin components of their electricity costs were, on average, five per cent higher. All inclusive gas prices between September 2001 and August 2004 were, on average, 6 per cent higher, although they were only 3 per cent higher when compared with other public sector organisations. Part of this difference will have been influenced by the fact that Wales has some of the highest gas transportation charges in the United Kingdom.

Sites with consistent levels of consumption generally attract lower prices

1.24 Consistency of consumption and the perceived reliability of a site’s consumption profile directly influence the final prices offered by suppliers. For example, baseload electricity (the level of consumption that remains consistent throughout the year at all times) attracts a lower price than residual electricity (to meet excess demand above the baseload). This is because suppliers need to balance their own energy purchases and sales on a daily basis.

Figure 5: Wholesale market prices for gas and electricity, 1 April 2003 to 21 September 2005
1.25 The accuracy of consumption data is not such a concern for high demand electricity supplies, where electronic half hourly meter readings are available. However, the best information available to potential suppliers of gas has been a monthly consumption profile based on figures reported by individual NHS trusts and, for suppliers of low demand electricity, projected annual consumption. Improved monitoring of consumption, possibly through the wider application of automated metering technology, would enable more robust data to be provided to suppliers and, as a result, may deliver more competitive prices. Our consultants advised that the difference between a credible and a poor set of data may be as much as 2 per cent of the total cost.

The timing of energy procurement is critical to the price obtained, and, in retrospect, Welsh Health Supplies has achieved both positive and negative results.

1.26 In determining when to seek prices for NHS trusts’ energy supplies, through competitive tender or contract extension, Welsh Health Supplies draws on advice from external market analysts. However, the outcomes of energy procurement decisions can only be judged retrospectively in the light of subsequent price movements which often confound the earlier predictions of these analysts.

1.27 Our consultants examined the timing of the various energy procurement exercises undertaken by Welsh Health Supplies between August 2000 and February 2004, prior to the more recent competitive tenders for new five year gas and high demand electricity contracts. They compared the position of the wholesale market at these times with the range in market prices over the 18 months prior to the start of each fixed price contract period (Appendix 2).

1.28 Overall performance is around the middle of the range, reflecting the low risk approach adopted by Welsh Health Supplies. However, there have been both positive and negative outcomes at different times. The use of contract extensions has also, in most cases, enabled Welsh Health Supplies to book future supplies when market prices have been at a similar or lower level than if it had adopted a calendar-based approach to procurement, completing a competitive tender between one and two months ahead of each contract renewal date.

1.29 The high demand electricity contract was extended between April 2002 and March 2003, with prices booked in December 2001. At that time, electricity prices were at their lowest point since April 2001 and market analysts were predicting increasing prices over the winter period. The decision to extend therefore made good sense while offering reduced costs compared with 2001/2002. However, the predicted price rises did not occur, with prices falling by a further 10 per cent between January 2002 and March 2002. Although the decision on the 2002/2003 contract had already been taken, Welsh Health Supplies took good advantage of these falling prices by booking in April 2002 a further year’s supply, from April 2003 to March 2004.

1.30 However, Welsh Health Supplies experienced mixed results in extending the high demand electricity contract for the period between April 2004 and March 2005. In February 2003, for commercial reasons, one of the two suppliers (Supplier one) offered an early opportunity to book particularly competitive prices for the 13 sites it supplied (Figure 6). This resulted in comparable prices between 2003/2004 and 2004/2005, although 10 sites took up the alternative offer of green electricity at additional cost.
1.31 Welsh Health Supplies also sought prices in March 2003 from the supplier of the other 44 high demand sites (Supplier two), but these appeared less favourable than the prices offered by the first supplier and would have resulted in price increases of between 6 and 12 per cent for individual sites. The advice at the time from external market analysts was that prices were likely to display an upwards trend between then and the contract renewal date of April 2004, meaning that organisations would be wise to book prices as early as possible if they could get a good deal. Welsh Health Supplies recommended that trusts should not accept these prices as, in its opinion, they did not represent a good deal at the time, given the apparent difference in the prices offered by the two suppliers. Welsh Health Supplies again sought prices for these 44 sites in July 2003, although the offer, which showed a marginal reduction on the March 2003 offer, was again rejected.

1.32 From July 2003 onwards, market prices continued to fluctuate, but there was a significant upwards trend, and Welsh Health Supplies eventually extended the contract on 20 November 2003. This followed advice from market analysts that the risk of prices going up even further outweighed the chance of any reductions, although this was not reflected in the subsequent price movements. By that point, the market price had risen by 19 per cent since July 2003 and, overall, the final 2004/2005 prices accepted for these 44 sites represented a 32 per cent increase on the prices paid for 2003/2004. Had the prices offered in March 2003 been accepted, we estimate that these 44 high demand sites would have saved around £650,000 in 2004/2005. In hindsight, Welsh Health Supplies has recognised that its perception of the prices originally offered by the second supplier was affected by the artificially low prices offered, for commercial reasons, by the first supplier.
1.33 The low demand electricity contract, for all trusts other than North West Wales, was extended on fixed prices between October 2002 and September 2004. Welsh Health Supplies achieved success by booking prices in June 2002 when the market price was 1.64 pence per kilowatt hour, compared to the price range of 1.5 to 2.0 pence per kilowatt hour in the 18 months prior to October 2002. Prices for the subsequent contract extension for all trusts, from October 2004 to September 2005, were booked in February 2004 when market prices reached their highest level for 12 months, contributing to a 25 per cent increase in the all inclusive prices for these sites. However, Welsh Health Supplies successfully avoided booking this electricity nearer to October 2004, when market prices would have been up to 45 per cent higher than in February 2004 (Figure 7).

1.34 Welsh Health Supplies also achieved success in its 2003/2004 gas contract extension. Following advice from market analysts, prices were booked in January 2003, well ahead of the contract renewal date in September 2003, when market prices would have been up to 13 per cent higher (Figure 8). Welsh Health Supplies estimated that the early decision to extend these contracts, which was justified because of the looming military action in Iraq and broadly comparable pricing with 2002/2003, saved NHS trusts in Wales up to £600,000 between September 2003 and August 2004.

Figure 7: The timing of the procurement of electricity for low demand sites for October 2004 to September 2005 and the market price trend for such contracts

Source: John Hall Associates
Welsh Health Supplies has changed its approach to energy procurement to secure better value for money over the longer term, although it is too early to judge the success of these arrangements.

1.35 In recent competitive tenders for the gas and high demand electricity contracts, running from September 2004 and April 2005 respectively, Welsh Health Supplies adopted a different approach in terms of the tender process, contract length and the method by which prices are agreed and reviewed over the contract term (Figure 9). These changes have the potential to deliver better value for money and broadly reflect a strategy that is increasingly being adopted by other large public and private sector energy buyers. The core purpose of the new strategy is to enable Welsh Health Supplies to maximise the flexibility it has to book future unit energy prices at a time, and for a period, of its choosing.

1.36 Prior to the new five-year contract, electricity suppliers refused to provide Welsh Health Supplies with an indication of the level of their supplier margin and administration charges, which were merged with the unit energy costs. As a result, it is not possible to demonstrate whether the new five-year contract has directly resulted in a reduction in these costs. Two of the three gas suppliers provided this information for 2003/2004, allowing comparison with the 2004-2009 contract for 93 sites. Of these sites, 63 saw a reduction in their supplier margin and administration costs in the 2004-2009 contract, two had identical costs for both periods and 28 sites had higher costs.
1.37 One of the main features of the new contracts is a more flexible approach to price setting, as an alternative to annual fixed prices. This option has been available for gas contracts for some time and our consultants explained that, over the longer term, it had yielded better results than annual fixed pricing. However, flexible pricing is less well established for electricity procurement, having only been available since April 2004. This type of electricity contract is only currently available to purchasers that consume in excess of 120 gigawatt hours per annum. It was therefore reliant on all NHS trusts in Wales agreeing to a single supplier across their high demand sites.

1.38 A competitive tender based on the supplier margin and administration elements of the total energy cost should allow a longer lead time to book the unit energy prices, which comprise the majority of the total costs. However, the tender processes undertaken by Welsh Health Supplies took longer than expected, largely as a result of the amount of pre-tender negotiation required with potential suppliers to establish the framework for these new style contracts. The new gas contract, from September 2004, was awarded at the end of July 2004, while the high demand electricity contract, from April 2005, was awarded at the end of February 2005. In each case, this left only one month within which to book the unit energy prices from the start of each contract period.

Figure 9: A comparison of Welsh Health Supplies’ old and new approaches to the procurement of gas and high demand electricity supplies

<table>
<thead>
<tr>
<th></th>
<th>Old approach</th>
<th>New approach</th>
<th>Potential benefits of the new approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tender process</td>
<td>Gas: Tenders evaluated on the all inclusive delivered price including</td>
<td>Tenders evaluated only on the supplier margin and administration costs.</td>
<td>The contract award could therefore occur well ahead of the contract start date, enabling successful contractors to undertake any administration relating to the establishment of the contract and minimising disruption.</td>
</tr>
<tr>
<td></td>
<td>transmission and metering costs.</td>
<td>For electricity, the margin and administration charges are the same across all sites.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electricity: Tenders evaluated on the combined energy cost, supplier margin</td>
<td></td>
<td>The energy cost element could then be booked at any point prior to the start of the contract term, helping avoid a situation where the tender exercise coincides with particularly high or volatile market prices.</td>
</tr>
<tr>
<td></td>
<td>and administration cost, but excluding other, regulated costs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract length</td>
<td>Gas: Two years with the possibility of extension for up to a further five</td>
<td>Five years with the option to extend for a further five years.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>years.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Electricity: One year with the possibility of extension for up to a further</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>three years.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price setting</td>
<td>Annual fixed prices.</td>
<td>Flexible pricing within which any amount of gas or electricity could be</td>
<td>Prices could be booked for a month at a time, or fixed for a longer period. This should allow NHS trusts to spread the risks and to take advantage of favourable market conditions as they occur.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bought for any period at any point.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The electricity contract also offers the option of purchasing the baseload</td>
<td>In theory, trusts could elect to take different approaches within the overall contract, dependent on the relative importance placed on budget control or price. For example, annual fixed prices give greater budgetary control but may not give the best price over the longer term.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>electricity at a different point to the residual electricity, thereby</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>spreading the risk.</td>
<td></td>
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</tbody>
</table>

Source: Wales Audit Office review of Welsh Health Supplies’ records
The new gas and high demand electricity contracts coincided with a significant increase in market prices

1.39 Independent market analysis early in 2004 suggested that gas prices were unlikely to rise significantly prior to completion of the tender exercise for the new gas contract, reducing the risk presented by not taking the option to extend the previous contract. Also, Welsh Health Supplies did not feel that there was a strong enough case to extend the previous contract given that market price movements in 2003 meant sites were likely to experience up to a 20 per cent increase in their all inclusive gas costs.

1.40 In hindsight, had the previous contract been extended and prices booked in January 2004 (eight months ahead of the start date, as was the case for the 2003/2004 extension), NHS trusts would have avoided the significant, although unexpected, increase in gas prices that occurred later in 2004, saving, we estimate, around £350,000 between September 2004 and August 2005.

1.41 The new gas contracts allow Welsh Health Supplies to spread risk in a volatile market through flexible purchasing. Prices with one of the three suppliers, supplying just over half the sites but only 8 per cent of total consumption, were fixed for a whole year at the start of August 2004. The majority of consumption, with the other two gas suppliers, was booked on a more flexible basis throughout the contract period, in blocks of between one and five months. This strategy was intended to spread the risk of buying a whole year’s gas supply when prices were high.

1.42 NHS trusts experienced an average 42 per cent increase in their all inclusive gas prices between 2003/2004 and 2004/2005. However, in the event, there was no significant difference in the extent of the increase experienced by those sites on annual fixed prices and those for which the gas was purchased on a more flexible basis.

1.43 The new five-year electricity contract for high demand sites, from April 2005, also coincided with rising prices, although in this case a competitive tender had to be carried out because there was no option to extend the previous contract. The new contract was not formalised until the end of February 2005 and, because Welsh Health Supplies expected the market price to fall back, it did not book prices until 18 March 2005. Again, in hindsight, it would have been better to purchase electricity as soon as possible, as market prices increased by 8 per cent in the first two weeks of March. In an attempt to minimise the risk of further increases, and allow sufficient time for the new contract to become established before having to make further purchasing decisions, Welsh Health Supplies purchased six months worth of electricity, to September 2005.

1.44 Prior to a decision being made on the successful supplier for the contract, Welsh Health Supplies had predicted an uplift in unit charges for electricity (excluding fixed/regulated costs) of between 30 per cent and 80 per cent, depending on the supplier sites were with previously. However, increasing market prices around the time of the initial tender award, and subsequently, are likely to result in an average increase of more than 100 per cent, with some sites experiencing an increase of up to 200 per cent.

The new energy contracts have implications for both Welsh Health Supplies and NHS trusts

1.45 Although annual fixed prices remain an option, the new style contracts have already resulted in more frequent purchasing decisions and
changes in price. This has implications for the decision making process between Welsh Health Supplies and the NHS trusts, and for the local management of budgets. Recognising this, Welsh Health Supplies has established an energy price risk management group, involving energy budget setters or holders from the NHS trusts. This group, which convened for the first of its quarterly meetings in July 2005, will review energy market trends and agree target prices and periods of purchase. The intention is that trusts will set their energy budgets accordingly and Welsh Health Supplies would seek to procure energy within the target price range. This approach will not necessarily result in the lowest prices but should deliver greater budget certainty, and it will be for the NHS trusts collectively to determine the relative importance of these factors.\(^6\)

1.46 To assist in monitoring the likely impact of changing market prices, Welsh Health Supplies has signed up to a web-based service that will track prices every 15 minutes and measure the likely impact of price movements on its contracts. This facility will help inform decision making, although there will also need to be clear protocols for reporting back to trusts, in light of subsequent market trends, the relative success of decisions that are taken.

1.47 Despite these developments, there is still a risk that, through absence of key staff from the workplace or other workload demands, Welsh Health Supplies could miss out on opportunities to purchase energy at favourable times. The fact that members of the Welsh Health Supplies energy procurement team have previously taken individual responsibility for the various energy contracts, rather than operating more flexibly across them, increases this risk. However, Welsh Health Supplies told us that it hopes its new longer term contracts will enable it to deploy its staff more flexibly across the different contracts.

1.48 As in many other parts of the NHS, staff recruitment and retention remain a challenge and present a further risk to the effective management of the new contracts. Welsh Health Supplies’ energy team has experienced particular staffing pressures over the past year as a result of long-term sickness absence and the retirement, in May 2005, of the member of staff responsible for electricity procurement. In seeking to fill this post, Welsh Health Supplies has been unable to find as experienced a replacement. The utilities team leader also retired in September 2005, although his replacement had been working alongside the utilities team prior to this retirement.

1.49 The energy procurement team is also responsible for administration of the NHS clinical waste management contract, while Welsh Health Supplies is taking on additional work in connection with the development of the NHS Healthcare Waste Strategy. Welsh Health Supplies explained that it would like also to place responsibility for this work within its energy procurement team, but the team’s limited staff resources has meant that the work has had to be distributed across other teams. The introduction of competitive procurement for water supplies, expected sometime in the near future, is also likely to generate additional work. In keeping with the objectives of the Assembly Government’s Making the Connections and Better Value Wales strategies, Value Wales is investigating the potential for wider collaboration in energy procurement across the Welsh public sector. This too could have resource implications for Welsh Health Supplies.

\(^6\) Trusts could adopt different target price parameters, with different purchasing decisions for different trusts within the overall contract framework. However, Welsh Health Supplies has indicated that, for ease of administration in the early stages of these contracts, it will be looking to agree a common approach across all trusts.
1.50 More frequent price changes also increase the need for trusts to carefully monitor their energy bills to ensure that they are being charged correctly. Our consultant’s examination of a sample of validated bills from 19 large hospital sites in Wales identified errors which, if replicated across the sector, suggest a possible overcharge of £59,500 in 2003/2004 (Appendix 4). Some of these errors, which Welsh Health Supplies considers to be common across the energy supply industry, arose from inconsistent unit prices or overlaps in the dates charged (Case Study B).

## Case Study B. Examples of errors identified in NHS trusts’ electricity and gas bills

**Bronllys Hospital (Powys Local Health Board)** – during negotiations over the extension of the gas contracts for September 2003 to August 2004, Welsh Health Supplies requested that the charges for three separate meters at Bronglais Hospital (Ceredigion and Mid Wales NHS Trust) be aggregated to give a single unit price for invoicing purposes. An administrative error meant that, in the revised pricing schedules, the same charge was also attributed to Bronllys Hospital. As a result, instead of being invoiced at the agreed rate of 1.0689 pence per kilowatt hour, Bronllys Hospital was charged 1.089 pence per kilowatt hour, resulting in an overpayment of £948 over the contract period.

**Morriston Hospital (Swansea NHS Trust)** – overlapping dates on two invoices mean that Morriston Hospital was charged twice for electricity consumed on 31 March 2003, at a cost of £1,124. The Trust is now pursuing a refund from the relevant supplier.

Welsh Health Supplies has used electronic auctions to deliver procurement savings, but does not believe that the approach is best suited to its energy contracts.

1.51 Welsh Health Supplies conducts all tenders electronically via its website, and has successfully used on-line auctions for the procurement of some products, notably the supply of blood-collection bottles. However, our consultants explained that electronic auctions for energy procurement have not always proved successful and Welsh Health Supplies has rejected this approach because of the complexity of its energy contracts and the number of variables involved. Welsh Health Supplies also questioned whether the savings quoted by certain organisations that have used electronic auctions are more a reflection of the trend in market prices at the time, or the robustness of organisations’ previous tendering processes, than like for like savings delivered by this approach.

1.52 Welsh Health Supplies has purchased an electronic auction software package with an unlimited licence. This should help avoid significant additional development costs were it to revisit the use of electronic auctions in any future energy related tenders.
Part 2: NHS trusts are struggling to reduce primary energy consumption and need to further improve energy efficiency

2.1 In November 2001, the Auditor General for Wales reported on the progress made by the NHS in Wales towards the United Kingdom wide NHS target for a 20 per cent reduction in primary energy consumption between 1990/1991 and 1999/2000. Against this target the NHS in Wales achieved a 9 per cent reduction. The report recommended that NHS trusts, “give priority to energy-saving measures, from simply promoting energy consumption awareness to investing in energy efficient plant”.

2.2 This part of our report examines the progress NHS trusts in Wales are making towards their latest energy targets and the factors influencing improvement, including:

- the extent of corporate commitment to energy management;
- the potential to reduce energy consumption, given appropriate priority and investment; and
- the financial resources available for investment in energy saving measures.

The achievement of energy consumption and efficiency targets will be a major challenge

2.3 Welsh Health Circulars (2000) 50 and (2002) 116 set out the key targets for the NHS in Wales relating to energy consumption and efficiency (Figure 10). Welsh Health Estates monitors progress towards these targets annually. The targets also form part of the balanced scorecard performance management regime for NHS trusts. In October 2004, the Assembly Government’s Health and Social Care Department wrote to NHS trusts to remind them of the importance placed on achieving the targets.

Figure 10: Energy consumption and efficiency targets for the NHS in Wales

<table>
<thead>
<tr>
<th>Energy Consumption Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 15 per cent reduction in primary energy consumption across the NHS trusts in Wales between March 2000 and March 2010 (or an equivalent reduction in carbon dioxide emissions).</td>
</tr>
<tr>
<td>Measurement of primary energy consumption is based on energy consumed that is purchased from external suppliers or as part of contract energy management arrangements, and applies a multiplying factor to the electrical consumption to account for inefficiencies or losses in the generation of electricity and its transmission and distribution to individual sites. These factors have recently been revised by the Department for Environment, Food and Rural Affairs and now stand at 2.68 for the 1999–00 base year and 2.6 for 2004/2005. Electricity sourced externally on renewable ‘green’ tariffs is counted towards primary energy consumption, but not towards the equivalent carbon dioxide emissions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy Efficiency Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of the NHS estate, 75 per cent to be in EstateCode Category B for energy performance (annual consumption of less than 65 gigajoules per 100 cubic metres of heated space) by 2005, and 95 per cent by 2008.</td>
</tr>
<tr>
<td>A separate target of less than 55 gigajoules per 100 cubic metres is in place for all new buildings. Existing buildings were set the target of 65 gigajoules of energy per 100 cubic metres, but with no specific deadline for achieving this. These targets are based on the net energy consumption of sites, taking account of any additional energy consumed that is generated on site by combined heat and power systems. In this case, no multiplying factors are applied to the electrical consumption.</td>
</tr>
</tbody>
</table>

Note

Progress against these targets is measured only for main hospital sites and, in the case of the energy efficiency targets, relates only to the essential estate (that deemed to have a long term health use of five years or more). The energy efficiency targets relate to individual NHS trusts, but the primary energy target is an all Wales target based on the aggregate consumption across the trusts.


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* Auditor General for Wales report, Managing the Estate of the National Health Service in Wales, November 2001.
Primary energy consumption has increased by 0.6 per cent since 1999/2000

2.4 Overall, primary energy consumption by NHS trusts increased by 0.6 per cent between 1999/2000 and 2004/2005, although there was a reduction of 1.9 per cent between 2003/2004 and 2004/2005, due in large part to the sell off, by Pembrokeshire and Derwen NHS Trust, of the majority of its St David’s Hospital, Carmarthen site. However, Welsh Health Estates has reported that net energy consumption fell by around 5 per cent between 1999/2000 and 2004/2005. This reflects a trend of decreasing fossil fuel consumption but increasing electrical consumption, which contributes disproportionately to the primary energy figures. Despite some rationalisation of the estate, the overall increase in primary energy consumption also needs to be set against an 8 per cent increase in heated volume across the main hospital sites used for comparison, since 1999/2000.

2.5 Carbon dioxide emissions fell by around 5 per cent between 1999/2000 and 2004/2005, largely because electricity sourced externally on renewable ‘green’ tariffs is not counted when calculating carbon dioxide emissions. Green electricity has now been guaranteed until 2008 for the main hospital sites in Wales. Assuming that these sites remain on green electricity supplies through to 2010, this should enable trusts to achieve the 2010 primary energy, or equivalent carbon emission, reduction target. However, enabling trusts to meet this target through the procurement of green electricity reduces the incentive to achieve real reductions in energy consumption. Take-up of green electricity will also not impact on the energy efficiency targets which are based on net consumption regardless of the energy source.

Energy efficiency has improved, although significant further progress is needed if the energy efficiency targets are to be met

2.6 NHS trusts in Wales consumed an average 57 gigajoules of energy per 100 cubic metres in 2004/2005, although there is significant variation in the performance of individual trusts (Figure 11). This represents an improvement from an average 64 gigajoules per 100 cubic metres in 2001/2002. Collectively, in 2004/2005, NHS trusts in Wales consumed an average 57 gigajoules of energy per 100 cubic metres in 2004/2005, although there is significant variation in the performance of individual trusts (Figure 11). This represents an improvement from an average 64 gigajoules per 100 cubic metres in 2001/2002. Collectively, in 2004/2005,

Figure 11: Energy efficiency performance of NHS trusts in Wales, 2004/2005

<table>
<thead>
<tr>
<th>Estate Code Category</th>
<th>Average energy efficiency performance–main hospital sites (GJ/100m³)</th>
<th>Percentage of total estate in Category B (&lt;65GJ/100m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bro Morgannwg</td>
<td>49</td>
<td>47</td>
</tr>
<tr>
<td>Cardiff and Vale</td>
<td>48</td>
<td>97</td>
</tr>
<tr>
<td>Carmarthenshire</td>
<td>64</td>
<td>96</td>
</tr>
<tr>
<td>Ceredigion &amp; Mid Wales</td>
<td>66</td>
<td>16</td>
</tr>
<tr>
<td>Conwy &amp; Denbighshire</td>
<td>58</td>
<td>91</td>
</tr>
<tr>
<td>Gwent Healthcare</td>
<td>64</td>
<td>50</td>
</tr>
<tr>
<td>North East Wales</td>
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<td>27</td>
</tr>
<tr>
<td>North Glamorgan</td>
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<td>100</td>
</tr>
<tr>
<td>North West Wales</td>
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<td>96</td>
</tr>
<tr>
<td>Pembrokeshire &amp; Derwen</td>
<td>71</td>
<td>34</td>
</tr>
<tr>
<td>Powys Local Health Board</td>
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<td>91</td>
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<tr>
<td>Swansea</td>
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<td>83</td>
</tr>
<tr>
<td>Velindre</td>
<td>73</td>
<td>57</td>
</tr>
<tr>
<td>All Wales Average</td>
<td>57</td>
<td>79</td>
</tr>
</tbody>
</table>

Note
Robust consumption figures are not available for the Welsh Ambulance Services NHS Trust.

Source: NHS Estates and Facilities Performance Management System (EFPMS) data
the NHS trusts in Wales met the EstateCode target of 75 per cent of the estate in EstateCode category B by 2005, although five trusts were still well short of this mark and will need to improve their energy efficiency performance significantly to meet the target of 95 per cent by 2008. Swansea NHS Trust, which recorded the highest average energy efficiency performance, expressed doubts about its ability to meet the EstateCode targets, due in particular to ever increasing service demands at Morriston Hospital. This site comprises 43 per cent of the Trust’s heated volume but recorded consumption of almost 87 gigajoules per 100 cubic metres in 2004/2005.

2.7 Estates rationalisation can lead to improved energy efficiency. For example, North East Wales NHS Trust has closed Meadowslea and Dobshill community hospitals which were its worst sites in terms of energy performance. Similarly, Bro Morgannwg NHS Trust’s energy performance has improved in recent years as a result of the closure of Neath General, Port Talbot and Hensol Hospitals, while the new Neath Port Talbot Hospital, which now accounts for one-third of the Trust’s total heated volume, recorded energy consumption of just 31 gigajoules per 100 cubic metres in 2004/2005. However, not all NHS trusts have benefited in this way, and estates managers in two trusts noted that uncertainties over the long term future of the estate were affecting their ability to plan any major energy efficiency related investment.

Service and other pressures make the targets for energy consumption and efficiency particularly challenging

2.8 We asked NHS trusts about the factors limiting their capacity to reduce energy consumption. The majority cited increased service delivery (in terms of the range of activity, hours of provision or application of modern electronic technologies), use of information technology and demand for air conditioning as significant limiting factors, although the age of the estate and the extent of backlog maintenance were also considered to be having a significant impact in at least six trusts (Figure 12). Although some demand for air conditioning is driven by clinical needs, trusts commented on the increasing demand for comfort cooling across all areas. In an effort to control this, Cardiff and Vale NHS Trust was the first Trust to introduce a comfort cooling policy.

Figure 12: Factors limiting NHS trusts’ capacity to reduce energy consumption

<table>
<thead>
<tr>
<th>Factor</th>
<th>Number of trusts reporting this as having a significant impact</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased demand for air conditioning</td>
<td>11</td>
<td>Carmarthenshire NHS Trust reported that the number of air conditioning units increased by 10 per cent in 2003/2004.</td>
</tr>
<tr>
<td>Increased service delivery</td>
<td>10</td>
<td>Diagnostic activity levels involving CT scans or X-rays increased by 4 per cent between 2000 and 2004.</td>
</tr>
<tr>
<td>Increased use of information technology</td>
<td>10</td>
<td>The number of computers in Cardiff and Vale NHS Trust increased by an estimated 50 per cent between 2001/2002 and 2003/2004, equivalent to 1,700 new machines.</td>
</tr>
<tr>
<td>The extent of backlog maintenance</td>
<td>8</td>
<td>Backlog maintenance costs across the NHS estate in Wales total approximately £470 million.</td>
</tr>
<tr>
<td>The age of the estate</td>
<td>6</td>
<td>24 per cent of the NHS Wales estate still dates from before 1948.</td>
</tr>
</tbody>
</table>

Source: Wales Audit Office survey of NHS trusts in Wales and NHS Estates and Facilities Performance Management System data
There are concerns about the reliability of the energy performance data provided by trusts, while the current energy consumption and efficiency targets may no longer be appropriate.

2.9 Welsh Health Estates has expressed some concern about the reliability and consistency of energy consumption reporting from year to year by a number of trusts and this may affect the year on year trends reported. Although Welsh Health Estates attempts to validate the data received annually from trusts, its capacity to do this is limited and it focuses on questioning any unusual patterns, such as significant changes in trusts’ consumption. Our own analysis of the data for 2004/2005 identified a range of anomalies relating either to the consumption data provided for certain sites or the status of sites in terms of the supply of green or brown electricity from external suppliers. Welsh Health Estates has addressed these issues in its final analysis of the data for 2004/2005, but recognises that there may be other discrepancies that it has been unable to identify.

2.10 The energy targets for the NHS in Wales are expressed in gigajoules, whereas energy consumption is generally billed and monitored by trusts in kilowatt hours (one gigajoule equals 278 kilowatt hours). Conversion between these units could lead to confusion. The measurement of energy efficiency by heated volume is also questionable, as it:

- limits the potential for comparison with other sectors, where performance is generally measured by floor area;
- masks the impact of high ceilings, which are among the most significant causes of poor energy efficiency; and
- is the only estates indicator that uses a heated volume measure, making it costly to collate and prone to error.

2.11 These concerns were highlighted in the consultant’s report from a joint Carbon Trust and Welsh Health Estates project within Gwent Healthcare NHS Trust (Appendix 5), which also criticised the focus on primary rather than net energy consumption. In addition, the report recommended that Welsh Health Estates develop a carbon intensity measure, now reflected in its annual Estate Condition and Performance Report as kilogrammes of carbon dioxide emitted per kilowatt hour of energy consumed. It also recommended the development of a consumption measure to reflect trusts’ relative activity rates, although this is yet to be implemented.

2.12 The energy targets are also out of step with the increasing international focus on carbon emissions and renewable energy rather than absolute consumption. The UK Government’s Review of the Climate Change Programme suggested two new targets of 10 per cent of electricity to be produced from renewable sources by 31 March 2008 and 15 per cent of electricity to be provided from good quality combined heat and power by 2010. Meanwhile, the Assembly Government’s Sustainable Development Action Plan included in its top ten actions the aim that all Assembly Government buildings will, by 2010, be exclusively using renewable electricity, procured from external suppliers or generated on-site through the application of renewable technologies or combined heat and power. The Action Plan states a desire to move towards a similar target for all public buildings in Wales. At a UK level, the Building Research Establishment, on behalf of the Department of Health, is rewriting the Energy Code for NHS buildings, with consideration being given to replacing the heated volume target with one that encourages reduced carbon emissions.
Corporate commitment to managing energy consumption is mixed

2.13 Six trusts considered that the low corporate priority given to energy management was an extremely significant barrier to improving energy efficiency (Appendix 6). This commitment could be demonstrated in various ways, including:

a regular consideration of energy performance by trust boards and senior management;

b the development of effective policies and strategies relating to energy matters;

c incorporation of energy management within a wider strategic commitment to environmental and sustainability issues;

d efforts to raise staff and patient awareness of energy efficiency issues; and

e the allocation of staff resources to energy management.

Board level interest in energy performance varies

2.14 Six of the fifteen trusts stated that energy performance was reported to the Trust Board annually or more frequently (each month in the case of North Glamorgan NHS Trust)8. Where energy performance is reported, this generally includes a range of information on consumption, carbon dioxide emissions and progress towards NHS energy targets. In two trusts, energy performance was never reported to the Trust Board, even though the estates departments were represented on the Boards.

Few NHS trusts had policy frameworks in place to support effective energy management

2.15 By September 2004, six trusts had an energy policy in place and a further five trusts had policies under development (Figure 13). Most existing policies had been written or reviewed, and approved by trust boards, in the previous two years. However, the policy in North East Wales NHS Trust dated from October 2000, prior to developments such as the introduction of the climate change levy, and was only endorsed at the estates department level. The Trust intends to develop a revised policy as part of the implementation of its wider environmental management system.

2.16 The development and publication of an energy policy should demonstrate the commitment of an organisation to effective energy management. However, despite having had energy policies approved by their trust boards, estates managers at two NHS trusts identified the low corporate priority given to energy management as an extremely significant barrier to improved energy efficiency.

2.17 There is no single model for an energy policy, the effectiveness of which is largely determined by the activity it stimulates. However, of the six policies developed:

a only three set out clear lines of responsibility for policy implementation;

b two made no clear commitment to regular reporting on progress in pursuit of the policy aims;

c just one made reference to specific measurable targets, although others commented on general goals;

8 In some cases, energy performance was reported to trust boards as part of the annual update of their estates strategies. For the purpose of our analysis, we have not counted this as, in years such as 2004 when estates strategies were not required to be updated, there would be no reporting on energy performance.
only one made any commitment to raising staff awareness; and

- none made any firm commitment to exploring low carbon energy sources.

2.18 Welsh Health Circular (2002) 116 required NHS trusts to submit annual action plans to Welsh Health Estates setting out how they intended to achieve the energy consumption and efficiency targets. The deadline for the first of these

Figure 13: Policy frameworks in support of energy management

<table>
<thead>
<tr>
<th>Trust Name</th>
<th>Energy expenditure 2004/2005 (£000s)</th>
<th>Energy policy</th>
<th>Energy action plan</th>
<th>Environmental policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bro Morgannwg</td>
<td>1,316</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Cardiff and Vale</td>
<td>3,908</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Carmarthenshire</td>
<td>1,057</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Ceredigion &amp; Mid Wales</td>
<td>356</td>
<td>H</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Conwy &amp; Denbighshire</td>
<td>1,379</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Gwent Healthcare</td>
<td>2,434</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>North East Wales</td>
<td>1,374</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>North Glamorgan</td>
<td>754</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>North West Wales</td>
<td>1,413</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Pembrokeshire &amp; Dyfed</td>
<td>637</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Powys Local Health Board</td>
<td>710</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Swansea</td>
<td>2,580</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Vale of Glamorgan</td>
<td>495</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Welsh Ambulance Services</td>
<td>Not available</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
</tbody>
</table>

Note
- G Developed and approved.
- H Under development at the time of our survey.

Source: Wales Audit Office survey of NHS trusts in Wales and NHS Estates and Facilities Performance Management System (EFPMS) data

plans was 31 March 2003 but, by September 2004, only nine of the fifteen trusts had developed such a plan, in some cases in advance of a formal energy policy. Welsh Health Estates has expressed concern about the robustness of some of these action plans, despite issuing guidance to trusts on their structure and content.

2.19 Welsh Health Circular (2002) 116 also required NHS trusts to develop environmental policies by April 2003. By the time of our survey, in September 2004, eleven trusts had developed such a policy, although a further three trusts had policies under development. Although not specifically required to have them, none of the trusts had developed an overarching sustainable development policy within which commitments to tackling carbon dioxide emissions might be expected to feature.

2.20 Welsh Health Circular (2002) 116 required NHS trusts to introduce environmental management systems. These are intended to reduce organisations’ impact on the environment through a process of continual performance improvement, including energy performance. The Circular provided no detail on the minimum standard expected of these systems, but there are various accreditation options available to trusts, most notably the ISO14001 and Green Dragon schemes (Figure 14).

2.21 Trusts were required to make a clear commitment, by August 2005, to establish these systems. At the time of our survey, Cardiff and Vale NHS Trust and Conwy & Denbighshire NHS Trust were already operating ISO14001 accredited systems, while Gwent Healthcare NHS Trust was working towards one. Most of the remaining trusts were seeking Green Dragon accreditation, or indicated that this was likely to be their preferred option, due to the phased nature of the scheme. For example, Bro Morgannwg NHS Trust is aiming for initial Green Dragon accreditation at Level 2, but with a time frame for Level 5 accreditation by December 2006.

Figure 14. The ISO14001 and Green Dragon environmental management systems

ISO14001
The ISO14001 international accreditation standard for environmental management systems comprises five core elements:

- Commitment – define an environmental policy and ensure commitment to the environment management system;
- Planning – to fulfil the environmental policy;
- Implementation – of the policy, objectives and targets;
- Measuring and Evaluation – of environmental performance; and
- Review and Continual Improvement – with the objective of improving environmental performance.

Green Dragon
Green Dragon is a stepped standard which recognises progress towards effective environmental management. There are five levels of accreditation, with Level 5 broadly equivalent to ISO14001:

- Level 1: Commitment to Environmental Responsibility;
- Level 2: Complying with Environmental Legislation;
- Level 3: Managing Environmental Impacts;
- Level 4: Environmental Management Programme; and
- Level 5: Continual Environmental Improvement.

Trusts have gone to varying lengths to raise awareness about energy efficiency issues among staff and patients

2.22 The 15 NHS trusts in Wales undertake a range of activities to raise awareness of energy efficiency among staff and members of the
public (Figure 15). The Welsh Ambulance Services NHS Trust, Velindre NHS Trust and Powys Local Health Board had not carried out any of the measures listed in the 18 months prior to our survey, although Velindre NHS Trust told us that it had more recently undertaken a publicity campaign as part of NHS Wales’ Environment Awareness Week. Swansea NHS Trust, which spent almost £2.6 million on energy in 2004/2005, reported that induction training on energy efficiency was the only method employed, despite recognising the lack of staff awareness as an extremely significant barrier to improving energy efficiency. The Trust is now reviewing other opportunities for awareness raising activity, including the possible development of an Environmental Steering Group.

2.23 In addition to the measures listed in Figure 15, North Glamorgan NHS Trust has introduced a staff suggestion award for energy efficiency, and reports on energy related issues to its Public Information Liaison Group. The Trust has also established an inter-departmental energy user group (Case Study C). Elsewhere, Cardiff and Vale NHS Trust has developed an energy information video presentation, which is displayed in public and circulation areas and on the patient television system.

2.24 Since the time of our survey, North West Wales NHS Trust has undertaken an energy awareness campaign led by the Trust Chairman as campaign director and supported by external consultants funded through the Carbon Trust and Welsh Health Estates. The lessons from the campaign will be disseminated across the NHS trusts in the form of an energy campaign toolkit. The campaign included:

a a series of energy walkabouts to take suggestions from staff on potential energy saving measures;

b the recruitment and training of more than 30 staff to act as local energy champions and as ambassadors for the campaign in their departments or areas;

c presentations to members of the Trust Board and senior management; and

d targeted training for catering staff.

2.25 One of the most significant barriers to improved staff awareness is that budgets to meet energy costs are not devolved to individual sites or departments (Appendix 6). Therefore, there is no clear incentive for staff to save energy. Although devolved budgeting is unlikely to be practical without a significant increase in sub-metering to measure local consumption, and the costs of administering devolved budgets may outweigh the benefits, trusts should at least explore the possibility of incorporating energy consumption into their internal performance management systems.

Figure 15. The key measures taken by NHS trusts to raise staff and public awareness of energy efficiency issues between April 2003 and September 2004

<table>
<thead>
<tr>
<th>Measure</th>
<th>Number of trusts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaflet or poster campaigns</td>
<td>9</td>
</tr>
<tr>
<td>Induction training on energy efficiency</td>
<td>7</td>
</tr>
<tr>
<td>Coverage in Trust Annual Report</td>
<td>6</td>
</tr>
<tr>
<td>Cross-departmental energy committee</td>
<td>6</td>
</tr>
<tr>
<td>Special events, eg energy days</td>
<td>6</td>
</tr>
<tr>
<td>Coverage on Trust website</td>
<td>4</td>
</tr>
<tr>
<td>Appointment of local energy champions</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Wales Audit Office survey of NHS trusts in Wales
The time and expertise devoted to energy management is limited in many trusts but support is available through Welsh Health Estates and, increasingly, from the Carbon Trust in Wales.

2.26 On average, trusts rated a lack of staff time as a more significant barrier to improved energy efficiency than a lack of technical skills or information on potential energy-saving opportunities (Appendix 6). Depending on its energy consumption profile, where an organisation spends more than £1 million annually on energy, a full-time energy manager position may prove to be self-financing through the energy savings delivered. However, to be effective, it is important that such a post is supported by a strategic commitment to improve and to invest in energy saving measures, and that the post holder is able to focus significant attention on delivering energy savings, relative to other tasks, such as energy procurement or bill checking.

2.27 Of the nine NHS trusts with annual energy expenditure of £1 million or more in 2004/2005, four (Bro Morgannwg, Cardiff and Vale, Conwy & Denbighshire, and Swansea) had established an energy manager post, although a further two trusts (Gwent Healthcare and Pontypridd & Rhondda) employed estates officers who devoted more than 70 per cent of their time to energy management. In Carmarthenshire NHS Trust, the Environmental Officer spent around 30 per cent of their time on energy management, specifically on awareness raising campaigns; and in North West Wales NHS Trust, energy management responsibilities were spread across eight estates officers, each devoting 15 per cent of their time to energy management, although the Trust has since employed a full-time environmental/energy manager. North East Wales NHS Trust did not have a substantive post responsible for energy management, although this is under review.

2.28 In five of the six trusts with annual energy expenditure of less than £1 million, no individual spent more than 15 per cent of their time on energy management. The exception is North Glamorgan NHS Trust, which has an energy manager spending about 65 per cent of his time on energy management duties, and an environmental officer responsible for awareness campaigns and training.

2.29 Welsh Health Estates has a service level agreement with the Assembly Government to provide to NHS Wales a full range of technical and professional estates policy guidance. Five NHS trusts rated the energy management support provided by Welsh Health Estates as very good, seven as good, two as average and
one as poor. The five trusts rating support as very good included four of the five smallest trusts in terms of energy expenditure where, at the time of our survey, no individual committed more than 15 per cent of their time to energy management. The more positive response from these trusts could therefore reflect a greater reliance on the support provided by Welsh Health Estates.

2.30 The emergence of the Carbon Trust in Wales offers a complementary source of energy management support for trusts, through the provision of on-site technical surveys and advice. Welsh Health Estates and the Carbon Trust have been working together closely in the establishment and roll-out of their NHS energy efficiency project (Appendix 5), and the development of an energy campaign toolkit for trusts. The Carbon Trust is also represented on the recently established Welsh Health Environmental Forum, and its energy subgroup. This forum provides an opportunity for trusts to discuss common problems and share good practice, although Welsh Health Estates considers that some trusts are more actively involved than others.

There is the potential to reduce energy consumption, given appropriate priority and investment

Energy surveys have identified the potential to reduce consumption and improve efficiency

2.31 The joint carbon management project between Welsh Health Estates and the Carbon Trust in Wales estimated that, if Gwent Healthcare NHS Trust was typical of the rest of the NHS in Wales, an additional capital investment of £3.3 million, alongside general improvements in energy management procedures, would be required to achieve the target of a 15 per cent reduction in primary energy consumption (Appendix 5). Once achieved, this reduction in consumption was estimated to yield annual financial savings of around £2.2 million, at 2002/2003 prices.

2.32 Our consultant reviewed a random selection of ten recent energy surveys at sites across seven NHS trusts. These identified potential energy savings worth £569,000 per annum, and an annual reduction in carbon dioxide emissions of 6,400 tonnes, for an initial outlay of £1.1 million (Figure 16), including some measures that could be carried out at no financial cost.

2.33 Overall, the potential payback periods for each site ranged from five months to more than ten years. However, two trusts explained that, following further investigation, some of the measures recommended by their energy surveys proved not to be viable.

2.34 Our questionnaire survey of NHS trusts also identified scope for the wider application of various energy efficiency measures, although further local survey work would be required to confirm whether these would be practical or cost effective. For example:

- five trusts had not introduced any condensing boilers which can be up to 40 per cent more efficient than conventional systems (although they are most suitable for smaller sites, such as health centres or for buildings on larger sites that are not connected to the central heating system);
- four trusts had not introduced any internal presence detection lighting; and
- automatic power-down facilities on equipment such as computers and photocopiers had been extensively implemented in only four trusts.
Better use could be made of systems for monitoring and controlling energy consumption

2.35 Monitoring systems collect and analyse data on energy consumption with a view to targeting resources on areas of high, or abnormally high, consumption. Eight of the 15 trusts reported that they had introduced a specific system for monitoring and targeting energy consumption, although all trusts take monthly meter readings for the purpose of checking bills. In six of these eight trusts, the system was supported by bespoke monitoring and targeting software.

Sub metering and automated metering technology could improve monitoring of energy consumption, but it can be costly and the paybacks are difficult to quantify

2.36 Although automated meter reading technology can be relatively costly to install, potential benefits include reduced administration costs and more detailed energy consumption data. Twelve of the 15 NHS trusts reported that they had considered investing in automated meter readers, although the technology had only been implemented in three trusts. Nevertheless, automated data is now available to trusts for their high demand electricity sites, drawing on the...
half-hourly data generated for suppliers from the meters installed at these sites. Welsh Health Supplies has arranged for NHS trusts in Wales to join a contract established by the Purchasing and Supply Agency for the NHS in England, which makes this data available over the internet. This should further improve consumption monitoring, although abnormal trends will still require further local analysis.

2.37 Fitting sub-meters to parts of buildings, or pieces of equipment, enables even closer monitoring of consumption trends. Overall, 11 of the 15 NHS trusts had installed some sub-metering and 10 trusts reported that new or additional sub-metering was planned for the following 12 months, with Cardiff and Vale NHS Trust having set aside £10,000 for this purpose. Welsh Health Estates, in conjunction with the Carbon Trust, has also developed the Hospital Energy Assessment Tool (HEAT), designed to help trusts model the profile of energy consumption in circumstances where there is insufficient metering in place to do this accurately.

Where installed, Building Energy Management Systems are not always being used to their full potential to control energy consumption.

2.38 Building energy management systems can monitor and control heating, air conditioning and lighting across a site. With the exception of the Welsh Ambulance Services, all NHS trusts in Wales have such a system, with coverage across their estates ranging from 35 per cent to 92 per cent. Some of these systems are quite old and are not as sophisticated as those available today. For example, the system at Powys Local Health Board dates from the late 1980s and an energy survey at Bronllys Hospital, in February 2003, recommended installing a new system at an estimated cost of £25,000, but with projected energy savings worth £7,900 a year.

2.39 Several energy surveys reviewed by our consultant recommended possible low or no cost improvements in the use of building energy management systems. For example, a survey at the Princess of Wales Hospital (Bro Morgannwg NHS Trust) suggested changes to the control strategy programmed into the system which, if implemented, were estimated to save £7,330 per annum for an initial investment of only £1,500. The proposed changes, which were implemented immediately following the review, included adjusting the controls for 20 split air conditioners, set to operate between 6.30 am to 5.00 pm over a seven day week, in areas occupied between 8.00 am and 5.00 pm over a five day week.

2.40 The Royal Glamorgan Hospital (Pontypridd & Rhondda NHS Trust) has developed a sophisticated building energy management system, which was due to be extended to Dewi Sant Hospital in 2005. The Trust employs a former technician of the company that designed the system, who has developed a range of software tools to maximise its benefits. The Trust has also developed an energy strategy database, to profile each building with consumption reports and details of planned and completed energy efficiency projects.

Opportunities for on-site energy generation through the use of combined heat and power or renewable energy technologies have yet to be fully explored.

2.41 Combined heat and power is the simultaneous generation of thermal and electric energy from the same fuel source, and is more efficient than conventional generation methods. In 2004/2005, 17 combined heat and power units were operating across 11 hospital sites in Wales. These generated around 8 per cent of the total electricity consumed by NHS trusts. A further six units had been installed but were not
operating during 2004/2005, on the grounds of cost.

2.42 Given its relatively high installation and maintenance costs, the viability of combined heat and power depends largely upon whether the heat generated can be used. While hospitals benefit from their generally significant baseload demand for heating and hot water, the use of spare heat in the summer can prove challenging, although it could potentially be used by absorption chilling equipment for the provision of air conditioning. The economic benefits of combined heat and power also depend on the gap between market prices for gas and electricity: the cheaper gas prices are relative to electricity prices, the stronger the business case.

2.43 All but two of the 15 trusts had considered the viability of extending the use of combined heat and power, but most had discounted it on cost grounds. These included Swansea NHS Trust where an updated appraisal of the potential for combined heat and power at Morriston Hospital concluded that it was not viable, while the Trust has also ceased discussions with Swansea University about a joint scheme involving the Singleton Hospital site. However, new or expanded combined heat and power schemes are still being considered for the University Hospital of Wales (Cardiff and Vale NHS Trust), Ysbyty Glan Clwyd (Conwy & Denbighshire NHS Trust) and the Royal Glamorgan Hospital (Pontypridd & Rhondda NHS Trust). The Carbon Trust in Wales has also commissioned a study on the short-term and medium-term opportunities for retention or expansion of combined heat and power across the public sector in Wales.

Case Study D. Installation of Solar (Photo-voltaic) Panelling at Bronllys Hospital

Powys Local Health Board secured funding for the installation of 60 photo-voltaic (solar power) panels at Bronllys Hospital. The total project cost was £400,000, met by a combination of the Department of Trade and Industry’s ‘Clear Skies’ programme and the European Regional Development Fund’s Objective 2 Programme. The bid for funding was supported by the Mid Wales Energy Agency, a not-for-profit organisation providing sustainable energy support to householders, businesses, local authorities and community groups.

Installation of the panelling was completed in March 2005 and should generate 45,500 kilowatts of electricity per annum (6 per cent of the Hospital’s needs), with a likely financial saving of at least £2300 per annum at 2005/2006 prices. The Local Health Board will also benefit from being able to sell back to electricity suppliers its Renewables Obligation Certificates from the electricity generated, currently valued at around £38 per megawatt hour, suggesting an additional annual income of £1,700.

Note  Renewable Obligation Certificates can be sold to electricity suppliers to help them fulfil their obligation to derive a certain percentage of the electricity they supply (rising to 15 per cent by 2015) from renewable sources.

Source: Wales Audit Office survey of NHS trusts in Wales

2.44 Some trusts have explored opportunities for renewable generation, such as solar power, wind power and bio-fuel boilers. Recent developments include the installation of solar panels at Bronllys Hospital in Powys Local Health Board (Case Study D), and funding of £100,000 from the Wood Energy Business Scheme towards the installation of wood-fuelled boilers at the new second Rhondda Community Hospital.
NHS energy management in Wales

(Pontypridd & Rhondda NHS Trust). Wood-fuelled boilers are also being considered for the new community hospital in Tremadog (North West Wales NHS Trust) reflecting the Trust’s practice of appraising the potential of low emission fuel sources for all new builds.

2.45 Welsh Health Estates has established a renewable energy group, including representatives from the Assembly Government, NHS trusts and Welsh Health Supplies. The group is working on a number of initiatives, including the production of guidance for the NHS on renewable energy and the potential application of wind power. However, the capital cost of some renewable technologies is so high in relation to the cost savings that result that investment is unlikely, unless supported by external grants.

Energy efficiency considerations need to have a higher profile in the design of major capital projects, routine maintenance programmes and procurement

2.46 The ongoing programme of renewals and disposals across the NHS estate should help to improve energy performance, depending upon the extent to which efficiency measures are incorporated into new build and refurbishment projects. Trusts have a variety of arrangements for managing these projects, but only four trusts stated that their energy manager (or energy lead) was routinely involved in their planning. Three trusts reported that their energy leads were rarely or never involved.

2.47 Where a trust submits to the Assembly Government an outline business case for capital funding for new buildings, the proposals are required to achieve an ‘excellent’ rating for energy efficiency, when assessed against the NHS Environmental Assessment Tool. However, this assessment relates to the project design and, although post project evaluation is required, no clear process is in place to ensure that proposed energy efficiency measures are ultimately implemented.

2.48 Routine maintenance could also improve energy efficiency. For example, replacement lighting may be fitted for reasons other than energy saving, but nevertheless could result in reduced consumption. However, seven trusts reported that maintenance schedules did not include checks to reduce energy wastage, and six trusts reported that planning and prioritisation of routine maintenance were rarely informed by energy efficiency considerations.

2.49 In November 2004, the Assembly Government stated that “sustainable development based procurement will support our commitments on climate change through stimulating demand for new types of goods and services…and help meet energy efficiency targets”\(^1\). However, Cardiff and Vale NHS Trust was the only Trust with a procurement policy that made specific reference to the consideration of energy efficiency in the procurement of new equipment. The procurement policy for Bro Morgannwg NHS Trust refers to environmental considerations, but makes no direct reference to energy efficiency. Four trusts stated that energy efficiency was not considered in product selection.

2.50 The purchase of computer monitors provides one example of the different approaches taken by some trusts in the procurement of new equipment. North Glamorgan NHS Trust and Carmarthenshire NHS Trust explained that they now routinely purchase flat screen monitors, which typically consume half the electricity of traditional monitors but come at a higher upfront cost.
cost, while North West Wales NHS Trust has embarked on an IT replacement programme, introducing lower consuming devices in the process. By contrast, North East Wales NHS Trust told us that it had not bought flat screen computer monitors because of their higher purchase cost.

Limited finance is available to invest in energy saving measures

2.51 As a result of short-term financial pressures, most trusts have made relatively little investment in energy saving measures in recent years. NHS trusts collectively rated ‘a lack of capital’ and ‘other priorities for capital investment’ as two of the most significant barriers to improved energy efficiency (Appendix 6). In one trust we visited, the energy manager noted that plans in place for a range of energy efficiency related schemes were unlikely to proceed due to a lack of funds.

Only four trusts have established ring-fenced energy saving budgets

2.52 Rising prices highlight the need for trusts to invest in energy saving measures to control costs. Four trusts had ring-fenced budgets for energy saving measures in 2004/2005: Cardiff and Vale (£150,000), Gwent Healthcare (£150,000), North West Wales (£50,000) and Pontypridd & Rhondda (£30,000). These represented between 2.4 per cent and 6.2 per cent of energy expenditure in each trust in 2004/2005.

2.53 Where funds are not ring-fenced, potential energy saving schemes have to compete with other priorities. Several trusts suggested that other priorities usually take precedence, with one stating that “impact on service delivery is the first priority when allocating funding, due to pressures on available capital”. Trusts told us that the typical payback period required for investment in energy efficiency measures ranged from one year to seven years.

Six trusts have contracted with the private sector to secure capital funding for energy related projects

2.54 To acquire significant capital funding for energy related plant and equipment, six trusts have formed ongoing contract energy management partnerships with the private sector. Most recently, North Glamorgan NHS Trust entered into a 25 year contract from April 2004, which included an initial capital injection of £1 million at Prince Charles Hospital, for the provision and maintenance of a new combined heat and power unit, together with new boiler plant, a lighting upgrade and improvements to the building energy management system. The Trust’s Energy Manager commented that, as a result of this arrangement, “the Trust has been able to invest in an ageing energy infrastructure and improve its technology to 21st-century standards. If we had not gone down the contract energy management route, other priorities would have had to be met from limited capital”. However, energy managers in some other trusts expressed reservations about this type of arrangement and, as one noted, “contracts that tie trusts in for long periods are financially risky, particularly when the energy markets are so volatile”.

2.55 Although we did not consider in detail the likely costs and benefits of these private sector contracts, it is important that they include incentives to use energy efficiently. For example, a contract energy management arrangement at Llandough Hospital (Cardiff and Vale NHS Trust), running from 1994 to 2012, provides for the design, implementation, operation and maintenance of three combined heat and power units, along with the operation and maintenance of the Trust’s steam boilers. A recent study
commissioned by the Trust found that this contract provided little incentive to achieve improved energy efficiency.

The Assembly Government has not set aside specific funds for investment in energy saving measures, in contrast with the position in other parts of the United Kingdom.

2.56 Since 1992/1993, public bodies funded through the Northern Ireland Office have been able to access grants from a Central Energy Efficiency Fund (Case Study E). In March 2004, the Deputy First Minister of the Scottish Executive announced the launch of a £20 million energy efficiency investment scheme for the public sector in Scotland. £4 million has been allocated to Scottish Health Boards on a one off basis with the intention that recipient bodies redirect a proportion of the resulting energy cost savings to make the investment self sustaining over the longer term.

2.57 HM Treasury has identified energy efficiency as one of three priority areas for this year’s applications to its public sector Invest to Save Budget – Inclusive Communities programme. A total fund of £40 million is available for projects commencing in 2006/2007, although allocation to energy related schemes will depend on the spread of applications and the strength of their business cases. Areas of the public sector in Wales that form part of the Assembly Government’s devolved responsibilities, including the NHS, are not eligible for this funding.

2.58 The Assembly Government’s strategy for energy efficiency ‘Energy Saving Wales’, published in October 2004, recognises the important role of the public sector in helping reduce carbon dioxide emissions. However, the Assembly Government has not developed a specific funding stream for energy saving projects across the public sector in Wales, although it provides financial support to the work of the Carbon Trust in Wales. Officials explained that there were dangers in encouraging energy-saving measures solely through the award of grants and that a wide range of solutions, such as loan schemes, might be needed to ensure that measures become sustainable. These need to be matched by an equal commitment from organisations’ own funds and a clear demonstration of financial and environmental savings. In the absence of any wider public sector initiative, the Health and Social Care Department, in conjunction with Welsh Health Estates, has now set aside specific funding as part of its Capital Investment Programme to pump prime investment in energy saving measures across NHS trusts in Wales.

Case Study E. The Central Energy Efficiency Fund in Northern Ireland

A Central Energy Efficiency Fund has operated in Northern Ireland since 1992/1993. The Fund distributed £2.75 million in 2003/2004 and is available to all public bodies funded through the Northern Ireland Office. The largest NHS related scheme funded to date provided £400,000 of the £500,000 required to install a wind turbine as part of a new hospital development.

Applications can be made for up to 100 per cent of total project costs, and are evaluated in terms of their projected reduction in energy consumption and/or carbon dioxide emissions.

Reported outcomes to 31 March 2005, include:

- 2,000 projects funded;
- £10 million of annual energy savings delivered; and
- 500,000 tonnes of carbon dioxide saved (since 1998).

Source: Public Sector Energy Committee for Northern Ireland
Appendix 1: Study methodology

On the procurement of energy supplies we:

- interviewed staff responsible for energy procurement on behalf of the Office of Government Commerce (OGC Buying Solutions), the NHS Purchasing and Supply Agency in England and the Welsh Purchasing Consortium as part of our initial scoping work;
- interviewed key staff and examined files and records at Welsh Health Supplies relating to the various energy procurement exercises undertaken since 2000; and
- contracted John Hall Associates to: advise us on recent trends in the energy markets and general issues relating to the procurement of energy; evaluate the timing of the procurement exercises undertaken by Welsh Health Supplies for electricity and gas since 2001 and the competitiveness of the prices obtained; critique the future strategy for energy procurement and the likely challenges to achieving value for money in the future; and to check a sample of energy bills for accuracy.

On the management of energy consumption we:

- interviewed relevant officials from the Welsh Assembly Government, Welsh Health Estates and the Carbon Trust in Wales;
- reviewed the energy consumption/energy efficiency performance of the NHS trusts in Wales as reported in the annual NHS Estates and Facilities Performance Management System (EFPMS) data returns;
- distributed a survey questionnaire to each NHS trust in Wales in September 2004 which sought information relating to a range of energy management practices. We followed up this survey with short visits to six of the 15 NHS trusts in Wales to expand on the detail of the questionnaire responses; and
- contracted Fairbrook Associates Ltd to assist us in the development of our survey questionnaire to trusts and to advise us on the outcomes of this work. Our consultant also provided us with a summary of the key findings from 10 recent energy surveys conducted across the NHS estate in Wales and an analysis of trusts’ policies relating to energy management.
Appendix 2: Evaluation of the timing of electricity and gas procurement undertaken by Welsh Health Supplies between August 2000 and February 2004

| Contract period | Date when prices were booked | Market price at time of booking (pence per kW) | Market price range (and median) over the 18 months prior to the start of each contract period | Average market price between one and two months prior to the start of each contract period | Welsh Health Supplies position in relation to median price over the previous 18 months (1 = lowest quartile) |
|-----------------|-------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------
| **High demand electricity - April to March contracts** | | | | | |
| 2001/2002: Competitive tender | 13-02-01 and 16-02-01 | 1.96 and 1.92 | 1.70 to 2.12 (1.90) | Not applicable | 3 |
| 2002/2003: Contract extension | 14-12-01 and 17-12-01 | 1.85 | 1.52 to 2.05 (1.88) | 1.71 | 2 |
| 2003/2004: Contract extension | 27-03-02 and 10-04-02 | 1.61 and 1.62 | 1.53 to 1.91 (1.69) | 1.71 | 1 |
| 2004/2005: Contract extension | 20-11-03 and 11-02-03 | 1.74 and 2.30 | 1.85 to 2.30 (1.82) | 2.16 | 2 and 4 |
| **Low demand electricity – October to September contracts** | | | | | |
| 2000-2002: Competitive tender | 30-08-00 | 1.97 | 1.72 to 2.26 (1.93) | Not applicable | 3 |
| 2002-2004: Contract extension and tender for North West Wales NHS Trust | 26-06-02 and 30-08-02 | 1.64 and 1.63 | 1.52 to 2.05 (1.82) | 1.58 | 1 |
| 2004/2005: Contract extension | 04-02-04 and 11-02-04 | 2.40 | 2.20 to 3.38 (2.33) | 2.86 | 3 |
| **Gas – September to August contracts** | | | | | |
| 2001/2002: Competitive tender | 19-07-01 | 0.74 | 0.43 to 0.82 (0.7) | Not applicable | 3 |
| 2002/2003: Contract extension | 10-07-02 and 08-08-02 | 0.68 and 0.66 | 0.63 to 0.78 (0.69) | 0.68 | 2 and 1 |
| 2003/2004: Contract extension | 24-01-03 | 0.68 | 0.64 to 0.77 (0.70) | 0.75 | 2 |

Notes

- The multiple dates for booking prices in some of the contract periods reflect different arrangements with individual suppliers.
- Analysis of average market prices one and two months prior to the start of each contract period represents the typical timescale within which, in the case of the contract extensions, a competitive tender might otherwise have been completed.

Source: John Hall Associates
Appendix 3: Components of NHS trusts’ electricity and gas costs

### Electricity

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy cost and supplier margin</td>
<td>The Wholesale Market Energy Price; The Renewables Obligation: suppliers are legally obliged to demonstrate that they have supplied a specified percentage of electricity from renewable sources and have passed on the additional costs of doing so to customers; Balancing Services Use of System charges: these are levied to cover the administration costs of operating the balancing market; and Supplier Margin: this is applied to sites on an individual basis and sites with less predictable consumption patterns can expect to pay more.</td>
</tr>
<tr>
<td>Distribution use of system charges</td>
<td>Levied to pay for the maintenance and operation of the local distribution network, these include a range of unit and standing charges, as well as an availability charge for an agreed level of supply capacity made available on the distribution network.</td>
</tr>
<tr>
<td>Transmission use of system charges</td>
<td>Levied to pay for the operation and upkeep of the national transmission network which delivers electricity from the power station to the local distribution network. For high demand electricity, these charges are based on a site’s consumption at the three half-hourly periods of highest demand across the national transmission system, separated from each other by 10 clear days, during the financial year.</td>
</tr>
<tr>
<td>Losses</td>
<td>Transmission losses are paid to cover the energy lost when transmitting power through the high voltage National Grid transmission network. Distribution losses are charged to pay for the energy lost in supplying electricity from the National Grid to the end user.</td>
</tr>
<tr>
<td>Climate change levy</td>
<td>Charged at 0.43 pence per kilowatt hour although certain buildings, such as residences, are exempt from the levy, as is most renewable ‘green’ electricity.</td>
</tr>
<tr>
<td>Metering</td>
<td>Charges paid to cover the costs of meter operation.</td>
</tr>
</tbody>
</table>

### Gas

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy cost and supplier margin</td>
<td>The Wholesale Market Energy Price; Supplier margin and administration, including balancing changes for risk.</td>
</tr>
<tr>
<td>Transportation</td>
<td>Charges to cover the delivery of gas to sites via the distribution network. Costs vary depending upon consumption patterns and location.</td>
</tr>
<tr>
<td>Climate change levy</td>
<td>Charged at 0.15 pence per kilowatt hour although certain buildings, such as residences, are exempt from the levy, as is gas supplied to certain combined heat and power schemes.</td>
</tr>
<tr>
<td>Metering</td>
<td>Charges paid to cover the costs of meter operation.</td>
</tr>
</tbody>
</table>

Note

VAT is also payable either at 5 per cent or 17.5 per cent depending on the type of building.

Source: John Hall Associates
Appendix 4: Results of an energy bill checking exercise across the NHS trusts in Wales

Our consultants checked for accuracy a sample of electricity and gas bills from 19 of the main hospital sites across Wales. Overall, 61 per cent of the electricity bills and 27 per cent of the gas bills examined displayed an error of more than £10, although subsequent investigation explained some of the errors in the gas bills. These errors amounted to a net overcharge of £23,000 for electricity and £2,500 for gas.

Our consultants reported that the level of billing error was lower than they had anticipated. Nevertheless, if replicated across the 15 NHS trusts in Wales during 2003/2004, an overcharge of 0.65 per cent on electricity bills, and of 0.18 per cent on gas bills, would imply possible excess charges of around £59,500 (£48,100 for electricity and £11,400 for gas).

<table>
<thead>
<tr>
<th></th>
<th>Electricity bills</th>
<th>Gas bills</th>
<th>Gas bills, excluding four sitesa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of bills checked</td>
<td>210</td>
<td>291</td>
<td>219</td>
</tr>
<tr>
<td>Total value of bills checked</td>
<td>£3,489,000</td>
<td>£2,647,000</td>
<td>£1,413,435</td>
</tr>
<tr>
<td>Number of bills with potential error &gt;£10</td>
<td>129</td>
<td>80</td>
<td>31</td>
</tr>
<tr>
<td>Total net value of potential errors</td>
<td>+£22,615</td>
<td>-£3,781</td>
<td>+£2,483</td>
</tr>
<tr>
<td>Potential to over- and under-charging as a percentage of the value of bills examined</td>
<td>+0.65</td>
<td>0.14</td>
<td>+0.18</td>
</tr>
</tbody>
</table>

Note

a. Four sites were charged for some months at a lower unit price than that agreed in their contract schedules. We later confirmed that the company concerned may have been invoicing for the metering element of the delivered unit price separately, although this was not always consistent.

Source: John Hall Associates.
Appendix 5: The NHS Energy Efficiency Project established by Welsh Health Estates and the Carbon Trust in Wales

Commissioned in October 2002 and completed in April 2003, the Carbon Trust in Wales and Welsh Health Estates jointly funded a pilot energy efficiency project in Gwent Healthcare NHS Trust. The project aimed to develop a strategic approach to the achievement of the target of a 15 per cent reduction in primary energy consumption by 2010.

Gwent Healthcare NHS Trust was chosen for the pilot as it had a mixed portfolio of property types including rural and community hospitals, making it broadly representative of the wider NHS trust estate in Wales.

The project found that a strategic approach to energy efficiency in the NHS trusts in Wales would be most effective if implemented as a partnership between Welsh Health Estates and the NHS trusts, with support from the Assembly Government and the Carbon Trust.

The ten strategic recommendations for the Trust arising from the pilot were to:

- ensure senior management commitment at Executive Board level;
- adopt an energy policy including a life-cycle cost approach to capital procurement;
- implement an energy efficiency improvement process aimed at continuous improvement;
- incorporate estates and energy issues in the clinical Performance Management System;
- actively exploit Welsh Health Estates’ support and expertise;
- communicate energy performance to trust management, trust staff and the community;
- establish local commitment to energy saving and carbon dioxide emissions reduction initiatives;
- develop and maintain a rolling carbon dioxide emissions reduction plan;
- embed energy and climate change issues in all forms of training; and
- develop a funding strategy based on a combination of internal funding from energy savings, private and public sector investment, and UK government grants.

Outputs from the pilot project included an organisational diagnostic tool for Welsh Health Estates, a generic energy strategy support pack for NHS trusts and an outline strategy for Welsh Health Estates to rollout the pilot work to other trusts, a process which is ongoing.

The outcomes from the project suggested that, across the NHS trusts in Wales, an additional capital investment of £3.3 million, alongside general improvements in energy management procedures, would be required to achieve the target of a 15 per cent reduction in primary energy consumption. Once achieved, this reduction in consumption was estimated to yield annual financial savings of around £2.2 million, at 2002/2003 prices.
Appendix 6: Barriers to improvements in energy efficiency

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Average rating</th>
<th>Number of trusts rating as extremely significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departments not accountable for energy costs</td>
<td>1.6</td>
<td>7</td>
</tr>
<tr>
<td>Other priorities for capital investment</td>
<td>1.7</td>
<td>9</td>
</tr>
<tr>
<td>Lack of capital</td>
<td>1.8</td>
<td>7</td>
</tr>
<tr>
<td>Energy objectives not integrated into operating, maintenance or purchasing procedures</td>
<td>2.1</td>
<td>4</td>
</tr>
<tr>
<td>Strict adherence to capital budgets</td>
<td>2.3</td>
<td>4</td>
</tr>
<tr>
<td>Low corporate priority given to energy management</td>
<td>2.4</td>
<td>6</td>
</tr>
<tr>
<td>Lack of time/other priorities</td>
<td>2.4</td>
<td>2</td>
</tr>
<tr>
<td>Lack of staff awareness</td>
<td>2.7</td>
<td>2</td>
</tr>
<tr>
<td>Energy manager lacks influence/authority</td>
<td>2.7</td>
<td>4</td>
</tr>
<tr>
<td>Low corporate priority given to environmental performance</td>
<td>2.9</td>
<td>4</td>
</tr>
<tr>
<td>Technical risk</td>
<td>3.0</td>
<td>1</td>
</tr>
<tr>
<td>Organisational uncertainty</td>
<td>3.0</td>
<td>2</td>
</tr>
<tr>
<td>Conflicts of interest within the organisation</td>
<td>3.0</td>
<td>2</td>
</tr>
<tr>
<td>Technology inappropriate at Trust sites</td>
<td>3.4</td>
<td>0</td>
</tr>
<tr>
<td>Cost of staff training</td>
<td>3.5</td>
<td>0</td>
</tr>
<tr>
<td>Difficulty of obtaining information on the energy consumption of purchased equipment</td>
<td>3.6</td>
<td>0</td>
</tr>
<tr>
<td>Lack of information/poor quality information on energy efficiency opportunities</td>
<td>3.7</td>
<td>0</td>
</tr>
<tr>
<td>Cost of identifying opportunities, analysing cost effectiveness and tendering</td>
<td>3.7</td>
<td>1</td>
</tr>
<tr>
<td>Cost of disruptions, hassle, inconvenience</td>
<td>3.7</td>
<td>0</td>
</tr>
<tr>
<td>Lack of technical skills</td>
<td>4.2</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Wales Audit Office survey of NHS trusts in Wales