

Schools Energy Report

Education, Children and Families

21 June 2011

1. Purpose of report

- 1.1 To provide information on works that have been undertaken and further planned works to improve the energy efficiency of schools.
- 1.2 A motion by Councillor Johnstone was considered by Education Children and Families Committee on the 15 March 2011.

2. Background

- 2.1 Committee considered a detailed report on the Children and Families Asset Management plan in June 2010. This report provided a comprehensive statement on the condition, sufficiency and suitability of schools across the City. The school estate is large and diverse, ranging from very modern, to Victorian buildings and this diversity presents a number of challenges in improving energy efficiency. While a number of programmes have been undertaken to reduce energy consumption and improve CO2 emissions, the variability in size, age, occupancy levels, opening patterns and condition of the estate has meant that energy reduction strategies cannot be uniformly applied. The Council has, therefore, had to target the areas of greatest efficiency gain where funding has allowed and opportunities have presented themselves. Monitoring data for the last 4 years indicates some progress may now be being made against an overall backdrop of increasing demand for energy.

3. Main Report

- 3.1 Council wide Monitoring of the energy efficiency of buildings and energy usage and carbon emissions is undertaken by City Development and the Sustainable Development Unit. Data for the

Children and Families school estate for electricity and gas usage over the period 2007/08 and 2010/11 is summarised in table 1 below.

Table 1 Electricity and gas usage 2007/08 – 2010/11

| Year | Electricity Kilowatt Hours | Gas Kilowatt Hours |
|---------|----------------------------------|--------------------------|
| 2007/8 | 25.8m | 79.3m |
| 2008/9 | 26.9m | 81.7m |
| 2009/10 | 29.1m | 115.6m |
| 2010/11 | 29.0m | 106.7m |

3.2 Over the period electricity usage increased from 25.8m kwh's in 2007/08 to 29m kwh's in 2010/11. Over the same period the gas usage increased overall from 79.3m to 106.7m. Figures over the 4 year period peaked in 2009/10 and reduced from this high point in 2010/11. Gas figures for 2010/11 show a reduction on the previous years total of 7.69%. The figures will have been influenced by two relatively severe winters, the construction of new PPP schools and more intensive community use of schools including flood lit astro-turf pitches offset by school closures.

3.3 Over the period 2007/08 – 2010/11 the Council invested heavily in energy efficiency measures across its operational estate. This investment has had the effect of limiting the rate of increase in the Council's overall in energy consumption. While it is difficult to draw firm conclusions at this point it would appear that gas usage overall in schools has now started to fall. Electricity usage in 2010/11 for Children and Families also appears to have stabilised at 2009/10 levels of around 29m kilowatt hours per annum (rounded) following a period of ongoing increase. It is not possible at this stage to draw firm conclusions from these figures without more years of robust trend data being available.

3.4 The remainder of this report sets out the action that has been taken to reduce energy usage across the council's schools since 2007/08 and the further works planned.

Energy Performance Certificates (EPC)

3.5 Energy Performance Certificates became a statutory requirement under the EU Energy Performance of Buildings Directive which took effect from 4 January 2009. All public buildings over 100sqm that are regularly accessed by members of the public must display a current EPC. The Council has invested considerable effort into assessing the energy efficiency of all its buildings. The estate has now been surveyed and Energy Performance Certificates have been produced for each building. The certificate includes a section on recommendations to improve the efficiency of buildings. This assessment has been incorporated into the asset management process to inform and direct

the current programme of investment. The works undertaken are focused on delivering improvements that will allow reduced energy consumption.

Energy Investment Programme

- 3.6 Since 2007/08 the Council has invested over £3.0m in energy investment and water conservation measures. The investment made in energy related projects since 2007/08 is shown in table 2 below.

Table 2 Investment Works in Schools 2007/08 - 2010/11

| | 2007/08 | 2008/09 | 2009/10 | 2010/11 | Total |
|------------------|---------|---------|---------|---------|-------|
| | £ | £ | £ | £ | £ |
| Investment Works | 1.613m | 0.429m | 0.709m | 0.287 | 3.04m |

- 3.7 Works included upgrading boiler plant, the conversion of a coal fired boiler to a gas fired boiler at Liberton High school, estate wide thermostatic controls lighting controls, swimming pool heat recovery plant, loft insulation and water conservation measures. To inform this energy improvement programme 86 schools have been audited for energy efficiency and thermal imaging was used for the first time in schools to identify building inefficiencies and inform the investment programme. This was the first time that this information was available on this scale and it forms the basis of current investment programmes.

Future Asset Management Works

- 3.8 Asset Management works for Children and Families in the Capital Investment programme (CIP) 2011-14 total £21.648m. A number of major projects including the new Boroughmuir, James Gillespie's and Portobello High schools and Towerbank and Corstorphine primary schools are also included in the capital programme and each of these projects will, through the replacement and upgrade of buildings, make a major contribution to improved energy efficiency.
- 3.9 Future planned energy improvement works across the school estate over the next 3 years include projects to upgrade mechanical and electrical plant, wiring and pipe work, and enhance the fabric of schools. The CIP 2011-2014 includes a provision of £1.2m for boiler works including the replacement of the boilers at South Morningside, Towerbank, Tollcross, Buckstone and St Margaret's primary schools and Pilrig Park special school. The CIP also includes £0.5m for replacing windows and doors at a number of schools including Bruntsfield, Gilmerton and Trinity primary schools. Insulation works are planned at Queensferry and Tollcross primary schools and Pilrig Park special school. A range of sustainability projects for example lighting upgrades will also be undertaken at Bruntsfield, Stockbridge and Trinity primary schools. Cumulatively these works should make a significant difference to the comfort of school buildings and their overall efficiency.

- 3.10 In addition to this information strategies are being developed to reduce energy consumption and the carbon footprint using changes in technology.

Smart Metering Programme

- 3.11 During 2010/11 a programme of smart metering was approved in the City's schools. Currently 147 Non Half Hourly and 44 Half Hourly electricity meters have been installed and 147 gas data loggers have been fitted to properties in the school estate. These units are designed to allow establishments to accurately monitor their energy consumption on site.
- 3.12 There are a small number of outstanding issues to be resolved in buildings where electronic smart meters can't be installed (28 electricity supplies and 13 gas supplies) due to the existing supply provided by the utility companies being incompatible with the new smart metering technology. CEC has requested upgrades to the incoming electrical supply points to allow smart metering technology to be installed. It is understood there is however a waiting list for this work as local authorities elsewhere are also seeking to adopt smart metering strategies. As yet no confirmation of dates has been received. The next step is to provide training for business managers to allow the effective management of energy consumption at the local level.

Voltage Optimisers

- 3.13 During 2010/11 Children and Families authorised additional expenditure of £0.273m on an energy investment programme to reduce energy and water consumption within its estate. Works included insulation, draught stripping, lighting upgrades, instantaneous water heater to replace immersion heaters and the installation of voltage optimisers in Balerno, Castlbrae, Currie, Leith Academy, Liberton, St. Thomas of Aquins, Trinity Academy and WHEC secondary schools. This project, which will deliver average savings of 7% per annum in electricity consumption, was the main strategy adopted for the programme in the 2010/11 financial year.
- 3.14 In addition to reducing consumption and costs at some of the largest energy using schools, the programme will also reduce the department's carbon footprint and reduce ongoing revenue costs. The programme will also reduce future capital costs by increasing the life of electrical plant through ensuring that electricity is supplied at the correct voltage for optimum performance. This initial phase of the programme is now completed and a programme of monitoring is currently underway and opportunities for installing voltage optimisers in further buildings are being explored.

CEEF (Central Energy Efficiency Fund) Programme

- 3.15 The City of Edinburgh Council has access to a £1.2m revolving fund from the Scottish Government. This fund can be used to invest in energy and carbon reduction projects across the Council's operational portfolio. The funding is in the form of a loan and is paid back over a maximum of 5 years from the savings accrued through the investment. The school estate has been a major beneficiary from the fund and since 2007/08 CEC has invested £0.806m using the fund.

Building Energy Management Systems (BEMS)

- 3.16 The Council has an extensive portfolio of BEMS systems covering all the major properties in the Council operational portfolio. All high schools and the majority of primary schools have these systems. It is widely accepted that automated controls systems are the most effective way of controlling heating within buildings and Building Standards require that optimised control equipment is fitted as a minimum standard.
- 3.17 In essence BEMS are an automated intelligent controls system pre programmed to manage the heating for an individual property. The system and controls are located within individual schools. Monitoring of these systems is carried out remotely by City Development. As service delivery patterns change the control systems can be adjusted to reflect these changes. However, schools need to inform Property Services of any changes that they require. In a number of schools an element of local control is available through the application of thermostatic radiator valves (TRV's) though this is not suitable for all properties.
- 3.18 The Council's BMS systems are in need of upgrading to reflect changes in technology, in particular a change to open protocol systems that can use a variety of components from different suppliers. A small number of systems have been upgraded by the Energy and Water Team using an open protocol system called Backnet that allows components from other manufacturers to be utilised thus ensuring a best value solution is available in future.

Wave 3 Schools

- 3.19 The new Wave 3 schools will have an environmental responsibility, not just in terms of resources and materials used in their construction, but also in terms of operation and maintenance during their lifetime. Ideally, the buildings will become a learning tool, demonstrating sustainable principles and promoting environmental awareness. The achievement of BREEAM 'very good' is now a Council priority for all new building projects, with the aspiration being to deliver 'excellent'.

Energy Contracts

- 3.20 Utility contracts are now procured through Procurement Scotland under Scottish Government guidelines. City of Edinburgh is a partner in the Procurement Scotland Electricity, Gas and Water contracts. The contracts came into force in July 2010, September 2010 and April 2011 respectively.

Feed in Tariffs (FiTs)

- 3.21 Legislation came into force in July 2010 that allows local authorities to supply electricity to the national grid. The UK government, in common with other EU governments, introduced a FiT's scheme that applies to renewable energy generation. The predominant method of generation is Solar PV, though the tariff applies to generation using any renewable source e.g. wind, water or combined heat and power. City Development and Corporate Procurement are currently developing a procurement strategy to ensure best value for the Council going forward as these tariffs are contracted over a 25 year period and may have implications for the Council's operational estate in the future. A specific report on this issue will be submitted to elected members when this strategy is complete.

4 Financial Implications

- 4.1 The financial implications of the energy management are contained within the Revenue Budget and Capital Investment Programme approved by Council on 10 February 2011.
- 4.2 Energy improvement works are included within £21.648m in Asset Management works over the period 2011/14.
- 4.3 These totals will be subject to change once the final outturn position for the 2010/11 financial year has been established and any adjustments necessary are made to reflect actual expenditure incurred during 2010/11 compared with the forecast position which prevailed when the Report to Council in February was prepared.

5 Equalities Impact

- 5.1 There are no equalities implications arising directly from this report.

6 Environmental Impact

- 6.1 There will be significant benefits arising directly from this report through investment in increased building efficiency.

7 Recommendations

- 7.1 Committee is asked to note the contents of this report and the intention to submit a further report on feed in tariffs.

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Appendices None

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Wards affected All

**Background
Papers** None

