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1 Executive Summary

During the financial year 2008/2009, for the Academic and Campus Services buildings, the University purchased 85,966,036 kWh of energy at a cost of £4,756,506 resulting in emissions of 24,725 tonnes of Carbon Dioxide. Further the University used 266,258 m$^3$ of water at a cost of £640,188. The overall cost for utilities for the year was £5,396,694.

2 Energy as Supplied Summary

The energy supplied to the University is different to the actual energy use on site. This is because the University uses a Combined Heat and Power station to generate electricity on site. The result of this is that some of the gas supplied to the site is used to generate electricity. The energy supplied to the site does not therefore directly relate to that consumed by the end users in the buildings. The table below details the energy as supplied to the site. The actual energy use within buildings is detailed later in the report. While energy consumption as supplied reduced by 1%, the actual cost of energy increased by 63% overall.

Table 1 Energy as Supplied

<table>
<thead>
<tr>
<th>Energy</th>
<th>Consumption, kWh</th>
<th>Cost, £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>18,421,828</td>
<td>2,315,214</td>
</tr>
<tr>
<td>Gas</td>
<td>62,624,973</td>
<td>2,173,171</td>
</tr>
<tr>
<td>Oil</td>
<td>334,994</td>
<td>19,609</td>
</tr>
<tr>
<td>Steam</td>
<td>4,584,241</td>
<td>248,512</td>
</tr>
<tr>
<td>Total</td>
<td>85,966,036</td>
<td>4,756,506</td>
</tr>
</tbody>
</table>

Figure 1 Energy as Supplied

---

1 kWh equates to Kilo Watt Hour
3 Carbon Dioxide Emissions – Actual for 2008/2009

There is increasing awareness of the need to reduce carbon dioxide emissions. The University has carried out a baseline check of its emissions and the bulk of these arise from energy use within buildings. Based on the energy as supplied to site the associated Carbon Dioxide emissions are calculated as per the table below. (Note these emissions figures do not include the Rowett Institute which was taken over in 2008.)

Table 2 Carbon Dioxide Emissions²

<table>
<thead>
<tr>
<th>Energy</th>
<th>Consumption, kWh</th>
<th>kgCO₂/kWh</th>
<th>Tonnes CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>18,421,828</td>
<td>0.537</td>
<td>9,893</td>
</tr>
<tr>
<td>Gas</td>
<td>62,624,973</td>
<td>0.206</td>
<td>12,900</td>
</tr>
<tr>
<td>Oil</td>
<td>334,994</td>
<td>0.265</td>
<td>89</td>
</tr>
<tr>
<td>Steam</td>
<td>4,584,241</td>
<td>0.294</td>
<td>1,347</td>
</tr>
<tr>
<td>Total</td>
<td>85,966,036</td>
<td></td>
<td>24,229</td>
</tr>
</tbody>
</table>

4 Carbon Dioxide Emissions – Performance against Targets

The Utilities Policy currently details the University’s targets for reducing carbon dioxide emissions. As part of the Utilities Policy the University has set a target to meet or better the Kyoto protocol with regard to carbon dioxide emissions resulting from energy use in buildings. For developed countries the target was to reduce emissions from 1990 levels by 5.2% by 2008-2012. For the UK the target was to reduce emissions from 1990 levels by 12.5% by 2008-2012. The current year shows a 12.9% reduction in carbon dioxide emissions from the 1990 baseline year. Figure 2 below shows the target line for reducing emissions and the actual performance for the University. The University will be developing a Carbon Management Plan during 09/10 that will include the other main sources of green house gas emissions from University activities, for example transport, going forward.

Figure 2 Carbon Reduction Target³

² The conversion factors used (kgCO2/kWh) are based on those quoted in the “Guidelines to Defra’s Greenhouse Gas (GHG) conversion factors for company reporting”.

³ The reason for the peak in the graph was due to the following factors 1) The merger with Northern College, 2) the start of operation of the MRF, and 3) the start of operation of Oceanlab.

The target for reducing carbon dioxide emissions is an absolute target and changes to the size of the estate, either increase, or reduction will affect the actual emissions, but will not result in a change to the target.
5 European Union Emissions Trading Scheme (EU-ETS)

The Combined Heat and Power station exceeds 20MW capacity and is covered by the EU-ETS. As a result the University reports on emissions arising from use of gas and oil at the Old Aberdeen Campus. Under this scheme a number of allowances are allocated to the University for this Site each year, with one allowance being equivalent to one tonne of carbon dioxide. To establish the allocation, an average of 4 years emissions was assessed, this came to 8,148 tonnes. The allocation received under the scheme was 6,924 allowances (a 15% reduction). The reporting year under EU-ETS is annual.

- Historical Average Emissions 8,148 tonnes
- Actual Emissions 2008 7,521 tonnes
- Allowances 2007 6,924
- Excess Emissions 597 tonnes

The University target for EU-ETS allocations is to reduce emissions in line with the number of allocations received. For the calendar year 2008 the University exceeded the number of allowances by 597 tonnes. This still represents an improvement in performance compared with historic emissions of 7%. It was necessary to purchase allowances to make up the shortfall and this cost £6,800.

6 Combined Heat and Power Station (CHP)

The Combined Heat and Power station commenced operation in May 2007 and has been fully operational during the 2008/2009 financial year. There are two main benefits from having the CHP station.

Reduction in Carbon Dioxide Emissions
A power station typically operates at an efficiency of about 40%, whereas while the CHP engine generates electricity at about 40%, the heat that would otherwise be wasted, is used to provide heating and hot water for University buildings. This means that the CHP engine has an overall operating efficiency of nearly 80%.

Reduction in Costs
The CHP engine generated 52% of the electrical load for the Old Aberdeen Campus as shown in the figure 3. The effect of generating electricity using the CHP engine was to reduce the average overall price for electricity at the site from 12.2p/unit to 9.5/unit.

Overall the implementation of the CHP scheme has resulted in a cost saving of £410,000, and a reduction in emissions of approximately 3,100 tonnes, for the year. Part of the cost savings are due to the fact that the CHP station qualifies as good quality CHP under the CHPQA scheme, and is exempt from CCL for gas used.
7 Energy as Used

The actual energy used within the buildings is metered, and this information is recorded to generate consumption data on a monthly basis...

In the case of the buildings supplied with electricity and heat from the CHP station, it is necessary to discount the gas used to generate electricity, and add in the amount of electricity generated by the CHP station. The effect of this is detailed in the table 3 and figure 4:

Table 3 Energy as Used

<table>
<thead>
<tr>
<th>Energy as Used</th>
<th>Consumption, kWh</th>
<th>Percent of Overall Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity Grid - Green</td>
<td>13,692,639</td>
<td>17%</td>
</tr>
<tr>
<td>Electricity Grid - Brown</td>
<td>4,729,189</td>
<td>6%</td>
</tr>
<tr>
<td>Electricity CHP – Generated On site</td>
<td>7,722,532</td>
<td>10%</td>
</tr>
<tr>
<td>Gas</td>
<td>50,204,973</td>
<td>62%</td>
</tr>
<tr>
<td>Oil</td>
<td>334,994</td>
<td>0%</td>
</tr>
<tr>
<td>Steam</td>
<td>4,584,241</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>81,268,568</td>
<td>100%</td>
</tr>
</tbody>
</table>
Figure 4 Energy as Used

By quantifying the energy as used by the larger buildings it is possible to generate energy consumption trends in the form of graphs for each building. These graphs can be used to raise awareness by demonstrating energy use in buildings to occupants. In addition this information can be used to identify areas that may benefit from energy conservation projects.

8 Energy Saving – Using Technology

The University has signed up to Salix a program operated via the Carbon Trust. Under this program a budget for energy saving measures is set up. The money saved from the energy saving measures is then fed back in to the budget meaning money is available for further measures in future years. During the course of the year 2 energy saving measures have been implemented using this scheme. The first is remote switching of computers. In phase one this will be used to control class room pc’s enabling them to be turned off when not required. In addition the system has the facility to power up machines to enable updates to be implemented during the night, and once complete the machines are put back in to standby. The second measure is to install thermostatic radiator valves with limited control in University Office. This measure is aimed at improving local heating control, and eliminating the need for electric heaters.

Where new buildings and major refurbishments are implemented the aim is to exceed current building standards, examples of this are the new Suttle Building, and the new Oceanlab 2. Given that new buildis are additional loads it is very important to minimise their consumption as they will directly add to the University’s overall carbon dioxide emissions.

9 Energy Saving – Staff Awareness/Good Housekeeping

The Environment Office uses a wide range of media to promote sustainability. Energy and water conservation are included as part of this. Measures include noticeboards, leaflet holders, the website, and the quarterly “Readable” magazine. Talks are given as part of staff inductions, and College meetings are regularly attended and updates provided.

The other main avenue of awareness raising is via the Environmental Champions, who identify local energy issues and either address them directly or ask for support from the Environment Office.

10 Installation of Renewable Energy Technology

This is an area where progress is currently limited. A ground source heat pump has been installed at Oceanlab phase2, but apart from that there are no other renewables currently present on the University Estate.
The Grampian NHS Trust is planning to develop a CHP scheme which will include a biomass boiler at the Foresterhill site. The biomass fuel source would be the renewable element of this project. The University is liaising with the Trust about the possibility of having electricity and heat supplied direct from this source.

11 Water Consumption

The revised target set in the Utilities policy is to reduce water consumption from 2007/2008 levels by 2% year on year.

Table 4 – Water Consumption and Cost

<table>
<thead>
<tr>
<th>Utility</th>
<th>Consumption, m³</th>
<th>Cost, £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>266,258</td>
<td>198,579</td>
</tr>
<tr>
<td>Sewerage</td>
<td>-</td>
<td>441,609</td>
</tr>
<tr>
<td>Total</td>
<td>266,258</td>
<td>640,188</td>
</tr>
</tbody>
</table>

Water consumption 2007/2008 279,202 m³
Water consumption 2008/2009 266,258 m³
Reduction 12,944 m³ (4.6%)

The target has been exceeded during 2008/2009. The majority of this has been at the Zoology building and is a result of water saving measures installed as part of the building refurbishment.

12 Water Saving – Using Technology

The majority of the observed reductions has been at the Zoology building and is a result of water saving measures installed as standard, as part of the building refurbishment.

13 Water Saving - Staff Awareness/Good Housekeeping

The main area where staff can help with water conservation is in the reporting of leaks. Reminders of this are issued via different means to help maintain awareness levels.

14 Grey water/Rainwater harvesting

This is the water equivalent of a renewable source. The University investigates installing grey water systems as part of all new build projects.
15 Appendix 1 - Rowett Institute

The Rowett Institute merged with the University during June08. This is the first year operation by the University. The energy consumptions and associated carbon dioxide emissions are summarised below:

Energy Consumption and Cost

<table>
<thead>
<tr>
<th>Utility</th>
<th>Cons, kWh</th>
<th>Cost, £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric</td>
<td>3,335,699</td>
<td>424,292</td>
</tr>
<tr>
<td>Gas</td>
<td>1,922,119</td>
<td>48,287</td>
</tr>
<tr>
<td>Oil</td>
<td>3,558,568</td>
<td>1,619,029</td>
</tr>
<tr>
<td>Steam</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>8,816,385</td>
<td>2,091,608</td>
</tr>
</tbody>
</table>

Carbon Dioxide Emissions

<table>
<thead>
<tr>
<th>Utility</th>
<th>Cons, kWh</th>
<th>Kg CO₂/kWh</th>
<th>Tonnes CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric</td>
<td>3,335,699</td>
<td>0.537</td>
<td>1,791</td>
</tr>
<tr>
<td>Gas</td>
<td>1,922,119</td>
<td>0.206</td>
<td>396</td>
</tr>
<tr>
<td>Oil</td>
<td>3,558,568</td>
<td>0.265</td>
<td>943</td>
</tr>
<tr>
<td>Steam</td>
<td>-</td>
<td>0.294</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>8,816,385</td>
<td>-</td>
<td>3,130</td>
</tr>
</tbody>
</table>

The Rowett site was in operation during 1990, but there is no historic data for the energy use and subsequent carbon dioxide emissions in this year.
### Appendix 2 – University of Aberdeen Energy Breakdown

#### Electricity Use 2008/2009

**Electric – Individually Metered**

<table>
<thead>
<tr>
<th>Academic</th>
<th>Cost Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balgownie Home Farm Stead</td>
<td>ES002</td>
<td>33,866</td>
<td>4,481</td>
</tr>
<tr>
<td>Balgownie Sports Pavillion</td>
<td>ES002</td>
<td>20,589</td>
<td>3,345</td>
</tr>
<tr>
<td>Bettyhill</td>
<td>ES005</td>
<td>1,807</td>
<td>233</td>
</tr>
<tr>
<td>Boathouse</td>
<td>ES006</td>
<td>5,823</td>
<td>981</td>
</tr>
<tr>
<td>Butchart Recreation Centre</td>
<td>ES007</td>
<td>148,856</td>
<td>20,772</td>
</tr>
<tr>
<td>46/48 College Bounds</td>
<td>ES009</td>
<td>52,309</td>
<td>7,974</td>
</tr>
<tr>
<td>50 College Bounds</td>
<td>ES010</td>
<td>3,348</td>
<td>529</td>
</tr>
<tr>
<td>52 College Bounds</td>
<td>ES010</td>
<td>10,862</td>
<td>1,855</td>
</tr>
<tr>
<td>Cullert, Newburgh</td>
<td>ES015</td>
<td>8,280</td>
<td>1,348</td>
</tr>
<tr>
<td>Human Physiology</td>
<td>ES021</td>
<td>88,818</td>
<td>11,938</td>
</tr>
<tr>
<td>Liberty SRC</td>
<td>ES025</td>
<td>104,156</td>
<td>13,813</td>
</tr>
<tr>
<td>Elphinstone Institute</td>
<td>ES038</td>
<td>3,956</td>
<td>476</td>
</tr>
<tr>
<td>Chaplaincy Centre, 25 High St</td>
<td>ES039</td>
<td>14,453</td>
<td>2,419</td>
</tr>
<tr>
<td>Humanity Manse, 19 CBs</td>
<td>ES040</td>
<td>24,953</td>
<td>3,616</td>
</tr>
<tr>
<td>57 High Street</td>
<td>ES049</td>
<td>2,750</td>
<td>348</td>
</tr>
<tr>
<td>Thoms Place and Thoms Court</td>
<td>ES049</td>
<td>322</td>
<td>31</td>
</tr>
<tr>
<td>Wrights and Coopers Place</td>
<td>ES049</td>
<td>3,790</td>
<td>472</td>
</tr>
<tr>
<td>Powis Gate, Music Dept, 41 CB</td>
<td>ES051</td>
<td>46,823</td>
<td>7,732</td>
</tr>
<tr>
<td>Funeratory House, Shoe Lane</td>
<td>ES055</td>
<td>42,698</td>
<td>5,950</td>
</tr>
<tr>
<td>Cromarty Cadet Hall</td>
<td>ES067</td>
<td>10,319</td>
<td>2,254</td>
</tr>
<tr>
<td>Cromarty Lighthouse</td>
<td>ES067</td>
<td>33,513</td>
<td>3,323</td>
</tr>
<tr>
<td>23 St Machar Drive</td>
<td>ES068</td>
<td>159,381</td>
<td>22,364</td>
</tr>
<tr>
<td>Oceanlab</td>
<td>ES069</td>
<td>203,261</td>
<td>21,973</td>
</tr>
<tr>
<td>Town House</td>
<td>ES070</td>
<td>17,949</td>
<td>2,809</td>
</tr>
<tr>
<td>Kieth Park</td>
<td>ES074</td>
<td>58,724</td>
<td>8,964</td>
</tr>
<tr>
<td>17 High Street</td>
<td>ES077</td>
<td>16,715</td>
<td>3,239</td>
</tr>
<tr>
<td>9A Dunbar Street</td>
<td>ES079</td>
<td>41,206</td>
<td>5,829</td>
</tr>
<tr>
<td>5 Dunbar St</td>
<td>ES081</td>
<td>7,344</td>
<td>1,216</td>
</tr>
<tr>
<td>Balmoral Estates Bothy</td>
<td>ES150</td>
<td>348</td>
<td>42</td>
</tr>
<tr>
<td>IMS</td>
<td>ES024</td>
<td>3,399,071</td>
<td>360,932</td>
</tr>
<tr>
<td>Marischal College</td>
<td>ES046</td>
<td>310,421</td>
<td>52,874</td>
</tr>
<tr>
<td>MRF</td>
<td>ES073</td>
<td>1,441,351</td>
<td>157,186</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>6,318,062</td>
<td>731,318</td>
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</tbody>
</table>

**Electric – Medical School**

<table>
<thead>
<tr>
<th>Academic</th>
<th>Cost Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Sch</td>
<td>ES153</td>
<td>1,552,235</td>
<td>187,342</td>
</tr>
<tr>
<td>Link Block only</td>
<td>ES032</td>
<td>1,268,063</td>
<td>142,967</td>
</tr>
<tr>
<td>Polwarth only</td>
<td>ES033</td>
<td>188,318</td>
<td>21,280</td>
</tr>
<tr>
<td>West Block</td>
<td>ES027</td>
<td>202,946</td>
<td>22,239</td>
</tr>
<tr>
<td>Library</td>
<td></td>
<td>9,664</td>
<td>1,216</td>
</tr>
<tr>
<td>Med Chi</td>
<td>ES032</td>
<td>2,883</td>
<td>292</td>
</tr>
<tr>
<td>Med Physics</td>
<td>ES028</td>
<td>9,994</td>
<td>1,961</td>
</tr>
<tr>
<td>IAHS</td>
<td>ES078</td>
<td>556,307</td>
<td>66,450</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>3,790,411</td>
<td>443,746</td>
</tr>
</tbody>
</table>
## Electric Sub3 Academic

<table>
<thead>
<tr>
<th>Academic</th>
<th>Imported</th>
<th>CHP Generated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost Code</td>
<td>Cons, kWh</td>
<td>Cost</td>
</tr>
<tr>
<td>Sub No 3</td>
<td>Various</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MacRobert</td>
<td>ES045</td>
<td>683,929</td>
<td>87,589</td>
</tr>
<tr>
<td>Edward WA</td>
<td>ES017</td>
<td>73,660</td>
<td>9,446</td>
</tr>
<tr>
<td>MacRobert OM</td>
<td>ES045</td>
<td></td>
<td></td>
</tr>
<tr>
<td>William Guild</td>
<td>ES064</td>
<td>127,121</td>
<td>15,370</td>
</tr>
<tr>
<td>Taylor Building</td>
<td>ES060</td>
<td>190,861</td>
<td>23,477</td>
</tr>
<tr>
<td>New Kings</td>
<td>ES048</td>
<td>57,564</td>
<td>7,384</td>
</tr>
<tr>
<td>Old Brewery</td>
<td>ES050</td>
<td>14,623</td>
<td>1,767</td>
</tr>
<tr>
<td>Regent</td>
<td>ES054</td>
<td>66,118</td>
<td>8,480</td>
</tr>
<tr>
<td>Edward Wright</td>
<td>ES018</td>
<td>832,712</td>
<td>100,754</td>
</tr>
<tr>
<td>University Office</td>
<td>ES063</td>
<td>215,178</td>
<td>27,578</td>
</tr>
<tr>
<td>KCCC</td>
<td>ES043</td>
<td>88,594</td>
<td>11,384</td>
</tr>
<tr>
<td>Kings Quad</td>
<td>ES042</td>
<td>87,039</td>
<td>11,136</td>
</tr>
<tr>
<td>Kings Pavilion</td>
<td>ES044</td>
<td>85,956</td>
<td>11,022</td>
</tr>
<tr>
<td>Kings Elph Hall</td>
<td>ES042</td>
<td>50,658</td>
<td>6,491</td>
</tr>
<tr>
<td>Special Collins</td>
<td>ES042</td>
<td>69,164</td>
<td>8,484</td>
</tr>
<tr>
<td>Meston Or</td>
<td>ES047</td>
<td>357,378</td>
<td>42,895</td>
</tr>
<tr>
<td>Meston Ext</td>
<td>ES047</td>
<td>346,855</td>
<td>41,605</td>
</tr>
<tr>
<td>Central Htg S</td>
<td>ES008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHS Local Dis</td>
<td>ES008</td>
<td>4,651</td>
<td>598</td>
</tr>
<tr>
<td>CHP Station</td>
<td>ES008</td>
<td>427,854</td>
<td>54,872</td>
</tr>
<tr>
<td>QML</td>
<td>ES052</td>
<td>517,320</td>
<td>66,272</td>
</tr>
<tr>
<td>Fraser Noble</td>
<td>ES035</td>
<td>360,035</td>
<td>43,250</td>
</tr>
<tr>
<td>Zoology</td>
<td>ES065</td>
<td>1,398,247</td>
<td>158,502</td>
</tr>
<tr>
<td>Cruickshank</td>
<td>ES014</td>
<td>285,409</td>
<td>30,382</td>
</tr>
<tr>
<td>Cruickshank G</td>
<td>ES014</td>
<td>11,279</td>
<td>1,371</td>
</tr>
<tr>
<td>St Marys</td>
<td>ES056</td>
<td>66,904</td>
<td>8,097</td>
</tr>
<tr>
<td>Humanity MA</td>
<td>ES041</td>
<td>5,315</td>
<td>683</td>
</tr>
<tr>
<td>Crombie Annx</td>
<td>ES013</td>
<td>15,368</td>
<td>1,795</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>6,379,790</td>
<td>781,048</td>
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</table>

## Electric – Service Charge Income

<table>
<thead>
<tr>
<th>Academic - Non University Use</th>
<th>Exported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>Cons, kWh</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>Polwarth, Trust</td>
<td>ES032</td>
</tr>
<tr>
<td>Link, Trust</td>
<td>ES153</td>
</tr>
<tr>
<td>Foresterhill, Med Chi</td>
<td>ES032</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
</tr>
</tbody>
</table>
### Electric – Service Charge Expenditure

<table>
<thead>
<tr>
<th>Cost Code</th>
<th>Imported</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental Health, Royal Cornhill</td>
<td>ES012</td>
<td>-</td>
<td>554</td>
</tr>
<tr>
<td>Health Centre, Foresterhill</td>
<td>ES022</td>
<td>-</td>
<td>3,888</td>
</tr>
<tr>
<td>OMRA</td>
<td>ES026</td>
<td>-</td>
<td>14,961</td>
</tr>
<tr>
<td>MRI Scanner, Foresterhill</td>
<td>ES029</td>
<td>-</td>
<td>14,720</td>
</tr>
<tr>
<td>Mosque, Foresterhill</td>
<td>ES030</td>
<td>-</td>
<td>1,113</td>
</tr>
<tr>
<td>PET Scanner</td>
<td>ES031</td>
<td>-</td>
<td>35,467</td>
</tr>
<tr>
<td>Fraser Noble Court</td>
<td>ES036</td>
<td>-</td>
<td>2,720</td>
</tr>
<tr>
<td>Woodend MRI</td>
<td>ES072</td>
<td>-</td>
<td>41,164</td>
</tr>
<tr>
<td>RACH</td>
<td>ES075</td>
<td>-</td>
<td>13,137</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td></td>
<td></td>
<td><strong>127,723</strong></td>
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</tbody>
</table>

### Electric – Overall Total Academic

<table>
<thead>
<tr>
<th>Academic</th>
<th>Imported</th>
<th>CHP Generated</th>
<th>Cons, kWh</th>
<th>Cost, £</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Total</strong></td>
<td><strong>15,085,453</strong></td>
<td><strong>1,939,821</strong></td>
<td><strong>6,775,192</strong></td>
<td><strong>21,860,645</strong></td>
</tr>
</tbody>
</table>

### Electric – Campus Services

### Electric – Individually Metered

<table>
<thead>
<tr>
<th>Campus Services</th>
<th>Cost Code</th>
<th>Imported</th>
<th>Cons, kWh</th>
<th>Cost, £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hillhead Hall</td>
<td>RC061</td>
<td>2,428,805</td>
<td>268,409</td>
<td></td>
</tr>
<tr>
<td>110 High Street</td>
<td></td>
<td>30,851</td>
<td>3,955</td>
<td></td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td></td>
<td><strong>2,459,656</strong></td>
<td><strong>272,364</strong></td>
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</table>

### Electric Sub3 Campus Services

<table>
<thead>
<tr>
<th>Campus Services</th>
<th>Cost Code</th>
<th>Imported</th>
<th>CHP Generated</th>
<th>Cons, kWh</th>
<th>Cost, £</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hub</td>
<td>RC018</td>
<td>445,965</td>
<td>57,142</td>
<td>461,766</td>
<td>31,979</td>
</tr>
<tr>
<td>Crombie Hall</td>
<td>RC041</td>
<td>179,808</td>
<td>19,134</td>
<td>196,976</td>
<td>13,641</td>
</tr>
<tr>
<td>Kings Hall</td>
<td>RC077</td>
<td>94,891</td>
<td>10,087</td>
<td>102,499</td>
<td>7,098</td>
</tr>
<tr>
<td>Johnston Hall</td>
<td>RC041</td>
<td>156,055</td>
<td>16,665</td>
<td>186,100</td>
<td>12,888</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td></td>
<td><strong>876,719</strong></td>
<td><strong>103,029</strong></td>
<td><strong>947,341</strong></td>
<td><strong>65,607</strong></td>
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</tbody>
</table>

### Electric – Overall Total Campus Services

<table>
<thead>
<tr>
<th>Campus Services</th>
<th>Imported</th>
<th>CHP Generated</th>
<th>Cons, kWh</th>
<th>Cost, £</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Total</strong></td>
<td><strong>3,336,375</strong></td>
<td><strong>375,393</strong></td>
<td><strong>947,341</strong></td>
<td><strong>1,824,059</strong></td>
</tr>
</tbody>
</table>

### Electric – Overall Total

<table>
<thead>
<tr>
<th>Cons, kWh</th>
<th>Cost, £</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Total</strong></td>
<td><strong>18,421,828</strong></td>
</tr>
</tbody>
</table>
## Gas Use 2008/2009

### Gas – Individually Metered

<table>
<thead>
<tr>
<th>Academic</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>50/52 College Bounds, SRC</td>
<td>ES010</td>
<td>169,178</td>
<td>6,558</td>
</tr>
<tr>
<td>23 St Machar Drive</td>
<td>ES014</td>
<td>932,043</td>
<td>33,475</td>
</tr>
<tr>
<td>Edward Wright Annexe</td>
<td>ES017</td>
<td>117,827</td>
<td>3,976</td>
</tr>
<tr>
<td>IMS</td>
<td>ES024</td>
<td>3,697,906</td>
<td>124,731</td>
</tr>
<tr>
<td>Liberty Safework</td>
<td>ES025</td>
<td>183,276</td>
<td>6,209</td>
</tr>
<tr>
<td>Medical Physics</td>
<td>ES028</td>
<td>68</td>
<td>2</td>
</tr>
<tr>
<td>Medical School</td>
<td>ES032</td>
<td>5,723</td>
<td>149</td>
</tr>
<tr>
<td>Fraser Noble</td>
<td>ES035</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Elphinstone Institute, 24 High Street</td>
<td>ES038</td>
<td>25,692</td>
<td>851</td>
</tr>
<tr>
<td>Chaplaincy Centre, 25 High Street</td>
<td>ES039</td>
<td>98,556</td>
<td>3,824</td>
</tr>
<tr>
<td>Humanity Manse</td>
<td>ES040</td>
<td>72,619</td>
<td>2,752</td>
</tr>
<tr>
<td>King’s College, Elphinstone Hall</td>
<td>ES042</td>
<td>3,426</td>
<td>117</td>
</tr>
<tr>
<td>MacRobert Building</td>
<td>ES045</td>
<td>3,233</td>
<td>110</td>
</tr>
<tr>
<td>Marischal College</td>
<td>ES046</td>
<td>2,319,523</td>
<td>90,246</td>
</tr>
<tr>
<td>Meston Extension</td>
<td>ES047</td>
<td>1,258</td>
<td>41</td>
</tr>
<tr>
<td>Meston Original</td>
<td>ES047</td>
<td>1,659</td>
<td>54</td>
</tr>
<tr>
<td>New Kings</td>
<td>ES048</td>
<td>2,233</td>
<td>65</td>
</tr>
<tr>
<td>57 High Street</td>
<td>ES049</td>
<td>13,229</td>
<td>446</td>
</tr>
<tr>
<td>St Marys</td>
<td>ES056</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Zoology</td>
<td>ES065</td>
<td>322</td>
<td>12</td>
</tr>
<tr>
<td>Cromarty Lighthouse</td>
<td>ES067</td>
<td>40,964</td>
<td>1,030</td>
</tr>
<tr>
<td>Oceanlab</td>
<td>ES069</td>
<td>336,763</td>
<td>11,370</td>
</tr>
<tr>
<td>Townhouse</td>
<td>ES070</td>
<td>61,075</td>
<td>2,313</td>
</tr>
<tr>
<td>MRF</td>
<td>ES073</td>
<td>2,599,671</td>
<td>87,902</td>
</tr>
<tr>
<td>Kieth Park</td>
<td>ES073</td>
<td>150,522</td>
<td>6,774</td>
</tr>
<tr>
<td>IAHS</td>
<td>ES078</td>
<td>691,833</td>
<td>21,255</td>
</tr>
<tr>
<td>9A Dunbar Street</td>
<td>ES079</td>
<td>51,439</td>
<td>2,265</td>
</tr>
<tr>
<td>5 Dunbar Street</td>
<td>ES081</td>
<td>67,644</td>
<td>2,376</td>
</tr>
<tr>
<td>Unit 5 Holland Street</td>
<td>ESXXX</td>
<td>225,656</td>
<td>10,517</td>
</tr>
<tr>
<td>Suttie Centre</td>
<td>ES087</td>
<td>99,485</td>
<td>3,411</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td></td>
<td>11,972,824</td>
<td>422,831</td>
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</tbody>
</table>

### Gas - Service Charge Income

<table>
<thead>
<tr>
<th>Academic</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polwarth and Link, NHS Trust</td>
<td>ES032</td>
<td>3,962</td>
<td>103</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td></td>
<td>3,962</td>
<td>103</td>
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</tbody>
</table>
### Gas for CHP Station

<table>
<thead>
<tr>
<th>CHP Overall</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHP Station</td>
<td>Various</td>
<td>38,038,320</td>
<td>1,336,653</td>
</tr>
<tr>
<td>CHP Station - Engineer Maintenance</td>
<td>ES008</td>
<td>-</td>
<td>98,379</td>
</tr>
<tr>
<td>CHP Station - Gas used for heating</td>
<td>Various</td>
<td>25,618,320</td>
<td>900,219</td>
</tr>
<tr>
<td>CHP Station - Gas used for electricity</td>
<td>Various</td>
<td>12,420,000</td>
<td>436,434</td>
</tr>
</tbody>
</table>

### Gas – Heating Supplied off CHP Station

<table>
<thead>
<tr>
<th>Academic - CHP Heat Breakdown</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butchart Recreation Centre</td>
<td></td>
<td>612,092</td>
<td>21,509</td>
</tr>
<tr>
<td>CHP Office</td>
<td></td>
<td>13,630</td>
<td>479</td>
</tr>
<tr>
<td>Cruickshank</td>
<td></td>
<td>372,312</td>
<td>13,083</td>
</tr>
<tr>
<td>Cruickshank GH</td>
<td></td>
<td>159,339</td>
<td>5,599</td>
</tr>
<tr>
<td>Kings College - Visitor Centre</td>
<td>ES042</td>
<td>1,104,300</td>
<td>38,805</td>
</tr>
<tr>
<td>Edward Wright</td>
<td></td>
<td>607,683</td>
<td>21,354</td>
</tr>
<tr>
<td>Kings College - Elphinstone Hall</td>
<td>ES042</td>
<td>559,984</td>
<td>19,678</td>
</tr>
<tr>
<td>Fraser Noble Building</td>
<td></td>
<td>1,871,015</td>
<td>65,747</td>
</tr>
<tr>
<td>St Marys</td>
<td></td>
<td>567,924</td>
<td>19,957</td>
</tr>
<tr>
<td>Kings College + Kings Pavillion</td>
<td>ES042</td>
<td>1,829,598</td>
<td>64,291</td>
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<tr>
<td>MacRobert Building</td>
<td></td>
<td>1,245,296</td>
<td>43,759</td>
</tr>
<tr>
<td>Meston Building</td>
<td>ES047</td>
<td>1,913,331</td>
<td>67,234</td>
</tr>
<tr>
<td>Meston Extension</td>
<td>ES047</td>
<td>2,158,979</td>
<td>75,866</td>
</tr>
<tr>
<td>Powis Gate</td>
<td></td>
<td>137,384</td>
<td>4,828</td>
</tr>
<tr>
<td>Queen Mother Library</td>
<td></td>
<td>1,260,706</td>
<td>44,301</td>
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<tr>
<td>Regent Building</td>
<td></td>
<td>311,136</td>
<td>10,933</td>
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<tr>
<td>Taylor Building</td>
<td></td>
<td>1,993,669</td>
<td>70,057</td>
</tr>
<tr>
<td>University Office</td>
<td></td>
<td>524,378</td>
<td>18,426</td>
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<tr>
<td>William Guild</td>
<td></td>
<td>1,806,073</td>
<td>63,465</td>
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<tr>
<td>Zoology Building</td>
<td></td>
<td>2,717,883</td>
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</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>21,766,712</td>
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</table>

### Gas – Individually Metered

<table>
<thead>
<tr>
<th>Campus Services</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUB</td>
<td></td>
<td>49,359</td>
<td>1,981</td>
</tr>
<tr>
<td>Crombie Kitchen</td>
<td>RC041</td>
<td>50,562</td>
<td>1,835</td>
</tr>
<tr>
<td>Johnston Hall</td>
<td>RC041</td>
<td>16,376</td>
<td>617</td>
</tr>
<tr>
<td>Hillhead</td>
<td>RC061</td>
<td>12,685,625</td>
<td>415,236</td>
</tr>
<tr>
<td>Hillhead Halls Kitchen</td>
<td>RC061</td>
<td>175,273</td>
<td>6,565</td>
</tr>
<tr>
<td>Hillhead Halls SL</td>
<td>RC061</td>
<td>60,193</td>
<td>2,300</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>13,037,389</td>
<td>428,534</td>
</tr>
</tbody>
</table>
Gas – Heating Supplied off CHP Station

<table>
<thead>
<tr>
<th>Campus S - CHP Heat Breakdown</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUB</td>
<td>615,728</td>
<td>21,636</td>
<td></td>
</tr>
<tr>
<td>Crombie Halls</td>
<td>809,946</td>
<td>28,461</td>
<td></td>
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<tr>
<td>Johnston Halls</td>
<td>2,006,336</td>
<td>70,502</td>
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</tr>
<tr>
<td>Sub Total</td>
<td>3,432,010</td>
<td>120,600</td>
<td></td>
</tr>
</tbody>
</table>

Gas – Overall Total Campus Services

| Total Campus - ex CHP gas    | 16,469,399| 549,134 |

Gas – Overall Total (ex CHP electric)

| Overall Total - ex CHP gas   | 50,204,973| 1,736,736|

Gas – Overall Total inc CHP electric

| Overall Total - inc CHP gas  | 62,624,973| 2,173,171|
Oil Use 2008/2009

Oil - 35s Gas Oil

<table>
<thead>
<tr>
<th>Academic</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balgownie</td>
<td>ES002</td>
<td>239,782</td>
<td>10,729</td>
</tr>
<tr>
<td>Bettyhill</td>
<td>ES005</td>
<td>11,880</td>
<td>463</td>
</tr>
<tr>
<td>CHP Station</td>
<td>ES008</td>
<td>72,168</td>
<td>3,560</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>323,830</td>
<td>14,752</td>
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</tbody>
</table>

Oil – Kerosene

<table>
<thead>
<tr>
<th>Academic</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culterty</td>
<td>ES015</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Oil - Service Charges Expenditure

<table>
<thead>
<tr>
<th>Academic</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraser Noble Court</td>
<td>ES036</td>
<td>-</td>
<td>4,307</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td>-</td>
<td>4,307</td>
</tr>
</tbody>
</table>

Oil – Overall Academic

| Total Academic |       | 323,830   | 19,058|

Oil - 35s Gas Oil

<table>
<thead>
<tr>
<th>Campus Services</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHP Station</td>
<td></td>
<td>11,164</td>
<td>551</td>
</tr>
<tr>
<td>Hillhead Halls</td>
<td>RC061</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
| Total Campus Services | 11,164 | 551

Oil – Overall Total

| Overall Total   |       | 334,994   | 19,609|
Steam Use 2008/2009

Steam – Metered

<table>
<thead>
<tr>
<th>Academic</th>
<th>Code</th>
<th>Cons, kWh</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Centre</td>
<td>ES027</td>
<td>795,909</td>
<td>39,783</td>
</tr>
<tr>
<td>West Block</td>
<td>ES033</td>
<td>265,465</td>
<td>12,696</td>
</tr>
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<td>IMS</td>
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Steam – Service Charges Income

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Steam – Service Charges Expenditure

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Steam – Total Use

| Total Academic |       | 4,584,241 | 248,512 |
## Water Use 2008/2009

**Water – Metered**

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<td>Butchart</td>
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<td>2,040</td>
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<td>ES063</td>
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<td>1,828</td>
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<td>William Guild Building</td>
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<td>4,750</td>
<td>7,074</td>
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## Water – Unmetered

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<th>Cost</th>
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<td>-</td>
<td>-</td>
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<td>ES009</td>
<td>-</td>
<td>577</td>
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<td>Fh Human Physiology</td>
<td>ES021</td>
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<td>19 College Bound</td>
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<tr>
<td>Church/Church Hall, Kings College</td>
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<td>Car/Lorry park, Dunbar Street</td>
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<td>-</td>
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<tr>
<td>Links, Cromarty</td>
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<tr>
<td>Harbour, Cromarty</td>
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## Water - Service Charges Income

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## Water - Service Charges Expenditure

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<tr>
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<td>RACH</td>
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## Water – Total Academic

| Total Academic                    | 160,801   | 152,808  |
Water – Metered

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<td>3,737</td>
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Water – Overall Total

<p>| Overall Total |          | <strong>266,258</strong> | <strong>198,579</strong> |</p>
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<th>Cost Code</th>
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<td>7,171</td>
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<td>William Guild Building</td>
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**Sewerage – Unmetered**

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<th>Cost</th>
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<tr>
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<td>-</td>
<td>-</td>
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<tr>
<td>48 College Bounds</td>
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<td>1,457</td>
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**Sewerage – Total Academic**

| Total Academic | 151,733 | 356,652 |

**Sewerage – Metered**

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<thead>
<tr>
<th>Campus Services</th>
<th>Cost Code</th>
<th>Cons, m3</th>
<th>Cost</th>
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<td>RC018</td>
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**Sewerage – Overall Total**

| Overall Total | 251,917 | 441,609 |