

**UTILITIES REPORT**  
**PERIOD AUGUST 2008 TO JULY 2009**  
**University of Aberdeen**

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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<sup>1</sup> 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<sup>3</sup> of water at a cost of £640,188. The overall cost for utilities for the year was £5,396,694.

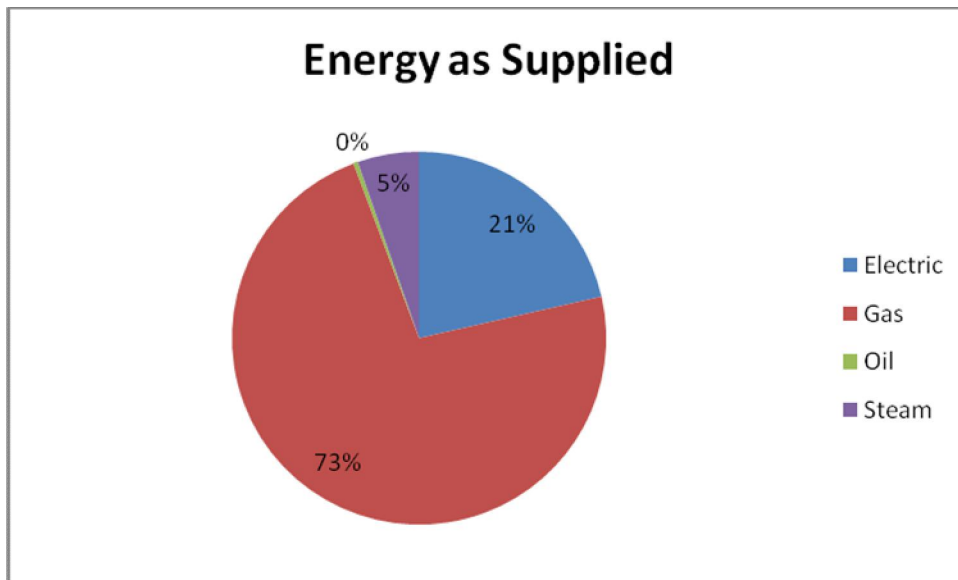
## 2 Energy as Supplied Summary

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**

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

**Figure 1 Energy as Supplied**



<sup>1</sup> 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.)

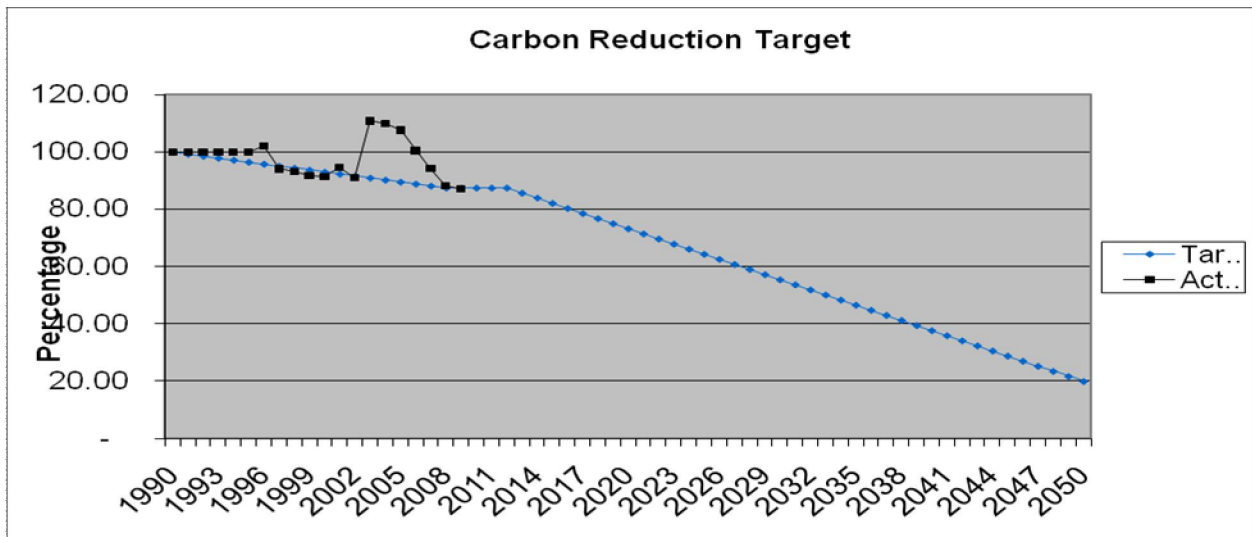
**Table 2 Carbon Dioxide Emissions<sup>2</sup>**

Energy	Consumption, kWh	kgCO <sub>2</sub> /kWh	Tonnes CO <sub>2</sub>
Electricity	18,421,828	0.537	9,893
Gas	62,624,973	0.206	12,900
Oil	334,994	0.265	89
Steam	4,584,241	0.294	1,347
Total	85,966,036		24,229

### 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 Target<sup>3</sup>**



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

<sup>3</sup> 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

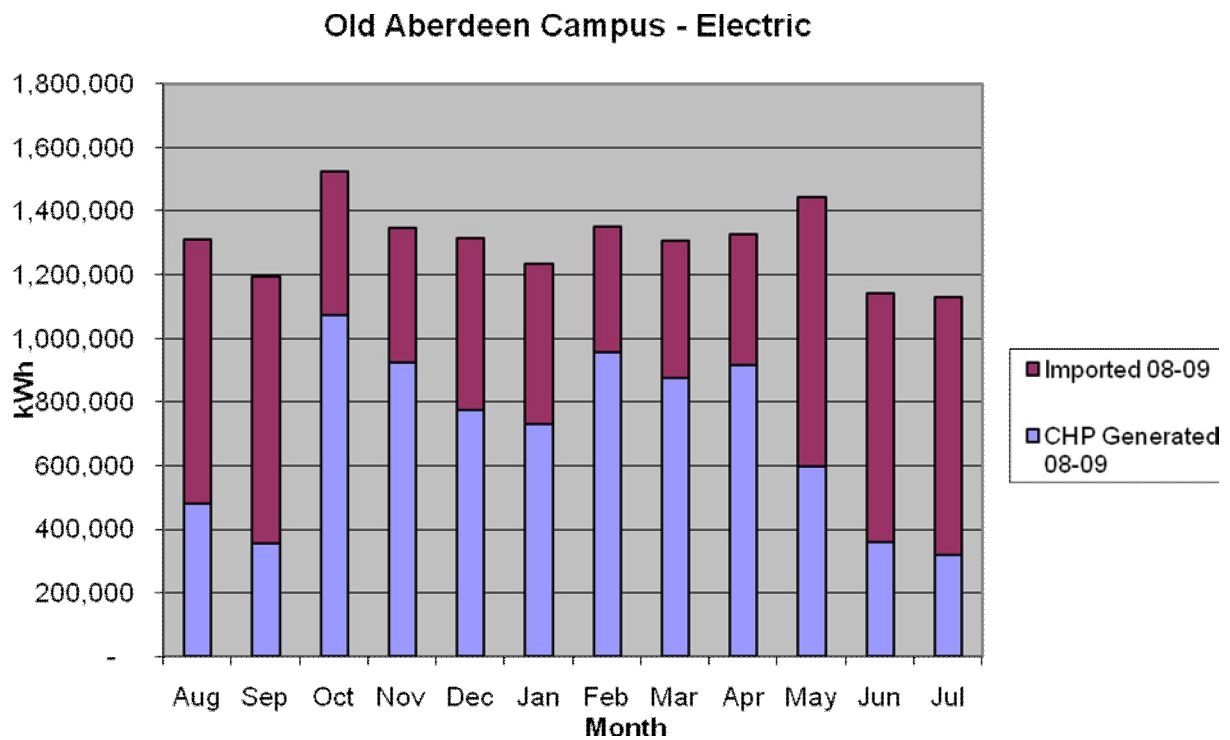
A power station typically operates at an efficiency of about 40%, whereas while the CHP engine generates electricity at about 40%, the heat that would otherwise be wasted, is used to provide heating and hot water for University buildings. This means that the CHP engine has an overall operating efficiency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

Figure 3 Old Aberdeen Campus electricity consumption for period 08/09



## 7 Energy as Used

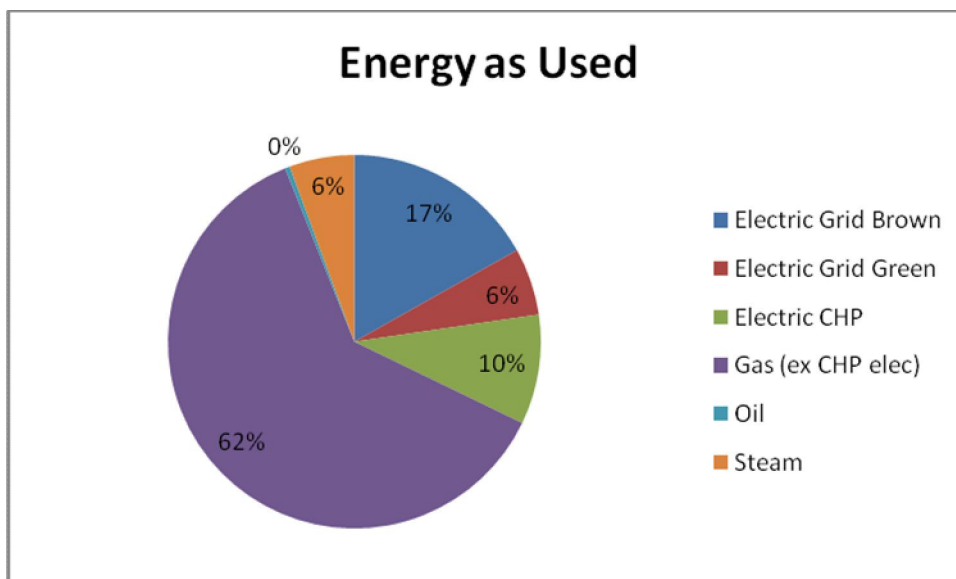
The actual energy used within the buildings is metered, and this information is recorded to generate consumption data on a monthly basis...

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

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

**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 Suttie 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**

Utility	Consumption, m <sup>3</sup>	Cost, £
Water	266,258	198,579
Sewerage	-	441,609
Total	266,258	640,188

Water consumption 2007/2008 279,202 m<sup>3</sup>  
 Water consumption 2008/2009 266,258 m<sup>3</sup>  
 Reduction 12,944 m<sup>3</sup> (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

Utility	Cons, kWh	Cost, £
Electric	3,335,699	424,292
Gas	1,922,119	48,287
Oil	3,558,568	1,619,029
Steam	-	-
Total	8,816,385	2,091,608

### Carbon Dioxide Emissions

Utility	Cons, kWh	Kg CO <sub>2</sub> /kWh	Tonnes CO <sub>2</sub>
Electric	3,335,699	0.537	1,791
Gas	1,922,119	0.206	396
Oil	3,558,568	0.265	943
Steam	-	0.294	-
Total	8,816,385		3,130

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.

## 16 Appendix 2 – University of Aberdeen Energy Breakdown

### Electricity Use 2008/2009

#### Electric – Individually Metered

<b>Academic</b>		Imported	
	Cost Code	Cons, kWh	Cost
Balgownie Home Farm Stead	ES002	33,866	4,481
Balgownie Sports Pavillion	ES002	20,589	3,345
Bettyhill	ES005	1,807	233
Boathouse	ES006	5,823	981
Butchart Recreation Centre	ES007	148,856	20,772
46/48 College Bounds	ES009	52,309	7,974
50 College Bounds	ES010	3,348	529
52 College Bounds	ES010	10,862	1,855
Culterty, Newburgh	ES015	8,280	1,348
Human Physiology	ES021	88,818	11,938
Liberty SRC	ES025	104,156	13,813
Elphinstone Institute	ES038	3,956	476
Chaplaincy Centre, 25 High St	ES039	14,453	2,419
Humanity Manse, 19 CBs	ES040	24,953	3,616
57 High Street	ES049	2,750	348
Thoms Place and Thoms Court	ES049	322	31
Wrights and Coopers Place	ES049	3,790	472
Powis Gate, Music Dept, 41 CB	ES051	46,823	7,732
Funerary House, Shoe Lane	ES055	42,698	5,950
Cromarty Cadet Hall	ES067	10,319	2,254
Cromarty Lighthouse	ES067	33,513	3,323
23 St Machar Drive	ES068	159,381	22,364
Oceanlab	ES069	203,261	21,973
Town House	ES070	17,949	2,809
Kieth Park	ES074	58,724	8,964
17 High Street	ES077	16,715	3,239
9A Dunbar Street	ES079	41,206	5,829
5 Dunbar St	ES081	7,344	1,218
Balmoral Estates Bothy	ES150	348	42
IMS	ES024	3,399,071	360,932
Marischal College	ES046	310,421	52,874
MRF	ES073	1,441,351	157,186
Sub Total		6,318,062	731,318

#### Electric – Medical School

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

Electric Sub3 Academic

Academic	Cost Code	Imported	Cost	CHP Generated	Cost	Total
		Cons, kWh		Cons, kWh		Cons, kWh
Sub No 3	Various					
MacRobert	ES045	683,929	87,589	704,327	48,777	1,388,256
Edward WA	ES017	73,660	9,446	81,503	5,644	155,163
MacRobert OM	ES045	-	-		-	-
William Guild	ES064	127,121	15,370	138,839	9,615	265,960
Taylor Building	ES060	190,861	23,477	212,866	14,742	403,727
New Kings	ES048	57,564	7,384	61,345	4,248	118,909
Old Brewery	ES050	14,623	1,767	15,517	1,075	30,140
Regent	ES054	66,118	8,480	75,783	5,248	141,901
Edward Wright	ES018	832,712	100,754	1,579,827	109,409	2,412,539
University Office	ES063	215,178	27,578	211,564	14,652	426,742
KCCC	ES043	88,594	11,384	116,365	8,059	204,959
Kings Quad	ES042	87,039	11,136	94,956	6,576	181,995
Kings Pavilion	ES044	85,956	11,022	90,039	6,236	175,995
Kings Elph Hall	ES042	50,658	6,491	49,507	3,429	100,165
Special Collins	ES042	69,164	8,848	41,982	2,907	111,146
Meston Or	ES047	357,378	42,895	401,362	27,796	758,740
Meston Ext	ES047	346,855	41,605	368,366	25,511	715,221
Central Htg S	ES008	-	-		-	-
CHS Local Dis	ES008	4,651	598	5,520	382	10,171
CHP Station	ES008	427,854	54,872	491,157	34,014	919,011
QML	ES052	517,320	66,272	548,510	37,986	1,065,830
Fraser Noble	ES035	360,035	43,250	452,636	31,347	812,671
Zoology	ES065	1,338,247	158,502	651,546	45,122	1,989,793
Cruickshank	ES014	285,409	30,382	269,397	18,657	554,806
Cruickshank G	ES014	11,279	1,371	16,441	1,139	27,720
St Marys	ES056	66,904	8,097	71,989	4,986	138,893
Humanity MA	ES041	5,315	683	7,490	519	12,805
Crombie Annx	ES013	15,368	1,795	16,356	1,133	31,724
Sub Total		6,379,790	781,048	6,775,192	469,207	3,154,982

Electric – Service Charge Income

Academic - Non University Use	Code	Exported	Cost
		Cons, kWh	
Polwarth, Trust	ES032	130,456	13,398
Link, Trust	ES153	1,264,217	129,835
Foresterhill, Med Chi	ES032	8,137	782
Sub Total		1,402,810	144,015

Electric – Service Charge Expenditure

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

Electric – Overall Total Academic

<b>Academic</b>	Imported		CHP Generated		Cons, kWh	Cost, £
<b>Overall Total</b>	15,085,453	1,939,821	6,775,192	469,207	21,860,645	2,409,028

Electric – Campus Services

Electric – Individually Metered

<b>Campus Services</b>		Imported	
	Cost Code	Cons, kWh	Cost
Hillhead Hall	RC061	2,428,805	268,409
110 High Street		30,851	3,955
<b>Sub Total</b>		2,459,656	272,364

Electric Sub3 Campus Services

<b>Campus Services</b>		Imported		CHP Generated		Total
	Cost Code	Cons, kWh	Cost	Cons, kWh	Cost	Cons, kWh
Hub	RC018	445,965	57,142	461,766	31,979	907,731
Crombie Hall	RC041	179,808	19,134	196,976	13,641	376,784
Kings Hall	RC077	94,891	10,087	102,499	7,098	197,389
Johnston Hall	RC041	156,055	16,665	186,100	12,888	342,155
<b>Sub Total</b>		876,719	103,029	947,341	65,607	1,824,059

Electric – Overall Total Campus Services

<b>Campus Services</b>	Imported		CHP Generated		Cons, kWh	Cost, £
<b>Overall Total</b>	3,336,375	375,393	947,341	65,607	1,824,059	441,000

Electric – Overall Total

	Imported		CHP Generated		Total	
	Cons, kWh	Cost, £	Cons, kWh	Cost, £	Cons, kWh	Cost, £
<b>Overall Total</b>	18,421,828	2,315,214	7,722,532	534,814	26,144,361	2,850,028

Gas Use 2008/2009

Gas – Individually Metered

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

Gas - Service Charge Income

<b>Academic</b>	Code	Cons, kWh	Cost
Polwarth and Link, NHS Trust	ES032	3,962	103
Sub Total		3,962	103

Gas for CHP Station

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

Gas – Heating Supplied off CHP Station

<b>Academic - CHP Heat Breakdown</b>	Code	Cons, kWh	Cost
Butchart Recreation Centre		612,092	21,509
CHP Office		13,630	479
Cruickshank		372,312	13,083
Cruickshank GH		159,339	5,599
Kings College - Visitor Centre	ES042	1,104,300	38,805
Edward Wright		607,683	21,354
Kings College - Elphinstone Hall	ES042	559,984	19,678
Fraser Noble Building		1,871,015	65,747
St Marys		567,924	19,957
Kings College + Kings Pavillion	ES042	1,829,598	64,291
MacRobert Building		1,245,296	43,759
Meston Building	ES047	1,913,331	67,234
Meston Extension	ES047	2,158,979	75,866
Powis Gate		137,384	4,828
Queen Mother Library		1,260,706	44,301
Regent Building		311,136	10,933
Taylor Building		1,993,669	70,057
University Office		524,378	18,426
William Guild		1,806,073	63,465
Zoology Building		2,717,883	95,505
Sub Total		21,766,712	764,875

Gas – Individually Metered

<b>Campus Services</b>	Code	Cons, kWh	Cost
HUB		49,359	1,981
Crombie Kitchen	RC041	50,562	1,835
Johnston Hall	RC041	16,376	617
Hillhead	RC061	12,685,625	415,236
Hillhead Halls Kitchen	RC061	175,273	6,565
Hillhead Halls SL	RC061	60,193	2,300
Sub Total		13,037,389	428,534

Gas – Heating Supplied off CHP Station

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

Gas – Overall Total Campus Services

<b>Total Campus - ex CHP gas</b>		<b>16,469,399</b>	<b>549,134</b>
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Gas – Overall Total (ex CHP electric)

<b>Overall Total - ex CHP gas</b>		<b>50,204,973</b>	<b>1,736,736</b>
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Gas – Overall Total inc CHP electric

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

Oil - 35s Gas Oil

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

Oil – Kerosene

<b>Academic</b>	Code	Cons, kWh	Cost
Culterty	ES015	-	-
<b>Sub Total</b>		<b>-</b>	<b>-</b>

Oil - Service Charges Expenditure

<b>Academic</b>	Code	Cons, kWh	Cost
Fraser Noble Court	ES036	-	4,307
<b>Sub Total</b>		<b>-</b>	<b>4,307</b>

Oil – Overall Academic

<b>Total Academic</b>		<b>323,830</b>	<b>19,058</b>
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Oil - 35s Gas Oil

<b>Campus Services</b>	Code	Cons, kWh	Cost
CHP Station		11,164	551
Hillhead Halls	RC061	-	-
<b>Total Campus Services</b>		<b>11,164</b>	<b>551</b>

Oil – Overall Total

<b>Overall Total</b>		<b>334,994</b>	<b>19,609</b>
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## Steam Use 2008/2009

### Steam – Metered

<b>Academic</b>	Code	Cons, kWh	Cost
Medical Centre	ES027	795,909	39,783
West Block	ES033	265,465	12,696
IMS	ES024	273,917	12,457
Polwarth North	ES032	671,843	31,963
Polwarth South	ES032	224,905	10,687
Med Physics	ES028	657,452	31,272
MRF	ES073	1,694,749	77,075
Sub Total		4,584,241	215,935

### Steam – Service Charges Income

<b>Academic</b>	Code	Cons, kWh	Cost
Foresterhill, Med Chi	ES032	-	550
Sub Total		-	550

### Steam – Service Charges Expenditure

<b>Academic</b>	Cost Code	Cons, kWh	Cost
Mental Health, Royal Cornhill	ES012	-	2,628
Health Centre, Foresterhill	ES022	-	1,968
OMRU	ES026	-	8,269
MRI Scanner, Foresterhill	ES029	-	1,790
PET Scanner	ES031	-	2,312
Woodend MRI	ES072	-	4,294
RACH	ES075	-	11,865
Sub Total		-	33,127

### Steam – Total Use

<b>Total Academic</b>		<b>4,584,241</b>	<b>248,512</b>
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Water Use 2008/2009

Water – Metered

<b>Academic</b>	Cost Code	Cons, m3	Cost
Balgownie HFS	ES002	3,268	2,516
Balgownie Pavillion	ES002	-	-
Bedford Hut	ES003	-	378
Bedford Road	ES003	1,737	1,033
Butchart	ES007	1,364	844
Heating Station (QML, Meston etc)	ES008	57,750	57,129
Cruickshank (5 Chanonry)	ES014	4,079	3,041
Cruickshank (7-8 Chanonry)	ES014	313	470
Culterty	ES015	1,413	1,364
Edward Wright	ES018	2,978	1,926
Liberty Safework	ES025	692	676
Medical Physics	ES028	6,216	5,819
Med Sch Polwarth	ES032	8,466	6,931
West Block	ES033	14,079	12,713
King's College	ES042	12,137	7,250
Kings Pavillion	ES044	3,849	4,432
MacRobert Building	ES045	2,351	2,389
Marischal (College)	ES046	1,089	962
Marischal (Micro)	ES046	438	718
New King's	ES048	985	889
Powis Gate, Music, 41College Bnds	ES051	224	504
Regent Building	ES054	767	779
St Marys	ES056	2,001	1,156
Taylor Building	ES060	3,238	2,040
University Office	ES063	2,132	1,828
William Guild Building	ES064	4,750	7,074
Zoology	ES065	19,599	15,359
23 St Machar Drive	ES068	958	862
Oceanlab	ES069	568	606
Oceanlab Boathouse	ES069	-	131
17 High Street	ES077	30	171
9A Dunbar Street	ES079	249	289
5 Dunbar Street	ES081	-	-
Kieth Park		356	646
MRF		2,725	2,142
Sub Total		160,801	145,067

### Water – Unmetered

<b>Academic</b>	<b>Cost Code</b>	<b>Cons, m3</b>	<b>Cost</b>
Betty Hill	ES005	-	144
Boat House	ES006	-	-
48 College Bounds	ES009	-	577
Fh Human Physiology	ES021	-	345
25 High Street	ES039	-	430
19 College Bound	ES040	-	371
Church/Church Hall, Kings College	ES042	-	-
Car/Lorry park, Dunbar Street	ES049	-	-
Links, Cromarty	ES067	-	206
Harbour, Cromarty	ES067	-	222
Townhouse	ES070	-	210
Sub Total		-	2,505

### Water - Service Charges Income

<b>Location</b>	<b>Code</b>	<b>Cons, m3</b>	<b>Cost</b>
Foresterhill, Med Chi	ES032	-	366
Sub Total		-	366

### Water - Service Charges Expenditure

<b>Academic</b>	<b>Cost Code</b>	<b>Cons, m3</b>	<b>Cost</b>
OMRU	ES026	-	1,313
MRI Scanner, Foresterhill	ES029	-	810
Mosque, Foresterhill	ES030	-	72
PET Scanner	ES031	-	957
Woodend MRI	ES072	-	1,859
RACH	ES075	-	590
Sub Total		-	5,601

### Water – Total Academic

<b>Total Academic</b>		<b>160,801</b>	<b>152,808</b>
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Water – Metered

<b>Campus Services</b>	Cost Code	Cons, m3	Cost
HUB	RC018	6,550	3,737
Crombie Hall	RC041	9,337	5,686
Johnston Hall	RC041	10,136	5,786
Hillhead Halls	RC061	79,434	30,562
<b>Total Campus Services</b>		<b>105,457</b>	<b>45,771</b>

Water – Overall Total

<b>Overall Total</b>		<b>266,258</b>	<b>198,579</b>
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Sewerage – Metered

<b>Academic</b>	<b>Cost Code</b>	<b>Cons, m3</b>	<b>Cost</b>
Balgownie HFS	ES002	3,105	-
Balgownie Pavillion	ES002	-	-
Bedford Hut	ES003	-	-
Bedford Road	ES003	1,650	2,310
Butchart	ES007	1,296	3,502
Heating Station (QML, Meston etc)	ES008	54,863	112,705
Cruickshank (5 Chanonry)	ES014	3,875	5,268
Cruickshank (7-8 Chanonry)	ES014	297	2,293
Culterty	ES015	1,342	2,363
Edward Wright	ES018	2,829	3,957
Liberty Safework	ES025	657	4,409
Medical Physics	ES028	5,905	8,678
Med Sch Polwarth	ES032	8,043	9,371
West Block	ES033	13,375	46,793
King's College	ES042	11,530	45,977
Kings Pavillion	ES044	3,657	7,171
MacRobert Building	ES045	2,233	13,069
Marischal (College)	ES046	1,035	9,834
Marischal (Micro)	ES046	416	922
New King's	ES048	936	1,563
Powis Gate, Music, 41College Bnds	ES051	213	1,266
Regent Building	ES054	729	1,302
St Marys	ES056	1,901	5,496
Taylor Building	ES060	3,076	4,254
University Office	ES063	2,025	2,829
William Guild Building	ES064	4,024	6,835
Zoology	ES065	18,619	32,376
23 St Machar Drive	ES068	910	3,017
Oceanlab	ES069	-	-
Oceanlab Boathouse	ES069	-	-
17 High Street	ES077	29	475
9A Dunbar Street	ES079	237	628
5 Dunbar Street	ES081	-	-
Kieth Park		338	1,103
MRF		2,589	11,398
Sub Total		151,733	351,166

Sewerage – Unmetered

<b>Academic</b>	Cost Code	Cons, m3	Cost
Betty Hill	ES005	-	233
Boat House	ES006	-	-
48 College Bounds	ES009	-	1,457
Fh Human Physiology	ES021	-	755
25 High Street	ES039	-	1,011
19 College Bounds	ES040	-	837
Church/Church Hall, Kings College	ES042	-	-
Car/Lorry park, Dunbar Street	ES049	-	-
Links, Cromarty	ES067	-	241
Harbour, Cromarty	ES067	-	389
Townhouse	ES070	-	563
Sub Total		-	5,486

Sewerage – Total Academic

<b>Total Academic</b>		<b>151,733</b>	<b>356,652</b>
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Sewerage – Metered

<b>Campus Services</b>	Cost Code	Cons, m3	Cost
HUB	RC018	6,223	8,231
Crombie Hall	RC041	8,870	12,111
Johnston Hall	RC041	9,629	23,571
Hillhead Halls	RC061	75,462	41,044
<b>Total Campus Services</b>		<b>100,184</b>	<b>84,957</b>

Sewerage – Overall Total

<b>Overall Total</b>		<b>251,917</b>	<b>441,609</b>
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