THE HIGHLAND COUNCIL

RESOURCES COMMITTEE

26 NOVEMBER 2014

Agenda Item	27
Report No	RES/82 /14

HIGHLAND COUNCIL BIOMASS INSTALLATION PERFORMANCE REPORT

Report by Director of Development & Infrastructure

Summary

This report sets out to brief members on the annual performance of the Council biomass heating systems and describe the monitoring and management of the boilers.

1. Background

1.1 At the Finance, Housing and Resources Committee of 23rd January 2014 Councillors requested details on the operation and maintenance of biomass boilers. Members requested details on the systems performance, reporting arrangements and details on failures along with arrangements to manage the provision. This report outlines the annual performance statement for 2013-14.

2. Biomass strategy and implementation

2.1 The use of solid biomass fuelled heating systems provides a low carbon solution for Council premises and brings benefits to the Highlands by the significant reduction of CO_2 emissions.

2.2 The implementation of these systems helps the Council achieve compliance with the Scottish and UK Government legislation and European directives for low carbon buildings.

2.3 The Council Carbon Management Policy and Energy Management Performance Plan determined the use of renewable technology as a default fuel choice and this is supported by the Carbon Management Plan and Carbon Clever initiative.

2.4 There are further benefits to be gained from the provision of biomass systems through developing local skills and employment opportunities for the installation, maintenance and fuelling stages of the systems. The Council benefits from the systems financially in terms of fuel cost reductions, grant income and carbon tax reduction.

2.5 The Highland Council pioneered biomass systems with the first system being installed in 2004 at Dingwall Primary School. A total of 73 sites now have

biomass systems as a primary or sole fuel provision, with plans in place for a further 3 systems to be installed during the 2014-15 financial year. All sites are listed in Appendix 1.

2.6 Since the first installation in 2004 the procurement and specification arrangements for Highland Council biomass heating systems has varied, mainly because of technical complexities, technological development and site practicalities.

This has led to a diverse portfolio of biomass heating systems which the Council have actively sought to streamline. Specifications and standards have been established following a great deal of work with the Carbon Trust to identify any weaknesses across Scotland in the use of biomass systems. The Council standards for design and acceptable performance have evolved as part of this process, and have been rationalised in a way that will lead to less variation of equipment and arrangements being used through technical requirements and design reviews.

2.7 A strategic decision to move to pellet supply has removed many of the fuel issues that were being experienced with the wood-chip used in some of the early installations.

2.8 All existing systems have the facility for connecting external plant for emergency and shutdown periods.

3. Biomass Servicing Arrangements and Call Outs

3.1 With the recognition that the use of solid biomass systems requires more support in its operation, the Council assisted in the setting up of a Biomass Support contract option in a Scottish Government procurement provision, and was the first to establish a "managed heat solution" through that contract. In July 2013 a local company, **Highland Wood Energy (HWE)**, was appointed to look after all Highland systems.

3.2 The contract arrangements dictate that fuel and operation is to be managed by the contractor and they will monitor fuel levels, provide wood supplies in good time and remove all ash. The contractor will carry out all cleaning and servicing of the boilers at intervals recommended by the manufacturers and will respond to all emergency call outs. Emergency calls are via a dedicated contact number and email address and a response on site is required within **2 hours** with a restoration of heat within **4 hours**.

3.3 The Council Procurement and Energy sections oversee the biomass contract and the team meet with the contractor on a monthly basis to review the operational performance of the plant and the contractor. Formal reports are issued on a quarterly basis detailing the plant operation, amount of fuel used, number of call-outs and any problems that have arisen.

3.4 There have been some issues in the initial stages of the contract with familiarity of the plant installations along with the specific knowledge and experience of the contractor's staff. This is understandable with such a large

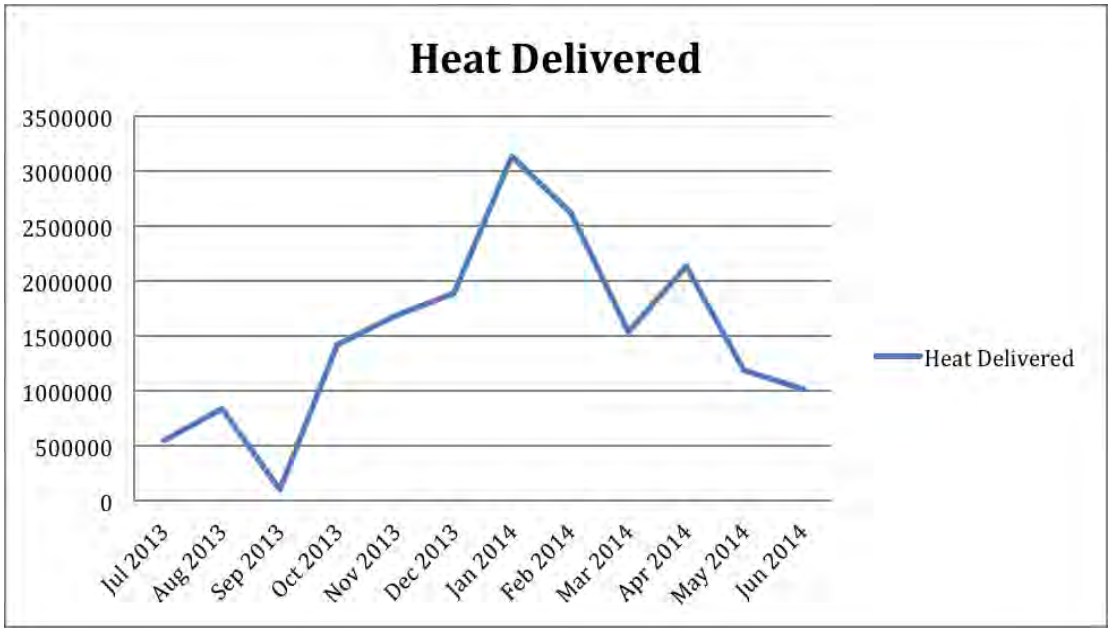
portfolio and the contractor is addressing this through specific training.

3.5 The biomass plants are cleaned and de-ashed every month and the contractor provided 4,771 tonnes of fuel to the boilers in 2013-14.

4. Annual Report

4.1 In the period of the first year of the contract the biomass units have generated 19,026,950 kWh of renewable heat. This equates to a saving on direct fuel costs of £391,955.00 and a reduction of 4,932 Tonnes of CO_2 from heating systems. There was a further windfall saving of £60,000 in Carbon (CRC) tax. Appendix 2 shows the contractor's supply summary of performance July 2013-September 2014.

4.2 Analysis of the performance of the plants shows that the heat delivered by 65 of the boilers falls within or above the expected range of generation and that the majority of boilers were available for heating almost all of the time.



4.3 There is room for improvement and optimisation of the various units can potentially deliver a higher heat generation or larger proportion of shared capacity.

4.4 Boiler system call outs (2013-14) have totalled 276 over the year and there have been particular sites that have required more attention than others as the contractor has failed to resolve all faults in a single visit. It should be noted that 27 sites have required more than 4 unplanned visits over the year. This is above the ideal and indicates that the preventative maintenance is not as effective as it should be with a total of 262 hours of unplanned downtime.

4.5 Call out response times reported for the contractor have been longer than expected although this can be attributed to both the geography of the Highlands and the resourcing of the calls. Steps are being taken by the

contractor to resolve this through employing additional resources.

4.6 The call out reporting from the contractor has shown that there are specific areas of improvement that need to be addressed in competence, experience with the Council biomass units and in responses to the faults. These areas are detailed in section 9.0.

5. Particular Site Issues

5.1 The installation of biomass in buildings is quite different in technical terms to the traditional oil, gas or electric heating systems and there has always been an appreciation that the solutions were new and required different skills and knowledge. The first installations were supplier/contractor led and as there was no established supply chain or knowledge network the Council fully relied on external partners to establish standards and maintain and operate the units. This led to over-complexity and some significant legacy problems with several systems.

5.2 It should be noted that although the Council have issued design standards and clear expectations of system requirements, the consultants employed, particularly on new build projects have not matched these, possibly due to skills gaps and cost based decisions, and this has added to our stock list and unique problems.

5.3 Several sites are identifiable as having perceived lower reliability and recent problems and others may have legacy issues that present different needs. These are outlined in Appendix 3.

5.4 The Czech boilers that the Council own have caused issues in obtaining parts from the manufacturer and this has led to significant downtime.

5.5 Historically, there had been issues with sites running out of fuel because the site managers did not place orders for fuel in time to allow delivery before using all stock. This potential problem has been removed through the introduction of the new managed heat contract.

6. Actions taken and modifications implemented on biomass systems

6.1 To enable better control through improved communication, the Council heating systems are increasingly being linked through the Council IT network and work is progressing with ICT and Fujitsu to provide email and text alerts on a range of factors for all heating systems (including biomass). This will provide early warning and attendance to any issues or faults in the systems. Further trials have been undertaken on installation of mobile phone (GSM) telemetry units to provide text (SMS) alerts from the boilers directly to the operating firm and this has been installed at a range of sites that are considered vulnerable (e.g. care homes), remote or problematic.

6.2 There have been issues with obtaining parts and there have been discussions with the servicing contractor regarding stock levels and routes for procurement that would allow a better provision to be retained and available for the

systems. An exercise is being undertaken to identify and monitor all spares requirements for this stock and this will help to inform reliability and future plant choice.

7. Risk Analysis for Biomass Systems

7.1 The biomass installations do present a different set of requirements to any grid-connected heating system and whilst similar to liquid fuels, they do require more technical input than gas or oil systems.

The following table examines potential risks that are envisaged along with details of how these are being monitored or addressed:

Risk	Actions Taken	Monitoring	Remedial considerations
Single fuel operation at the site	Systems have emergency connections available	GSM units and email alerts to be provided	More regular operational checks.
Biomass failure on single fuel sites	Stand-by Plant is available in the north region, and via local suppliers	Availability is being assessed, and in winter holiday periods, arrangements are put in place to secure availability from suppliers.	Additional stand-by plant is being considered for strategic locations.
Biomass fault or failure reporting	Single contact numbers are known at all sites	GSM units are being fitted to all vulnerable and single fuel sites.	Fault and info alerts are being actioned for all heating systems to email all relevant personnel.
Call out delays	Contractor is committing additional staff to cover the contractual response times	Monthly checks on performance via KPI reports. A live portal is being set up to provide more in-depth information	FM & MO officers are being offered more specialist training, to cope with simple fault analysis.
System sooting and sensor blocking	Contractor to check on build-ups and call out intervals.	Maintenance reports being checked to ensure quality of operation	Maintenance intervals to be reduced where call outs are regular.
Fuelling	Contractor must	Heat production	BMS systems are

Risk	Actions Taken	Monitoring	Remedial considerations
	monitor and is operating a “top-up” arrangement at all sites	figures are being matched to deliveries to assess stock. At holiday periods, a sequence is agreed along with stock status report.	connected to on-site monitors to assist with checks.
Spare parts	Contractor is to stock a palate of parts for all systems	Monthly reporting on use and stock	Reducing the number of manufacturers through creating design standards.
Associated Systems	Close co-operation with maintenance colleagues to ensure sharing of reports and controls	Monthly reporting	Examine potential for joint servicing and maintenance contracts.

8. Further Considerations for improvement

8.1 The information availability and exchange is an important aspect of addressing concerns and this needs to be reviewed for a wider and more accessible format. In addition, heating failures need to be clearly identified for specific cause.

8.2 Advanced fault finding training is to be given to janitors and facilities management or local maintenance staff to deal quickly with any problems raised.

9. Maintenance Servicing Improvements and Action Plans

9.1 The annual report on the service and maintenance contract has highlighted that there is room for improvement in the following areas:

- Service response time
- Unplanned call outs and boiler downtime
- Contractor capability
- Boiler heat generation

9.2 The contract monitoring arrangements are to improve with the contractor implementing a “real-time” portal for allowing information and records to be provided for analysis.

9.3 The contractor has been instructed to produce a status report and action plan for each boiler by the end of the year along with recommendations and timescales for any required works.

9.4 Capability issues have been raised with the contractor and they have been instructed to evidence a skills improvement plan that covers all the types and makes of boiler plant in the Council portfolio. This will be monitored at monthly meetings. The contractor has established links to the Czech manufacturers to enable parts and training to be undertaken on the boilers in the Council buildings.

9.5 An exercise is underway to analyse the load profiles of all sites, detailing the output capability, efficiency and performance to determine the additional potential of the plant and how the operation can be better optimised and controlled.

This should allow the Council to make better use of the biomass and further reduce the oil use and attributed carbon emissions.

10. Conclusion

10.1 The biomass installations have shown cost and carbon reductions over the year and significant reductions have been achieved in oil consumption and carbon emissions from our buildings.

10.2 The biomass systems have generally shown to be reliable and effective over the year and the managed heat provision has been a factor in achieving this although there are aspects where improvement can be made.

10.3 The strategic plan is to remove oil boilers where possible and the biomass boilers will operate as the main heating source for buildings.

11. Implications

11.1 The existing resources are sufficient to manage this programme of works.

11.2 There are no legal implications.

11.3 There are no equalities implications.

11.4 The biomass programme has significant benefit to the Council climate change actions and carbon clever programme.

11.5 There is a risk of systems failure leading to building operation and closure but the managed heat arrangement allows for mitigation measures to retain effective heat in buildings.

Recommendation

Members are asked to note the contents of paper and the improvements in performance of the biomass plants and the monitoring of the provision.

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Date: 10th November 2014

Appendix 1 – Biomass Sites List

Site	Boiler Type	Location	Status	Comment
Abernethy Primary	Hertz	Cabin	Operational	
An Acarsaid	Froling	Cabin	Operational	
Achtertyre Primary	Hertz	Cabin	Operational	
Ardersier Primary	Hertz	Cabin	Operational	
Averon Centre	Hertz	Built-in	Operational	
Avoch Primary	Froling	Built-in	Operational	
Aviemore Primary	Czech Hamont	Built-in	Partially Operational	1 of 2 boilers
Bayview House	Hertz	Cabin	Operational	
Beauly Primary	Hertz	Cabin	Operational	
Ben Wyvis Primary	ETA Hack	Built-in	Operational	
Black Isle Leisure	Hertz	Cabin	Operational	
Bridgend Primary	Hertz	Cabin	Operational	
Broadford Primary	Hertz	Cabin	Operational	
Bught Nursery	Hertz	Cabin	Operational	
Carrbridge Primary	Hertz	Cabin	Operational	
Castletown Primary	Hertz	Cabin	Non-Operational	
Croy Primary	Hertz	Cabin	Operational	
Culloden Academy	Hertz	Built-in	Operational	
Dingwall Leisure	Hertz	Cabin	Operational	
Dingwall Primary	KWB	Built-in	Operational	
Dornoch Primary	Hertz	Cabin	Operational	
Drummuie Offices	Hertz	Cabin	Operational	
Eigg Primary	Viessman	Built-in	Operational	Log Boiler
Glenurquhart Primary	Hertz	Cabin	Operational	
Golspie Primary	Hertz	Cabin	Operational	
Golspie Pool	Hertz	Cabin	Operational	
Grantown Primary	Hertz	Cabin	Operational	
Grant House	Hertz	Cabin	Operational	
Halkirk Primary	KWB	Cabin	Operational	
Hilton of Cadbol	Hertz	Cabin	Operational	

Appendix 1 – Biomass Sites List

Site	Boiler Type	Location	Status	Comment
Hilton Primary	Hertz	Cabin	Operational	
Highland Folk Park	Hertz	Built-in	Operational	
Invergordon Academy	Hertz	Cabin	Operational	
Invergordon Leisure	Hertz	Cabin	Operational	
Inverlochy Primary	Froling	Cabin	Operational	
Invernevis House	Hertz	Cabin	Operational	
Inverness High School	Hertz	Cabin	Operational	
Isabel Rhind Centre	Hertz	Cabin	Operational	
Kiltearn Primary	En Tech	Cabin	Operational	
Kilchuimen Primary	Hertz	Cabin	Operational	
Kingussie High	Viessman	Cabin	Operational	
Kingussie Primary	Hertz	Cabin	Operational	
Kinmylies Building	KWB	Built-in	Operational	
Kirkhill Primary	Hertz	Cabin	Operational	
Kilchoan Primary			Operational	Community Scheme
Lairg Primary	Froling	Cabin	Operational	
Lochaber High	Viessman	Built-in	Operational	
Lochaber Leisure	Czech Kob	Built-in	Operational	
Lochaline Primary	Hertz	Cabin	Operational	
Lochbroom House	Froling	Cabin	Operational	
Lochcarron Primary	En Tech	Cabin	Non-Operational	
Lochyside Primary	Binder	Cabin	Operational	
Lybster Primary	Hertz	Cabin	Operational	
Milton of Kildary Primary	Hertz	Cabin	Operational	
Milton of Leys Primary	Hertz	Built-in	Operational	
North Kessock Primary	Hertz	Cabin	Operational	
Park Primary	Czech ETA	Cabin	Operational	

Appendix 1 – Biomass Sites List

Site	Boiler Type	Location	Status	Comment
Plockton High	Czech Catfire	Built-in	Non-Operational	Awaiting Parts
Portree Primary	Hertz	Cabin	Operational	
Pultneytown Primary	KWB	Cabin	Operational	
Seaforth House	Hertz	Cabin	Operational	
Sleat Primary	Hertz	Cabin	Operational	
South Lodge	Hertz	Cabin	Operational	
Staffin Primary	Hertz	Cabin	Operational	
Tain Academy	Uniconfort	Built-in	Operational	
Tarradale Primary	Froling	Cabin	Operational	
Telford Centre	FRoling	Cabin	Operational	
Thurso High	Czech Kob	Built-in	Non-Operational	Awaiting Parts
Thurso Leisure	Hertz	Built-in	Operational	
Wick Children's Unit	Hertz	Cabin	Operational	

Appendix 2 – HWE Heat Supply Summary of Performance

Highland Council Heat Supply Summary of Performance July 2013 - September 2014

	Heat Supplied (kWh)	Fuel Supplied (Tonnes)	No. of Callouts	Estimated Planned Downtime (Hours)	Estimated Unplanned Downtime (Hours)	Unplanned Downtime %	Estimated Uptime %	Carbon Saved (Tonnes)	Estimated Fuel Savings (Based on an Oil Price of £0.65)
CAITHNESS									
Bayview House	472,170	115.07	-	4	-	0.00%	99.95%	122,670	£9,558.27
Castletown Primary School	184,787	45.35	13	4	78	0.89%	99.06%	48,008	£3,740.70
Thurso High School	190,050	41.61	14	4	84	0.96%	99.00%	49,375	£3,847.24
Thurso Swimming Pool	603,750	136.90	13	4	696	7.97%	92.01%	156,854	£12,221.89
Pulteneytown Primary School	102,930	30.89	4	4	24	0.27%	99.68%	26,741	£2,083.64
Wick Children's Unit	18,724	8.18	-	-	-	0.00%	100.00%		
Lybster Primary School	263,100	77.26	-	4	-	0.00%	99.95%	68,353	£5,326.01
Halkirk Primary School	426,390	88.12	4	4	24	0.27%	99.68%	110,776	£8,631.54
SUTHERLAND	-	-	-	-	-				
Lairg Primary School	44,820	30.45	2	4	270	3.09%	96.87%	11,644	£907.30
Drummuie Offices	399,240	99.35	16	4	96	1.10%	98.86%	103,723	£8,081.93
Golspie Primary School	386,770	93.24	5	4	30	0.34%	99.61%	100,483	£7,829.50
Sutherland Swimming Pool Complex	329,960	84.00	2	4	12	0.14%	99.82%	85,724	£6,679.48
Seaforth House Resource Centre	482,850	113.66	9	4	54	0.62%	99.34%	125,444	£9,774.47
Dornoch Acad & Primary School	16,220	53.25	5	4	30	0.34%	99.61%	4,214	£328.35
ROSS & CROMARTY	-	-	-	-	-				
Hilton of Cadboll Primary	142,490	46.02	2	4	12	0.14%	99.82%	37,019	£2,884.47
Tain Royal Academy	1,429,000	410.89	13	6	2,412	27.61%	72.40%	371,254	£28,927.66
Invergordon Academy	947	6.30	1	4	6	0.07%	99.89%	246	£19.17
Invergordon Leisure Centre	527,880	128.04	1	4	6	0.07%	99.89%	137,143	£10,686.03
Isabel Rhind Centre	204,010	61.84	-	4	-	0.00%	99.95%	53,002	£4,129.83
Milton Primary School	173,550	42.66	-	4	-	0.00%	99.95%	45,088	£3,513.22
Park Primary School	332,230	82.01	14	6	84	0.96%	98.97%	86,313	£6,725.43
South Lodge Primary School	396,959	53.49	4	4	24	0.27%	99.68%	103,130	£8,035.76
Bridgend Primary	110,880	37.32	6	4	36	0.41%	99.54%	28,807	£2,244.58
Averon Leisure Centre	69,117	15.08	7	-	42	0.48%	99.52%	17,957	£1,399.16
Kiltearn Primary School	147,354	11.12	3	4	18	0.21%	99.75%	38,283	£2,982.93
Dingwall Leisure Centre	661,100	160.33	15	4	762	8.72%	91.26%	171,754	£13,382.84
Dingwall Primary School	289,394	70.93	16	4	96	1.10%	98.86%	75,185	£5,858.29
Black Isle Leisure Centre	257,420	68.38	8	4	48	0.55%	99.41%	66,878	£5,211.03
Avoch Primary School	263,390	-	7	4	42	0.48%	99.47%	68,429	£5,331.88
Ben Wyvis Primary	470,060	119.26	21	6	126	1.44%	98.49%	122,122	£9,515.56
Tarradale Primary School	219,710	57.61	3	4	18	0.21%	99.75%	57,081	£4,447.65
Lochbroom House	298,735	68.61	8	4	48	0.55%	99.41%	77,611	£6,047.38
Lochcarron Primary School	49,641	16.43	2	4	3,816	43.68%	56.39%	12,897	£1,004.90
SKYE & LOCHALSH	-	-	-	-	-				
An Acarsaid Centre	166,580	56.60	1	4	6	0.07%	99.89%	43,277	£3,372.13
Broadford Primary School	157,456	43.98	-	4	-	0.00%	99.95%	40,907	£3,187.43
Plockton High School	819,450	236.86	9	4	3,126	35.78%	64.27%	212,893	£16,588.36
Auchtertyre Primary School	95,250	25.43	1	4	6	0.07%	99.89%	24,746	£1,928.17
Eigg Primary School	43,593	-	-	4	-	0.00%	99.95%	11,325	£882.47
INVERNESS	-	-	-	-	-				
Kirkhill Primary School	120,930	34.93	1	4	6	0.07%	99.89%	31,418	£2,448.02
Arderseir Primary School	142,051	38.86	-	4	-	0.00%	99.95%	36,905	£2,875.58
Beauly Primary	249,090	60.04	4	4	24	0.27%	99.68%	64,714	£5,042.40
Hilton Primary School	124,130	33.54	1	4	510	5.84%	94.13%	32,249	£2,512.80
Bught Nursery	707,370	173.98	6	4	390	4.46%	95.50%	183,775	£14,319.50
Inverness High School	297,201	73.20	-	4	-	0.00%	99.95%	77,213	£6,016.33
Kinmylies Building	392,212	55.32	9	4	2,046	23.42%	76.60%	101,897	£7,939.66
Milton of Leys Primary	277,640	81.04	11	6	66	0.76%	99.18%	72,131	£5,620.35
Culloden Academy	463,010	125.75	6	4	36	0.41%	99.54%	120,290	£9,372.85
Croy Primary School	152,730	40.74	-	4	-	0.00%	99.95%	39,679	£3,091.76
Glenurquhart Primary School	131,020	29.39	5	4	30	0.34%	99.61%	34,039	£2,652.28
Kilchuimen Primary School	225,760	64.49	4	4	24	0.27%	99.68%	58,652	£4,570.13
Telford Centre	274,570	99.40	3	4	18	0.21%	99.75%	71,333	£5,558.20
North Kessock Primary School	62,253	12.16	-	-	-	0.00%	100.00%	16,173	£1,260.21
BADENOCH & STRATHSPEY	-	-	-	-	-				
Kingussie High School	857,500	240.30	10	4	60	0.69%	99.27%	222,779	£17,358.62
Kingussie Primary School	300,140	72.28	7	4	42	0.48%	99.47%	77,976	£6,075.82
Highland Folk Museum	243,520	69.04	-	4	-	0.00%	99.95%	63,266	£4,929.65
Abernethy Primary School	203,250	68.44	7	4	42	0.48%	99.47%	52,804	£4,114.45
Carrbridge Primary School	134,363	36.30	1	4	6	0.07%	99.89%	34,908	£2,719.95
Grantown Primary School	267,485	66.44	8	4	828	9.48%	90.50%	69,493	£5,414.78
Grant House Resource Centre	333,480	75.69	11	8	438	5.01%	94.91%	86,638	£6,750.73
Aviemore Primary	1,086,740	294.30	9	6	54	0.62%	99.32%	282,335	£21,999.19
LOCHABER	-	-	-	-	-				
Inverlochy Primary School	182,330	63.70	1	4	6	0.07%	99.89%	47,369	£3,690.96
Invernevis House Resource Centre	152,270	42.50	6	4	36	0.41%	99.54%	39,560	£3,082.45
Lochyside RC Primary School	169,260	71.75	8	8	48	0.55%	99.36%	43,974	£3,426.38
Lochaber High School	1,704,720	542.98	6	4	36	0.41%	99.54%	442,886	£34,509.14
Lochaber Leisure Centre Site	782,600	217.60	8	8	1,122	12.84%	87.10%	203,319	£15,842.40
Lochaline Primary School	80,660	23.92	-	4	-	0.00%	99.95%	20,955	£1,632.82
	TOTAL 21,366,242	**TOTAL** 5,645	**TOTAL** 361	**TOTAL** 274	**TOTAL** 18,000	**AVERAGE** 3.12%	**AVERAGE** 96.84%	**TOTAL** 5,546,085	**TOTAL** £432,144.00

TOTAL Heat Supplied (kWh)	TOTAL Fuel Supplied (Tonnes)	TOTAL No. of Callouts	TOTAL Estimated Planned Downtime (Hours)	TOTAL Estimated Unplanned Downtime (Hours)	AVERAGE Unplanned Downtime %	AVERAGE Deemed Uptime %	TOTAL Carbon Saved (Tonnes)	TOTAL Estimated Fuel Savings (Based on an Oil Price of £0.65)
21,366,242.40	**5,644.60**	**361**	**274**	**18,000**	**3.12%**	**96.84%**	**5,546,085**	**£432,144.00**

Appendix 3 – Legacy Site Issues

Site	Historic Problem	Action	Comment
Abernethy Primary School	This site has had particular problems with wood chip freezing and causing failure of the biomass plant.	A replacement plant was installed in October 2013	
Aviemore Primary School	The biomass was installed as a contractor designed part of the project and the plant is of the same manufacturer as 2 other sites, although a unique model. This has suffered breakdown in one of the boilers that requires parts that are proving to be lengthy in obtaining.	Supply routes sourced by the Council to overcome the service contractor's inability to obtain parts.	The greater issue at this site is that there are problems with the heating system achieving adequate heat and performance and even with one of the boilers being intermittent or off, there is sufficient heat output for the site.
Ben Wyvis Primary School	The biomass plant at this site had developed combustion issues with one of the boilers that had resulted in dust and smoke from the chimney on a number of occasions.	The fault took some time to diagnose, but eventually required a full system reprogramming and this has fully resolved the issues.	
Castletown Primary School	The biomass unit at this site has suffered several problems with breakdown, fuel quality and component failure, there were software issues with the unit and the flue has come loose.	Last year a pump had to be replaced.	

Appendix 3 – Legacy Site Issues

Dingwall Primary School	This is the original installation undertaken by the Council, it has been over complicated in the fuel feed arrangement that caused numerous failures. The woodchip fuel quality was poor and this presented problems that led to shut-down. The system was prone to site isolation and the plant rarely ran.	A new pellet fuel system was installed in 2013 and this has resolved the issues.	
Dingwall Leisure Centre	The installation contractor had gone bust prior to successful completion of the works and over time problems in the arrangements have surfaced and been dealt with. There was significant issues with the controls	This has now been resolved and apart from fuel ordering problems, this is now functional.	Fuel ordering is no longer required as it is part of the managed service by the contractor
Drummuie Offices	The biomass system originally designed to use wood chip as part of a cluster arrangement with other public bodies, but became problematic due to fuel issues and temperature problems. The container for the fuel bulged and collapsed.	This has been converted to use wood pellets with the compartments rebuilt and is operating reasonably well, although does need adjustment on burning rates.	
Kinmylies offices	A fault here identified that several manufacturer's upgrades were required. The parts took some time to arrive and some components were damaged in transit.	The boiler has more recently been sooting up internally and the servicing and cleaning arrangement has been adjusted accordingly to resolve any further problems.	

Appendix 3 – Legacy Site Issues

Plockton High	There have been fuel bunker and delivery problems, along with control system clashes with the oil boiler at the site. More recently, the feed motor has broken	Substantial works have been carried out to have the controls and feed mechanisms working properly. Parts have been ordered for the motor.	
Pultneytown Primary	Fuel issues have caused repeated failures with this boiler, and the fuel lid has not been sealing well	The fuel issues are now part of the supply contract and the lid has been adjusted.	
Tain Royal Academy	Various problems at this site and the boiler plant is difficult to clean. There have been a range of component failures and the feed auger snapped	All parts have been replaced with the auger re-fitted in the summer	Additional servicing has been arranged at this site to assist with operation.
Thurso High	The Czech boiler has had numerous component failures	The failed items have been replaced	the manufacturer is to attend the site.

Appendix 3 – Legacy Site Issues

Biomass incidents and school closures

Site	Problem	Action	Comment
Carrbridge Primary School	The new heating system at Carrbridge failed on the first day of term due to a break in the fuel supply auger. This appears to be a clear component failure.	A temporary solution was put in place on the same day and the part was replaced within 2 days.	There have been **no other faults.**
Bridgend Primary School	The biomass unit at this school had a fault reported on 15th January 2014 and the contractor attended that day. The heating in the school failed and both oil boilerhouses seem to have developed a breakdown causing the school to close		
Grantown Primary School	The biomass unit had been operating as the only heat source for the building since August 2013, when the oil boilers were turned off by the servicing contractor due to obsolesce. The biomass system developed a pressure loss from a leak in associated pipework on 29th January 2014.	The contractor advised that this was rectified by 09:30. The boiler has operated without fault since then and instruction has now been issued to replace the oil plant.	