

REPORT OF LEADER OF THE COUNCIL

BIOMASS BOILERS IN COUNTY COUNCIL PROPERTIES

Purpose of the Report

1. The purpose of this report is to provide background on the operational, reliability and safety concerns relating to biomass boiler installations across the Council's properties and options for replacement.

Information and Advice

2. Nottinghamshire has embarked on a nationally recognised programme over the last 13 years of replacing former coal, oil and LPG (liquefied petroleum gas) fired boilers with biomass boilers fuelled by wood pellets, where appropriate. This programme has been under-pinned initially by central government grants totalling c. £2m, and latterly by Renewable Heat Incentive (RHI) payments of around £150,000 p.a.
3. This programme has effectively provided external investment into the Council's school and corporate stock, and helped deliver environmental commitments in successive strategic plans, with annual carbon savings of over 6,000 tonnes from more than 10MW of installed renewable energy capacity. There are currently 64 biomass boilers installed across the Council's schools, academy schools and corporate properties, all but one fuelled by wood pellets. These are set out, with their location and date of installation, in Appendix 1. The value of the wood pellet supply to these sites for locally-based businesses is around £750,000 p.a.
4. The RHI payments generated by recent installations have enabled the Council to replace ageing fossil fuel boilers in a number of its schools free of capital and maintenance charges to the schools, who remain responsible for day to day operation and pay an annual heat charge based on metered heat consumption. Installations have mainly been at sites in 'off-gas grid' areas or where gas connections would have proved expensive or the supply of insufficient pressure. Alternative fuels, such as oil and LPG, have prices that are generally higher and more volatile than wood pellet. The most recent programme of biomass boiler installations, supported by the RHI, was approved by Finance and Property Committee in September 2012.

The safety track record of biomass boilers

5. Most installations on County Council properties have operated successfully without incident, however there were two significant incidents in 2014/15 at Abbey Gates Primary and Ordsall Primary, both relating to a particular boiler make, installed approximately 9 years ago.

6. Following the incident at Ordsall Primary, which took the form of a small uncontained ignition within the plant room, the County Council commissioned an independent investigation into the performance of similar boilers. This report found the installations to be intrinsically safe but identified a number of recommendations with regard to the maintenance and operation of the boilers. It is important to highlight that the maintenance and operation of the boilers is the responsibility of the building occupier, which in the case of schools is the Head Teacher. In response to this report the County Council has:
- Updated the guidance document for the maintenance and operation of biomass boilers and made this document available to all Nominated Property Officers (NPOs) via a link on the log-in page of the County Council's property portal (P2).
 - Established a programme of training events for each manufacturer type available to all caretakers and site managers with responsibilities for biomass boilers. Independent academies have also been invited to attend. The County Council holds a log of attendees at training events and is monitoring Council employees' attendance.
7. The investigation was subsequently extended through the Council's commissioning of a further independent 'Site Specific Risk Assessment & Engineering Inspection' of biomass installations on all Council maintained sites. Ashdale Engineering was commissioned in January 2016 to undertake this exercise, the purpose being to establish any technical, operational or design development/best practice issues which might be evident. It was recognised that the national and industry guidance for the design and operation of this relatively recent form of heating has evolved during the last 13 years and whilst the Council's earlier installations met the guidance available at the time of installation, they might not be installed in the same form today.
8. The Ashdale Engineering report makes a number of recommendations, all of which it was decided to address. With regard to the physical installations this resulted in a programme of works to upgrade or even replace the installations according to their age and type of manufacture. The workstreams are categorised as:

Significant work

- Replacement of systems that had been converted from coal fired boilers (2 sites)
- Replacement of pellet stores where they had been converted from coal stores (20 sites)
- Replacement/improvement of fabric pellet stores (6 sites).

The installation of a pellet store to current design recommendations will generally require planning consent and therefore extends the time period for the works

General upgrading of installations

- Improvement of burn-back protection
- Checking/testing of overheat/over pressure provision and replacement where check/test fails.

Programme of Remedial Works

9. With the exception of sites which are still within the British Gas contract period (who installed some of the boilers and will be commissioned to undertake the remedial works), Arc Partnership has been commissioned to deliver and manage the programme of works with a requirement that all works would be completed by the end of September 2017, before the commencement of the heating season. A list of the affected school sites is attached as **Appendix 2**.
10. The two sites identified by Ashdale Engineering for replacement of the converted coal fired boiler systems were:
 - St Matthew's CE Primary, Normanton on Trent, and
 - St Wilfrid's CE Primary (Lower School), Calverton
11. Ordsall Primary had also previously been identified as requiring a replacement boiler. Replacement of these three boilers is complete. In each case, an alternative fuel source has been provided: oil at St Matthew's and gas at St Wilfrid's CE Lower School site and Ordsall Primary. A further three premises, Valley Young People's Centre and Mornington and Dunham on Trent Primaries have also been provided with replacement boilers via other programmes of work.
12. In addition, Netherfield Infant and Nursery School (Mansfield) has raised concerns over the age and reliability of its biomass boiler. The planned remedial works which included the replacement of the existing converted coal silo on this site have therefore been temporarily placed on hold while an option appraisal is undertaken to establish whether it is possible within reasonable cost parameters to replace the boiler with a gas alternative. It is important to emphasise that this site has been assessed as being safe, recommendations on more economic and better performing replacement will be brought forward in due course.
13. The works are progressing to programme, which is monitored through monthly review meetings, with work currently been completed at 18 schools. These are:
 - Abbey Road Primary
 - Brookhill Leys Primary
 - Butler's Hill Infant
 - Crescent Primary
 - Garibaldi College
 - Greasley Beauvale Primary
 - Holly Primary
 - Lady Bay Primary
 - Ordsall Primary
 - Prospect Hill Infant
 - Prospect Hill Junior
 - Ranby CE Primary
 - Robert Miles Junior
 - Rylands Junior
 - Sir John Sherbrook Junior
 - Springbank Primary
 - St Matthew's CE Primary

- St Wilfrid's Primary

14. Updates have been provided to the Health & Safety Executive (HSE), in the case of notifiable incidents.

Options for Replacement

15. Members may be aware the UK is a committed signatory to the Paris climate change agreement, and a new national emissions reduction plan setting out how to meet targets agreed by Government and Parliament is overdue. The Government's independent Committee on Climate Change, Chaired by Lord Deben, has indicated this plan must provide a path for the uptake of low carbon heat. Biomass boilers and other sustainable technology are a means of supporting these current and emerging requirements.
16. At the time of the decision to install biomass boilers ranging over the last 10-15 years they provided a cost effective sustainable heating source for the premises involved. However, the range, reliability and efficiency of sustainable technology has changed during the last decade meaning that biomass boilers may no longer be the preferred source of heating when considering their replacement.

Potential options

17. The types of heating source available to replace the existing boilers will depend on the circumstances of each individual site. However, broadly they may be categorised into traditional and sustainable.

Traditional:

Within this list will include options for replacement with gas, oil or LPG heating sources. In terms of gas the key criteria will be the ability to connect into a gas supply and at what cost, while oil and LPG sources have represented relatively costly options which have previously resulted in the decision to install biomass.

Sustainable

Air Source Heat Pumps. These operate on a heat exchange principle. Generally, for this option to be viable the heat system around the schools would need to have the correct emitters in order to work effectively at the temperatures that can be provided by air source heat. In addition as the system relies on an electrical driving pump, the premises would need sufficient electrical capacity. The above issues may in some cases increase significantly the capital costs of installation. Currently these type of systems do not attract RHI payments.

Ground Source Heat Pumps (GSHP) The general criteria for the successful operation of this technology is similar to the above. As the heat exchange is emanating from the ground as opposed to the air, test bore holes are usually required/recommended which can cost in the region of £10,000.

Water Source Heat Pumps (WSHP) Clearly the use of this technology would rely on a convenient access to a water source, such as a lake or river. Again the issues identified above on the other heat source pump systems would equally apply here.

Other sources of water heat are available, such as shallow gravel beds and mine water, both of which are present within Nottinghamshire and have been utilised elsewhere demonstrating their potential as practical and cost effective heat sources. Both suitably designed GSHP and WSHP systems are eligible for RHI payments.

Solar Water. This could be used for heating hot water but does complicate legionella procedures for a public building. Generally, it would not be considered viable for providing space heating as the greatest output, during the longest days of the year, are at times when heating is least needed. Solar thermal currently attracts RHI payments

Combinations

Electrical heating may be an option and if it is combined with onsite generation (e.g. PVs, wind energy) and storage, this may increase viability.

The decision process for replacement

18. The type of heating source that is appropriate is clearly highly site and premises sensitive. As a result, it is suggested that a specialist options feasibility study is commissioned via Arc Partnership for each site seeking a recommendation on the most appropriate replacement heating source, providing commentary on:-
- Reliability of the heating source
 - Anticipated running costs and costs of installation compared to the next economically viable option
 - Ease of use
 - Expected life span of the new system
 - Existing and expected future issues with the current heating system and period of usage before replacement is necessary.

The cost of undertaking this study would be in the region of £3,000 per site equating to approximately £140,000 which would be met from the Planned Maintenance budget. A period of six months would be required to undertake the work.

19. A decision on when to replace the existing biomass boiler systems will be informed by the commissioned feasibility study. It is proposed that Members may wish to seek to replace those boilers based on
- The identification of any new health and safety issues
 - Operational efficiency and performance
 - An assessment of those boilers reaching the end of their economic life.
20. At present there is no capital budget for the replacement of the boilers. The decision on when to replace the boilers will influence how much funding is required and when. Resources will be bid for through the capital programme.

Capital budget implications

23. The programme of remedial works nearing completion is estimated at £1.66m and is being funded through the Schools Capital Maintenance allocation from the Department for Education.
24. There is no current capital budget allocation for the replacement of the biomass boilers.

Revenue budget implications

25. These are contained within the report.

Other Options Considered

26. It is possible to determine the replacement of the biomass boilers as and when they reach the end of their economic life. However, to address any on-going concerns over the reliability and safety of the boilers, a more comprehensive review for a replacement programme is considered appropriate.
27. Depending on the preferred option for each site, Members may wish to consider at the time of the replacement whether it is appropriate to seek some form of capital contribution from the schools, which may well benefit from significant revenue savings in running costs

Reason/s for Recommendation/s

28. The programme of monitoring, training and remedial works meets the County Council's responsibilities under Health & Safety legislation. The remedial works preserve the Council's investment into what are otherwise independently assessed as inherently safe installations, bringing all of the earlier installations up to current design standards.
29. The options and issues for the replacement of the existing boilers is very site specific. A comprehensive review would assist in making decisions that aligns with the overall aspirations and corporate objectives of the Council.

Statutory and Policy Implications

30. This report has been compiled after consideration of implications in respect of crime and disorder, finance, human resources, human rights, the NHS Constitution (Public Health only), the public sector equality duty, safeguarding of children and vulnerable adults, service users, sustainability and the environment and ways of working and where such implications are material they are described below. Appropriate consultation has been undertaken and advice sought on these issues as required.

Implications for Service Users

32. The training programmes and remedial works will bring all biomass installations up to the design standards and best practice currently in place.

Financial Implications

33. These are set out in the report.

RECOMMENDATION/S

- 1) That Committee agrees to determine future replacement based on assessments of risk, operational effectiveness and economic life.

- 2) That the feasibility study as outlined within the report is commissioned.
- 3) That a further report is presented to this committee on the results of the feasibility study.

Councillor Mrs Kay Cutts MBE
Leader of the County Council

For any enquiries about this report please contact:

Andrew Stevens
Group Manager- Property
T: 0115 9772085
E: andrew.stevens@nottscc.gov.uk

Constitutional Comments (CEH 21.09.17)

34. The recommendations fall within the remit of Policy Committee under its terms of reference.

Financial Comments (GB 20/9/2017)

35. The financial implications are set out in the report.

Background Papers and Published Documents

36. Except for previously published documents, which will be available elsewhere, the documents listed here will be available for inspection in accordance with Section 100D of the Local Government Act 1972.

School Capital Programme Progress Report - report to Children & Young People's Committee on 20 March 2017

Ashdale Engineering (report dated 2/5/16)
Executive Summary: Risk Assessment Biomass Boilers

Kiwa – Expert investigation of boiler performance for Nottinghamshire County Council (report dated 11/8/15)

Electoral Division(s) and Member(s) Affected

37. Ward(s): All
Member(s): All

File ref.: /SB/SB/
SP: 3263
Properties affected: 09998 - Various NCC Properties/non-property item

20170918 sw

Appendix 1

Biomass heated sites across County Council schools, academy schools and other County Council properties

Site	Date of installation
Schools with biomass boilers generating RHI payments	
Healdswood Primary, Skegby	2014
Hollywell Primary, Kimberley	2016
Intake Farm, Mansfield	2015
James Peacock, Ruddington	2015
Langold and Dyscarr Primary	2015
Queen Eleanor Primary, Harby	2015
Springbank Primary, Eastwood	2013
Stanhope Primary Lower, Gedling	2015
Stanhope Primary Upper, Gedling	2015
Walesby CofE Primary	2015
Non schools sites generating RHI payments	
Northern Area Highways Depot, Bilsthorpe	2013
Westfield Folkhouse, Mansfield	2013
Worksop Library, Worksop	2014
Schools without RHI payments	
Abbey Road Primary, West Bridgford	Sep-09
Albany Infant and Nursery School, Stapleford	2006
All Saints CofE, Harworth	2006
Brookhill Leys Primary, Eastwood	Sep-10
Brookside Primary School, East Leake	Nov-08
Broomhill Juniors, Hucknall	Mar-08
Butlers Hill Infants & Nursery, Hucknall	2006
Central Infants & Nursery, Carlton	May-08
Central Junior, Carlton	May-08
Crescent Primary Lower, Mansfield	Dec-06
Crescent Primary Upper, Mansfield	Dec-06
Dunham on Trent CofE Primary(Wood Chip)	2006
Elkesley Primary and Nursery, Elkesley	Jun-08
Greasley Beauvale Primary, Newthorpe	2011
Holly Primary, Forest Town	May-09
John T Rice Infant and Nursery, Forest Town	Feb-09
Kneesall CofE Primary, Kneesall	2006
Lady Bay Primary, West Bridgford	Oct-08
Linby cum Papplewick C of E Primary, Linby	2006
Mornington Primary, Nuthall	2006
Muskham Primary, North Muskham	Oct-08
Netherfield Infant & Nursery, Meden Vale	Nov-08
Newlands Junior, Forest Town	Jun-09
Prospect Hill Infant & Nursery, Worksop	Sep-08
Prospect Hill Junior, Worksop	Oct-08
Ranby CofE Primary, Ranby	2009
Rylands Junior, Beeston	Dec-08
Trowell CofE, Trowell	May-09
Yeoman Park Special, Mansfield Woodhouse	Mar-08
Non schools sites without RHI payments	
Dukeries Young Peoples Centre, Ollerton	Feb-08

Hawtonville Youth Centre, Newark	2008
Mansfield Day Services, Rainworth	Jan-09
Retford Youth and Childrens Centre	2009
Valley Young People's Centre, Worksop	2009
Academies	
Arnbrook Primary, Arnold	Oct-07
Bishop Alexander, LEAD, Newark	2008
Garden Lane Playing Fields, Sutton College	2007
Garibaldi Maths & Computing College	2006
Hall Park, Eastwood	Oct-07
Leamington Primary, Sutton in Ashfield	Nov-08
Leverton C of E, North Leverton	2009
Ranskill Primary, Ranskill	2006
Redhill Lower, Arnold	Jun-09
Robert Miles Junior, Bingham	Sep-10
Sir Donald Bailey, Newark	Sep-08
Sir John Sherbrooke Junior, Calverton	Feb-09
St John's C of E, Worksop	Mar-08
The Beech, Mansfield	2015
The Rushcliffe School, West Bridgford	Dec-08
The Samworth Church, Mansfield	2015
Tuxford Primary, Tuxford	2015