

Appendix B: List of sites and detailed business case

Table B1 – List of schools to be included in programme

This list is subject to final technical feasibility, planning and other considerations. Some of the facilities listed may be substituted for other eligible sites as the programme progresses and the issues are addressed.

School	School Type	School Type	Capital Cost	RHI Income	CO ₂ Reduction	Annual Charge to School in Yr 1	Net Annual Cost to School in Yr 1	Net Annual Cost to Authority in Yr 1
Amesbury Christ The King Catholic Primary School	VA	Primary school	70,000	15,224	69	15,991	-352	-19,892
Newton Tony CE VC School	VC	Primary school	70,000	13,397	61	14,072	-309	-17,505
Winterslow CE Aided Primary School	VA	Primary school	70,000	13,260	60	13,927	-306	-17,325
Trowbridge The Clarendon College	Academy	Secondary school	150,000	17,119	162	40,945	-724	-29,071
Tidworth Clarendon Junior School	FD	Primary school	70,000	10,267	47	10,784	-237	-13,415
Chippenham St Mary's Primary	VA	Primary school	70,000	10,195	46	10,709	-235	-13,321
Trowbridge St Augustine's Catholic School & College	Academy	Secondary school	150,000	15,811	153	35,519	-781	-26,179
Durrington Avon Valley College	FD	Secondary school	170,000	16,965	174	40,307	-886	-28,731
Devizes Bishops Cannings CE VA Primary	VA	Primary school	70,000	9,544	40	10,025	-177	-12,471

School	School Type	School Type	Capital Cost	RHI Income	CO ₂ Reduction	Annual Charge to School in Yr 1	Net Annual Cost to School in Yr 1	Net Annual Cost to Authority in Yr 1
Ludgershall Castle Primary School	FD	Primary school	120,000	12,371	88	21,422	-1100	-18,573
Warminster New Close Primary School	CY	Primary school	70,000	8,830	40	9,275	-204	-11,537
Tidworth Zouch Primary School	FD	Primary school	70,000	8,343	38	8,763	-193	-10,901
Salisbury Wyvern College	VA	Secondary school	150,000	13,350	109	25,308	-557	-20,738
Durrington CE Controlled Junior School	VC	Primary school	70,000	7,327	33	7,696	-169	-9,574
Woodford Valley CE Aided School	VA	Primary school	70,000	7,179	33	7,540	-166	-9,380
West Ashton CE VA Primary School	VA	Primary school	70,000	7,155	32	7,515	-165	-9,349
Melksham Forest and Sandridge CE Primary School	VA	Primary school	70,000	6,838	31	7,182	-158	-8,935
Tisbury St John's CE Primary School	VC	Primary school	70,000	6,802	31	7,144	-157	-8,887
Great Bedwyn CE School	VC	Primary school	70,000	6,631	30	6,965	-153	-8,664
Seend CE Aided Primary School	VA	Primary school	70,000	6,252	28	6,567	-144	-8,169
Holy Trinity CE Primary Academy	Academy	Primary school	70,000	5,691	24	5,978	-106	-7,436
All Cannings CE	VC	Primary	70,000	5,657	26	5,942	-131	-7,391

School	School Type	School Type	Capital Cost	RHI Income	CO ₂ Reduction	Annual Charge to School in Yr 1	Net Annual Cost to School in Yr 1	Net Annual Cost to Authority in Yr 1
Primary School		school						
Market Lavington St Barnabas CE School	VC	Primary school	70,000	5,413	25	5,686	-125	-7,073
Broad Hinton CE Primary School	VC	Primary school	70,000	5,413	23	5,685	-100	-7,072
Luckington Primary School	CY	Primary school	70,000	5,374	22	5,645	-100	-7,022
Woodborough CE Aided Primary School	VA	Primary school	70,000	5,340	22	5,608	-99	-6,977
Rushall CE VA School	VA	Primary school	70,000	5,331	22	5,599	-99	-6,965
Warminster Kingdown School	Academy	Secondary School	90,000	5,645	41	9,560	-210	-8,436
Idmiston St. Nicholas CE Aided Primary School	VA	Primary school	70,000	5,088	23	5,344	-118	-6,648
Chippenham Hardenhuish School	Academy	Secondary	150,000	8,804	64	14,909	-328	-13,156
Cherhill CE Primary School	VA	Primary school	70,000	4,878	22	5,124	-113	-6,374
Seagry CE Primary School	VC	Primary school	70,000	4,872	22	5,117	-113	-6,366
Minimum Lifetime Discounted Cost (20 years)							-£655,699	-£3,210,281

Benefits to the council of using biomass boilers

a) Carbon reduction potential

Oil has the highest carbon content of all stored fuels and a typical primary school would emit in the region of 20-40 tonnes of CO₂ per annum from its oil consumption. The Carbon Reduction Commitment recognises biomass as a zero-carbon technology. If all oil consumption in the corporate estate and schools at sites that have not recently been fitted with new oil plant was replaced by biomass, the resulting total reduction in carbon emissions is estimated to be approximately 2,213 tCO₂ (18 % of the corporate target for carbon reduction). If the programme of works recommended were undertaken this is estimated to achieve a reduction of 1,641 tCO₂ (14 % of the corporate target for carbon reduction).

b) Cost reduction potential

Wiltshire Council currently pays the CRC costs for all corporate emissions and those of all schools, including Academies and Special Schools. However, a proposal is currently out to consultation with schools for the council to charge individual schools for their CRC costs. This proposal was agreed in principle by Schools Forum in October 2011.

The current CRC payment of £ 12 per tCO₂ does not apply to the output of any biomass boiler and a conversion from oil to biomass would therefore realise a first-year cost saving under the CRC in the order of £ 200-300 for a small primary school. For a large secondary school this figure could be in the region of £2,000. The cost of CRC is expected to rise steadily in a manner similar to the landfill tax escalator so that the savings to schools will increase proportionately.

The unit cost of oil varies from site to site and order to order. It is not uncommon for prices to fluctuate dramatically throughout the year and the price available on one day might vary from that available a few days later by as much as 20%. There is currently no corporate contract for oil and each site procures oil independently. A guideline unit price for oil is £ 0.055 per kWh, which is equivalent to £ 0.56 per litre of a common type of heating oil. This can only be an illustrative value as a consolidated data set of all oil consumption and prices is not currently available. The typical unit cost of natural gas is around £ 0.021, with most sites supplied via a corporate contract through the Office of Government Commerce. Wood pellet unit prices may vary between £ 0.030 and £ 0.045. When subsidised by the Renewable Heat Incentive payments, the equivalent unit rate for a typical boiler suitable for a primary school would represent a net income per unit of fuel consumed. For a large school the tariff is lower due to the larger boiler size required, but the equivalent heating cost is approximately halved, making it roughly equivalent to the cost of natural gas. The impact of the RHI scheme on the cost effectiveness of this technology cannot be overstated and the availability of this long-term subsidy represents an opportunity to bring forward some or all of the works already expected as part of an inevitable gradual shift away from oil to a sustainable alternative.

c) Overlaps with planned maintenance programme

Boilers age during their service life and the maintenance costs increases significantly towards the end of their useful life. Boiler lifetime is not fixed, but an expectation would be that a boiler should be serviceable at a reasonable level of performance for 20 years. Some of the facilities in the scope of the proposed programme are of an age where the expectation is that they will need replacing within the next five years. This programme therefore represents an opportunity to deal cost effectively with an existing liability, realising additional cost savings by undertaking the work while there is an additional financial incentive through the Renewable Heat Incentive. The expectation is that over £ 250,000 of liabilities will be resolved through this programme, reducing the real cost of the programme accordingly.

d) Value added benefits

In addition to the direct financial benefits there is a highly cost-effective opportunity to incorporate additional networked metering and controls solutions that could;

1. Reduce existing demands on officer resources for data gathering
2. Provide curriculum-based educational tools
3. Reduce the risk of sites closing due to lack of heating fuel
4. Realise cost savings through optimising heating and raising awareness of consumption levels
5. Permit increasingly detailed analysis of site operation to identify further cost-saving opportunities
6. Allow the authority to realise procurement cost savings

These include the collection and monitoring of energy consumption data, especially with respect to statutory requirements such as CRC and other UK and European directives¹. Detailed consumption data would enable Wiltshire Council to offer cost-effective energy management services, including the procurement and distribution of biomass and other fuels.

Finance options for the programme

The following suggested finance options relate to the recovery of cost and generation of income from budgets held by schools, Academies and other third parties.

It is a key recommendation of this proposal that the party responsible for the procurement of fuel also be responsible for the maintenance of the boiler plant. Historically, experience of biomass projects has shown that the cheapest fuels can be of low quality and this can create excessive tar and mineral deposits that may contribute to increased maintenance costs. Additionally, procurement of cheap, low-quality fuels can significantly increase the physical quantity of fuel being consumed, resulting in dramatic increases in fuel delivery and maintenance frequency. Cost pressures on budget holders may cause this to become a serious issue and it is recommended that the authority retain responsibility for procurement of wood fuel in order to manage both these and related issues.

1) Charging for metered heat

This model is the preferred solution and the strategic benefit of charging for heat would be that this can continue even after the original project cost has been recovered, thereby generating an annual revenue stream that can be reinvested back into projects in schools to further improve energy efficiency and reduce carbon emissions. The creation of a revenue stream will be an important step in dealing with the strategic trends detailed elsewhere in this proposal.

This model would see the council charge the school per unit of heat, taken from the heat meter already required for the administration of the Renewable Heat Incentive scheme. The tariff would be set to cover the operational costs, including administration and may include an annualised balance of any life cycle capital cost not recovered via the RHI. The regulations around tariff setting are already understood and a service level agreement would be required to manage operational issues such as failure to deliver heat and provide for renegotiation. If the school ceased requiring heat then no repayment would be made from the school and no RHI payment would be received by the local authority. The investment cost would be recovered in all likely scenarios except where the school becomes financially unviable or closes due to an unsustainable long-term fall in student numbers.

This repayment method is a means to extend the repayment period outside that permitted by a project agreement and could utilise an Energy Services Company vehicle to hold the financial risk if the council is unwilling or unable to hold it directly.

2) Other Models Considered

2.1) Five Year Payback

The model would realise investment recovery via a project agreement with the utility budget holder for the facility, based on a five year repayment period. The utility budget holder would receive the RHI payment for the duration of the scheme (20 years).

Analysis of this approach has shown that the full financial benefit of engaging in biomass fuel provision could not be realised using this model and the net revenue cost to the school in the initial five year period would be excessive.

2.2) RHI Only

Analysis of this approach has shown that the full financial benefit of engaging in biomass fuel provision could not be realised using this model and the RHI payments alone will produce a longer payback than is preferred. Further to these considerations, the financial benefit realised by the schools, without capital investment on their part, would be excessive and disproportionate when considering that other schools in a similar position will not be included in the scope of works and would see no similar benefits.

2.3) Five Year Loan Repayment + RHI

This model would realise annual revenue generation for 20 years via the RHI payment, collected by Wiltshire Council directly from the RHI Scheme Coordinator. A separate project agreement would be made with the utility budget holder for the facility to repay the

associated (non-RHI) cost savings to the council for the first five years of the project life. Thereafter no additional payments would be due from the utility budget holder for the facility.

Analysis of this approach has shown that the full financial benefit of engaging in biomass fuel provision could not be realised using this model and the net revenue cost to the school in the initial five year period would be excessive.

2.4) *Novation of Relevant Budget*

Due to the administrative complexity of this option, this model is outside the scope of this proposal.

Assumptions

The information presented in this document is derived from the best data available and calculated using accepted industry methodologies and conversion factors. The financial illustrations are intended to be as representative as possible, notwithstanding the large number of variables and difficulty in predicting the future changes in the national and global economic position during the next 20 years which may affect the financial assumptions used here. The approach in calculating the values used in this financial summary and cost model has been conservative, with an expectation that this represents the minimum cost saving from the programme. Detailed assumptions are set out in Table B2.

Table B2 – Assumptions used for producing the financial summary and cost model

Variable	Assumption	Explanation
Discount Rate	1.50%	This is the standard value used by Wiltshire Council for assessing the present value of future balances.
Utility and fuel cost inflation	Not included	To ensure the financial model is conservative, the expected financial benefit of the cost of oil inflating above base rate (as has historically been seen) has not been included.
Conversion factors and calorific values (except bio-fuels)	DECC	Values are as used by Department of Energy and Climate Change.
Calorific values (bio-fuels)	Pellet (4800 kWh/tonne) Chip (3500 kWh/tonne)	The standard for bio-fuels to be used by Wiltshire Council has not yet been agreed, so an indicative value has been taken across a number of suppliers.
Boiler efficiency (existing)	[Q=0.75] Indicative range: [0.6<Q<0.85]	The influence of boiler efficiency on the consumption of oil is significant but cannot be obtained without specialist survey work. A conservative value is used to represent the average age of boiler plant and the approximate condition as it is understood by Strategic Property Services engineers.
Boiler efficiency (biomass)	[Q=0.9]	A standard for biomass boiler plant to be used by Wiltshire Council has not yet been agreed, so a representative value for a wood pellet boiler has been used, reduced slightly to allow for slight reduction over plant lifetime.
Carbon footprint of biomass	[0.0 tCO ₂ /kWh]	Under the Carbon Reduction Commitment bio-fuels are considered to be carbon neutral. No account is taken of whole life-cycle carbon footprint such as that resulting from fuel production or distribution.
Carbon Reduction Commitment unit rate	[12 £/tCO ₂] rising to 50 £/tCO ₂ by 2031-32	The cost per tonne of carbon is expected to rise rapidly from £12 per tonne in 2011/12 but future rates have not yet been set. A conservative cost increase is presented in line with expectations in the industry.
Ownership of Carbon Reduction Commitment costs	School	It is assumed that the annual CRC payments will be recharged to schools as proposed in the current consultation sent out to all schools (closing end of January 2012)

Variable	Assumption	Explanation
Bulk Fuel Purchase Cost	£ 0.038 per kWh	Wiltshire Council expects to procure wood pellet at this cost or better.
Benchmark Fuel Cost	£ 0.040 per kWh	This reference cost will be the price it is expected that schools could procure wood pellet if buying independently in small quantities.