

Hawkesbury Village Hall: Boiler options preliminary business case

	Present	New condensing boiler	Future biomass
Consumption kWh (year)	64,392	50,083	45,592
Current Carbon per Annum (teCO2)	16.1	12.5	-
Carbon <i>Savings</i> per Annum (teCO2)	-	3.6	16.1
Price per kWh	£0.059	£0.059	£0.0396
Fuel cost	£3,799.13	£2,954.88	£1,804.70
Maintenance cost	£180.00	£180.00	£360.00
Total Ops Costs	£3,979.13	£3,134.88	£2,164.70
RHI Income	-	-	£3,920.95
Assumed efficiency	70%	90%	87%
CAPEX	-	£5,750.00	£31,750.00
Total cost (annum)	£3,979.13	£3,134.88	-£1,756.25
Savings (annum)	-	£844.25	£5,735.38
ROI (Years)	-	6.8	5.5
IRR (over 3 years)	-	-34.91%	-25.81%
NPV (over 3 years)	-	-£3,668.76	-£16,348.99

Assumptions

Hall heating usage is 6.5 hours 3 days a week, 8.75 hours 2 days a week and (conservatively) 5.5 hours on the weekends, equating to 42.5 hours per week

Only heated during the commercial heating season (1 October - 15 May) which is 227 days or 32.4 weeks

The total estimated usage for the year is 42.5 hours per week * 32.4 weeks which equals 1,377 hours

For comparison sake, the above calculations use only tier 1 estimates from EGS RHI calculator spreadsheet (i.e. as it is close enough it assumes 1314 hours heating per annum)

Wood pellets cost of £190 per tonne

Net CV of pellets = 4.8MWh per tonne, therefore 4,800kWh per tonne = 9.5 tonnes required

Price per kWh = £190/te divide 4800kWh/te

RHI pays 8.6p/kWh (for tier 1 up to 1314hrs/yr, tier 2 is 2.2p/kWh)

Maintenance costs for the present boiler of £180/year

Biomass boiler consumption assumes a 12% reduction due to compensation controls which come as standard

Biomass option includes a capital cost for 'lean to' housing for the biomass boiler of £3,000, though volunteers could potentially build this at £0

Current *Consumption* is based on 2009 use as stipulated in the Encraft report of December 2009 (only reliable consumption data), namely 64392kWh (6,621 litres). The only other data currently available is *deliveries* not *usage*.

Current *Cost* is based on best estimate of average price for the **last 12 months** (61.18p/litre)

NOTE - IRR and NPV are only done over 3 years which are short term horizons especially for biomass using RHI. It is recommend that using payback at this stage would be sensible.

NPV can be described as the "difference amount" between the sums of discounted: cash inflows and cash outflows. It compares the present value of money today to the present value of money in the future, taking inflation and returns into account

IRR calculations are commonly used to evaluate the desirability of investments or projects. The higher a project's IRR, the more desirable it is to undertake the project. Assuming all projects require the same amount of up-front investment, the project with the highest IRR would be considered the best and undertaken first.

ROI is in essence 'simple payback'

Biomass (plant material) can be a renewable energy source, but importantly, only if the rate of extraction does not exceed the rate of production