NH POWER Workshop Sessions 2023/24

Assessment ref: 14/12/2023 17:27:42 - 2-SP1
Trust: Example Trust
Site: Example Hospital

Select delivered energy service: **Geothermal heat - all site heat**

Select start year for new energy service: **2027**

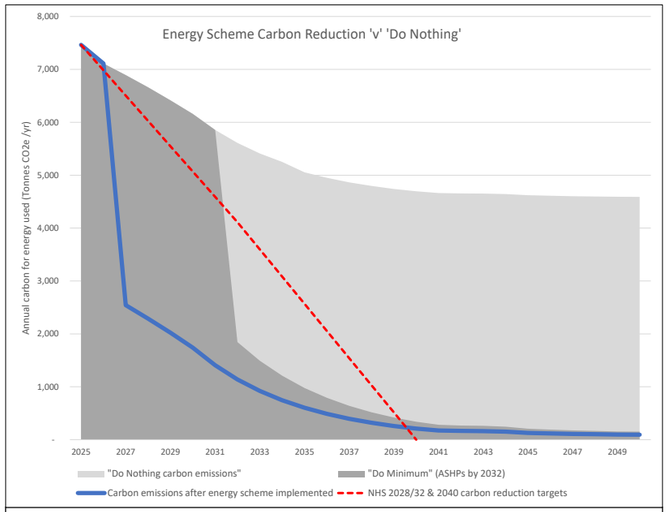
Comparewith 'Do Minimum' by 2032 **Yes**

Delivered Energy Price

	Annual cost 2027	Annual cost 2032	
Existing cost of energy (nat. gas boilers):			
Total annual heat delivered to offtaker(s) kWh	21,233,375	21,233,375	
Annual cost of heat generated energy	£1,837,155	£2,078,573	
Annual cost of heat generated O&M	£196,838	£222,704	
Total existing annual cost of heat per annum	**£2,033,993**	**£2,301,277**	
Total existing equivalent heat price	**9.58 p/kWh**	**10.84 p/kWh**	
New energy service:	**Proposed service** Geothermal heat - all site heat	**Do minimum service** Trust funded heat pump	
Annual electricity genenerated (or used) kWh	(1,179,632)	(9,651,534)	
New annual cost of energy compared to existing cost	£297,444	£2,753,434	
Annual funded service cost for heat incld O&M	£1,806,486	£487,970	*1*
Total new cost of heat per annum	**£2,103,931**	**£3,241,404**	
	9.91 p/kWh	**15.27 p/kWh**	
Up front capital investment by Trust (if funded by Trust)	**£0**	**£6,730,616**	*2*
Demand side energy improvements			
Heat demand reduction kWh	-		
Electricity demand reduction kWh	-		
Total savings in heat costs from demand reductions	£0		
Total savings in elec costs from demand reductions	£0		
Total avoided costs from demand reductions	£0		
Demand side funded service cost incld O&M	**£0**		
Include demand side improvements in new energy service?	**No**		
Total annual cost of energy compared to existing cost	Excluded		
Total funded service cost for heat incld O&M	**Excluded**		
Total new cost of heat including demand side measures	**Excluded**		
Total equivalent heat price	**9.91 p/kWh**	**15.27 p/kWh**	
Total annual savings delivered to offtaker(s)	£1,963,551	-£674,861	
Total annual service payment made by offtaker(s)	£1,806,486	£487,970	
Total one-off value of investments made	£21,608,979	£6,730,616	
Net saving against BAU	£157,065	-£1,162,831	
NPV 30 years	**£3,927,857**	**-£27,333,201**	

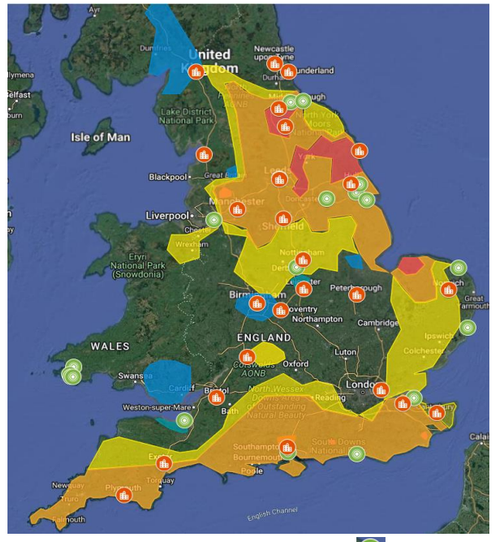
Select other savings to be included ***(from below)***

Carbon Emissions



Year 1 carbon: **4,350 TCO2e**
Lifetime carbon: **125,185 TCO2e**

Strategic Energy Map



Site located on BGS data for deep geothermal	Yes	
Average BGS Geo survey depth to 50 deg C	1,979	km

Notes:
1= Includes capital charges if Trust funded capital
2 = Capital for do minimum assumed as funded by Trust

Additional third-party heat demand to break even	**6,245,110**	kWh (equiv. heat)
Solar PV area initial assessment		m2 PV area
Alternative solar PV area		m2 PV area

First year annual savings

Energy generation measures

	Alternative energy generation measures 2027	7.35 p/kWh		25.22 p/kWh		
		Gas kWh/yr	£ saving	Electricity kWh/yr	£ saving	Total net saving £
No	Savings from Solar PV	-	£0	-	£0	£0
No	Hydrogen ready combined heat and power	-	£0	-	£0	£0
No	Heat Pump (ASHP, GSHP, WSHP)	-	£0	-	£0	£0
Yes	Geothermal Heat	24,980,441	£1,837,155	(1,179,632)	-£297,444	£1,539,711
	Third party heat required to achieve + NPV	6,245,110	£459,289	(294,908)	-£74,361	£384,928
No		-	£0	-	£0	£0
No	New Energy Centre (with/without H2 enabled)	-	£0	-	£0	£0
No	Hydrogen boilers without CHP	-	£0	NA	NA	£0
No	District heat service (gas) - replaces all site heat	-	£0	-	£0	£0
	District heat service - equivalent heat delivery	-	£0	-	£0	£0
No			£0		£0	£0
	Sub-total first year savings:	***24,980,441***	***£2,296,444***	***(1,179,632)***	***-£371,805***	**£1,924,639**
	Total first year energy generation savings:	**£1,924,639**				
	Total first year avoided costs savings:	£38,912				
	Total first year energy + avoided costs	**£1,963,551**				

Total guaranteed value of services provided year 1

Service improvement costs 2027	
	£0
	£0
	£0
£15,500,000	£16,284,688
	£1,000,000
	£0
	£0
	£0
	£0
	£17,284,688
With on-costs	**£21,608,979**

(incld ncis)

Service maintenance cost 2027	
£0	£0
£0	£0
£0	£0
£115,569	£186,125
	£14,834
£0	£0
£0	£0
£0	£0
£0	£0
	£0
	£0
	£200,959

Total service annual cost	**£200,959**
Total service delivery cost	**£293,858**
(ncld on-costs and NCIS)	
Funder repayment	**£1,512,629**
Total service payment year 1	**£1,806,486**

Alternative energy generation measures avoided costs 2027	
Description	**£ saving**
Savings from Solar PV	
Hydrogen ready combined heat and power	
Heat Pump (ASHP, GSHP, WSHP)	
Geothermal Heat	
Geothermal third party heat investment cost recovery	£38,912
New Energy Centre (with/without H2 enabled)	
Hydrogen boilers without CHP	
District heat service (gas) - replaces all site heat	
Total first year energy generation avoided cost savings:	**£38,912**

Carbon saved	4,350 TCO2e

Demand side measures

Include demand side measures as costs in Service Contract? No (if "No" assume Trust fund assets & pays depreciation and capital charges)

	Energy conservation measures 2027	7.35 p/kWh		25.22 p/kWh		
		Gas kWh/yr	£ saving	Electricity kWh/yr	£ saving	Total net saving £
No	Savings from de-steam	-	£0	-	£0	£0
No	Savings from fabric measures	-	£0	-	£0	£0
No	Savings from AHU fan upgrades	-	£0	-	£0	£0
No	Savings from BMS upgrades	-	£0	-	£0	£0
No	Savings from LED lighting	-	£0	-	£0	£0
No		-	£0	-	£0	£0
No			£0		£0	£0
	Sub-total first year savings:	***-***	***£0***	***-***	***£0***	***£0***
	Total first year energy conservation savings:	**£0**				
	Total first year avoided costs savings:	£0				
	Total first year energy + avoided costs	**£0**				

Total guaranteed value of services provided year 1

Service improvement costs 2027	
	£0
	£0
	£0
	£0
	£0
	£0
	£0
With on-costs	**£0**

(incld ncis)

Service maintenance cost 2027	
	£0
	£0
	£0
	£0
	£0
	£0
	£0
	£0

Total service annual cost	**£0**
Total service delivery cost	**£0**
(ncld on-costs and NCIS)	
Funder repayment	**£0**
Total service payment year 1	**£0**

Energy conservation measures avoided costs 2027	
Description	**£ saving**
Savings from de-steam	
Savings from fabric measures	
Savings from AHU fan upgrades	£20,000
Savings from BMS upgrades	
Savings from LED lighting	
Total first year energy conservation avoided cost savings:	**£0**

Carbon saved	0 TCO2e

Existing Energy & O&M costs

	2025	2032	
Electricity (average for day and night rate)	24	28.5	p/kWh excluding VAT, excluding CCL
Assumed initial value	*24*		*p/kWh*
Electricity spark spread constent	*3.4*	*3.4*	
Natural gas *	7	8.3	p/kWh excluding VAT, excluding CCL
Assumed initial value	*6.5*		*p/kWh*
Existing operation & maintenance & lifecycle	£187,353	£252,398	£/yr excld VAT
Assumed initial value	*£187,353*		

Assumed Geothermal COP	18
Assumed initial value	*18*

*H2 assumed to be parity with Natural Gas