Trust Board Paper Z

To:	**Trust Board**
From:	**Andrew Seddon – Director of Finance and Business Services**
Date:	**27 June 2013**
CQC regulation:	**All applicable**

Title:	**NHS Energy Efficiency Fund - Bid**

Author/Responsible Director:
Andrew Seddon - Director of Finance and Business Services
Nigel Bond - Capital Projects Manager (NHS Horizons Property and Facilities Management Partnership)

Purpose of the report:
To inform Trust Board of the progress of our bid for an allocation from the energy efficiency fund and to seek endorsement of commitments made in the application process. A condition of the bid is that Trust Board endorse these commitments.

The report is provided to the Board for:

Decision		Discussion	
Assurance		Endorsement	X

Summary/Key points:

- The Trust has submitted bids totalling £2,164,524 for the replacement of combined heat and power units (CHP) at LRI and GH.
- The bids were successful in getting through Stage 1 of the bidding process. Stage 2 bids were submitted and are now being considered.
- Investment in energy systems are required to replace old defunct plant and to achieve 3 strategic aims; revenue cost reduction, reduced carbon emissions and increased resilience of the electrical and heating infrastructure.
- In order to gain funding, the Trust is required to commit to:
  - Funding any additional cost over and above the Stage 1 bid, estimated at £112,110
  - Confirm that revenue costs associated with the plant will be funded by the Trust
  - That revenue savings realised by the scheme will be re-invested into patient services/environments

Recommendations:
Trust Board is asked to **endorse** the following commitments which have been made as part of the bidding process:

- The Trust Board approves the submissions to the NHS Energy Efficiency Fund and confirms that the revenue consequences to the project are affordable
- The Trust Board agrees to the principle of re-investing 100% of the savings gained into patient related services and environment
- Any difference between the Stage 1 submission cost and the actual cost of the scheme, currently estimated at £112,110, will be funded from the Trust's capital programme

Previously considered at another corporate UHL Committee:	No
Resource implications (e.g. Financial, HR):	None
Assurance implications:	None
Patient and Public Involvement (PPI) implications:	None
Stakeholder Engagement implications:	None

Equality Impact: An equality impact assessment was agreed with Deb Baker prior to submission of the bid. This confirms no detrimental impact.	
Information exempt from disclosure:	No
Requirement for further review:	No

Andrew Seddon
Director of Finance and Business Services

Nigel Bond
Capital Projects Manager
NHS Horizons Property and Facilities Management Partnership

20 June 2013

UNIVERSITY HOSPITALS OF LEICESTER NHS TRUST

REPORT TO: **TRUST BOARD**

DATE: **27 JUNE 2013**

REPORT BY: **ANDREW SEDDON – DIRECTOR OF FINANCE AND BUSINESS SERVICES**
NIGEL BOND – CAPITAL PROJECTS MANAGER (NHS HORIZONS PROPERTY AND FACILITIES MANAGEMENT PARTNERSHIP)

SUBJECT: **NHS ENERGY EFFICIENCY FUND – BID**

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1. Purpose

1.1 To inform Trust Board of the progress of the Trust's bids to replace the combined heat and power plants (CHP) at LRI and GH.

1.2 To seek endorsement by the Trust Board of commitments given as a pre-request of a successful bid.

2. Background

2.1 The DoH has made £50m available for improving energy efficiency within the NHS and to achieve 3 strategic outcomes: reduced energy costs, reduce Co2 emissions and increase resilience.

2.2 The Trust submitted two expressions of interest which related to the replacement of combined heat and power (CHP) units at the LRI and GH.

2.3 The bids were successful in getting through Stage 1. The requirement under Stage 2 was for the Trust to submit detailed design and cost proposals (Appendix A and B).

2.4 During the detailed design process, additional costs were identified as detailed below.

Size:	Stage 1 cost (£):	Stage 2 cost (£):	Variance:
LRI	£1,212,000	£1,278,024	£ 66,024
GH	£ 952,524	£ 998,610	£ 46,086
Total	**£2,164,524**	**£2,276,634**	**£112,110**

2.5 Annual savings which will be achieved when these CHP units are installed amount to £589,891. This is after the revenue cost of running the equipment has been deducted from savings.

3. Clarifications required

3.1 Additional assurances required by the Bid Evaluation Team have emerged during the Stage 2 process. It has been made clear that the success of our bids is dependant upon the Trust's commitment to the following:

- The Trust should commit to re-investing the savings made into patient services
- The Trust should confirm that it will meet the revenue costs associated with operating the plant
- The Trust will agree to find any differences in cost between the Stage 1 and 2 bids
- A pre-condition for the release of funds is a copy of the Trust Board minutes stating that the Board has approved the submission and the conditions described in 3.1.1 to 3.1.3 of the paper

4. Recommendation

4.1 During discussions with the Bid Evaluation Team, NHS Horizons highlighted issues to the Director of Finance and Business Services who agreed an appropriate response. This paper seeks endorsement by the Trust Board of the following commitments:

- The Trust Board approves the submissions to the NHS Energy Efficiency Fund and confirms that the revenue consequences to the project are affordable

- The Trust Board agrees to the principle of re-investing 100% of the savings gained into patient related services and environment

- Any difference between the Stage 1 submission cost and the actual cost of the scheme, currently estimated at £112,110, will be funded from the Trust's capital programme.

Andrew Seddon
Director of Finance and Business Services

Nigel Bond
Capital Projects Manager
(NHS Horizons Property and Facilities Management Partnership)

20 June 2013

Annex A – Stage 2 Application form

Stage 2 submissions will substantiate Stage 1 *Expressions of Interest* applications. Confirmation and assurance of the initial bids to the fund through the provision of more robust information is required, including clear identification of the reinvestment into patient care.

Information should be copied directly from the Stage 1 application submission, where applicable. It should not differ, but if any changes have been made to Stage 1 information then they should be clearly indicated with (##).

DH Project Ref: T065/02	
Trust : University Hospitals of Leicester NHS Trust	
Address: Leicester Royal Infirmary, Level 3 Balmoral Building, Infirmary Square, Leicester. LE1 5WW.	
Project Site: Leicester Royal Infirmary	
Project Title: Leicester Royal Infirmary CHP	
Trust Project Director and contact details: (Name, Title, e-mail, telephone number, address) Mike Webster Estates Transformation and Property Manager Mike.Webster@leicspart.nhs.uk 0116 2958928 OSL House East Link Meridian Business Park Leicester LE19 1UX	**Trust Project Manager and contact details:** (Name, Title, e-mail, telephone number, address) Nigel Bond Capital Projects Manager Nigel.bond@uhl-tr.nhs.uk 0116 2958914 OSL House East Link Meridian Business Park Leicester LE19 1UX

1. CAPITAL REQUIREMENT

If costs are greater than the original Stage 1 applications, then the new costing may affect the allocation of funding that may be awarded to the organisation.

Capital Expenditure breakdown ie works cost, equipment, fees, contingencies should be itemised. VAT must show the new capital expenditure

Please complete and attach the Annex C spreadsheet to detail the cost breakdown.

Capital expenditure excludes maintenance, staffing or other revenue costs

Original Stage 1 application costs, including vat :	**(£'000)** **£1,212,000**
Confirmed new cost if changed from stage 1 application. The reasons for any change should be addressed below (max 250 words) The costs have risen slightly after consultation with the CHP manufacturers and identification of works required to complete the installation and the provision of more robust costs for these items. The increase is approximately 5%. The Trust accepts that additional funding may not be available and is prepared to fund the balance. Actual figures are reflected in this document to demonstrate that they have been factored in to the payback calculations. To be clear the Trust is still seeking funding to the value of the stage 1 bid. Please contact the project Manager if clarification is required	**(£'000)** **£1,278,024**

Works Cost (£'000)	Equipment (£'000)	Fees (£'000)	Contingencies (£'000)	Recoverable VAT	Non-recoverable VAT
£968,200	**£……**	**£48,410**	**£48,410**	**£……**	**£213,004**

Capital Expenditure Including VAT (£'000):	**£1,278,024**

2. ANNUAL SAVINGS

Stage 1 Annual savings (£'000):	**£326,613 – £396,074**
Stage 2 confirmed Annual savings (£`000):.	**£389,145**

	If changed from Stage 1 application. the reasons for any change should be addressed below (max 250 words). The impact of the CHP systems has been investigated in significantly more detail. This process has involved the use of half hourly data for both power and gas consumption where previously monthly figures were used. Analysis has been undertaken that matches site loads to the maximum output of the CHP plant and reduces CHP output accordingly where necessary. The resulting operational profile has been used to calculate the useful annual CHP output for heat and power, gas consumption and boiler gas offset. This has resulted in a more accurate estimate of CHP outputs. Half hourly profiles have also enabled the use of detailed tariff information and a more accurate estimate of costs and savings. CRC savings have also been incorporated at £12 per tonne. Additional changes have included the addition of a 20kW peak parasitic electrical load for operation of shunt pumps, cooling fans and controls. The existing boiler combustion efficiency has also been re-evaluated at 85% for the Stage 2 analysis as opposed to the 80% used at Stage 1. Contracted CHP availability remains at 90%.		
3. VALUE FOR MONEY **Has the Finance Director assessed the scheme/ project, that the investment is value for money?** **Please complete and attach the Annex B VfM Spreadsheet**	**Yes**	**No**	**Confirmation exact percentage of the returns will be re-invested in patient services (%)**
	Yes ……	…….	50%
4. PROJECT DESCRIPTION	**Stage 1 Description:** Please copy here from your Stage 1 application's `outline of the proposed project requiring funding' the original description of the project (max 500 words). The Stage 1 text is as follows: *The existing CHP units are no longer operational and are beyond economic repair, but have served the LRI/NHS well – reducing the overall CO_2 emissions generated by the services provided. To assist in achieving the CO_2 reductions of the NHS Carbon Reduction Strategy & the University Hospitals of Leicester's own Strategies it is proposed to replace the existing multiple CHP units with new 1600kWe plant, viable in both the economic and environmental sectors. The proposal makes use of existing mechanical and electrical infrastructure which might otherwise fall into disuse.* *The capital cost is estimated at £1,212,000 this value is used in both calculation methods, Consultant's calculations indicate possible annual saving in energy costs of £326,613 giving a simple payback of 3.71years. Environmentally there is an estimated reduction in carbon dioxide emissions of 2,988tonnes per annum.* *Using the statistical approach with more complex tariffs shows an optimistic annual saving of £396,074 giving a simple payback of 3.06years.*		

It is proposed to develop an innovative design concept, to optimise and simplify the LTHW system in order to maximise the energy/carbon saving potential of the investment. A schematic of the proposed pipework arrangement has already been developed to achieve the following:

1) *Maximise the use of the LTHW boiler so as to reduce demand on the steam plant;*
2) *Utilise the reclaimed heat to reduce demand on the LTHW boiler.*

The reclaimed heating system is a sub system of the more extensive LTHW System. We propose to change flow and return temperature from the present 90°C flow / 80°C return to maximise the thermal carrying capacity of the existing pipework whilst reducing the pumping power. By increasing the temperature drop over the system the amount of water to be pumped is reduced by 33% with a consequent reduction in resistance in the pipework, reducing the size of the pump and drive.

The system will deliver 4200kWt (boiler output) irrespective of whether the CHP plant is operating, utilising the existing plant to its maximum potential. The CHP plant is positioned on a 'shunt circuit' on the LTHW return to the boiler. When reclaimed heat from the CHP plant is available, the shunt pump will extract a proportion of the main system return water, pass it through the CHP heat exchangers where it will pick up the reclaimed heat and return to the pipework before it enters the boiler. This increase in the return water temperature will be seen by the boiler as reduced demand and its output will automatically reduce. Should the CHP plant fail to operate or be taken out of service, the boiler plant will 'see' the full load on the system and adjust its output accordingly. The addition of a normally closed bypass around the boiler would enable the CHP to operate even if the boiler became inoperable. All the manufacturers who have expressed an interest have confirmed that their CHP will operate satisfactorily with temperatures up to 95°C.

Stage 2 Changes and supplementary information

Please use this space to describe changes, if any, to the original outline of the scheme at Stage 1 given above and to provide any supplementary information you may wish to include. (max 250 words).

The Stage 1 proposals have been re-assessed and have been determined to be technically sound. There are therefore no changes to the technical content of the scheme.

The capital cost is estimated at £1,278,024, Consultant's calculations indicate possible annual operational savings in energy costs of £389,145 giving a simple payback of 3.28years. Environmentally there is an estimated reduction in carbon dioxide emissions of 2,701tonnes per annum.

Changes in the predicted savings are as a result of the more detailed feasibility study undertaken. The Stage 1 calculations assumed that the CHP would operate for 17hours per day whilst the Stage 2 calculations do not arbitrarily limit operating hours, rather as previously discussed the CHP output more closely matches the heat and power profile of the site. Therefore the Stage 2 assessment results on assumed operational hours in excess of those for the Stage 1 assessment, resulting in additional savings.

Additionally the impact of the Carbon Reduction Commitment has been incorporated at a cost of £12 per tonne of CO_2 emitted, resulting in further annual financial savings. In mitigation the combustion efficiency of the existing LTHW Boiler has been re-evaluated upwards from 80% to 85%.

5. PROJECT TIMETABLE **The programme management for the project should provide a completed project plan, to accompany this form. (This should be completed using Microsoft program planning tool or equivalent).**	**DH Approval Date:**	**Commencement on Site Date:**	**Practical Complete on Site Date:**	**In Use Date**
	Latest date by which DH approval is required to meet planned timescales. 5 July 2013	The date that the works are expected to start on site. 3 October 2013	The date that the works are expected to be practically complete and brought into service. 31 December 2013	1 January 2014……

6.TRUST BOARD APPROVAL	Please state "YES" if the Trust Board has approved this submission and that the revenue consequences of the project are affordable and provide a copy of an **extract** of the relevant Trust Board Minute**.** Otherwise, state the date when Trust Board approval will be achieved and acknowledge that funding will not be available until the Board has approved the scheme. This submission has been approved at executive level but will go to the Trust Board on 27 June for formal approval. We acknowledge that funds will not be released until this is achieved.
7.STRATEGIC AIMS	Please confirm that the project is consistent with the Strategic aims of the organisation which should : **(** max 250 words) • Demonstration that the Scheme identifies the key element of benefit, achievement of energy carbon efficiency saving and energy performance improvement. The proposed project will result in the most cost effective measure by which carbon dioxide emissions can be reduced at the site. It will also result in a significant reduction in the Trust's operating costs, carbon dioxide emissions and will release funds that can be invested directly into patient care and further energy saving projects. The benefits to the resilience of the site are significant with regard to reinforcing heating and hot water supply, with additional possible benefits regarding non-essential electrical loads in the event of mains power failure. As such the project aligns closely with our corporate aims to reduce carbon emissions and achieve emissions targets for 2015 and 2020. The proposal also affords substantial benefits to the resilience of the Trust in our provision of healthcare services to the local community.
8. RISK **What risks are there associated with successful delivery?**	Please provide details of risks to the successful delivery of the scheme/project in relation to contractual, timescales, financial and achievement of benefits where applicable, that have been assessed and mitigation planned. (Shown as a table with a traffic light appraisal applied). Please complete risk register and attach as part of Annex B spreadsheet. The risk assessment spreadsheet has been completed as required and accompanies this document.

9. SCHEME BENEFITS	**(i) Existing Energy Details (Annual):**	**ENERGY CONSUMPTION (kWh)**	**CARBON DIOXIDE EMISSION (CO_2) [tonnes]**
	Fossil:	**42,210,769**	**8,358**

The Annual Revenue Savings should be based on the ERIC calculations. **Calculations should be based on the same methodology as used in the tables at items 13.2 and 13.3 of the Stage 2 submission requirements guidance.**	**Electricity:**	**27,157,319**	**14,040**
	Hot Water:	**NA**	**NA**
	Other (please specify):	**NA**	**NA**
	(ii) Post Project Energy (Annual):	**ENERGY CONSUMPTION (kWh)**	**CARBON DIOXIDE EMISSION (CO_2) [tonnes]**
	Fossil:	**60,962,937**	**12,071**
	Electricity:	**14,751,328**	**7,626**
	Hot Water:	**NA**	**NA**
	Other (please specify):	**NA**	**NA**
	Confirmation of what exact period of returns are projected. (Years)	This should be supported in the completed and attached Annex B Annex B shows that the initial capital cost will be returned in year 4. There will then be benefits for a further 11 years before the CHP will be due for replacement in year 16	
	(iii) Explain what additional benefits/outputs will be delivered.	Please state any additional benefits that the scheme/project will deliver, particularly with regard to patient care, healthcare, sustainability and environmental improvements. **(max 250 words)** The project will provide reinforced supplies of both heat and power to the site. The current LTHW supply is via a boiler. The provision of a bypass will enable the CHP to supply LTHW when the boiler is offline for servicing or maintenance in the event of failure. The provision to use the electrical output of the CHP to supply non-essential loads in the event of a mains power failure remains a possibility. This is dependent upon effective load prioritisation and management and remains to be investigated in detail. The financial savings achieved will be invested in part directly into patient services with 50% of the savings being used in this manner. Overall the proposal reduces the total carbon emissions of both the Trust and the NHS in the provision of our services to the local community and nationwide respectively. The investments being made will prove to demonstrate the willingness of the NHS to invest in measures to reduce environmental impact and improve sustainability of our operations. It will demonstrate the lead that the NHS is taking in resource efficiency and reducing impact on the local and global environment and provide an example for others to follow.	

	(iv) What provisions are being provided to address the final full report stage, as well as regular interim reports, and financial breakdown to allow lessons to be learnt and the sharing of knowledge by the organisation?	**(max 250 words)** An experienced M&E design consultancy will be involved in the detailed specification and design of the systems to be installed, this is to include the metering package that will enable the monitoring of operational performance. This package will be as a minimum the metering required for compliance with the requirements of the CHPQA. Monthly reports will be provided as part of the maintenance contract in order to monitor performance and an annual review will be undertaken in order to compare actual performance against that predicted. This information will be suitable for use in case studies and annual reports for public consumption if required.
	(v) Demonstration of how the balance will be utilised?	**(max 250 words)** The Trust has committed to investing 50% of the operational financial savings realised by the project directly into patient services. Specific area for investment will be agreed at Trust Board on 27th June this will include investment in improving the quality of the main entrance areas, the creation of a visitors centre at the LRI which will give patients and public access to information and support from the trust and partner agencies such as Age UK. Improvements will be made to ward and outpatient environments by redecoration.
10. EQUALITY DUTY	**Summary of equality analysis and statement of overall impact.**	**(max 250 words)** The scheme has been review by the Trust's equality lead who is satisfied that the proposals meet equality requirements. The nature of the proposed investment is such that all the changes take place behind the scenes of the hospital. The output from the CHP units, heat and electricity, provide the same function as the existing means of supply therefore there is no change and no detrimental impact on any persons sharing relevant characteristics under the Equality act 2010.
11. ATTACHMENTS	**Submitted with this completed Annex A application form is:**	
	Annex B – Value for Money Appraisal Spreadsheet	**Yes**
	Annex C – Breakdown of Costs	**Yes**

	Annex D – Expenditure Profile	**Yes**
	Planning Programme (Microsoft or equivalent)	**Yes**

SIGNED (Trust Chief Executive): Name _____ Signature _____

SIGNED (Trust Finance Director): Name _____ Signature _____

DATE: _____ 2013

Annex A – Stage 2 Application form

Stage 2 submissions will substantiate Stage 1 *Expressions of Interest* applications. Confirmation and assurance of the initial bids to the fund through the provision of more robust information is required, including clear identification of the reinvestment into patient care.

Information should be copied directly from the Stage 1 application submission, where applicable. It should not differ, but if any changes have been made to Stage 1 information then they should be clearly indicated with (##).

DH Project Ref:T065/01	
Trust : University Hospitals of Leicester NHS Trust	
Address: Leicester Royal Infirmary, Level 3 Balmoral Building, Infirmary Square, Leicester. LE1 5WW.	
Project Site: Glenfield Hospital	
Project Title: Glenfield Hospital CHP	
Trust Project Director and contact details: (Name, Title, e-mail, telephone number, address) Mike Webster Estates Transformation and Property Manager Mike.Webster@leicspart.nhs.uk 0116 2958928 OSL House East Link Meridian Business Park Leicester LE19 1UX	**Trust Project Manager and contact details:** (Name, Title, e-mail, telephone number, address) Nigel Bond Capital Projects Manager Nigel.bond@uhl-tr.nhs.uk 0116 2958914 OSL House East Link Meridian Business Park Leicester LE19 1UX

1. CAPITAL REQUIREMENT

If costs are greater than the original Stage 1 applications, then the new costing may affect the allocation of funding that may be awarded to the organisation.

Capital Expenditure breakdown ie works cost, equipment, fees, contingencies should be itemised. VAT must show the new capital expenditure

Please complete and attach the Annex C spreadsheet to detail the cost breakdown.

Capital expenditure excludes maintenance, staffing or other revenue costs

Original Stage 1 application costs, including vat :	**(£'000)** **£952,524**
Confirmed new cost if changed from stage 1 application**.** The reasons for any change should be addressed below (max 250 words) The costs have risen slightly after consultation with the CHP manufacturers and identification of works required to complete the installation and the provision of more robust costs for these items. The increase is approximately 5%. The Trust accepts that additional funding may not be available and is prepared to fund the balance. Actual figures are reflected in this document to demonstrate that they have been factored in to the payback calculations. To be clear the Trust is still seeking funding to the value of the stage 1 bid. Please contact the project Manager if clarification is required	**(£'000)** **£998,610**

Works Cost (£'000)	Equipment (£'000)	Fees (£'000)	Contingencies (£'000)	Recoverable VAT	Non-recoverable VAT
£756,523	**£……**	**£37,826**	**£37,826**	**£……..**	**£166,435**

Capital Expenditure Including VAT (£'000):	**£998,610.36**

2. ANNUAL SAVINGS

Stage 1 Annual savings (£'000):	**£210,007 - £211,642**
Stage 2 confirmed Annual savings (£`000):.	**£200,746**

	If changed from Stage 1 application. the reasons for any change should be addressed below (max 250 words). The impact of the CHP systems has been investigated in significantly more detail. This process has involved the use of half hourly data for both power and gas consumption where previously monthly figures were used. Analysis has been undertaken that matches site loads to the maximum output of the CHP plant and reduces CHP output accordingly where necessary. The resulting operational profile has been used to calculate the useful annual CHP output for heat and power, gas consumption and boiler gas offset. This has resulted in a more accurate estimate of CHP outputs. Half hourly profiles have also enabled the use of detailed tariff information and a more accurate estimate of costs and savings. CRC savings have also been incorporated at £12 per tonne. Additional changes have included the addition of a 20kW peak parasitic electrical load for operation of shunt pumps, cooling fans and controls. The existing boiler combustion efficiency has also been re-evaluated at 85% for the Stage 2 analysis as opposed to the 80% used at Stage 1. Contracted CHP availability remains at 90%.		
3. VALUE FOR MONEY **Has the Finance Director assessed the scheme/ project, that the investment is value for money?** **Please complete and attach the Annex B VfM Spreadsheet**	**Yes**	**No**	**Confirmation exact percentage of the returns will be re-invested in patient services (%)**
	YES ……	…….	50%
4. PROJECT DESCRIPTION	**Stage 1 Description:** Please copy here from your Stage 1 application's `outline of the proposed project requiring funding' the original description of the project (max 500 words). The Stage 1 text is as follows: *The existing CHP units are no longer operational and are beyond economic repair, but have served the Glenfield Hospital/NHS well – reducing the overall CO_2 emissions generated by the services provided. To assist in achieving the CO_2 reductions of the NHS Carbon Reduction Strategy & the University Hospitals of Leicester's own Strategies it is proposed to replace the existing 2 CHP units with a new single 770kWe plant, viable in both the economic and environmental sectors. The proposal makes use of existing mechanical and electrical infrastructure which might otherwise fall into disuse.* *The capital cost is estimated at £952,524, this value is used in both calculation methods, a supplier's calculations indicate possible annual saving in energy costs of £211,642 giving a simple payback of 4.5years. Environmentally there is an estimated reduction in carbon dioxide emissions of 1,719tonnes per annum.* *Using the statistical approach with more complex tariffs shows an optimistic annual saving of £210,642 giving a simple payback of 4.54years.*		

It is proposed to develop an innovative design concept, to optimise and simplify the LTHW system in order to maximise the energy/carbon saving potential of the investment. A schematic of the proposed pipework arrangement has already been considered, to utilise the maximum reclaimed heat to reduce demand on the LTHW boiler.

The reclaimed heating system is a sub system of the more extensive LTHW System. We propose to change flow and return temperature from the present 90°C flow / 80°C return to maximise the thermal carrying capacity of the existing pipework whilst reducing the pumping power. By increasing the temperature drop over the system the amount of water to be pumped is reduced by 33% with a consequent reduction in resistance in the pipework, reducing the size of the pump and drive.

The system will deliver 4200kWt (boiler output) irrespective of whether the CHP plant is operating, utilising the existing plant to its maximum potential. The CHP plant is positioned on a 'shunt circuit' on the LTHW return to the boiler. When reclaimed heat from the CHP plant is available, the shunt pump will extract a proportion of the main system return water, pass it through the CHP heat exchangers where it will pick up the reclaimed heat and return to the pipework before it enters the boiler. This increase in the return water temperature will be seen by the boiler as reduced demand and its output will automatically reduce. Should the CHP plant fail to operate or be taken out of service, the boiler plant will 'see' the full load on the system and adjust its output accordingly. The addition of a normally closed bypass around the boiler would enable the CHP to operate even if the boiler became inoperable. All the manufacturers who have expressed an interest have confirmed that their CHP will operate satisfactorily with temperatures up to 95°C.

Stage 2 Changes and supplementary information

Please use this space to describe changes, if any, to the original outline of the scheme at Stage 1 given above and to provide any supplementary information you may wish to include. (max 250 words).

The Stage 1 proposals have been re-assessed and have been determined to be technically sound. There are therefore no changes to the technical content of the scheme.

The capital cost is estimated at £998,610, Consultant's calculations indicate possible annual operational savings in energy costs of £200,745 giving a simple payback of 4.97years. Environmentally there is an estimated reduction in carbon dioxide emissions of 1,474tonnes per annum.

Changes in the predicted savings are as a result of the more detailed feasibility study undertaken. The Stage 1 calculations assumed that the CHP would operate for 17hours per day whilst the Stage 2 calculations do not arbitrarily limit operating hours, rather as previously discussed the CHP output more closely matches the heat and power profile of the site. Therefore the Stage 2 assessment results on assumed operational hours in excess of those for the Stage 1 assessment, resulting in additional savings.

Additionally the impact of the Carbon Reduction Commitment has been incorporated at a cost of £12 per tonne of CO_2 emitted, resulting in further annual financial savings. In mitigation the combustion efficiency of the existing LTHW Boiler has been re-evaluated upwards from 80% to 85%.

5. PROJECT TIMETABLE

The programme management for the project should provide a completed project plan, to accompany this form. (This should be completed using Microsoft program planning tool or equivalent).

DH Approval Date:	Commencement on Site Date:	Practical Complete on Site Date:	In Use Date
Latest date by which DH approval is required to meet planned timescales. 5 July 2013	The date that the works are expected to start on site. 3 October 2013	The date that the works are expected to be practically complete and brought into service. 31 December 2013	……

6.TRUST BOARD APPROVAL	Please state "YES" if the Trust Board has approved this submission and that the revenue consequences of the project are affordable and provide a copy of an **extract** of the relevant Trust Board Minute**.** Otherwise, state the date when Trust Board approval will be achieved This submission has been approved at executive level but will go to the Trust Board on 27 June for formal approval. We acknowledge that funds will not be released until this is achieved and acknowledge that funding will not be available until the Board has approved the scheme.
7.STRATEGIC AIMS	Please confirm that the project is consistent with the Strategic aims of the organisation which should : **(** max 250 words) • Demonstration that the Scheme identifies the key element of benefit, achievement of energy carbon efficiency saving and energy performance improvement. The proposed project will result in the most cost effective measure by which carbon dioxide emissions can be reduced at the site. It will also result in a significant reduction in the Trust's operating costs, carbon dioxide emissions and will release funds that can be invested directly into patient care and further energy saving projects. The benefits to the resilience of the site are significant with regard to reinforcing heating and hot water supply, with additional possible benefits regarding non-essential electrical loads in the event of mains power failure. As such the project aligns closely with our corporate aims to reduce carbon emissions and achieve emissions targets for 2015 and 2020. The proposal also affords substantial benefits to the resilience of the Trust in our provision of healthcare services to the local community.
8. RISK **What risks are there associated with successful delivery?**	Please provide details of risks to the successful delivery of the scheme/project in relation to contractual, timescales, financial and achievement of benefits where applicable, that have been assessed and mitigation planned. (Shown as a table with a traffic light appraisal applied). Please complete risk register and attach as part of Annex B spreadsheet. The risk assessment spreadsheet has been completed as required and accompanies this document.

9. SCHEME BENEFITS

The Annual Revenue Savings should be based on the ERIC calculations.

Calculations should be based on the same methodology as used in the tables at items 13.2 and 13.3 of the Stage 2 submission requirements guidance.

(i) Existing Energy Details (Annual):	ENERGY CONSUMPTION (kWh)	CARBON DIOXIDE EMISSION (CO_2) [tonnes]
Fossil:	17,111,208	3,388
Electricity:	12,770,721	6,602
Hot Water:	NA	NA
Other (please specify):	NA	NA
(ii) Post Project Energy (Annual):	**ENERGY CONSUMPTION (kWh)**	**CARBON DIOXIDE EMISSION (CO_2) [tonnes]**
Fossil:	25,366,376	5,023
Electricity:	6,757,692	3,494

	Hot Water:	**NA**	**NA**
	Other (please specify):	**NA**	**NA**
	Confirmation of what exact period of returns are projected. **(Years)**	This should be supported in the completed and attached Annex B Annex B shows that the initial capital cost will be returned in year 7. There will then be benefits for a further 8 years before the CHP will be due for replacement in year 16	
	(iii) Explain what additional benefits/outputs will be delivered.	Please state any additional benefits that the scheme/project will deliver, particularly with regard to patient care, healthcare, sustainability and environmental improvements. **(max 250 words)** The project will provide reinforced supplies of both heat and power to the site. The current LTHW supply is via a boiler. The provision of a bypass will enable the CHP to supply LTHW when the boiler is offline for servicing or maintenance in the event of failure. The provision to use the electrical output of the CHP to supply non-essential loads in the event of a mains power failure remains a possibility. This is dependent upon effective load prioritisation and management and remains to be investigated in detail. The financial savings achieved will be invested in part directly into patient services with 50% of the savings being used in this manner. Overall the proposal reduces the total carbon emissions of both the Trust and the NHS in the provision of our services to the local community and nationwide respectively. The investments being made will prove to demonstrate the willingness of the NHS to invest in measures to reduce environmental impact and improve sustainability of our operations. It will demonstrate the lead that the NHS is taking in resource efficiency and reducing impact on the local and global environment and provide an example for others to follow.	
	(iv) What provisions are being provided to address the final full report stage, as well as regular interim reports, and financial breakdown to allow lessons to be learnt and the sharing of knowledge by the organisation?	**(max 250 words)** An experienced M&E design consultancy will be involved in the detailed specification and design of the systems to be installed, this is to include the metering package that will enable the monitoring of operational performance. This package will be as a minimum the metering required for compliance with the requirements of the CHPQA. Monthly reports will be provided as part of the maintenance contract in order to monitor performance and an annual review will be undertaken in order to compare actual performance against that predicted. This information will be suitable for use in case studies and annual reports for public consumption if required.	

	(v) Demonstration of how the balance will be utilised?	**(max 250 words)** The Trust has committed to investing 50% of the operational financial savings realised by the project directly into patient services. Specific area for investment will be agreed at Trust Board on 27th June this will include investment in improving the quality of the main entrance areas, the creation of a visitors centre at the LRI which will give patients and public access to information and support from the trust and partner agencies such as Age UK. Improvements will be made to ward and outpatient environments by redecoration.
10. EQUALITY DUTY	**Summary of equality analysis and statement of overall impact.**	**(max 250 words)** The scheme has been review by the Trust's equality lead who is satisfied that the proposals meet equality requirements. The nature of the proposed investment is such that all the changes take place behind the scenes of the hospital. The output from the CHP units, heat and electricity, provide the same function as the existing means of supply therefore there is no change and no detrimental impact on any persons sharing relevant characteristics under the Equality act 2010.
11. ATTACHMENTS	**Submitted with this completed Annex A application form is:**	
	Annex B – Value for Money Appraisal Spreadsheet	**Yes**
	Annex C – Breakdown of Costs	**Yes**
	Annex D – Expenditure Profile	**Yes**
	Planning Programme (Microsoft or equivalent)	**Yes**

SIGNED (Trust Chief Executive): Name _____ Signature _____

SIGNED (Trust Finance Director): Name _____ Signature _____

DATE: _____ 2013