Contents

Executive Summary

Purpose

The Scottish Government (SG) has developed a Non-Domestic Energy Efficiency (NDEE) Framework, which will comprise an Energy Performance Contract (EnPC) and a Framework of Contractors (SG's NDEE Framework) to deliver energy efficiency services to public bodies in Scotland.

This purpose of this Outline Business Case is to present the case for accessing the Framework to reduce the College's energy costs and carbon emissions by installing energy conservation measures (ECMs) and delivering energy conservation services (ECSs). This Outline Business Case will demonstrate the opportunities that exist for the selected Colleges in Scotland to improve their energy performance by implementing ECMs which can be installed through an EnPC under SG's NDEE Framework.

Results

The results from the desktop energy assessment are presented in Figure 1 below. In summary, there is potential for an estimated energy saving of 17% across the portfolio, which equates to an estimated carbon saving of 3,448tCO2. The estimated capital expenditure required for the project is £5.27m with a maximum payback period of 8.9 years (this excludes all SFC on costs such as project management resource, contingency and risk).

Figure 1 – Benchmarking Output – Portfolio Level

Estimated energy saving: **17%**	**Estimated capital expenditure:** **£5.27m**
Annual cost savings: **£593k**	**Estimated carbon saving:** **3,448tCO$_2$**

The above along with an allowance of £550K for project management resource, contingency and on costs provides a total project value of £5.8m.

As detailed in section 1.2 above, a number of ECMs were identified in site specific Project Registers following site surveys. These are presented in the Project Registers in each of the authority data packs for the individual Colleges (see Appendix 1-6).

Qualitative Benefits

Improvements in energy efficiency of the buildings will offer energy savings to each of the Colleges. Any savings from energy can provide a saving in revenue budgets to be used to offset other costs. In addition to the commercial benefits there are non-commercial benefits arising from a programme of non-domestic energy efficiency activity. This will include opportunities to combine other maintenance investment such as redecoration, rewiring, replacement of ceiling tiles, for example to enhance the building fabric and improve the quality of learning spaces for students.

Improvements to the air and water environment can be achieved through some of the measures such as boiler replacement and low flush WCs respectively.

If the programme is communicated to staff, students and the community in an appropriate way then there is the further reputational benefit to the Colleges of acting in a socially responsible and energy efficient manner.

Next Steps

The following steps should be taken to progress the project to the Development Stage:

- Gain management 'buy in' and approval of the Outline Business Case
- Secure required funding to progress the Development Stage (to end of Investment Grade Proposal (IGP))
- Establish project team and governance arrangements
- Call off SG's NDEE Framework
    - Issue notification of intent to mini competition under SG's NDEE Framework
    - Develop SG's NDEE Framework Invitation to Mini Competition (ITMC) Documents
    - Carry out Mini Competition and tender process
    - Framework Contractor selection
    - Implement Development Contract and produce IGPs
- Secure required funding for implementation and delivery of capital works.
- Review of baseline data and desktop energy assessment
- Produce Full Business Case (FBC)
- Appointment of Framework Contractor under EnPC

1 Approach

In order to develop the content of this Outline Business Case the following process was undertaken:

1. Data Gathering
2. Desktop Energy Assessment
3. Site Surveys
4. Project Register Development

The initial step was to gather appropriate data that could be used to investigate the energy performance of the various Colleges and the potential energy saving against the benchmark which in turn leads to the implementation of ECMs. Data required to be gathered included:

- Campus Name
- Building Name
- Building Usage including number of users, usage hours etc.
- Fuel Unit Costs
- Type of Tenure
- Heritage Status
- Floor Areas
- Year of Construction
- Refurbishment Details
- Energy Usage Data
- Energy Performance Certificate
- Metering Details

Following the data gathering exercise a desktop energy assessment of the Colleges, at the building level, to identify estimated capital expenditure, return on investment and energy, carbon dioxide and financial savings was carried out.

To ensure the robustness of the desktop energy assessment site surveys were carried out at each of the sites and have led to the identification of a number of ECMs that could be installed to meet the energy saving target identified. These are not exhaustive and are to be utilised as a guide as to the type of projects which could be considered appropriate for implementation at the various Colleges, however it should be noted that Framework Contractors under SG's NDEE Framework may develop further ECMs not included in the Project Register. The categories of ECMs detailed in Table 1 have been considered.

Table 1 - ECM Categories

ECM Cat. Ref.	ECM Cat Name	ECM Category Description
01	Automatic Meter Reading (aMR) systems	Energy consumption measurement, logging, communication & reporting systems.
02	Passive Measures (Passive)	Passive renewable energy technologies and measures, e.g. solar shading
03	Building Fabric (BF)	Building fabric thermal performance improvements, such as loft insulation.
04	Heating, Ventilation & Air Conditioning (HVAC)	Measures to improve energy efficiency of heating and cooling sources, distribution systems, heat emitters etc.
05	HVAC Controls	Building energy management systems and other HVAC controls.
06	Lighting and Lighting Controls (Light & Cntrl)	Artificial lighting systems and their control.
07	Electrical Equipment and Distribution (Electrical)	Efficient motors and other equipment; voltage management etc.
08	Low and Zero Carbon Technologies (LZC)	Biomass, solar thermal, heat pumps, photovoltaics, combined heat and power etc.
09	Specialist Systems (Specialist)	Swimming pools, lifts, catering, fume cupboards, process energy use etc.
10	Water Management (Water)	Management of water using devices, such as taps, WC cisterns, urinals etc.
11	Others (Others)	ECMs that do not fit into the above categories.

2 Strategic Context

2.1 Why retrofit?

The majority of the existing buildings within the College's estates will still be standing in 2050, so retrofitting the current building stock is a vital part of meeting emissions reductions targets and using energy in a more efficient and sustainable way.

Improving the performance of existing public sector buildings is key to reducing Scotland's CO_2 emissions. The wider economic and austerity environment also means there is a growing need to make existing buildings work harder, rather than replacing them with new ones.

2.2 Project Background

The Scottish Funding Council (SFC) are responsible for the funding of 25 colleges and 19 universities and higher education institutions across Scotland, the majority of which have the potential for their energy performance to be improved. SFC along with SG have identified six Colleges which they believe have the potential for energy efficiency improvements that can be addressed as part of this outline business case, these are as follows:

- Borders College
- Edinburgh College
- Newbattle Abbey College
- North East Scotland College
- West College Scotland
- West Lothian College

Advances in technology have led to more efficient alternatives to the existing building services and building fabric solutions becoming available. For the purposes of Scottish Government's NDEE Framework, these have been categories into eleven groups:

- ECM1 Energy Monitoring and Targeting
- ECM2 Passive Features
- ECM3 Building Fabric
- ECM4 Heating, Ventilation and Air Conditioning (HVAC)
- ECM5 HVAC Control
- ECM6 Lighting & Lighting Control
- ECM7 Electrical Equipment and Systems
- ECM8 Low and Zero Carbon (LZC) Technologies

- ECM9 Water Management
- ECM10 Specialist Energy Uses
- ECM11 Other

SG's NDEE Framework recognises that it is essential to support the retrofitting of energy efficiency assets with appropriate services. The Framework allows for the delivery of the following five Energy Conservation Services (ECSs), of which ECS1 is mandatory and the others are subject to the procuring authority's requirements:

- ECS1 Measurement and Verification
- ECS2 Bureau Service
- ECS3 Maintenance (of installed ECMs)
- ECS4 Lifecycle
- ECS5 Behaviour Change

This business case identifies the benefits and challenges of a bespoke package of ECMs and ECSs for each College and sets out the resources required for the SFC to manage an NDEE Programme for its sector.

2.3 Drivers for Change and Strategic Objectives

Each of the organisations involved in the project has specific Drivers for Change and Strategic Objectives associated with the project's outcome as follows:

Scottish Government Drivers

SG has commitments to meet carbon reduction targets of 80% by 2050. Energy efficiency in public estate is a driver of the reduction in carbon emissions and SG's NDEE Framework is a catalyst to ensure public bodies are driving energy efficiency within their estate.

The installation of ECMs and reduction in energy consumption will assist SG to achieve the obligations set out in The Climate Change (Scotland) Act 2009, (Section 63, Energy Performance of Non Domestic Buildings). The Climate Change (Scotland) Act 2009 sets legally binding targets in relation to greenhouse gas emissions reduction (42% by 2020, based on a 1990 baseline) and places various duties on public bodies. To support this there are linked ambitions; an energy efficiency target to reduce total final energy consumption in Scotland by 12% (against baseline of average consumption in 2005-07) and delivery of 11% of non-electrical heat demand by renewable sources.

In addition, new regulations for non-domestic buildings will come into force in June 2016 affecting the public sector and third sector estate and requiring energy performance to be improved.

Scottish Funding Council Drivers

SFC has a duty to encourage the College Sector to reduce its energy use and carbon emissions through the introduction of energy performance measures, energy reduction measures and reduction in water use across college buildings.

These actions will help to achieve the targets set in the Climate Change Act to reduce Scotland's carbon emissions by 80% by 2050.

College Drivers

The ongoing pressures that the Colleges are facing in relation to their budgets and how the cost and use of energy impacts these currently provides significant challenges. Therefore the importance of the introduction of ECMs and the reduction in energy use can have a positive impact to the Colleges budget, allowing savings to be used towards provision of education.

2.4 Third Party Considerations

During the investigation of project options consideration was given at each of the Colleges of the current condition of the estate along with future capital investment plans and backlog maintenance issues. These were discussed with each of the Colleges to establish if the ECMs considered could also act as a way of reducing the backlog maintenance issues or ensuring to have no impact on any future capital investment programme.

3 Current Portfolio

3.1 Current Condition

In order to establish the current condition of the various Colleges, detailed building and energy data for each of the buildings associated with the individual Colleges was collected. The building data gathered is essential for the benchmarking process as it provides an insight into the workings of the building and is used when considering where energy efficiencies could be realised. The energy data collected is used by the benchmarking process to calculate the energy performance and costs of each of the buildings in order to carry out the benchmarking process.

3.1.1 Borders College

The Borders College currently consists of 3 campuses: Hawick, Newton St Boswells and the main campus at Galashiels. Hawick is the most recently constructed of the College buildings having been completed in 2007. Due to this, the building is in relatively good condition with all main plant installed at the time of construction. The Newton St Boswells campus is made up of a teaching block constructed in 2006 and a reception/study area/workshop building which was constructed circa 1980 but was refurbished in 2012. The site also utilises two Portacabins which are nearing life expiry. The Galashiels campus is the main campus for the College and shares its facilities with Heriot Watt University. The building was built circa 1960, with an internal and external refurbishment in 2008 followed by an extension in 2009. Although the campus has recently installed a heat recovery system (SHARC Energy) which is in its final stages of commissioning, other items of plant within the building are around 20 years old. The building has a BMS which incorporates the new and existing heating systems.

Following the completion of the site surveys an authority data pack was created for the College which contains all the site specific information gathered during site visits, discussions with the Facilities Manager and through access to various forms of documentation which are included within the appendices where possible. This can be found in Appendix 1.

3.1.2 Edinburgh College

Edinburgh College consists of a number of buildings across four main campuses – Sighthill, Granton, Milton Road and Midlothian. The Sighthill campus consists of three buildings: the main building which was built circa 1970, the creative block built in 2006 and the sports hall built in 2010. The heating plant for the main building and the creative block is approaching 15 years old with the sports block having relatively up to date plant including solar heat recovery system. All buildings throughout the campus benefit from double glazing and the BMS system.

The Granton campus was constructed in 2006 and therefore is largely in good condition throughout. The boiler plant is the same age as the buildings and has only recently begun to have reliability issues. The building is fully double glazed, has PV installed, benefits from a BMS and the majority of lighting is sensor controlled.

The Milton Road campus is made up of Bolum house – the main building which includes halls of residence – and the Club which contains a swimming pool, gym, specialist teaching areas and catering facilities. Bolum house was built in 1972 and had extensive internal refurbishments carried out in 2008 when the Club building was constructed. The two buildings share the same boiler plant through a small scale district heating set up – though parts of the original plant equipment are now up to 20 years old. The club building has air tightness issues which can be noted within the plantroom. The majority of the buildings are double glazed throughout and are also linked to a BMS.

The Midlothian campus was built in 2008 and still has weather proofing issues with ingress of water and wind occurring regularly. The building plant is new as of construction therefore in good condition and is linked to the BMS.

The College also operates out of the Marine Drive building, a sports changing facility that was constructed circa 1970 and has had several refurbishments. The building has a variety of users and new playing fields are currently under construction. The College has one building on a short term rolling lease, Forthside, which is utilised for the construction and stone masonry practical classes.

Following the completion of the site surveys an authority data pack was created for the College which contains all the site specific information gathered during site visits, discussions with the Facilities Manager and through access to various forms of documentation which are included within the appendices where possible. This can be found in Appendix 2.

3.1.3 Newbattle Abbey College

Newbattle Abbey College is located within the Grade A listed Newbattle Abbey in Dalkeith and also uses a unit in the nearby industrial park. The building has had limited investment in recent times and as such the interior and its plant, which would benefit from modernisation, are in poor condition. As the building is listed, there would be limitations as to what work could be carried out. The rural skills unit was built in 1938 and utilises two wood burning stoves as a heating source. The ceiling was lowered and insulation installed on part of the unit in 2003, other than this it has had limited investment.

Following the completion of the site surveys an authority data pack was created for the College which contains all the site specific information gathered during site visits, discussions with the Facilities Manager and through access to various forms of documentation which are included within the appendices where possible. This can be found in Appendix 3.

3.1.4 North East Scotland College

North East Scotland College has a large number of buildings split over its 6 campuses: Gallowgate (Aberdeen City), Altens, Gordons, Clinterty, Fraserburgh and Peterhead. The Gallowgate campus has three buildings constructed in the 1960s and '70s. The tower block and east block benefitted from a refurbishment in 2014 including

replacement glazing and overcladding. The Altens Campus has five buildings with the majority built in the 1970s, other than Block F which was built in 1999 and Block M built in 2010. Block A received an internal upgrade in 2015 and Block B/C had a partial roof refurbishment. Block M has been BREEAM assessed as "excellent" as it includes PV panels, a 25kw wind turbine and rain water collection. The Gordons Campus consists of a sports and leisure facility which was built in 2005 and benefits from lighting sensors throughout. There are a number of buildings at the Gordons campus that are due to be demolished or are mothballed, these are: Block A, Guard House, Coffee Bar, Boiler House, Block C and Block D/E. The Clinterty campus was built in the 1970s with the Aset offices roof and lighting upgraded in 2015 and the two bungalows benefiting from internal refurbishment in the same year. The residential block and Portacabins at the campus are currently not in use. The Fraserburgh campus was built in 1974 and received a complete upgrade in 2012 incorporating a BMS across all buildings. The campus also has a nursery associated with it which is situated within a Portacabin on site. The Peterhead campus, Scottish Maritime Academy, was built in 1995 and benefited from an internal refurbishment in 2012. There are a number of buildings where only a small number of rooms are utilised by the College or that are on short term lease, these are: Crichie Cottage at the Inverurie Learning Centre, Hunter Annexe at SRUC Craibstone, the Fife Street Learning Centre and the new Ellon Learning Centre.

Following the completion of the site surveys an authority data pack was created for the College which contains all the site specific information gathered during site visits, discussions with the Facilities Manager and through access to various forms of documentation which are included within the appendices where possible. This can be found in Appendix 4.

3.1.5 West College Scotland

The College has a number of buildings across its main campuses at Clydebank, Greenock and Paisley. The Clydebank campus is a single building constructed in 2007 and therefore is in good condition. The building benefits from roof insulation, double glazing and a BMS linked to the heating plant. The Greenock campus includes the Finnart Street building and the Waterfront building. Finnart Street was constructed circa 1970 with the refectory area and main entrance benefiting from an internal and external refurbishment in 2013. The building has roof insulation, lighting sensors in 75% of areas though does not have double glazing throughout. A BMS is installed though an upgrade is required to the system and the boiler plant. The Waterfront building was constructed in 1995 and has not had any major refurbishment works. The building has roof insulation, though there are still issues with leaks, and 90% of areas have lighting sensors. A BMS is in place for the boiler plant. The Paisley campus is made up of 6 main buildings. There are also a number of buildings which are under short term lease, operated under a licence to occupy or are individual rooms leased within buildings. The remaining buildings are a variety of ages with the dates of construction in a range from circa 1960 through to 2011 which was the ICE building, a dedicated renewable training centre. The plant and condition of the buildings therefor

varies hugely as there have been few refurbishment works carried out. The College also operates out of a building in Dumbarton which is under short term lease.

Following the completion of the site surveys an authority data pack was created for the College which contains all the site specific information gathered during site visits, discussions with the Estates Managers and through access to various forms of documentation which are included within the appendices where possible. This can be found in Appendix 5.

3.1.6 West Lothian College

West Lothian College is based at Almondvale Crescent in Livingstone and consists of 5 buildings built in 2001. The Street and Terrace 1&2 buildings had extensions added in 2015 which were a sports facility and a workshop respectively. The boiler and associated plant were installed at construction and are therefore nearing the end of their expected life. The buildings are all controlled by a BMS.

Following the completion of the site surveys an authority data pack was created for the College which contains all the site specific information gathered during site visits, discussions with the Facilities Manager and through access to various forms of documentation which are included within the appendices where possible. This can be found in Appendix 6.

3.2 Current Approach to Energy Efficiency

3.2.1 Borders College

The College produced a Carbon Management Plan (CMP) in 2010 setting out a target of a 25% reduction in CO2 emissions to be achieved by 2015. The CMP only covered the Galashiels campus and also incorporated Heriot Watt University activity at the campus. It is assumed that the CMP is utilised as the methods for supporting the implementation of energy saving projects, with a number of potential projects identified and a baseline for emissions established. Examples of the projects the College is considering are installation of biomass boilers, installation of sub-metering and insulation of pipework. The College is currently in the process of creating a new CMP to incorporate all of the campuses.

3.2.2 Edinburgh College

Edinburgh College have a CMP for 2015-2020 which identifies an aim to reduce carbon emissions by 18% by 2020. The plan outlines a number of projects across energy, water, waste and transport; examples include boiler optimisation, rainwater harvesting and lighting replacements. The College has a Carbon Management Group in place as well as a Sustainability Forum and Sustainability Officer. The CMP was created to be utilised by the College as a mechanism for delivering a reduction in carbon emissions. The following projects, identified by the College, are examples of potential ECMs which are being considered: lighting replacement programme, installation of a CHP boiler, cavity wall insulation and installation of a pool cover.

3.2.3 Newbattle Abbey College

The College has a CMP, created with the Carbon Trust, which sets out a target of a 20% reduction in carbon emissions by 2015/16 with the main focus being on electricity and heating oil consumption. Example projects suggested in the CMP are installing loft insulation, draft proofing of windows and lighting replacements. The implementation and management of the CMP is the responsibility of the College's Carbon Management Group. The College has also had a condition survey carried out which identified potential works which would be required to upgrade its current condition, a number of which would improve energy efficiency. The resulting report is included within the authority data pack in Appendix 3.

3.2.4 North East College Scotland

North East College Scotland produced a carbon management plan in 2012 with a target of a 20% reduction in CO2 emissions by 2016. The CMP lists the various initiatives that the College has introduced with a view to improving sustainability which have led to the College receiving Ecocampus platinum status. The CMP has specified a number of projects, estimated the potential energy savings at the College and includes estimated costs and the payback period. A selection of the projects specified in the CMP are: installation of roof insulation, double glazing and installation of wall insulation. It is assumed that the CMP is utilised by the College to implement the projects identified to realise the energy efficiencies identified.

3.2.5 West College Scotland

The College is currently in the process of creating a new CMP to replace those for the individual campuses which have expired. The expired CMPs identify the management of the implementation of the CMP being the responsibility of the Carbon Management Team. The new CMP is expected to contain a number of projects which would improve energy efficiency across the College buildings and would be utilised as a means for delivering these projects.

3.2.6 West Lothian College

The College is in the final stages of producing a CMP to replace the previous plan which has recently expired. The College has a Carbon Management Team in place and it is expected that the new CMP will be utilised as the method for the delivery of ECMs to be identified within the CMP.

3.3 Proposed Future Investment Plans

3.3.1 Borders College

The College is currently looking at developing the Newtown St Boswells campus within the next 2 years to improve teaching and agricultural storage facilities. They are also in the process of securing workshop facilities at Tweedbank with a view to occupying from May 2016. Following the installation of the SHARC district heating system, the College is looking to install smaller more efficient back up boilers.

3.3.2 Edinburgh College

The College currently have plans for boiler improvements at the Milton Road Campus including phased replacement or decentralised heating of the club building.

3.3.3 Newbattle Abbey College

The condition survey, found in the authority data pack in Appendix 3 contains details of possible future capital works and planned maintenance at the College. The works specified within this document are linked to the condition of the building and detail required/aspirational work to get the College to specific conditions depending on the level of funding available.

3.3.4 North East Scotland College

Table 2 below details the planned future works at the College.

Table 2 - North East Scotland College Planned Future Works

Campus	Planned Works
Gallowgate	Heating, light/presence detectors, BMS, CCTV/fire/security alarms, internal refurbishment, possible solar photovoltaic panels, heat recovery, presence detectors. HV switching system. External fabric, glazing, roof works
Fraserburgh	Fraserburgh master plan new build(BREEAM), Internal upgrade of training kitchens/electrics/heating, Internal upgrade of Gymnastics area/electrics, Fraserburgh Air Conditioning Upgrade(under review), Possible photo voltaic panels
Clinterty	New CITB training Centre, Workshop - Requires replacements roof (Asbestos Containing Material (ACM)), Upgrade to electrics/ heating/lighting, Install BMS, Main Building - Window/fabric/internal external refurbishment, Electric/lighting/presence detectors, New Boiler/BMS/heating system
Altens	M Block decoration/ possible solar photovoltaic panels, A block – roof/window replacements, B/C – upgrade to some areas electric/heating/lighting/sensor/BMS possible solar voltaic, D/E - replacement roof(ACM), upgrade to electric/heating/lighting 9 specific areas/BMS/possible solar voltaic, F Block - external glazing/internal refurbishment upgrade lighting /sensor/controls
All sites	Energy monitoring role out. IT equipment automatic switch off. Improved BMS (Cylon all sites). Voltage Optimisers-review

3.3.5 West College Scotland

A full condition survey was carried out across the college during 2015, the results of which will form the basis of the College's infrastructure investment plans. The College intends to use the results of this project to supplement the outcome of the condition survey to create an overall infrastructure investment plan.

3.3.6 West Lothian College

The College has plans to complete the cavity wall insulation works to all five buildings which began last year. This was undertaken as a statutory requirement..

3.4 Portfolio Optimisation

A number of buildings have been excluded from the project in order to optimise the portfolio to maximise the effectiveness of the pursuit of energy efficiencies and savings. Table 3 specifies the colleges which have had buildings excluded and the reasons for these exclusions.

Table 3 – Excluded Buildings List

College	Building	Campus	Reason for Exclusion
Edinburgh College	Main & Nursery	Granton Campus	Low estimated energy saving and small number of identified projects
	Forthside	Forthside	Building on short term rolling lease
North East Scotland College	Block M	Altens Campus	Low estimated energy saving and currently BREEAM "excellent"
	Block A	Gordon Campus	Mothballed
	Guard House Coffee Bar	Gordon Campus	Mothballed
	Boiler House	Gordon Campus	Standalone building to power mothballed buildings
	Block C	Gordon Campus	To be demolished
	Block D/E	Gordon Campus	To be demolished
	Crichie Cottage	Inverurie Learning Centre	Short term lease
	Hunter Annexe	SRUC, Craibstone	Short term lease
	Residential Block	Clinterty Campus	Not in use
	Portacabin	Clinterty Campus	Derelict
	Fife Street Learning Centre	Fife Street Learning Centre	Short term lease
	New Ellon Learning Centre	Ellon Learning Centre	Only rent a single room on a short term lease
West College Scotland	Dumbarton	Dumbarton	Leased property
	5 New Street	Paisley Campus	Leased property
	Ferguslie Learning Centre	Paisley Campus	Rooms in a shared local community centre
	Renfrewshire Sports Centre	Paisley Campus	College operates under a licence to occupy so any amendments not within college control
	Barrhead Skills Centre	Paisley Campus	College will be relocating activity within the Barrhead area during summer 2016

4 Portfolio Analysis

4.1 Desktop Energy Review

The energy benchmarking analysis draws upon current building condition and energy consumption data, industry energy performance benchmarks and our own experience of implementing energy conservation measures to ascertain potential savings, capital expenditure and return on investment available from the implementation of an EnPC. This analysis helps to establish minimum performance standards thus guiding tendering Framework Contractors.

Current energy consumption per metre squared floor area (kWh/m2) is compared against a blend of industry benchmarks including CIBSE's TM46, Carbon Trust Energy Benchmarks and Display Energy Certificates (DECs) as well as Turner & Townsend's own in-house data resources to identify the estimated energy savings that are realistically achievable.

Whilst this analysis does not involve detailed design work, which is considered at a later stage, the energy benchmarks can be adjusted to take into account the condition of major plant and systems that may have a greater potential for energy savings.

Having established potential energy savings, an extensive database of over 3,000 individual energy conservation measures, across a wide range of technology types, to calculate capital expenditure.

Having calculated estimated energy savings and estimated capital expenditure, individual utility unit rates (£/kWh) for each building are used to calculate the maximum return on investment.

As Figure 2 illustrates there is significant potential for savings across the six Colleges.

Figure 2 – Benchmarking output – Portfolio Estimated Energy and Carbon Savings

Minimum estimated energy savings are expected to be 17% when comparing current performance against 'typical' building performance benchmarks.

In order to carry out the desktop energy review a number of assumptions had to be made. The first assumption was the use of the national average figures published by the Department for Energy and Climate Change (DECC) for the energy usage costs for a number of the buildings at North East Scotland College. The costs utilised were published in December 2015 and were £0.1016/kWh for electricity and £0.2652/kWh

for natural gas. Further individual building assumptions and adjustments were made during the benchmarking process, the details of which can be found in the Benchmarking Report in Appendix 7.

4.2 Indicative Project Register

A series of site visits were undertaken to each of the College campus buildings enabling a site survey checklist that detailed the key characteristics of the buildings to be produced. This checklist provides a summary description of the fabric, energy systems, heating, cooling, ventilation and lighting within these buildings.

Based on the results of the site visit a Project Register was produced that defines a suite of potential ECMs that are available to be applied to the respective campus buildings. The purpose of the Project Register is to provide a list of opportunities to provide focus in terms of potential measures to improve the energy efficiency of the buildings. The list of ECMs is not limited and other measures can be proposed by Framework Contractors. These available measures that are identified have the combined potential to deliver energy savings that exceed the benchmark values identified above.

The Project Registers draw upon the information submitted to SFC by each of the Colleges and the information provided during the data gathering stage. This information, which included ECMs suggested by the Colleges in their Carbon Management Plans and other supporting documents, was reviewed and amended to exclude measures that were not considered to be viable or include additional measures that had not been previously identified. These ECMs are categorised according to the references (00 to 11) defined by the Scottish Futures Trust (SFT) under SG's NDEE framework and listed in Table 4.

Table 4 – ECM Categories

ECM Cat. Ref.	ECM Cat Name	ECM Category Description
01	Automatic Meter Reading (aMR) systems	Energy consumption measurement, logging, communication & reporting systems.
02	Passive Measures (Passive)	Passive renewable energy technologies and measures, e.g. solar shading
03	Building Fabric (BF)	Building fabric thermal performance improvements, such as loft insulation.
04	Heating, Ventilation & Air Conditioning (HVAC)	Measures to improve energy efficiency of heating and cooling sources, distribution systems, heat emitters etc.
05	HVAC Controls	Building energy management systems and other HVAC controls.
06	Lighting and Lighting Controls (Light & Cntrl)	Artificial lighting systems and their control.
07	Electrical Equipment and Distribution (Electrical)	Efficient motors and other equipment; voltage management etc.
08	Low and Zero Carbon Technologies (LZC)	Biomass, solar thermal, heat pumps, photovoltaics, combined heat and power etc.
09	Specialist Systems (Specialist)	Swimming pools, lifts, catering, fume cupboards, process energy use etc.

10	Water Management (Water)	Management of water using devices, such as taps, WC cisterns, urinals etc.
11	Others (Others)	ECMs that do not fit into the above categories.

The Project Registers are presented for each College in the authority data pack reports appended to this document (Appendix 1-6). The ECMs identified in these registers are summarised in Table 5 and identify 390 individual projects across the buildings within the six Colleges. The measures are grouped by the ECM categories detailed in Table 4.

Table 5 – Summary of Project Registers for Edinburgh College (EC), Borders College (BC), Newbattle Abbey College (NAC), North East Scotland College (NESC), West College Scotland (WCS) and West Lothian College (WLC)

ECM Category and Description	EC	BC	NAC	NESC	WCS	WLC	Total
01 Energy consumption measurement, logging, communication & reporting systems.							
Building management systems	5	0	2	6	6	0	**19**
03 Building fabric thermal performance improvements, such as loft insulation.							
Insulation - building fabric	7	10	6	4	16	8	**51**
Insulation - draught proofing	4	0	1	1	0	8	**14**
Insulation - other	3	0	0	0	0	0	**3**
Insulation - pipework	3	5	3	0	4	0	**15**
04 Measures to improve energy efficiency of heating and cooling sources, distribution systems, heat emitters etc.							
Boilers	5	2	1	3	6	0	**17**
Cooling	7	0	0	0	0	0	**7**
Heating	2	0	9	2	1	0	**14**
Insulation - other	0	0	0	1	0	0	**1**
Upgrades	1	0	0	0	0	0	**1**
Ventilation	0	0	0	1	0	0	**1**
05 Building energy management systems and other HVAC controls.							
Boilers	0	5	0	0	0	0	**5**
Building management systems	11	5	3	0	7	5	**31**
06 Artificial lighting systems and their control.							
LED lighting	5	5	0	6	9	5	**30**
Lighting controls	3	0	3	6	9	5	**26**
Street lighting	5	5	0	0	0	0	**10**
Traffic lights	0	0	3	0	0	0	**3**
07 Efficient motors and other equipment; voltage management etc.							
Motor controls	0	0	0	1	0	0	**1**
Voltage management	6	5	3	6	9	5	**34**
08 Biomass, solar thermal, heat pumps, photovoltaics, combined heat and power etc.							
Combined heat & power	2	5	1	0	0	0	**8**
Heating	0	0	0	0	1	0	**1**
Renewable energy	5	10	8	7	8	10	**48**
09 Swimming pools, lifts, catering, fume cupboards, process energy use etc.							
Swimming pool cover	1	0	0	0	0	0	**1**
11 ECMs that do not fit into the above categories.							

ECM Category and Description	EC	BC	NAC	NESC	WCS	WLC	Total
Computers & IT solutions	0	0	0	12	21	0	**33**
Vending machines	6	0	0	0	0	0	**6**
Water and wastewater	0	7	3	0	0	0	**10**
Grand Total	**81**	**64**	**46**	**56**	**97**	**46**	**390**

4.2.1 Implications & Resulting Scope for Delivery of Project

In order to safeguard the lifetime benefit of the ECMs identified, other building fabric and system upgrades may be necessary. This relates to non-energy efficiency capital and maintenance investments in the building that, if undertaken after the investment in ECMs, could cause greater disruption. Examples of this could include:

- Redecoration of larger areas where intrusive works require reinstatement
- Replacement of roof waterproofing as part of the installation of roof mounted PV or other systems
- Upgrading the electrical wiring when installing replacement lighting equipment
- Replacement of suspended ceilings when replacing lighting

It is recommended that the investment in ECMs are programmed in conjunction with the wider capital and maintenance budgets for the respective buildings to maximise the value of the investment and avoid disruption.

4.2.2 Implication to Colleges Operation & Ongoing Maintenance Regime

Increased maintenance resulting from the installation of ECMs must be factored into the estimated lifecycle cost and the simple payback for each of the projects. This factor in the cost accounts for the operational maintenance and servicing regime as well as the lifecycle replacement of the equipment.

Some of the ECMs, notably the upgrade to building management systems and installing measurement, logging, communication and reporting measures can have a positive benefit on the operation of buildings. It can offer enhanced energy performance and improved control.

Many of the ECMs will have a neutral effect on the ongoing operation and maintenance procedures within the Colleges. An example of this would be lighting and building fabric improvements, such as insulation and draught proofing, although these have little immediate effect they may require future replacement.

The installation of efficient motors and other equipment, such as voltage management as well as installation of combined heat & power, replacement heating plant and

renewable energy systems will require increased and in some cases specialist maintenance which should be factored into the lifecycle cost.

4.2.3 Environmental Benefits

The installation of ECMs should deliver carbon emissions reductions as a result of the reduction in the energy demand. The solutions can also offer other enhanced environmental benefits such as improved management of the water resource through measures to reduce water consumption and greywater recycling.

The solutions should be designed sensitively in order to improve, or not be detrimental to, the buildings' environmental impacts locally. This will be controlled through environmental regulation and through the planning process. ECMs requiring planning and permitting consents must be approved through the relevant agency. This will particularly relate to measures that have a potential impact on the air quality, visual impact or noise.

5 Financial and Economic Analysis

5.1 Capital Investment

The benchmarking analysis carried out as part of the desktop energy review suggests that the total capital investment required to achieve a 17% reduction in energy consumption is £5.27million. In terms of the financial implications of the energy savings, a minimum annual saving in the region of £593k would be possible which equates to a maximum payback period of 8.9 years.

The total capital investment required is broken down by College in Table 6.

Table 6 – Estimated Capital Investment Broken Down by College

College	Estimated capital investment
Borders College	£197,000
Edinburgh College	£1,360,000
Newbattle Abbey College	£101,000
North East Scotland College	£1,580,000
West College Scotland	£1,610,000
West Lothian College	£424,000
Sub Total	**£5,272,000**
Project Team	£200,000
Client Overheads	£100,000
Risk/Contingency	£250,000
Total	**£5,822,000**

It should be noted that the costs stated above are at current day prices and do not include VAT.

5.2 Financial Benefits

There are a number of financial benefits associated with the implementation of the ECMs at the Colleges. The main high level benefits are detailed below:

- A reduction in energy consumption leading to reduced energy bills - the qualitative financial benefit of lower consumption in KWh will also increase over time if energy prices are assumed to increase.
- Reduction in cost of energy supply through onsite generation (where applicable)
- Reduced Operations and Maintenance (O&M) and lifecycle costs through the upgrade of plant and machinery

5.3 Affordability Quantitative Financial Appraisal

An analysis has been carried out of the impact upon the project's payback period and Net Present Value (NPV) taking account of energy price forecasts. The analysis includes the base case of a simple payback period, where no price growth or discount factors are applied, versus a discounted cash flow approach that takes into account Climate Change Levy (CCL), an estimate for inflation and energy price growth.

Both the base case and discounted cash flow scenarios generate sufficient energy cost savings to repay the investment within considerably less than 10 years, resulting in significant surpluses in later years.

The base case option shows a simple payback period of 8.9 years when considering energy cost savings alone. Taking account of climate change levy, inflation and DECC energy price growth forecasts under the discounted cash flow scenario increases the value of annual energy savings, reducing the simple payback period to 7.7 years.

The annual savings in energy and costs and the escalation factors applied are shown in Table 7.

Table 7 – Affordability Quantitative Financial Appraisal

Base Case					
Under the base case assumptions the project would have the following key metrics:					Units
Capital Cost:				£5,272,000	£
Annual Electricity Savings (kWh);				5,348,476	kWh
Annual Gas Savings (kWh);				4,684,808	kWh
Annual Fuel Oil Savings (kWh):				417,256	kWh
Annual Total Energy Savings (kWh)				10,450,540	kWh
Energy Cost Savings in Today's Prices (excluding CCL):				£593,000	£
Simple Payback Period:				8.9	years
Base Case key assumptions include the following:					
Grant funding (i.e. no interest payment)					
Year 1 total energy cost saving, including Climate Change Levy (CCL):				£634,929	
Energy Source	Unit Costs		Annual Saving		
	Energy	CCL	kWh	£	
Electricity:	0.0877	0.0052	5,348,476	£497,087	£
Gas:	0.0238	0.0018	4,684,808	£120,025	£
Oil:	0.0427	-	417,256	£17,817	£
Annual Total Energy Cost Saving (£)				£634,929	£
Simple Payback Period:				8.3	years
Inflation (CPI):				0.00%	%
DECC Price Growth Forecast:				Not applied	

Discounted Cash Flow						
Under the Discounted Cash Flow scenario, similar values are applied as in the Base Case for Capital Cost, Annual kWh savings						
Energy Source	DECC & CPI Escalation	Unit Costs		Annual Saving		
		Energy	CCL	kWh	£	
Electricity:	1.0873	0.0954	0.0054	5,348,476	£538,962	£
Gas:	1.0664	0.0254	0.0018	4,684,808	£127,429	£
Oil:	1.0328	0.0441	-	417,256	£18,402	£
Annual Total Energy Cost Saving (£)					£684,792	£
Simple Payback Period:					7.7	years
Inflation (CPI):					2.50%	%
DECC Price Growth Forecast:					Low Price Scenario	
Start of first savings year:					January 2018	

Notes
The figures in the above table are indicative only and do not constitute financial advice. They should be reviewed with consideration of the underlying assumptions regarding all key parameters.
No inflation is applied to the programming of the capital cost.

5.4 Funding Options

SFC are in the process of exploring the feasibility of providing funding through direct capital grant. This grant could be of a value up to £5.8m. In the event that the funding is less than £5.8m then SFC would look to reduce the scope of the project.

5.5 Benefits Realisation

The benefits of the ECMs will be realised once the installation phase is completed and measured through the measurement and verification (M&V) process.

The minimum guaranteed energy savings, the maximum investment level and the maximum payback period are set out above and form the basis upon which the projects will be tendered.

The appointed Framework Contractor guarantees the savings as set out in the payback calculation from the completion date of the installation of the ECMs. This relies on the maintenance regime outlined by the Framework Contractor in the O&M manuals being followed by your organisation.

Following the installation of the ECMs, the M&V process will commence. M&V is carried out by the Framework Contractor or an independent M&V specialist who reports on the actual energy and carbon savings that are being realised which is detailed in the Framework Contractor's M&V plan, agreed following the IGP. If savings are not being realised then the Framework Contractor will either rectify the under-performing ECMs,

install additional ECMs or be subject to a reduction in payment from SFC. Either way, the energy saving is guaranteed.

5.6 Qualitative and Social Benefits

Improvements in energy efficiency of the buildings will offer energy savings to each of the Colleges. Any savings from energy can provide a saving in revenue budgets to be used to offset other costs. In addition to the commercial benefits there are non-commercial benefits arising from a programme of non-domestic energy efficiency activity. This will include opportunities to combine other maintenance investment such as redecoration, rewiring, replacement of ceiling tiles, for example to enhance the building fabric and improve the quality of learning spaces for students.

Improvements to the air and water environment can be achieved through some of the measures such as boiler replacement and low flush WCs respectively.

If the programme is communicated to staff, students and the community in an appropriate way then there is the further reputational benefit to the Colleges of acting in a socially responsible and energy efficient manner.

SFC will be able to give weight to a broad range of community and sustainability benefits within the criteria that they set for evaluating tenders for this project. Examples of Key Performance Indicators (KPIs) that may be developed and expanded upon in mini competitions by SFC include:

<u>Employment and Training</u>

- Creation/delivery of employment opportunities for young/unemployed/persons from within disadvantaged groups
- Creation/delivery of training/upskilling outcomes

<u>Community and Educational</u>

- Creation/delivery of community outcomes for community organisations in which work is being undertaken
- Creation/delivery of educational initiatives/outcomes with schools
- Creation/delivery of educational outcomes with higher/further education establishments

<u>SMEs / Third Sector / Sheltered Workshops</u>

- Commitments to advertisement of contract opportunities
- Creation/delivery of sub-contract opportunities for SMEs/Third Sector/Sheltered Workshops

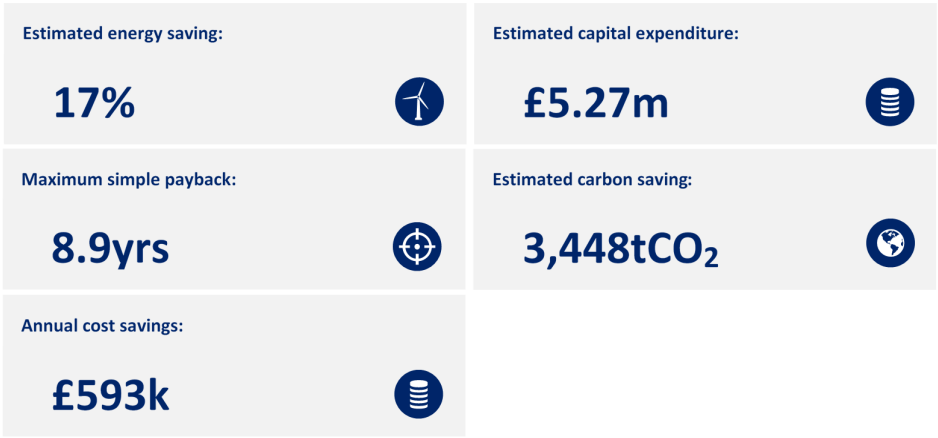
- Creation/delivery of activities aimed at enhancing the ability of SMEs/Third Sector/Sheltered Workshops to form part of supply chains

6 Project Delivery

6.1 Required Works & Services

The output of the desktop energy review has identified the potential available energy savings and the capital value of the project to achieve the estimated energy saving as presented in Figure 3.

Figure 3 - Benchmarking Output – Portfolio Level



It is anticipated that the Framework Contractor will develop a range of ECMs to meet the performance standard detailed above. The wide range of potential ECMs are specified in Table 8.

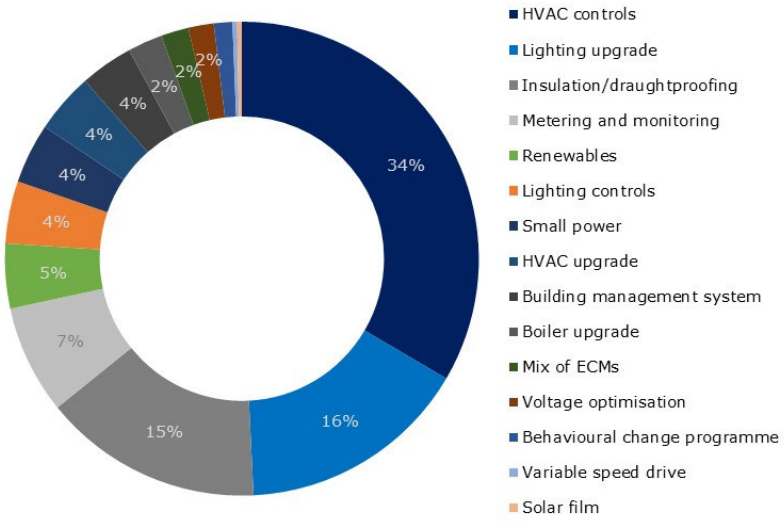
Table 8 - ECM Categories

ECM Cat. Ref.	ECM Cat Name	ECM Category Description
01	Automatic Meter Reading (aMR) systems	Energy consumption measurement, logging, communication & reporting systems.
02	Passive Measures (Passive)	Passive renewable energy technologies and measures, e.g. solar shading
03	Building Fabric (BF)	Building fabric thermal performance improvements, such as loft insulation.
04	Heating, Ventilation & Air Conditioning (HVAC)	Measures to improve energy efficiency of heating and cooling sources, distribution systems, heat emitters etc.
05	HVAC Controls	Building energy management systems and other HVAC controls.
06	Lighting and Lighting Controls (Light & Cntrl)	Artificial lighting systems and their control.
07	Electrical Equipment and Distribution (Electrical)	Efficient motors and other equipment; voltage management etc.
08	Low and Zero Carbon Technologies (LZC)	Biomass, solar thermal, heat pumps, photovoltaics, combined heat and power etc.
09	Specialist Systems (Specialist)	Swimming pools, lifts, catering, fume cupboards, process energy use etc.

10	Water Management (Water)	Management of water using devices, such as taps, WC cisterns, urinals etc.
11	Others (Others)	ECMs that do not fit into the above categories.

Figure 4 depicts the ECMs which are most commonly installed through EnPCs and is the benchmark that has been utilised to derive the financial scope of the project.

Figure 4 - Typical Energy Conservation Measures Implemented in EnPCs



These ECMs are supported, where necessary, by the delivery of particular ECSs and are underpinned by an energy performance guarantee. ECSs may include measurement and verification, bureau service, maintenance of installed assets, lifecycle and behaviour change and are selected based on the specific ECMs determined to be installed along with the Colleges current arrangement in relation to service provision.

6.2 Project Delivery Options

6.2.1 Procurement Options

Based on the above performance standards identified and the outputs of the Project Register a number of options have been considered as to how the Colleges can deliver these energy efficiency measures. These are as follows:

1 College implementation of measures through standard contract

2 College implementation of measures through Energy Performance Contract

3 Energy Performance Contract utilising SG's NDEE Framework

Based on the above, Table 9 details the advantages and disadvantages of each procurement option.

Table 9 – Procurement Options Advantages and Disadvantages

Option	Advantages	Disadvantages
College implementation of measures through standard contract	Smaller projects easier to find funding Project value is undetermined College has self-control of projects and delivery in line with CMP and future investment plans	Lengthy procurement to ensure PQQ process is carried out and correct short list of contractors is achieved. Economies of scale not achieved through separate College delivery. Awaiting College funding would involve delivery of ECMs as and when funding available meaning full benefit of energy saving not realised immediately. Potential energy savings are not guaranteed by the contractor. No specialist technical support through SG and PDU
College implementation of measures through Energy Performance Contract	Smaller projects easier to find funding Project value is undetermined College has self-control of projects and delivery in line with CMP and future investment plans	Lengthy procurement to ensure PQQ process is carried out and correct short list of contractors is achieved. Awaiting college funding would involve delivery of ECMs as and when funding available meaning full benefit of energy saving not realised immediately. Economies of scale not achieved through separate College delivery. No specialist technical support through SG and PDU

Option	Advantages	Disadvantages
Energy Performance Contract utilising SG's NDEE Framework	Quicker procurement as no PQQ process is required. Lower risk to the public or third sector body as a result of the pre-procurement of the Framework Contractors. Guaranteed energy consumption savings. Investment Grade Proposal produced by Framework Contractors prior to award of EnPC. The 12 contractors on the Framework have been selected for their capability and value for money at implementing retrofit NDEE projects in Scotland. The works and services they will carry out must comply with the Energy Performance Contract that Scottish Government has developed especially for this Framework. The contract includes guaranteed energy consumption savings that the successful Framework Contractor must achieve before receiving full payment. Central funding made available to carry out works	Limited to specified Framework Contractors When projects capital values are less than £1m consideration will need to be given to how to streamline the procurement process in order to deliver value for money.

Detailing the advantages and disadvantages of the five procurement options has led to the preferred option being to utilise the Scottish Governments NDEE Framework to deliver the project.

6.2.2 NDEE Contract Options

Under SG's NDEE Framework Contract there are various options as to how the ECMs and ECSs can be provided. The varying options are provided through the means of a Call-Off Contract under the Framework and will be based upon an EnPC with a performance guarantee. Each of the varying options are capable of delivering various levels of service and these are identified as follows:

- Design and build
- Design, build and operate
- Design, build, operate, finance
- Design, build, operate, finance and maintain

The type of contract to be implemented will depend on the type of ECMs identified and the level of services provision currently in place at each of the Colleges.

It is anticipated based on the current services at the six Colleges that the type of contract required will range from Design and Build to Design, Build, Operate, Maintain. Colleges are advised to state in their ITMC documentation any maintenance services that they require and any services that must be excluded, for example because they are already covered by an incumbent service provider. However, the Colleges' service requirement should also be re-assessed following the completion of the IGP by the Framework Contractor.

6.2.3 Procurement Options

Based on the use of SG's NDEE Framework the portfolio can now be reviewed in terms of how it can be delivered. There are two main options to be considered for delivery of the portfolio. The first option, Project 1, would be the delivery of the entire portfolio as one project, totalling an investment of £5.27million. The second option, Project 2, would be to group the projects as follows:

- Project 2a – North East Scotland College (£1.58milliion)
- Project 2b – West College Scotland (£1.61million)
- Project 2c – Borders College, Edinburgh College, Newbattle Abbey College and West Lothian College (£2.08million)

The benefits of Project 1 are that the project could be delivered by a single Framework Contractor and could be managed as a programme of improvements. There may also be reduced procurement costs if one procurement is undertaken, however there is also the risk that any issues that arise at any one college have the potential to delay the

whole procurement. The main benefits of Project 2 are that the groupings are efficient in terms of geography whilst also enabling the indicative capital expenditure threshold for the use of SG's NDEE framework to be met whilst including all the Colleges in the improvements programme.

6.3 Procurement Strategy

Having reviewed the procurement options available the most advantageous approach to delivering the ECMs identified would be through an EnPC. This ensures the required energy reduction is met and guaranteed by the contracting party and therefore ensures the return on investment is guaranteed. This can be achieved through the use of the Scottish Government's NDEE framework.

SG's NDEE framework is available to all public sector organisations in Scotland and streamlines the procurement process for energy services by providing pre-negotiated, EU-regulation-compliant contracts that can be used with a group of pre-qualified Framework Contractors.

The following outlines the advantages of using SG's NDEE Framework over other procurement approaches or frameworks:

- **Time** - Through the NDEE process, it is possible to appoint a Framework Contractor in under six months, thereby shortening the normal procurement period associated with public sector procurements. Part of the NDEE procurement includes the initial assessment and feasibility by which the Framework Contractor will be chosen and committed to guaranteed savings. In comparison, the timeframe for OJEU procurement, via the restricted process, is circa six months.

- **Cost** - SG's NDEE Framework Contractors are competitively tendered and there are no hidden fees or costs arising through SG's NDEE Framework procurement process. In addition, SG is establishing a Programme Delivery Unit (PDU) to support organisations through the tender, installation and measurement and verification elements of energy saving projects. Subject to eligibility criteria and a spending cap, the cost of PDU support to colleges will be covered by the Low Carbon Infrastructure Transition Programme.

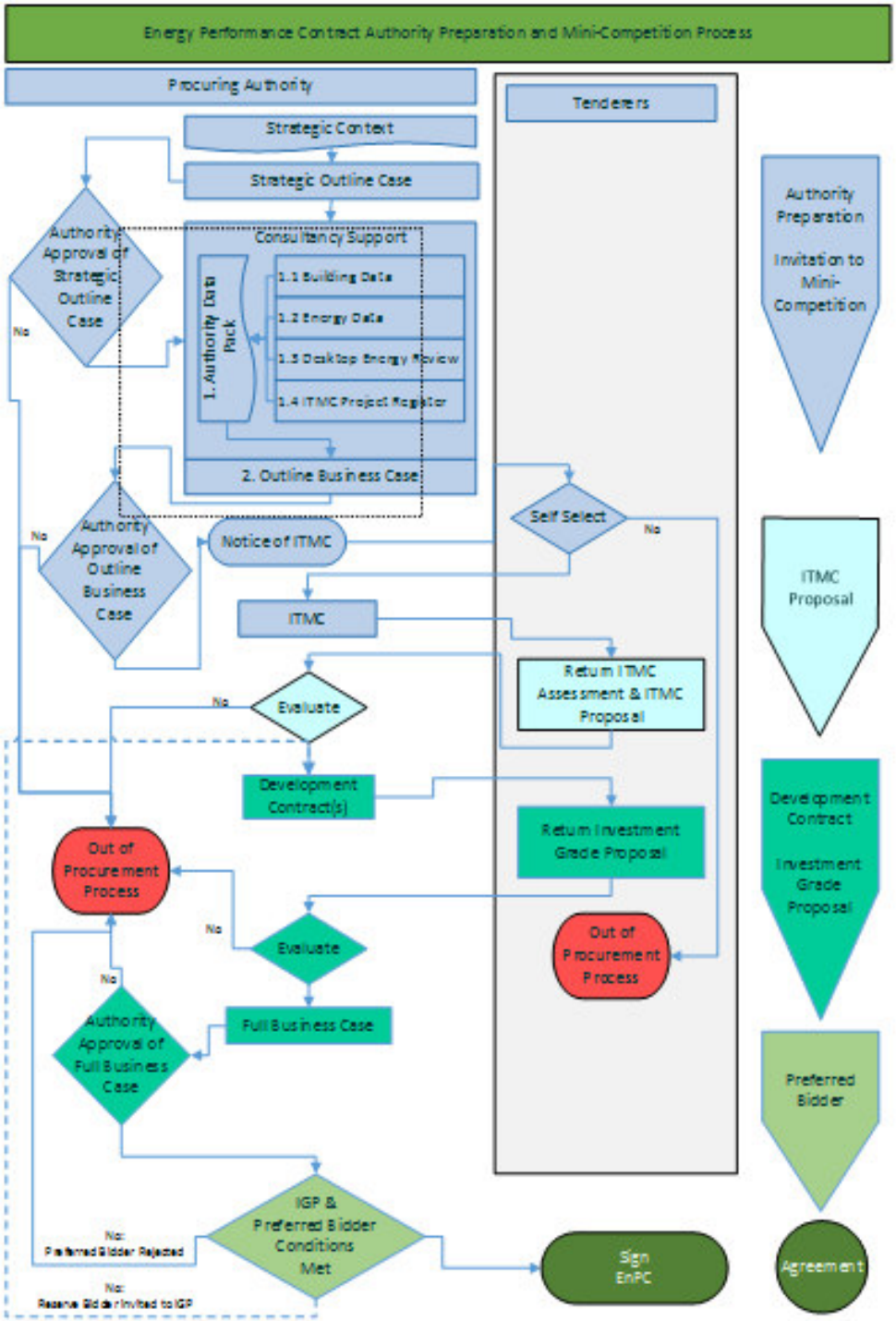
- **Energy Savings Guarantee** - When the project is complete and the ECMs are installed the Colleges will benefit, in full, from all of the energy savings realised. Under SG's NDEE Framework there is no sharing of any of the guaranteed energy savings with the programme or with the Framework Contractors.

- **Framework Contractors** - SG's NDEE Framework comprises 12 suppliers, all of whom are leading specialists in this field within the UK. As such, it is likely that any alternative procurement approach will attract responses from the NDEE Framework suppliers and that they will make up a preferred shortlist through alternative routes.

- **Assessment** - Using SG's NDEE Framework will significantly reduce the standard process to access these suppliers. SG's NDEE Framework also provides the structure, documents and technical specialists to support the Colleges and SFC to carry out the mini competition to select a preferred supplier and then to develop the IGP.

To embark on the procurement process through SG's NDEE Framework, SFC and the Colleges will be required to enter into the Invitation to Mini Competition (ITMC) process with the framework suppliers, the flow diagram in Figure 5 details the NDEE project timeline.

Figure 5 - NDEE Project Timeline



Specifically the next step for the Colleges and SFC is to carry out the ITMC process, this will involve the following:

- A notice of intention to mini competition will be issued to the Framework Contractors to make them aware that a mini competition is likely to be issued for the project.
- Completion of ITMC Documentation utilising the *Guidance Note for Procuring Authorities on Reviewing and Amending ITMC Volume 3, Technical Documentation of Scottish Governments NDEE Framework*. The level of information to be provided by SFC and the Colleges within the ITMC documentation should include, but not be limited to:
    - Names, Locations, Scale & Function of Portfolio
    - Energy & Water Consumption Data
    - Energy & Water Consumption Cost Data
    - Authority Minimum Requirements for Energy Performance Improvement
    - Authority Data Pack
    - Project Brief
    - Authority Specific terms & Conditions
    - M&V Specification
    - Template Development Contract
    - Template EnPC
- Following completion of ITMC documents the tender documentation can be issued to the Framework Contractors for mini competition purposes and to allow the mini competition process to commence.
- Tender responses are received from Framework Contractors who wish to tender for these works and the tender responses are evaluated.
- Following evaluation a Shortlisted Bidder is selected to execute the development contract and produce the IGP.
- Following the development of the IGP a successful Contractor(s) will be selected; the Colleges will enter into EnPCs with them and the ECMs will be implemented.

6.4 Contracting Strategy

As detailed above the selected route to deliver the scope of energy efficiency works is through EnPCs within the SG's NDEE Framework, the key elements of this contract include:

- A Framework Contractor proposes, designs and installs ECMs in a building.
- The Framework Contractor guarantees the level of energy consumption savings that the measures and any associated services will achieve
- The ECMs reduce operating costs
- Upfront investments in ECMs are recovered over time through cost savings
- Shortfall between the agreed level of energy consumption savings and those achieved as determined through an internationally agreed approach to M&V at the end of the Reporting Period is withheld from payment otherwise due to be made to the Framework Contractor

6.5 Resourcing & Governance

6.5.1 Project Resourcing

As part of the ongoing delivery of this project SFC and the Colleges should have an experienced project management resource, either in-house or external, to develop and coordinate the project on behalf of SFC and the Colleges throughout the process similar to any other construction project. The cost of this Client Project Management Team has been included in the capital investment costs identified in Section 5 of this Outline Business Case.

It is expected that the typical activities the project manager would carry out are:

- Engagement with other departments in the organisation such as building stakeholders, procurement, finance, legal, sustainability departments
- Gathering updated building and energy data to be included in any ITMC documentation
- Liaison with the Scottish Government's NDEE PDU
- Management of the preparation of the ITMC documentation
- Management of the evaluation of the supplier responses to the ITMC
- Management of the CDM responsibilities, health & safety and cost management for the project
- Work with the Framework Contractor during the IGP process (coordinating building access and providing information to the Framework Contractor).
- Manage and monitor the Framework Contractors performance during the IGP, installation and M&V stages.

- Point of contact throughout the project.

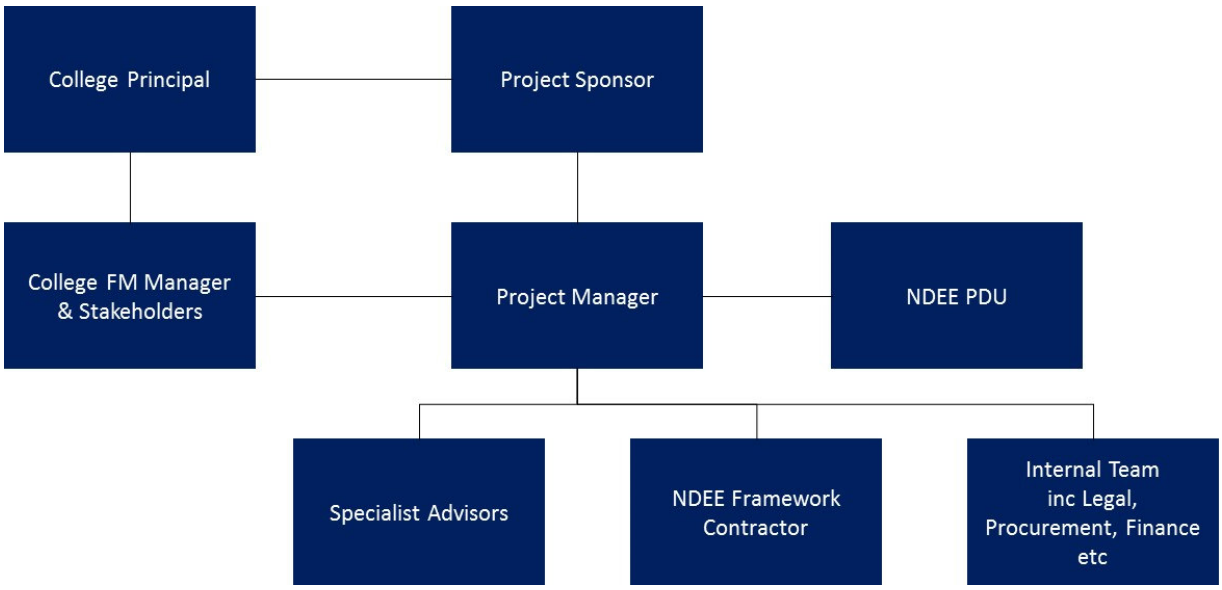
In addition SFC and the Colleges may require external specialist technical, financial and legal adviser support to assist them to develop a Full Business Case for the project, to prepare the project brief and/or to run a mini competition.

Furthermore SFC and the Colleges' project team will be supported by a PDU which SG is setting up to assist authorities through the SG's NDEE Framework process.

6.5.2 Project Governance

As well as adequate resource to ensure efficient delivery of the project, appropriate project governance should be put in place to ensure decision making and escalation issues are dealt with and resolved in a timeous manner. Therefore the diagram in Figure 6 details a proposed governance structure for the project going forward.

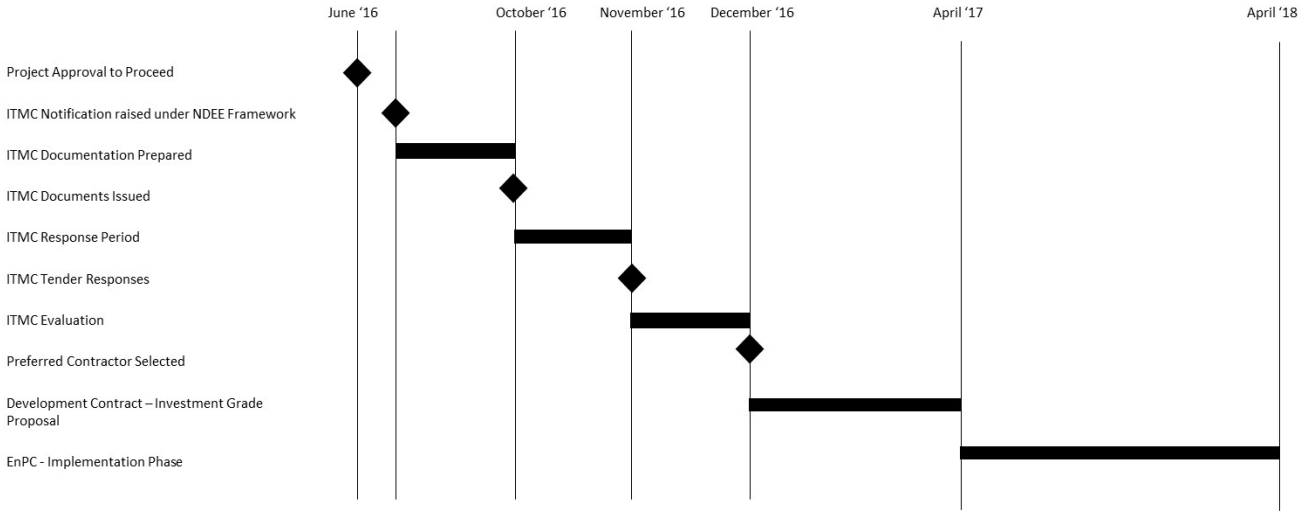
Figure 6 - Proposed Governance Structure for Project Delivery



6.6 Programme

An indicative project programme for an Energy Efficiency Programme of this size being delivered through a Framework of this type has been detailed in Figure 7 to allow an understanding of project timescales.

Figure 7 - Indicative Programme for an Energy Efficiency Programme



It is understood that due to funding availability the implementation of the project is not likely to commence until financial year 2017/2018 hence the programme showing implementation commencing April 2017.

In order to achieve the implementation dates stated the ITMC process and execution of the Development Contract should take place between June 2016 and April 2017.

7 Risk Assessment

7.1 Risk Analysis

Based on the project content, programme and delivery strategy Table 10 highlights the key risks associated with the project.

Table 10 - Outline Risk Register

Ref	Risk	Mitigation
1	Guaranteed savings not met	If the Measurement & Verification process shows there to be a shortfall , the Framework Contractor will not receive full payment until they either rectify the under-performing ECMs or implement further ECMs, at their own cost, to make up the shortfall
2	Framework Contractor performance issues	Progress meetings will be held with the Framework Contractor. Should any issues arise, the PDU will have direct links for escalation within the Framework Contractor's company.
3	No tenders are returned for the ITMC due to the targets being deemed as unachievable	As this is a tried and tested benchmarking process which has been used for over 600 projects, the results are proven to be reliable.
4	Security of funding	Through review and communication of the IGP it will be possible to secure funding at an early stage in the project and ensure that the funding is protected through written agreement between SFC and SG.
5	Presence of asbestos in buildings	Asbestos registers have been included in the authority data packs where they are available digitally. Elsewhere, the asbestos registers are available to view on site and will be utilised to help avoid disturbing ACMs.
6	A College may wish to drop out of the project for various reasons	Through continuous stakeholder management all the Colleges will be kept up to date on the progress of the project and will have the opportunity to raise and discuss any issues or concerns.

7	Procurement route chosen may lead to delays to the programme	By utilising SG's NDEE Framework process the likelihood of a delay is reduced as the PQQ process will not be required and the 12 Framework Contractors have already been established and are in place to respond.
8	College Capital Investment/Maintenance Plans are carried out and have an effect on building energy performance	Baseline information to be updated by project team prior to IGP.

7.2 Risk Management & Mitigation

Risk management should be in line with the SFC internal processes. Any retrofitting project taken forward will be exposed to typical construction risks such as planning, impact on business as usual and health and safety and as such these risks should be assessed on a College by College basis. A stringent risk and opportunity management process will need to be implemented to ensure that appropriate action is taken to mitigate risks and maximise opportunities. Regular progress meetings and stakeholder engagement will be required to ensure that the process is robust.

8 Legal

Section 6 (Project Delivery) provides an overview of possible procurement routes available to deliver this project.

Regardless of whether one or multiple procurements are undertaken and contractors appointed it is likely the contractor(s) would contract separately with each college.

Under the terms of the Framework Agreement, a public sector body wishing to contract for an energy efficiency retrofit project shall do so on the basis of an appropriate form of EnPC. The framework's supporting documentation includes a template contract design for Capital Funded (Design & Build) projects and we anticipate that this would be used as the basis for developing project specific contract (s). This EnPC is intended for projects which comprise principally the design and construction/installation of retrofit measures, but without any substantive operational or ongoing maintenance obligations in respect of those measures. The EnPC was specifically developed for projects that will be publicly financed and that payments from the relevant Authority to the Contractor will be made from the Authority's capital budget on a 'design and build' basis, modified as appropriate to the specific circumstances of each project.

Whilst guidance material can be provided highlighting areas that may require project specific amendment, we anticipate that the colleges may require additional legal advice. Consideration should be given to the possibility of procuring one set of legal advisors to advise all the colleges (and SFC where appropriate). It is anticipated that these advisors will need to engage closely with the colleges legal and procurement teams.

9 Conclusions and Next Steps

9.1 Conclusion

This Outline Business Case illustrates that through installing ECMs across the portfolio of Colleges reviewed as part of this project, an estimated energy saving of 17% can be achieved which equates to an estimated saving of 3,448tCO2. This would require a capital investment of £5.27m, with the maximum payback period being 8.9 years, along with an allowance of £550K for project management resource, contingency and on costs. This provides a total project value of £5.8m.

Site surveys were carried out and the findings confirmed that a number of ECMs could be installed at the Colleges, with 390 identified. It should be noted that the list of ECMs identified in the Project Registers are only as a recommendation and in no way exhaustive. A final list of ECMs will need to be developed by the selected Framework Contractor in order to meet the performance standard identified in the desktop energy review.

Following analysis of the various delivery options it is recommended that an EnPC through the Scottish Government's NDEE Framework is utilised to deliver this project.

9.2 Next Steps

The following steps should be taken to progress the project to the Development Stage:

- Gain management 'buy in' and approval of the Outline Business Case
- Secure required funding to progress the Development Stage (to end of Investment Grade Proposal (IGP))
- Establish project team and governance arrangements
- Call Off SG's NDEE Framework
    - Issue notification of intent to mini competition under SG's NDEE Framework
    - Develop SG's NDEE Framework Invitation to Mini Competition (ITMC) Documents
    - Carry out Mini Competition and tender process
    - Framework Contractor selection
    - Implement Development Contract and produce IGPs
- Secure required funding for implementation and delivery of capital works.
- Review of baseline data and desktop energy assessment
- Produce Full Business Case (FBC)
- Appointment of Framework Contractor under EnPC

Appendix 1
Borders College Authority Data Pack

Appendix 2
Edinburgh College Authority Data Pack

Appendix 3
Newbattle Abbey College Authority Data Pack

Appendix 4
North East Scotland College Authority Data Pack

Appendix 5
West College Scotland Authority Data Pack

Appendix 6
West Lothian College Authority Data Pack

Appendix 7
Benchmarking Report

Appendix 8
Economic Analysis

[To be added by SFC/SFT]