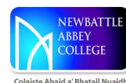


Colleges Energy Efficiency Pathfinder NDEE Project

EACU EWM Event, Edinburgh, May 2019

Andrew Wholley, Mott MacDonald

Austen Bamford, Ameresco



Agenda

1

Introduction to the NDEE
Framework and PSU

2

Background to the CEEP
Project - PSU

3

CEEP project Delivery and
Outcomes - Ameresco

4

Lessons Learned

5

Measurement and Verification

6

Questions

Introduction

Non-Domestic Energy Efficiency Framework

Energy Performance Contracts

Delivery of 'guaranteed saving' Energy Performance Contracts to the Scottish public sector.

Diverse Projects

Range of technologies implemented across diverse estates in Councils, NHS & Higher & Further Education.

12 Framework Contractors

From across the UK with diverse specialisms.

£21m of investment

Overall capital investment in framework projects at Contractor engagement and beyond.

Whole Building Approach

Large scale multi-measure projects.

£2.7 m Savings

Annual savings to date under the framework.

Payment linked to savings

'Guaranteed' savings under projects via detailed Measurement and Verification plans to IPMVP

8,500 tonnes CO₂

Annual savings to date under the framework.

Introduction

Mott MacDonald & the Project Support Unit (PSU)

Low Carbon Advisory Team

Team of energy & low carbon specialists supported by broad range of engineering disciplines and procurement advisors across various sectors

Strategic focus on supporting the transition to low carbon infrastructure & economy

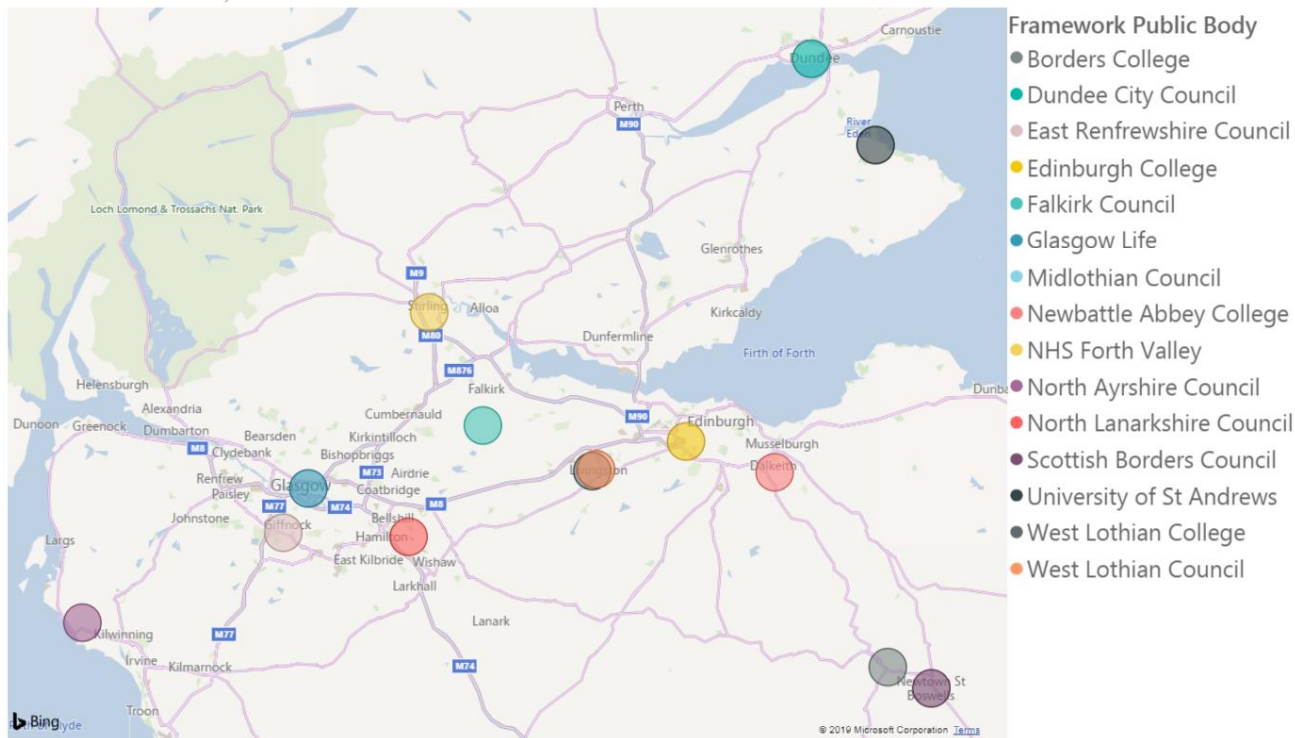
NDEE Framework PSU

- Operating since October 2016
- PM, Technical and Procurement Advisory
- Funded by Scottish Government up to £50,000 per project
- Run by Mott MacDonald and supporting bodies including Carbon Trust
- Live until February 2020



Engaged Framework Public Bodies

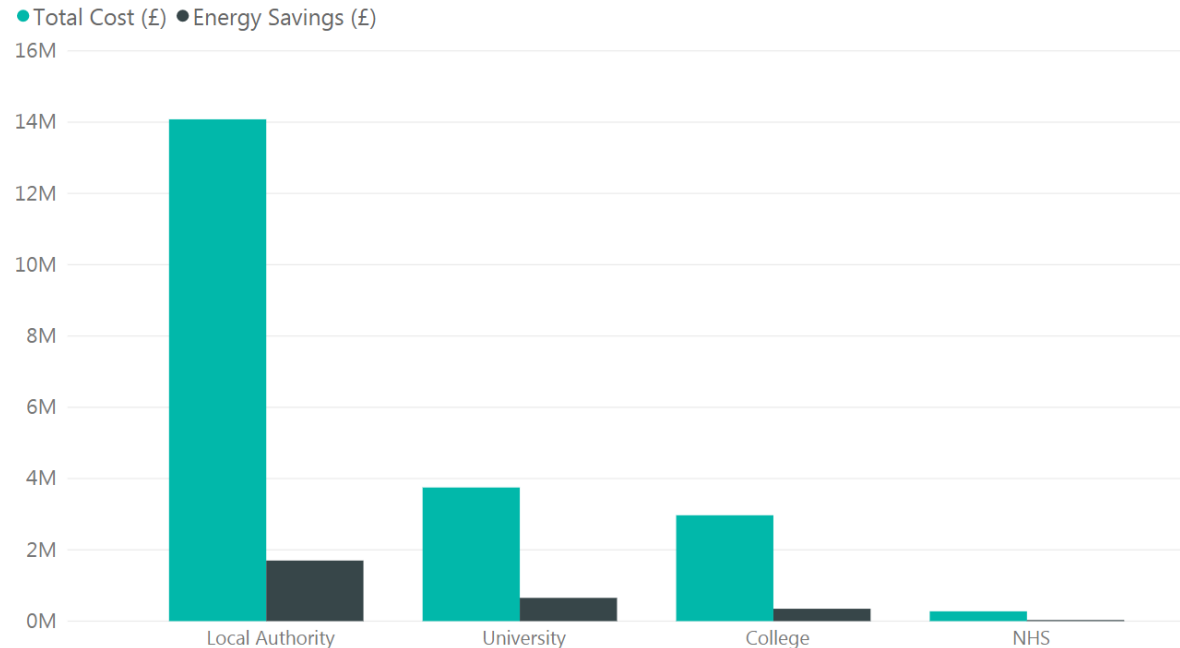
Realised and in implementation



Spend & Save per Framework Public Body

Realised and in implementation

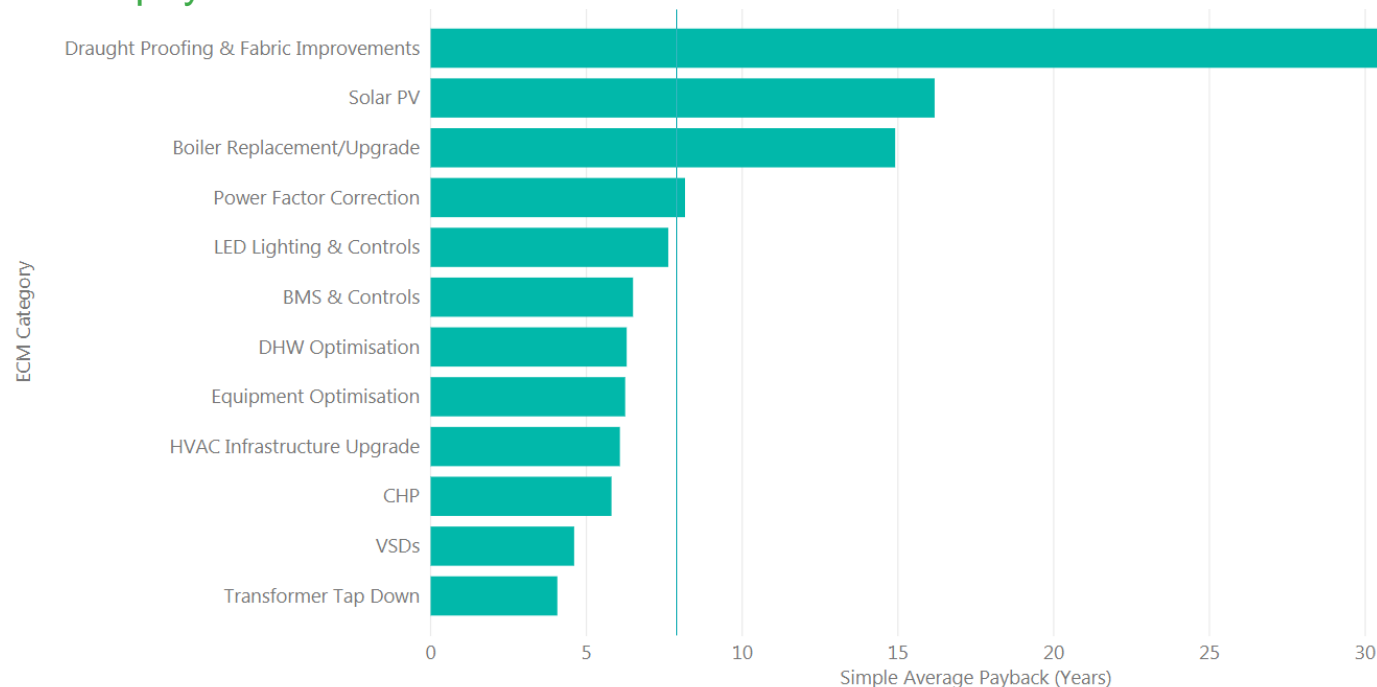
'Spend and Save' by Public Body to date
(exc. VAT)



Project paybacks

Realised and in implementation

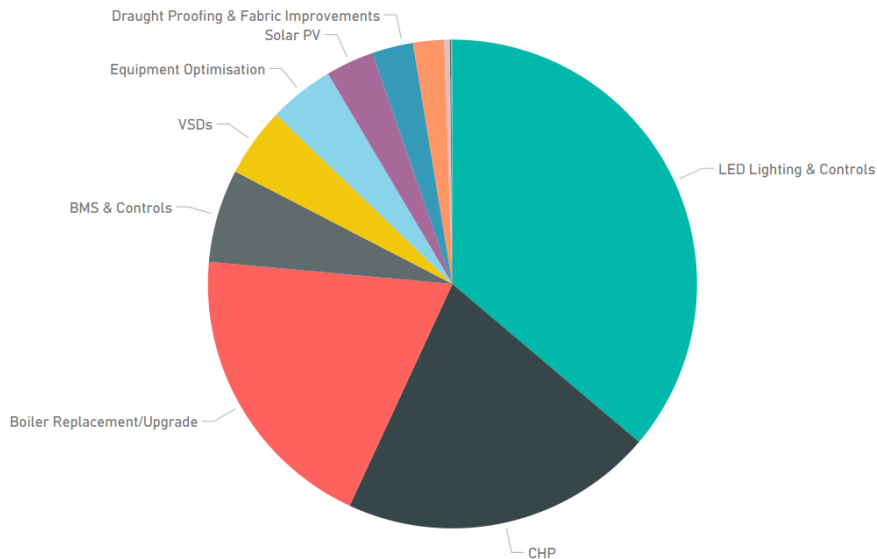
Simple ECM payback



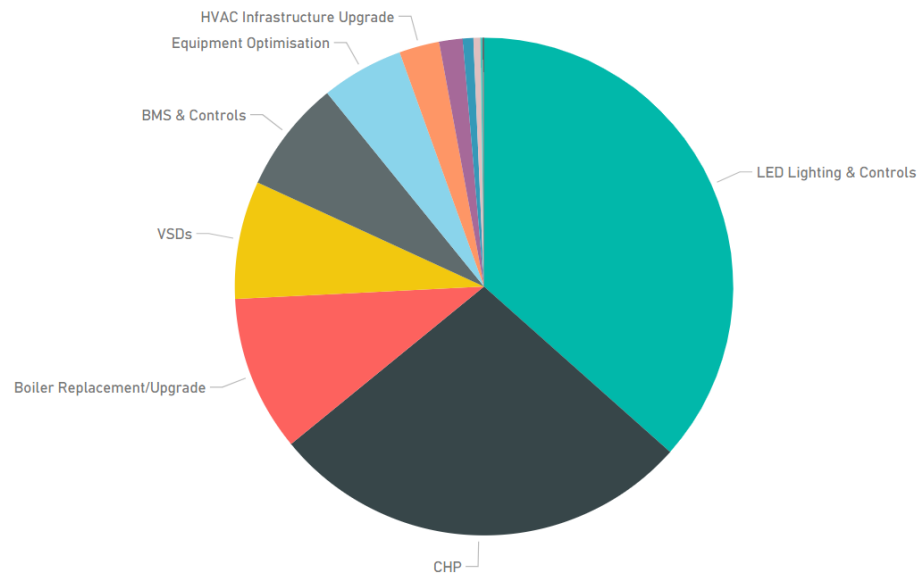
Spend & Save per Energy Conservation Measure

Realised and in implementation

Capex split per ECM



Savings split per ECM



Colleges Energy Efficiency Pathfinder (CEEP)

Capital stimulus funded project for Colleges

Investment at scale.

Four successful colleges in Edinburgh, Newbattle Abbey, Borders and West Lothian.



OBC agreed in 2016 by others

Developed on behalf of Scottish Funding Council – fund managers

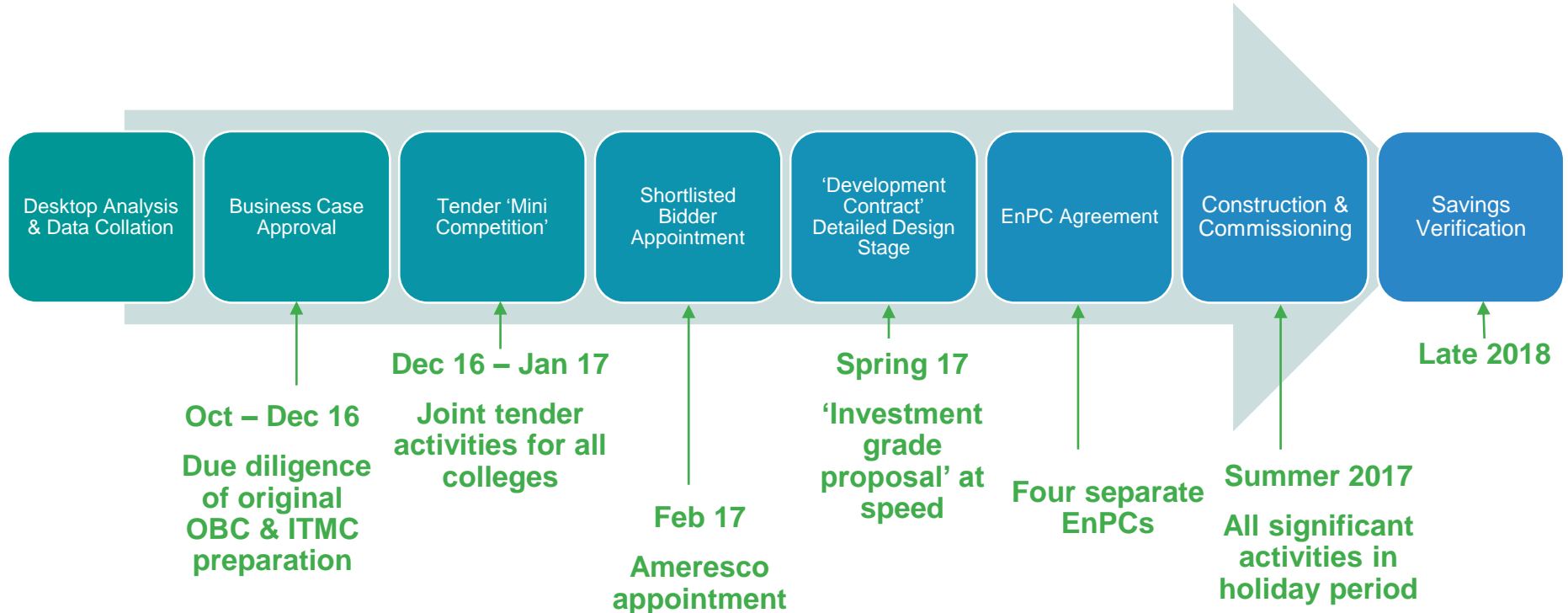


PSU support thereafter

Supporting delivery under standard NDEEF process and utilising standardised agreements.

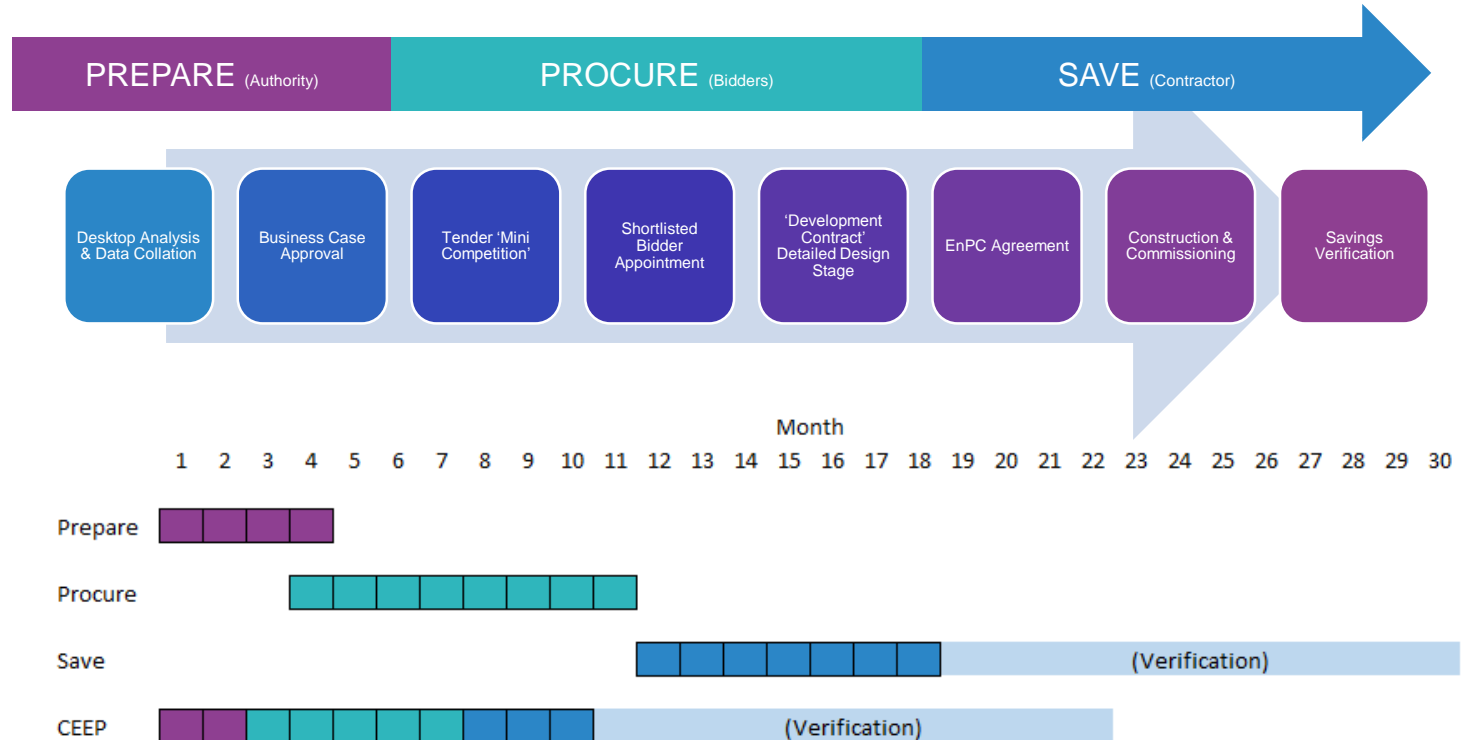


Colleges Energy Efficiency Pathfinder (CEEP)



Colleges Energy Efficiency Pathfinder (CEEP)

Challenging project programme linked to funding constraints





ENERGY PERFORMANCE CONTRACT

NON DOMESTIC ENERGY EFFICIENCY FRAMEWORK

COLLEGES PROJECT



COLLEGES

- Edinburgh College
- Newbattle Abbey College
- West Lothian College
- Borders College

Parallel Construction across all 4 colleges

BUILDING TYPE

- Historic
- Leisure Facilities
- Teaching Space
- Residential Accommodation





ECMS INSTALLED

Lighting and controls

BMS installation and controls optimisation

VSD Installation

Secondary Glazing

CHP Installation

Fuel Conversion

Boiler replacement

Transformer tap-down



Working at speed

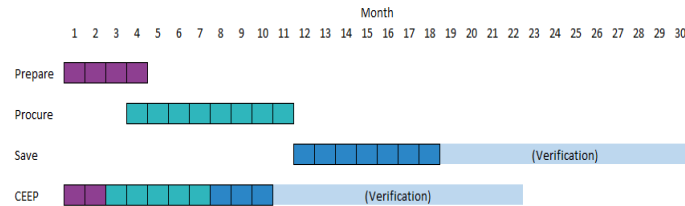
- 4 x IGP's completed in 1 month
- Installation over summer

Working in Live buildings

- High levels of communication

Asbestos

- Change to scope managed through 'change process'



- **Change Process**
 - Sign off process complexity due to funding route
- **Working with the Clerk of Works**
 - Took pressure off in a busy college environment
 - Overseeing works - provided confidence to college clients



- **Guaranteed Savings**
- **Reduced maintenance**
- **Improved Environment**
- **Asset upgrade**

Capital Investment	Guaranteed Avoided Cost	Payback
£ 3,750,000	£ 430,000	8.7 years



Measured Savings

Independent Analysis

Detailed measurement and verification savings reports by independent advisors confirmed achievement of Guaranteed Energy Cost Performance.

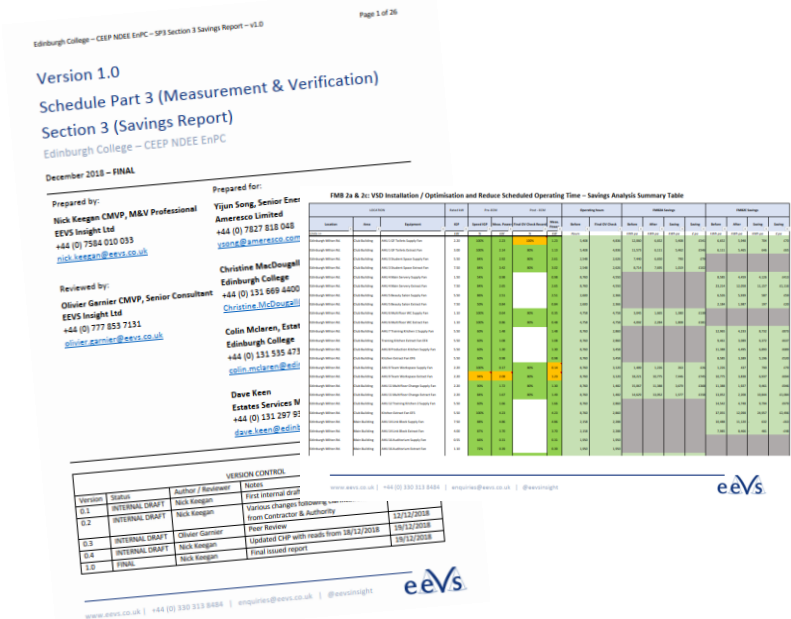
Differing approaches to verification dependent on technology.

Normalisation of performance against baseline as necessary.

Savings realised across the sites

Some discussions/analysis around performance of individual 'Fuel Measurement Boundaries' between M&V Professional, PSU and Contractor.

Ultimately, projects achieved savings targets on aggregate.




Colleges Energy Efficiency Pathfinder (CEEP)

Case Studies Available

M M CARBON TRUST
Non-Domestic Energy Efficiency Framework NDEEF
Borders College
Colleges Energy Efficiency Pathfinder (CEEP) Project

Project
NDEE Framework
Colleges Energy Efficiency Pathfinder (CEEP)
Client
Borders College
Locations
Various, Borders, Scotland
PSU Expertise
Project Management, Technical Advisory & Procurement Advisory



Opportunity
Working with the Scottish Funding Council (SFC), Borders College, alongside Edinburgh College, West Lothian College and Newcastle Abbey College, were successful in attaining Scottish Government 2017 Capital Stimulus Programme funding to support a large-scale Colleges Energy Efficiency Pathfinder (CEEP) project. The aim of the project was to provide significant energy and carbon emissions savings across the suite of Colleges and their campuses, with the challenge of a relatively short project programme.

Solution
To support develop and deliver the CEEP project, SFC and the Colleges identified Scottish Government's Non-Domestic Energy Efficiency Framework (NDEEF) as the ideal procurement route.

Made up of 12 Framework Contractors, the NDEEF is an OJEU compliant framework, which uses Measurement and Assessment documentation and processes to support public and third sector clients procure Energy Performance Contracts (EPCs), being the investment in Energy Conservation Measures (ECMs) to make energy, cost and carbon emissions savings in the built environment. Savings which NDEEF EPCs are underpinned by Measurement and Verification (M&V) principles, providing users with confidence that savings will be realised, or that they will otherwise be compensated by a Contractor. To further support in the management and development of NDEEF EPCs, a Project Support Unit (PSU) has been created by Scottish Government, which is led by Mott MacDonald and provides specialist supporting management and advisory expertise to framework users.

Outcomes
Using the NDEEF, and in collaboration with the PSU, the College was able to:

- Develop project requirements in its appropriate tender documentation;
- Run a non-competition to select a preferred Contractor;
- Review and agree the Contractor's detailed design solutions; and
- Ultimately, implement a range of ECMs throughout their estates within an 11-month period following Business Case approval, at a £300k capital cost.

Taking a 'whole building approach' to energy efficiency, ECNs included combined heat and power (CHP) plant, solar, passive solar, lighting optimisation and transformer 'tap' point. Annual energy cost savings of £426,000 were guaranteed under the contract with anticipated annual carbon savings of -176 tCO₂e.

↓ kWh
↓ CO₂
↓ £
Energy Saving
Reducing Carbon
Improving Asset Value

M M CARBON TRUST
Non-Domestic Energy Efficiency Framework NDEEF
West Lothian College
Colleges Energy Efficiency Pathfinder (CEEP) Project

Project
NDEE Framework
Colleges Energy Efficiency Pathfinder (CEEP)
Client
West Lothian College
Location
Lumphron, Scotland
PSU Expertise
Project Management, Technical Advisory & Procurement Advisory



Opportunity
Working with the Scottish Funding Council (SFC), West Lothian College, alongside Edinburgh College, Borders College and Newcastle Abbey College, were successful in attaining Scottish Government 2017 Capital Stimulus Programme funding to support a large-scale Colleges Energy Efficiency Pathfinder (CEEP) project. The aim of the project was to provide significant energy and carbon emissions savings across the suite of Colleges and their campuses, with the challenge of a relatively short project programme.

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Taking a 'whole building approach' to energy efficiency, ECNs included high efficiency lighting, upgrades, variable speed drive installations, passive optimisation and transformer 'tap' point. Annual energy cost savings of £498,000 were guaranteed under the contract with anticipated annual carbon savings of -171 tCO₂e.

↓ kWh
↓ CO₂
↓ £
Energy Saving
Reducing Carbon
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M M CARBON TRUST
Non-Domestic Energy Efficiency Framework NDEEF
Edinburgh College
Colleges Energy Efficiency Pathfinder (CEEP) Project

Project
NDEE Framework
Colleges Energy Efficiency Pathfinder (CEEP)
Client
Edinburgh College
Locations
Various, City of Edinburgh, Scotland
PSU Expertise
Project Management, Technical Advisory & Procurement Advisory



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Taking a 'whole building approach' to energy efficiency, ECNs included combined heat and power (CHP) plant, solar, passive solar, lighting optimisation and transformer 'tap' point. Annual energy cost savings of £498,000 were guaranteed under the contract with anticipated annual carbon savings of -171 tCO₂e.

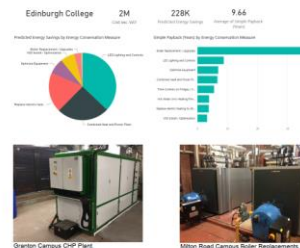
↓ kWh
↓ CO₂
↓ £
Energy Saving
Reducing Carbon
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ECNs were commissioned by the successful Contractor, Awareness, on programme in the autumn of 2017.

Initial M&V activities undertaken in late 2018 analysing ECM performance show very encouraging savings validation, with final CHP plant performance and overall savings analysis due in Spring 2019.

Other project benefits have also been realised including significantly improved heating and working environments, as well as learning opportunities for students around energy efficiency technologies and general construction related activities.

"These projects are helping us reduce our carbon emissions and meet our duties as outlined in the Climate Change (Scotland) Act 2009. In addition, significant financial savings are being realised, which will help us meet future projects." - Annette Burton, Principal, Edinburgh College





Questions?





Thank you

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