A&DS SCOTTISH FUTURES TRUST

Shared Learning Event

Energy Targets & Energy Efficiency

Summary of Workshop 03

25th August 2021

LEARNING ESTATE INVESTMENT PROGRAMME
Connecting People, Places & Learning

Attendees

Aberdeenshire Council
Aberdeen City Council
Angus Council
Architecture & Design Scotland
Argyll and Bute Council
Clackmannanshire Council
Dumfries and Galloway Council
Dundee City Council
East Ayrshire Council
East Dunbartonshire Council
East Lothian Council
Fife Council
Glasgow City Council
The Highland Council
Midlothian Council
Moray Council
North Ayrshire Council
North Lanarkshire Council
Orkney Islands Council
Perth & Kinross Council
Renfrewshire Council
Scottish Borders Council
Scottish Futures Trust
Scottish Government Learning Directorate
Shetland Islands Council
South Ayrshire Council
South Lanarkshire Council
Stirling Council
West Dunbartonshire Council
West Lothian Council

Presenters

Samantha Williams	East Lothian Council
John Fyfe	Perth and Kinross Council
Sarah Webb	Perth and Kinross Council
Ross Ramsay	Scottish Futures Trust
Karen Ridgewll	Architecture and Design Scotland

Introduction

Context

This Shared Learning Event was the fourth in an agreed series of events designed to promote discussion and sharing of best practice. In this event the focus was on Energy and Internal Environmental Quality, with the intention to discuss different approaches to achieving the energy target for LEIP and the requirement to meet BB101:2018, as well as a look ahead to what could be next for Net Zero.

This event followed on from the May 2021 event which included presentations from SFT's Construction Industry and Delivery Team, who gave an overview of initiatives that are set out in the terms, conditions and outcomes of the Learning Estate Investment Programme (LEIP).

As with previous events, it was hosted and facilitated by Scottish Futures Trust's (SFT) Learning Estate Infrastructure Team, alongside Architecture & Design Scotland (A&DS). The event was open to all Local Authorities across Scotland to provide an open forum to discuss initiatives and share ideas, best practice and challenges.

As well as a forum for Local Authorities to join together, the Shared Learning Events are designed to compliment support that is available on any aspect of the LEIP, from SFT's Learning Estate Infrastructure Team and wider stakeholders as appropriate.

Workshop

The workshop was held online on Wednesday 25th August 2021. It brought together 90 delegates from Local Authorities across Scotland, including representatives from SG Learning Directorate.

The event included presentations from:

- East Lothian Council
- Perth and Kinross Council
- SFT's Net Zero Team
- Architecture & Design Scotland.

Following each presentation there was a discussion session in which delegates were invited to bring forward any comments or questions they had.

Case Study 01
Wallyford High School
Q&A

Samantha Williams
East Lothian Council

Background

Q1: When the Wallyford HS project started, what was the background in terms of ELC environmental policy, climate emergency target/plan?

A1: Pre climate emergency, Technical standards compliant

Q2: Wallyford HS came into the LEIP Phase 1 in Sept 2019. Energy target was in development with input from across local authorities.
What were the issues incorporating the LEIP targets (BB101:2018 and energy target 67 kwh/m2/annum)?

A2: Assessment/modelling process, upgrade options, costs etc.

Q3: There was an option to meet the energy target by switching to heat pumps. LEIP clarification of role of heat pumps – should be measured on output side not input. How did the council react to this approach?

A3: ELC realised that this was difficult but understood that that was the right approach in light of responsibility to creating a lower carbon future.

Q4: With the heat pump option clarified, what measures were required to meet the energy target?

A5: The form of building fixed. Increased airtightness, triple glazing. These had an impact on costs which came around the same time as identifying a need to grout additional mine workings. Worked with team to identify savings but without compromising on external areas which often suffer. Having a clear educational and community purpose helped protect these outdoor areas from being targeted.

Current

Q6: What stage is the project at now?

A6: Contract signed and about to start on site.

Q7: The construction market is experiencing a wide range of disruptive influences at the moment, did this impact on the cost or programme for the project?

A7: The project costs are within the original budget which is within the LEIP programme metric. The programme hasn't been impacted.

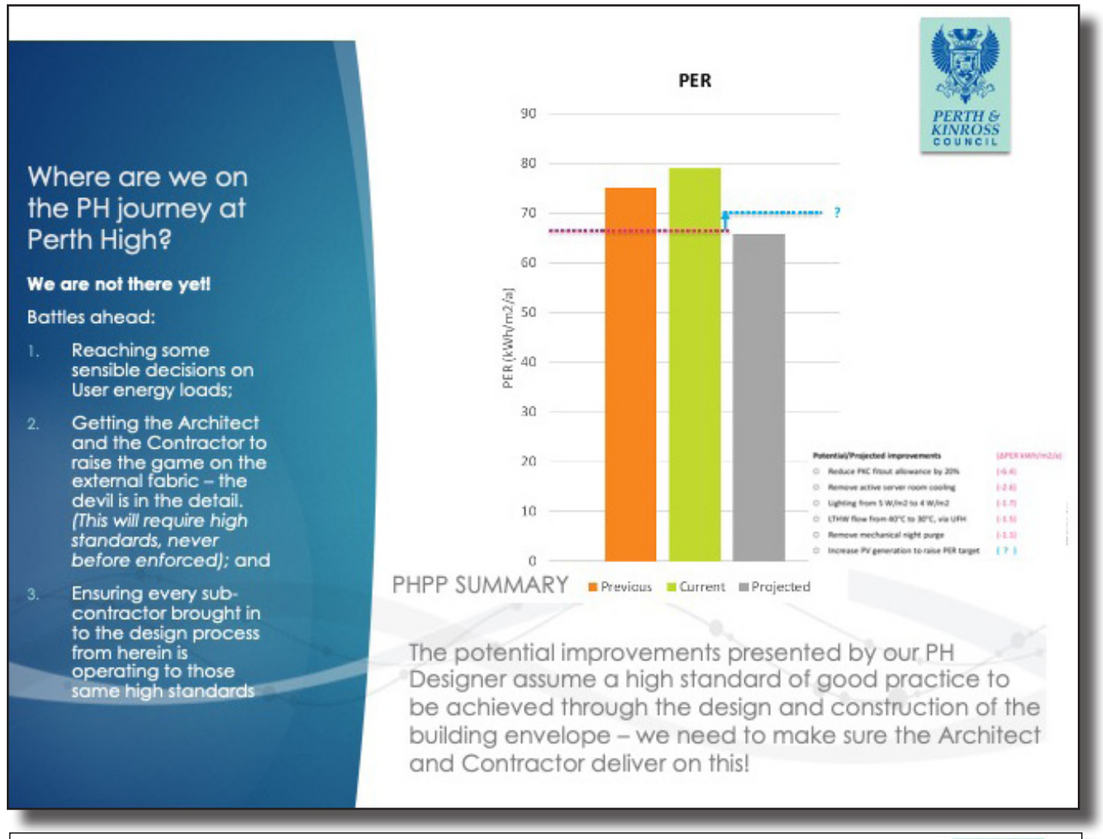
Look ahead

Q8: The design consultants and contractor are an integral part of meeting targets. Have you any observations about skills, attitude etc to meeting new challenges?

A8: For future projects we would ensure that the team have the appropriate skills at the selection stage.

Q9: Any consideration of utilising Passivhaus or other systematic approach for future projects?

A9: Currently looking at 2 new primary schools due to housing growth. ELC adopting LEIP energy target as good practice. Need to ensure that project budgets are aligned with requirements from the outset.



Case Study 02
Perth & Kinross Council
What has been learned to date?

John Fyfe & Sarah Webb
Perth and Kinross Council

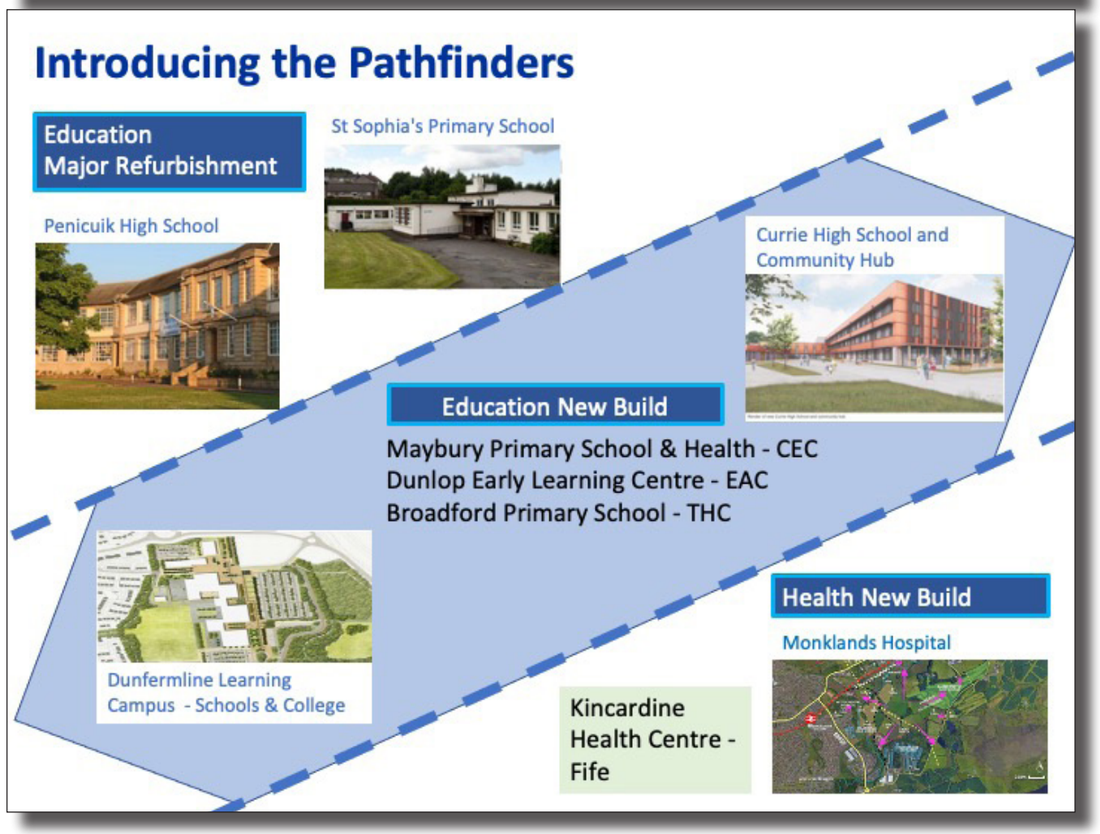
The proposals for the new Perth High School were already at RIBA Stage 2 (Concept Design) when PKC received LEIP funding for the project and two other education buildings.

Having sanctioned a change to Passivhaus certification for Perth High some months before, PKC were already underway with reviewing the base design to ensure we could meet the ambitious energy targets set by Passivhaus and then LEIP. The review process involved independent analysis by a Passivhaus Designer and our M+E Engineer consultants to ensure firstly that the basic form and orientation of the building was optimised. The conclusion was that the base design for Perth High was in a good place to achieve Passivhaus, therefore PKC are now moving forward with our appointed Passivhaus Designer and Design Team to develop and interrogate the 4 variables of M+E design, fabric, facade and unregulated user loads.

Interestingly we have learned that the bigger the building, the more that the M+E design impacts the energy use outcomes. At the time of writing the heating demand of the building design is 13.6kWh/m2/a – we are required to get below 13kWh/m2/a at design stage to achieve Passivhaus and the LEIP target. The Design Team have reached close to the heat demand target by reducing ventilation rates (but ensuring ventilation rates can be increased during a pandemic event), improving the efficiency of the air handling, heat recovery units and reducing the level of mechanical night time purge required. This is a difficult tight-rope to walk as we also have to ensure the risk of overheating is limited to less than 10% of the building if Passivhaus Certification is to be achieved. There is confidence within the team that with some adjustments to the heating design the target of 13kWh/m2/a will be met.

Despite all the efficiencies described above, the Perth High proposals are not yet meeting the Primary Energy Renewable (PER) Demand target of 67kWh/m2/a – we are still some way off at 78.9kWh/m2/a PER. This is due largely to the significant load demand and heat burden created by the unregulated Client loads ie. every device, each piece equipment / fitting which uses energy and emits heat in the building. Currently these unregulated loads account for close to half of the PER demand for Perth High. This emphasises that the onus on meeting ambitious energy use targets is not simply upon the design of the building but the way in which it is used.

PKC are looking at ways to reduce our user energy consumption by 20%, without compromising teachers' ability to deliver the curriculum now and in the future. If we fulfil this objective, PKC can move forward to the detail design stage knowing that a PER of 67kWh/m2/a can be achieved.



What's next for Net Zero? Reflections on the Net Zero pathfinders

Ross Ramsay
Scottish Futures Trust

The Net Zero Public Sector Buildings (NZPSB) Standard ("the Standard") is a new voluntary standard which has been developed by Scottish Government (through Scottish Futures Trust (SFT) and Zero Waste Scotland (ZWS) to support the Public Sector in setting ambitious targets to achieve net zero outcomes for new buildings and major refurbishments.
The Standard supports a challenging, credible path to net zero carbon materials and energy supplies for all non-domestic buildings. By 2045, projects that adopt the Standard will achieve zero embodied carbon during construction and subsequently the whole life of projects, including operational energy.

The Standard's Objectives are framed around three key themes:

- Place - making sure that we have the right buildings, in the right locations, delivered in the right way
- Carbon - making ambitious reductions in carbon emissions in all parts of a building's lifecycle
- Environment – achieving excellence in building internal environments and maximising the wider environmental benefits of each project

The Standard and the public sector buildings it helps create will form an important part of Scotland's net zero strategy, but more than this, they allow the public sector to take a leading role, positively influencing the wider construction sector.

The aim of the Pathfinder projects was to consider the performance of 10 public sector construction projects at stages 0 – 4 of the Royal Institute of British Architects (RIBA) Plan of Work against the Objectives of the Standard. The projects are listed as follows:

- Penicuik High School
- Broadford Primary School
- Currie High School
- Monkland's University Hospital
- Dunfermline Learning Campus (DLC) College
- DLC Schools
- Maybury School and Health Centre
- St. Sophia's Primary School
- Dunlop Early Learning Campus
- Kincardine Health Centre

The Pathfinder process, as well as helping each project understand its own challenges and opportunities in relation to net zero, has been used to refine and enhance the suite of documentation for those applying the Standard. However, as a collection of projects they also provide an excellent introduction for those considering the Standard.

All of the Pathfinder projects considered the Standard at different project stages, with each having specific opportunities and challenges in terms of its application. The Pathfinder process was conceived as an exploration of what it would take to apply the Standard and it was not a requirement that participants should go on to fully implement the requirements. Each was a snapshot of a project at a particular stage. Nonetheless, a number of those who took part were so convinced of the benefits of the Standard approach that they have opted to implement some or all elements going forward.

In summary the Pathfinder projects have provided a valuable set of test cases for the application of the Standard. These have been used to fine tune the requirements of the Standard but each provides an interesting perspective and useful insight into the application of the Standard.

Architecture & Design Scotland

Carbon Conscious Places
Support for the Learning Estate

Tackling the climate emergency is central to Scotland's Learning Estate Strategy. The current Learning Estate Investment Programme (LEIP) aims to deliver digitally enabled, low-carbon (new and refurbished) schools and campuses that are inclusive and welcoming places which meet the needs of the whole community.

Carbon Conscious Places offers early-stage place planning support to challenge both the direct and indirect emissions of a school estate. It offers an opportunity to discuss, identify and articulate how LEIP projects, through place planning, can prevent the climate crisis from getting worse and how they could be adapted to the impacts of climate change.

How can we help?

We know that there are many challenges for those who plan, design, and deliver our places, which include:

- Tackling the climate emergency
- Achieving Net Zero emissions
- Addressing inequalities in health and wellbeing
- Supporting inclusive economic stability

We are offering a new service to early-stage projects that could benefit from support to collaboratively identify and articulate outcomes that contribute to the achievement of the Climate Change (Scotland) Acts emission reduction targets.

Our Designing for a **Changing Climate: Carbon Conscious Principles** will be used to frame discussions to identify Inclusive Net Zero Economy Outcomes that supplement existing technical and environmental objectives that will inform a project brief and evaluation framework.

What can we offer?

- Carbon Conscious Principles local authority workshop to identify outcomes for a project evaluation framework
- Carbon Conscious placemaking support and design advice
- Service outputs that summarise support outcomes

Please contact us for more information or to express an interest in this new support service: karen.ridgewell@ads.org.uk

Designing for a changing climate
Carbon Conscious Places

Karen Ridgewell
Architecture & Design Scotland

Carbon Conscious Places was conceived in 2019 when Architecture & Design Scotland were asked by the Energy and Climate Change Directorate of the Scottish Government to undertake an exploration into the abilities of the planning system, at a local level, to act on the climate and biodiversity crisis.

Between 2019 & 2020 A&DS worked with 4 local authorities to focus on how the embracement of the Place Principle, and a focus on people centred design can contribute to the net-zero targets of the Climate Change (Scotland) Act. Through discussions about how we can rebalance how we move, how we support city and town centres and become more self-sufficient locally, we identified how their projects, which were operating at different scales, were working to reduce carbon emissions and adapt to the impacts of climate change.

The Carbon Conscious Places Report is not designed to be read as a manual. It does not suggest a fixed set of solutions for how to alter places because every place across Scotland is unique. Instead, it offers examples, principles and illustrations to help guide and inspire people to support a whole place approach.

Since the completion of the pilot, A&DS have been looking at the planning system across national, regional, and local levels, at their inter relationship and at the wider policy and guidance landscape to support Local Authorities, Major Players, and communities to further respond and act on the climate emergency and to look beyond the achievement of net-zero carbon from an energy in use perspective.

Most recently we've been using the Carbon Conscious Principles to frame support for partnership working in Skye and Raasay, commit to the flagship actions of Climate Ready Clyde, to establish a network of Climate Actions Towns and develop the assessment criteria for the next round of Rural Tourism Infrastructure Fund.

Carbon Conscious Places for Learning Estate Investment Programme (LEIP) projects, builds on our support and learning to date and is proposing early-stage support within the framework created by the Net Zero Public Sector Building Standard (NZPSBS) the LEIP Energy Standards and the Just Transition. It offers an opportunity to discuss, identify and articulate how LEIP projects, through place planning, can prevent the climate crisis from getting worse, how a design approach can embrace climate change adaptation and to balance location, building and service needs.

8 Principles of a Carbon Conscious Place:

1. A Place Led Approach
2. A Place of Small Distances
3. A Network of Small Distance Places
4. A Place Designed for and with Local People
5. A Place that Reuses Repurposes and Considers Whole Life Cost
6. A Place with Whole and Circular Systems
7. A Place the Supports Sharing
8. A Place Designed in Time

Further Support & Next Steps

SFT Net Zero Team Contacts

The Net Zero Team at SFT deliver and manage net zero infrastructure and finance programmes that support Scottish Government's National Infrastructure Mission to drive inclusive economic growth and build resilient places

For any enquiries relating to the work of the Net Zero Team, please contact the relevant team member as listed below;

Ross Ramsay
Associate Director - Net Zero
Ross.Ramsay@scottishfuturestrust.org.uk

Jamie Goth
Associate Director - Net Zero
Jamie.Goth@scottishfuturestrust.org.uk

Carbon Conscious Places Support for the Learning Estate

For more information or to an express an interest in Architecture & Design Scotland's new support service please contact;

Karen Ridgewell
Karen.Ridgewell@ads.org.uk

Useful Resources

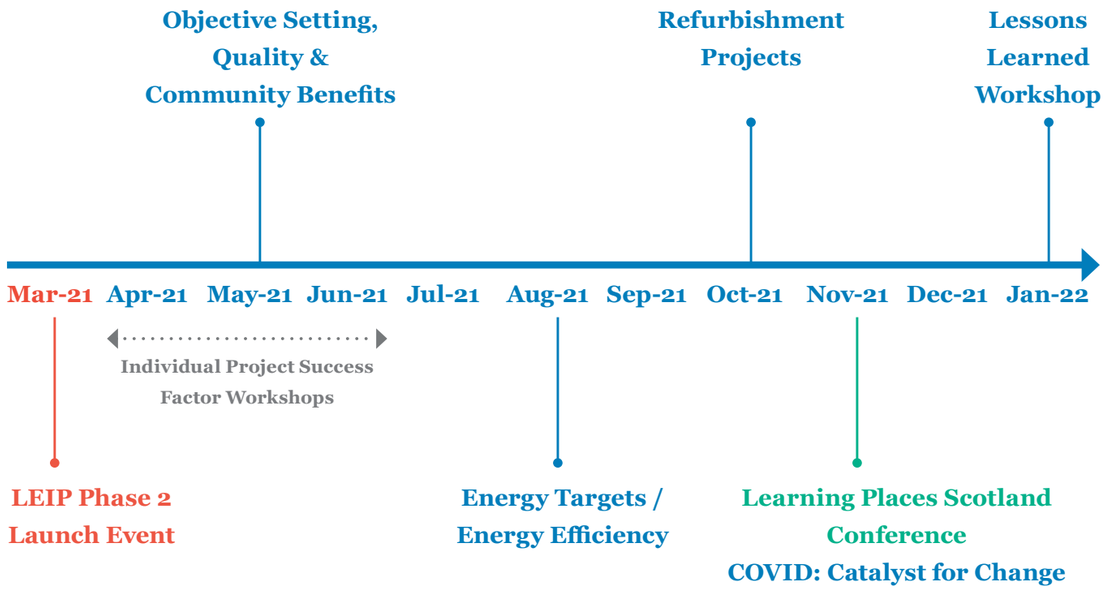
Please click on the below for relevant links;

Net Zero Public Sector Building Standard

Designing for a Changing Climate: Carbon Conscious Places

Indicative timeline for future Shared Learning Events

The indicative timeline highlights topics that we intend to cover in future LEIP Shared Learning Events. If you have any suggestions for themes to be included in future events or would like to contribute insights or thoughts at these events then please contact SFT or A&DS at the contact details below.



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