

SCOTTISH FUTURES TRUST

Net Zero Public Sector Buildings Standards

All-Energy / Dcarbonise 2022

11th May 2022

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Scottish Futures Trust





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FUTURES
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Net Zero Public Sector Buildings Standard



The Scottish Government's Voluntary Standard

Developed collaboratively by Scottish Government and:

- Scottish Futures Trust
- Zero Waste Scotland
- Health Facilities Scotland
- Construction and public sector in Scotland



How should the public sector respond to the challenge of net zero?

Scotland



UK



International



The Standard: what part of the problem will it address?

A voluntary Standard for ambitious public bodies

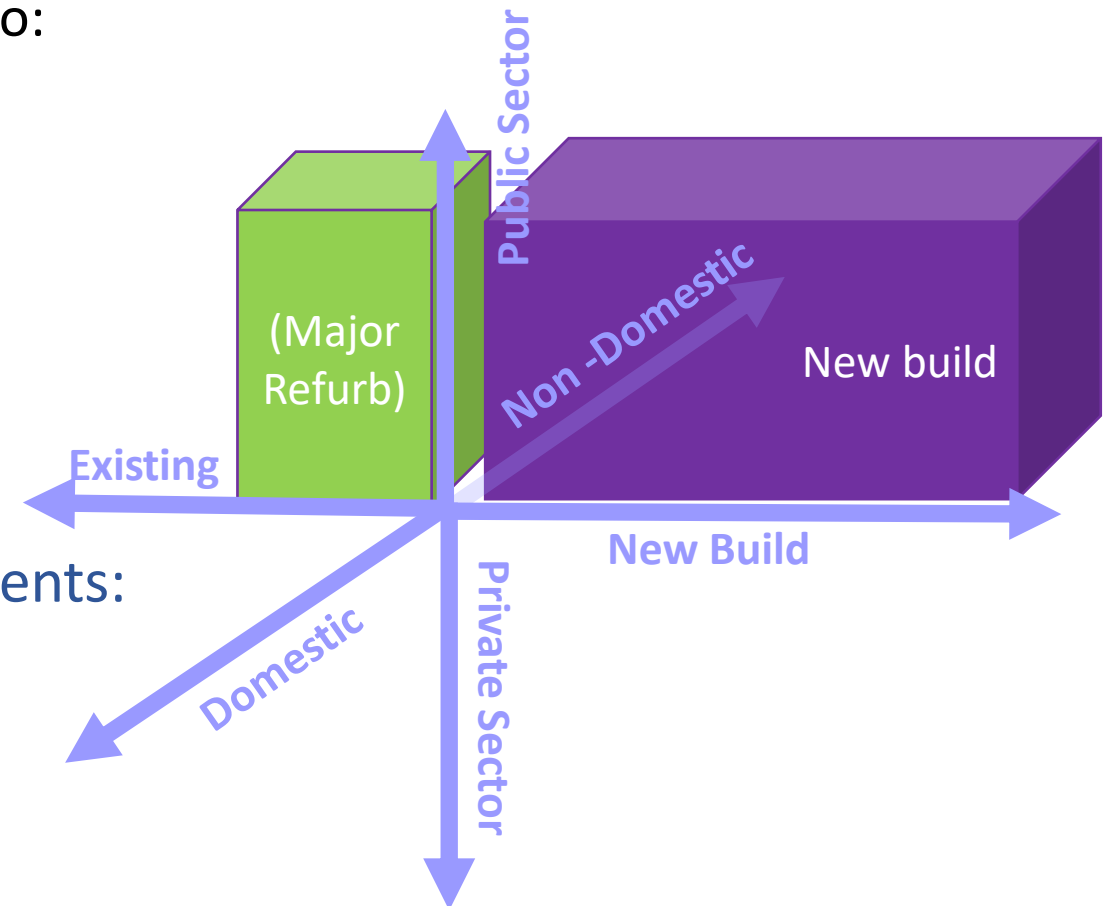
Applies the Scottish Government's Net Zero Policy to:

→ Construction Projects:

- Newbuild
- Major Refurbishment

→ Shaped by National & Local NZ commitments:

- Local Authority Areas
- Sectors
- Organisational Policies



The Standard: Benefits

What will it do differently?

- Set Net Zero Targets
- Verify them **in use**



Benefits

- Navigate energy & emissions regs
- Meet **legally binding** net zero targets
- Better air quality: indoor and out

How will it do it?

- Apply national & local targets to projects
- Prioritise reuse over new build
- Carbon performance targets as core project objectives
- Energy modelling to check design will meet targets
- Verify in use → remediate under-performance

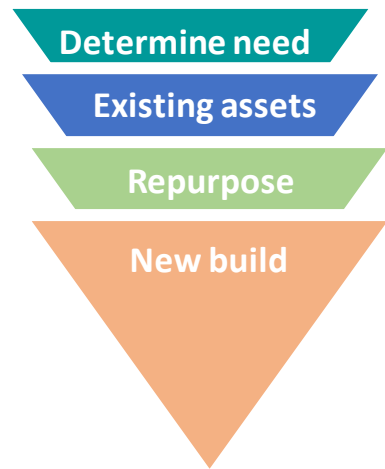


Objective 1: Place

Place	Inclusive NZ economy outcomes
Carbon	Construction embodied Operational energy Other whole life
Environment	Indoor environment Environmental aspects

Right building
Right place
Right outcomes

Infrastructure Investment Plan



Carbon Objectives 2 & 3

Place

Carbon

Environment

OB.2 Construction Embodied Carbon

- Target:**
600 kgCO₂e/m²
Cradle to practical completion:
- minimising materials demand
 - specifying low embodied carbon materials
 - minimising materials transport & construction energy demand
 - avoiding use of fossil fuels for transport & site use

OB.3 Operational Energy

Building Category

Hospital - Acute and Community
Further and Higher Education Laboratory
Police Station
Prison
Wet Leisure Centre*
Residential Care Home
Wholtime Fire Station
Further/Higher Education Mixed Use Campus
Health and Social Care Centre
Dry Leisure Centre
Nursery
Court
Office
Further/Higher Education Residencies
Further/Higher Education Teaching
Library
Community Centre
Secondary School
Primary School

100 kWh/m²/annum



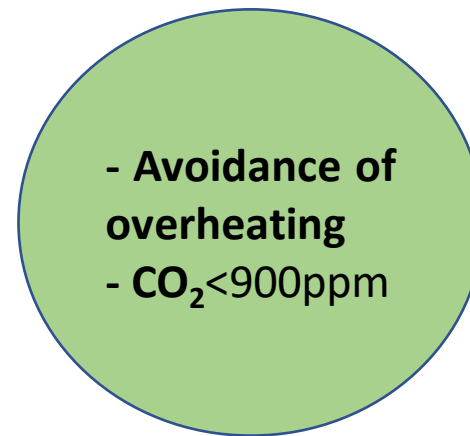
Objectives 5 and 6: Indoor and Outdoor Environment

Place	Inclusive NZ economy outcomes
Carbon	<p>Construction embodied</p> <p>Operational energy</p> <p>Other whole life</p>
Environment	<p>Indoor environment</p> <p>Environmental aspects</p>

Key indoor environmental quality parameters affecting comfort, health, wellbeing and productivity/cognitive performance of building occupants

Indoor Environmental Quality comprises:

- 1 Thermal Comfort
- 2 Indoor Air Quality
- 3 Natural light
- 4 Acoustics
- 5 Water Hygiene



- Adjusting exemplary targets for project-specific conditions
- Indoor environmental parameter measurement and reporting
- Aligning with other Standards, e.g. BREEAM, WELL
- Independent checks and verification

External environment and other aspects



Verification and Certification

Stage of the Standard	Objective	Third Party Verification Required
1. Application	Objective 1 Place All others: commitment to targets	OB.1 Response
2. Concept Design	Participant-led checks	
3. Detailed Design	OB.2 Construction Embodied Carbon OB.3 Operational Energy OB.4 Other Whole Life Carbon	Evidence the design will meet the targets must be Verified by a 3 rd Party Verifier for: OB.2 & 4: Lifecycle Assessment OB.3: Operational Energy <ul style="list-style-type: none"> - Energy options report; - Measurement & Verif. Plan - Dynamic Simulation Model Outputs
4. Delivery	Participant-led checks	
5. Verify Performance	Participant-Led Verification, enhanced by 3 rd Party Verification where performance is below threshold	
6. Continuous Improvement		
Reporting	Certification	
A report is submitted at each Stage, compiling outcomes of Verifications & Participant checks	Each Report & associated evidence must be lodged with the Scottish Government and, if all Requirements are met at Verify Performance Stage, the Project will be Certified as meeting the Standard	

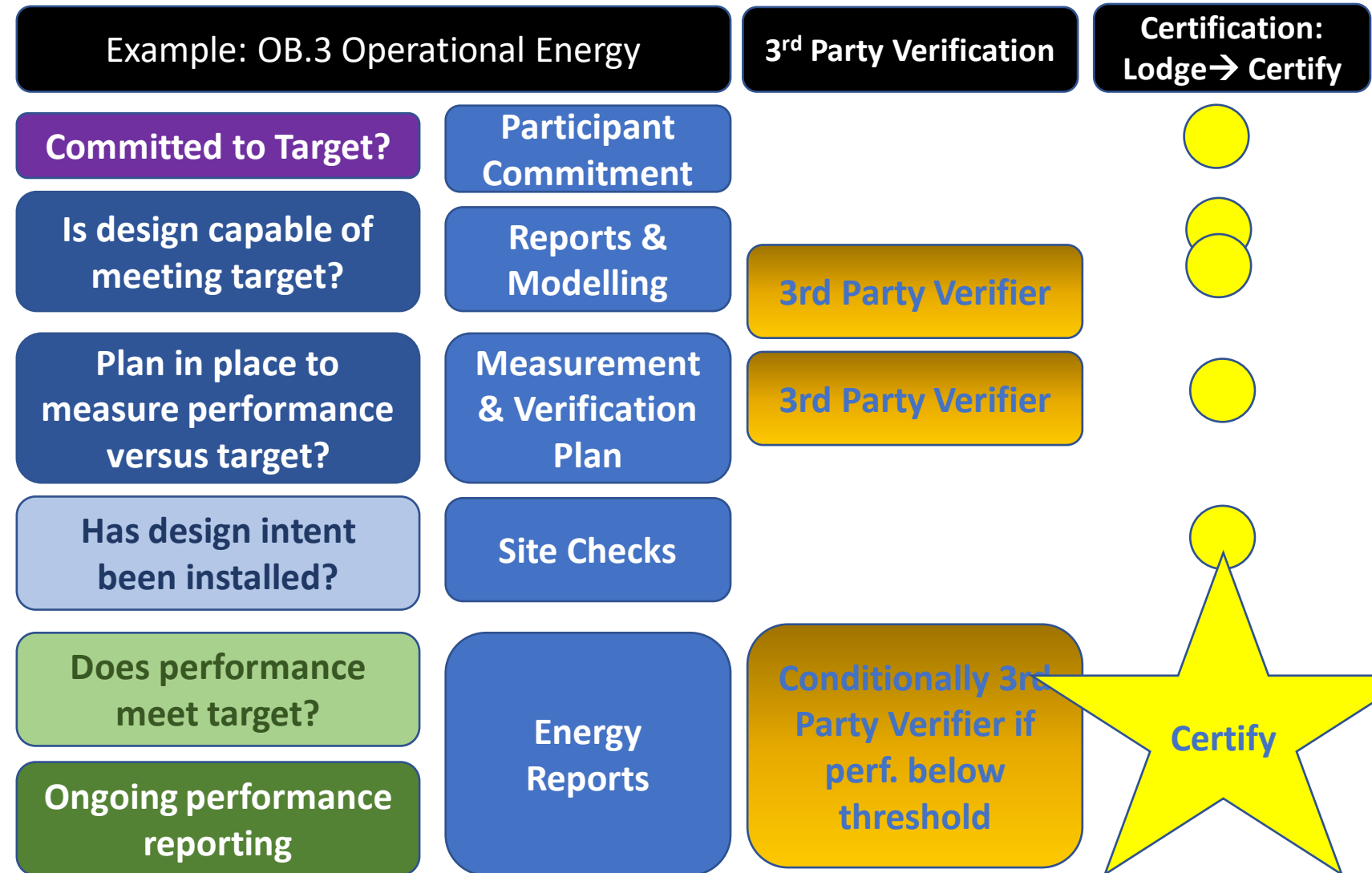


Example 3rd Party Verification: OB.3 Operational Energy

Minimise need for 3rd Party Verification by focusing on key items:

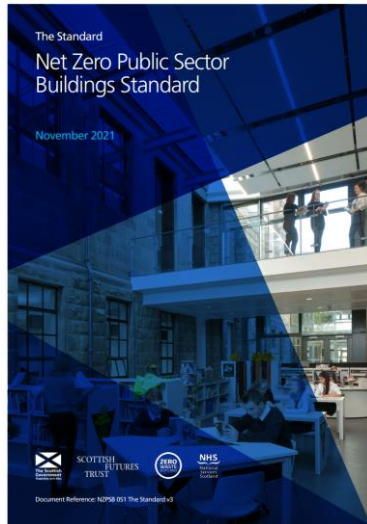
- Design's capability of achieving the target
- Measurement & Verification Plan

If performance meets target, no further 3rd Party Verification is required



How can I apply the Standard?

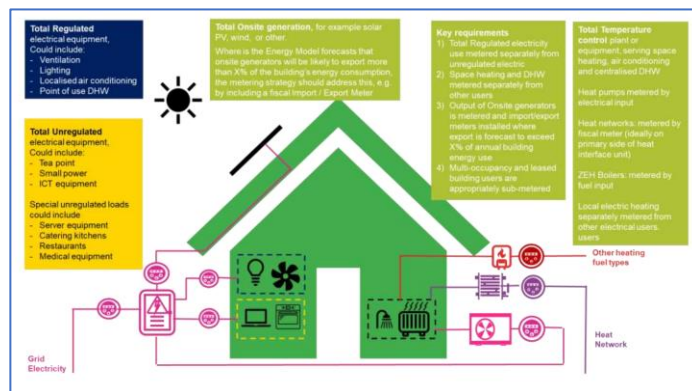
Standard



Suite of Supporting Documents



Pathfinder Case Studies



1 Objective 1: Inclusive NZC Economy Outcomes – Detailed Guidance

1.0 Inclusive Net Zero Carbon Economy Outcomes Investment Planning and Place Principles

The Standard draws on the Scottish Government's requirement that investment in Scotland's built estate should apply best practice in respect to 'Place-based' solutions, which support inclusive growth and drive a Net Zero emissions future.

The **Investment Hierarchy Approach** vision identifies that all future investment should robustly consider and implement necessary project drivers and requirements under the following three major themes:

- Theme 1 – Enabling Net Zero Emissions and Environmental Sustainability
- Theme 2 – Driving Inclusive Economic Growth
- Theme 3 – Building Resilient and Sustainable Places

The IIP details a step change in the appraisal of the strategic case for change in our built environment, with a clear Investment Hierarchy approach as summarised below:

Figure 1 – The IIP's Investment Hierarchy Approach

3

ST SOPHIA'S PRIMARY SCHOOL

School

Applying the Net Zero Public Sector Buildings Standard to a Primary School in East Ayrshire Council

Project details
Building type: Primary Schools
Standard review stage: Detailed design

Reduction in climate impacts
Predicted energy use: Less than kWh/m²
Typical usage: 162 kWh/m²
Predicted energy usage: kWh/m²

Project background
The Net Zero Public Sector Buildings Standard influenced the renovation of the St Sophia's Primary School in East Ayrshire Council. It involved influencing the planning of the major 1950s building refurbishment. The approach reflected desire from the local community to keep and enhance their existing buildings. East Ayrshire Council were keen to explore best practice around refurbishment. Embedding skills and learnings for this type of project and future refurbishments. In line with recommendations from the Net Zero Public Sector Buildings Standard, the refurbishment adopted the **EnerPHit** approach and aims to demonstrate exemplary energy performance and internal environment. The new voluntary Standard supported East Ayrshire Council to meet its net zero commitments for the refurbished St Sophia's Primary school building, influencing the project from detailed design stage.

Construction Embodied Carbon
Project specific 500 kg CO₂/m² with a stretch target of 300 kg CO₂/m²
The Net Zero Carbon Standard saves an average of 40% embodied carbon

Quote: "I think the Net Zero Public Sector Buildings Standard will be a great tool in setting clear targets and agendas from the beginning of the projects, helping designers and the whole project team to plan the project better rather than applying varying standards retrospectively!"
Magnus Dowds, Sustainability & Building Services Manager, East Ayrshire Council

Standard Document Suite

Requirements

- Requirements
- Glossary and Abbreviations

Tools and Templates

- Objectives 2 & 4 Options Report
- Energy Options Report
- IEQ Options Report Template & Guide
- OB.5 IEQ Toolkit

Management Activities

- Application Stage Registration Form
- Activity and Compliance Tracker

Guides

- User Engagement Guide
- Objectives Guide
- Risk Register Guide
- Objective 3 M&V Guide
- DSM Guide & Appendices
- Project Roles

Sector Guides

- Schools
- Advanced Learning
- Overview of Standard Pathfinder Projects

Case Studies



Standard Document Suite

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Complete this form when applying the Standard

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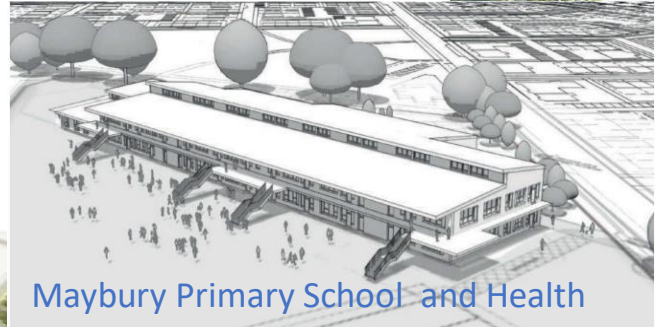


The Standard: Pathfinders

Education – Major Refurb.



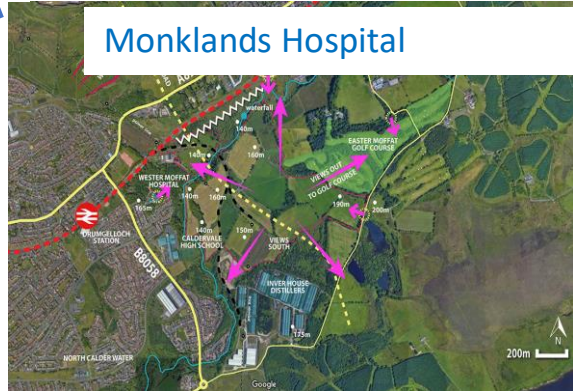
Education New Build



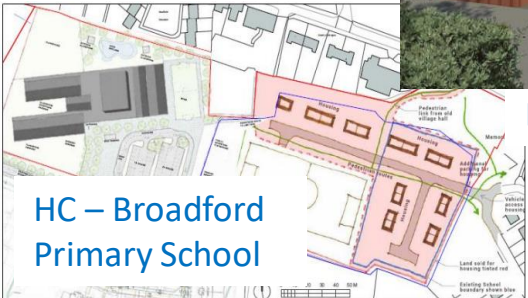
Dunfermline Learning Campus - Schools & College



Dunlop Early Learning Centre



Health New Build



What did we take from the Pathfinders ?

- **Interface:**

energy performance ↔ internal environmental

- **Refurbishment:**

increasing potential as preferred option

- **Construction embodied carbon:**

greatest scope for change

- **Place:**

applied flexibly to variety of Pathfinders' stages



Points for discussion

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Request the Standard Document Suite:

www.ScottishFuturesTrust.org.uk/page/net-zero-public-sector-buildings-standard

Are the Standards useful?

- New Build
- Existing estate

How can we embed the Standards and their principles in the support we offer stakeholders?

How do we engage sufficiently early around the Standards to ensure they are impactful?

