Agenda Item	4.
Report No	CCC/2/23

The Highland Council

Committee: **Climate Change Committee**

Date: **16 March 2023**

Report Title: **Energy Benchmarking of Property Estate**

Report By: **Interim Chief Executive**

1 Purpose/Executive Summary

1.1 The purpose of this paper is to inform Members of the work undertaken to date in relation to energy performance benchmarking of the Council's non-domestic estate.

2 Recommendations

2.1 Members are asked to:

I. Note the resultant analysis and assessment;
II. Approve the continuation of the exercise and update with 2022/23 data; and
III. Approve the distribution/awareness of the associated information deliverables, including the public facing Council website.

3 Implications

3.1 Resource – there are no ongoing resource implications, delivery of future work will be met from existing resources.

3.2 Legal – there are no legal implications arising from this report

3.3 Community (Equality, Poverty and Rural) – There are no direct implications arising from this report.

3.4 Climate Change/Carbon CLEVER – the project deliverables directly support and inform decisions with regard to achieving net zero, investment in buildings

(to improve Energy/Net Zero performance) and asset rationalisation considerations.

3.5 Risk – There is no risk directly relating to this paper.

3.6 Gaelic – There are no Gaelic implications arising from this project.

4 Background

4.1 Utilising the Scottish Public Sector Energy Benchmarking Tool, an evaluation of energy and water performance for all main properties within Highland Council property estate has been undertaken.

4.2 The evaluation compared relative energy and water performances to Scotland-specific energy benchmarks for public sector buildings.

4.3 Benchmarking energy performance is a process that either compares the energy use of a building with other similar structures or looks at how energy use varies from a baseline. It informs organisations about how and where they use energy and what factors drive their energy use. Benchmarking enables energy, building and asset managers to determine the key metrics for assessing performance, to establish baselines, and to set performance goals. It also helps to identify building upgrade opportunities that can reduce expenditure by lowering energy and operating costs, and it facilitates continuous improvement by providing diagnostic measures to evaluate performance over time, e.g., effectiveness of implemented projects.

4.4 It should be noted that benchmarking in itself does not directly reduce energy consumption, but rather provides the informed basis for justification of either behaviour change or investment in remedial works to realise savings in carbon, cost, and energy.

5 Data and Site Validation

5.1 To undertake meaningful analysis, data requires to be both complete and accurate with regard to site information, consumption data, function, and floor area. Validation of all key information was undertaken where possible to safeguard against inclusion of erroneous data or information. Some sites were discounted due to their function (no suitable benchmark available) or lack of appropriate key information.

5.2 For some building function types, although relative performance was not able to be undertaken, i.e., by floor area, reporting of absolute values has been included for reference purposes.

5.3 Energy and water invoicing information from 2021-22 was utilised as the primary source of consumption information. Where required, checks on outlying

values were undertaken against historical trends, and adjustments applied if appropriate. It should be noted that the Covid related lockdowns and changes to operating practises may have had an impact on consumptions and emissions over the past 3 years.

5.4 Many performance assessment values were found to be significantly out with reasonable expectations, e.g., 70% less than benchmark. Although some of these sites may be considered efficient, the extent of good performance is such that it is likely other factors, such as erroneous site data, estimated consumption information, operating patterns etc, is a significant contributing factor.

6 THC Property Portfolio

6.1 The following image graphically demonstrates the ratio of total floor area against individual property type categories.

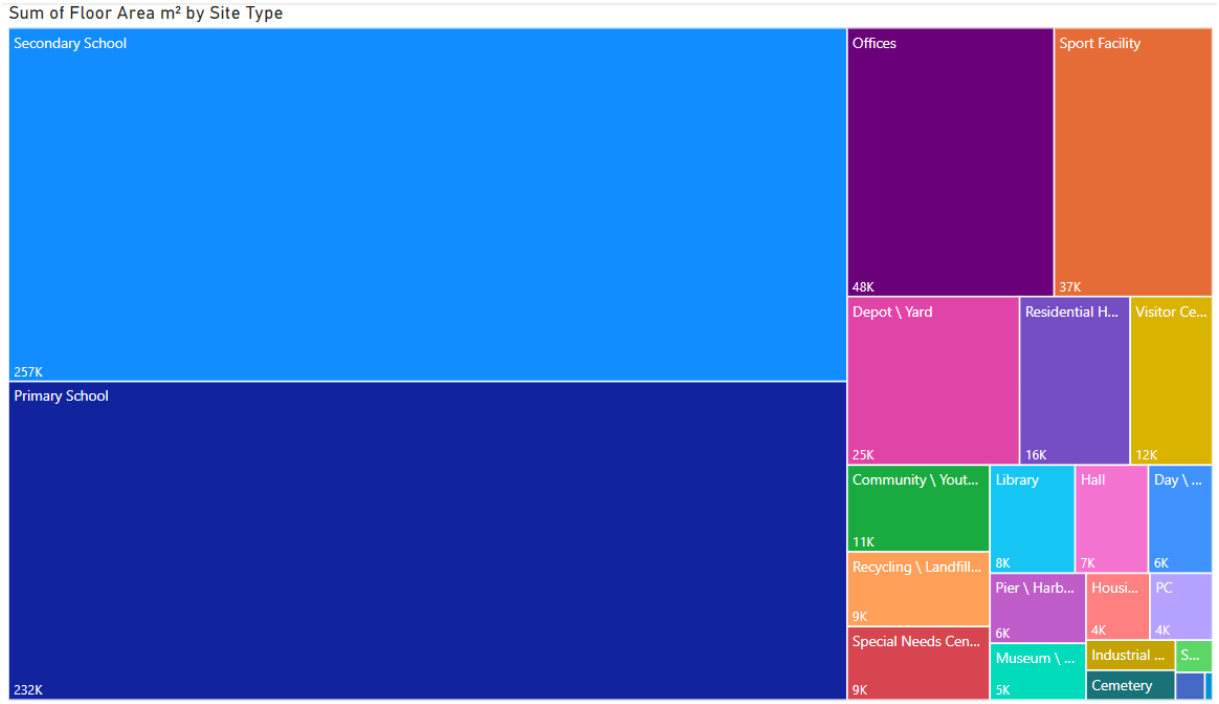

Figure 1 - Apportionment of property types by Floor Area

6.2 With respect to the non-domestic estate, there are approximately 1,029 sites with active utility supplies. Across these sites there are approximately a combined 2,323 individual utility supplies, broken down by utility as follows

Biomass	Electricity	Gas	Oil	Propane	Water
93	1,169	85	66	10	900

6.3 Following review and validation of available data, 554 sites were taken forward as part of the benchmarking analysis. The number of sites against which analysis was undertaken comprised the following

Property Type[1]	No of Properties	Properties Benchmarked
Secondary School	32[2]	32
Primary School	171[3]	171
Sport & Leisure	35	35
Offices	64	51
Depot \ Yard	52	39
Residential Home[4]	21	21
Other		
- Cemetery	49	4
- Changing Room / Pavilion	2	2
- Community \ Youth Centre	14	13
- Day \ Resource Centre	15	13
- Hall	11	8
- Housing \ Accommodation	50	12
- Industrial Type Activities	25	14
- Library	17	16
- Museum \ Art Gallery	3	2
- Nursery	4	2
- Public Convenience (PC)	81	80
- Pier \ Harbour	21	6
- Recycling \ Landfill Centre	20	17
- Shop	6	4
- Special Needs Centre	4	4
- Visitor Centre	8	8

Table 1 - Benchmarked Properties

6.4 With respect to property types, is it evident that the majority (+80%) of energy consumption, cost and carbon is associated with 6 property types. Accordingly, more detailed analysis and graphical information has been provided against these property types. Reference within graphics and tables to “others” reflect the collective of the remaining smaller contributing property types.

6.5 Where possible information and commentary has been included for all property types, however, due to limitations in available data and site related factors, further work, including site liaison, is required to complete for all.

7 Benchmarking Methodology

[1] Number of properties per type may vary from Educational provision totals, due to utility supply arrangements, e.g. shared and site type definition
[2] Includes special schools, shared and closed facilities
[3] Includes shared and closed facilities
[4] Property type includes care homes, residential homes in relation to both adult and child.

7.1 Relative benchmarks have been applied as per the following, and subsequently compared to the respective typical value for that building type.

- Carbon $kgCO2_e/m^2$
- Electricity[5] kWh/m^2
- Heating kWh/m^2 (inclusive of gas, oil, biomass, LPG)
- Water m^3/m^2
- Cost $£/m^2$

7.2 To facilitate consistency, the primary approach for performance reporting is based upon the percentage variance from what a typical building of that type should consume, e.g., a figure of 17% would indicate the property consumes 17% more than a typical property of that type. A negative value would indicate it consumes less.

7.3 Due to the large size of the estate and the complexity of the resultant analysis, the full analysis and report is contained with a dedicated document (see Appendix 1). A summary of key findings is contained in the following sections.

7.4 Insights and key take-away messages have been included to aid interpretation of the data. This has been partially completed as not all information and input has been available within the available timeframe. However, it is the intention to develop this aspect more fully.

8 Carbon

8.1 Carbon emissions are a common denominator and is the recommended method for assessing a buildings' environmental impact, directly relatable to the targets and aspirations of the Net Zero Strategy.

8.2 For the financial year 2021-22 carbon emissions from the built estate amounted to 25,582 tCO2e.

Utility	Carbon Emissions (tCO2e)	Carbon Emissions (%)
Electricity	10,699	42%
Gas	6,984	27%
Oil	6,072	24%
LPG	921	4%
Biomass	710	3%
Water	193	1%
Total	**25,582**	**100%**

Table 2 - Carbon emissions by Fuel

[5] Properties that are electrically heated have dedicated benchmarks

8.3 It should be noted that utilities such as biomass and water have a significantly reduced impact due to being naturally lower in carbon intensity, when compared to other utilities.

8.4 The following graphic shows CO2 emissions attributable to key property types.

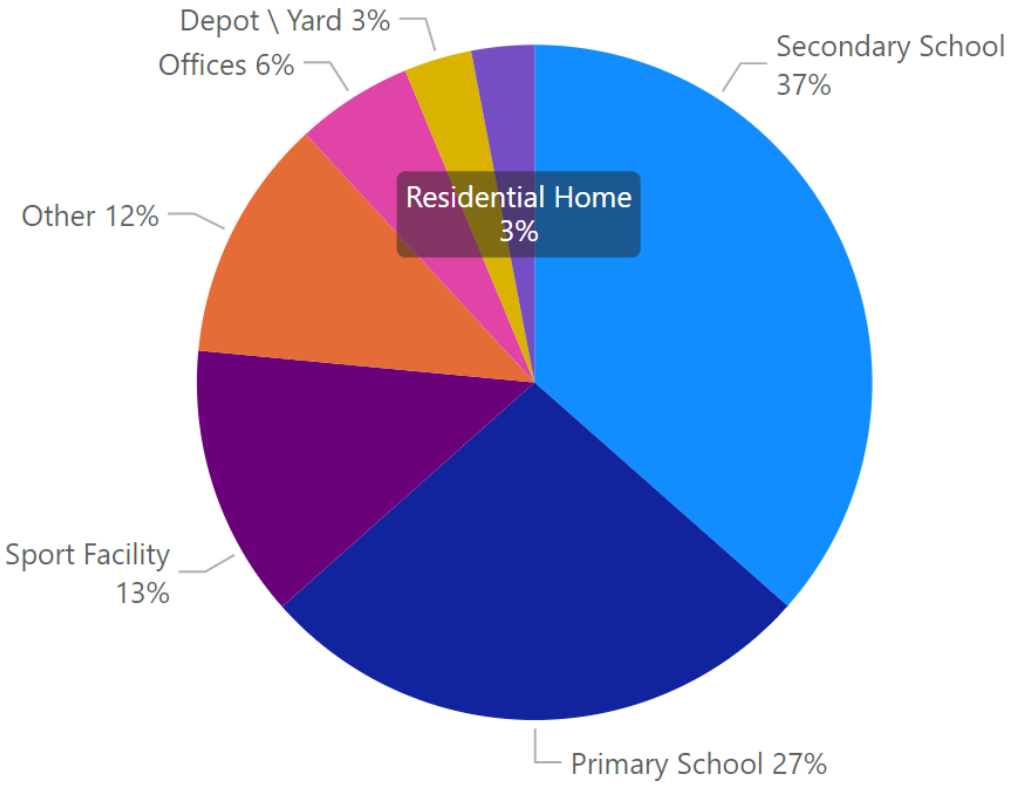

Figure 2 - Apportionment of carbon emissions to property types

8.5 Commentary

- 31% of buildings exceeded typical benchmark values
- Education accounts for 64% of total carbon emissions
    - Of the best 20 performing primary schools, 19 operated biomass-based heating systems
- The six largest contributing property types of cumulatively account for 88% of all building related carbon emissions.

8.6 Key Takeaway point

- Any meaningful reduction in carbon emissions requires focus on the school estate.

9 Electricity

9.1 The following graphic shows electricity consumption attributable to key property types.

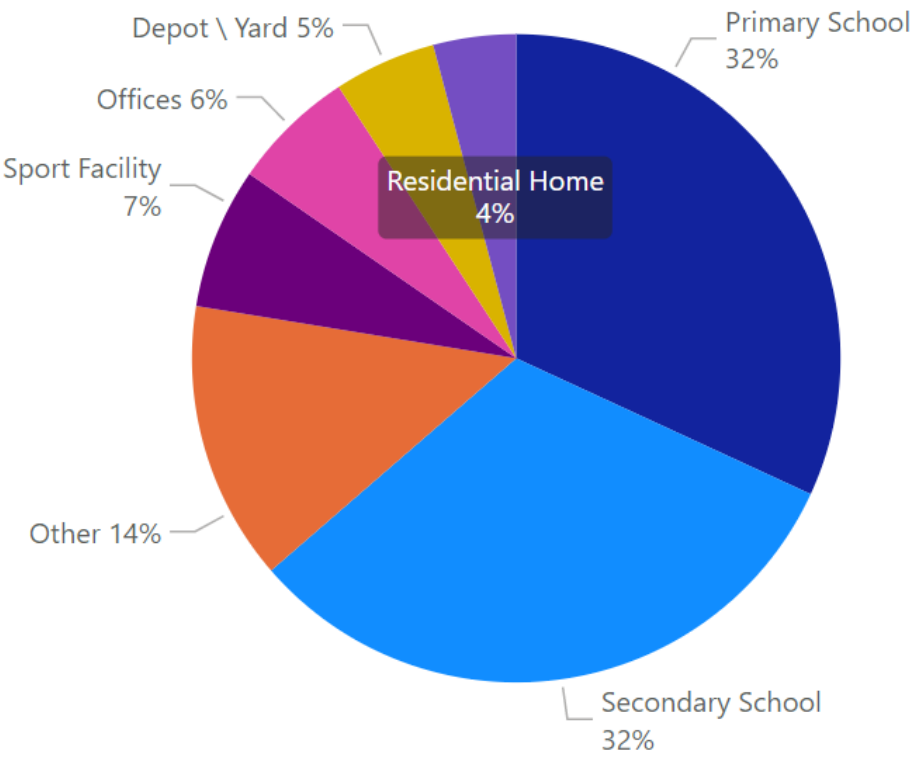

Figure 3 - Electricity Consumption by Property Type

9.2 How and to what extent electricity is consumed, varies across all properties. For some it may be limited to lighting and ICT equipment, whilst for others it may also be utilised for heating, air conditioning, catering, swimming pool hall ventilation etc.

9.3 Commentary

- THC properties collectively consume 46,293,127 kWh of electricity
- Primary & Secondary Schools account for 64% of all electrical consumption
- 46% of properties performed worse than the typical benchmark.
- 59% (247 of 418) buildings are thought to be electrically heated (based upon lack of alternative heating source). However, it has not been possible to definitively verify at this stage.

10 Heating

10.1 The following graphic shows electricity consumption attributable to key property types.

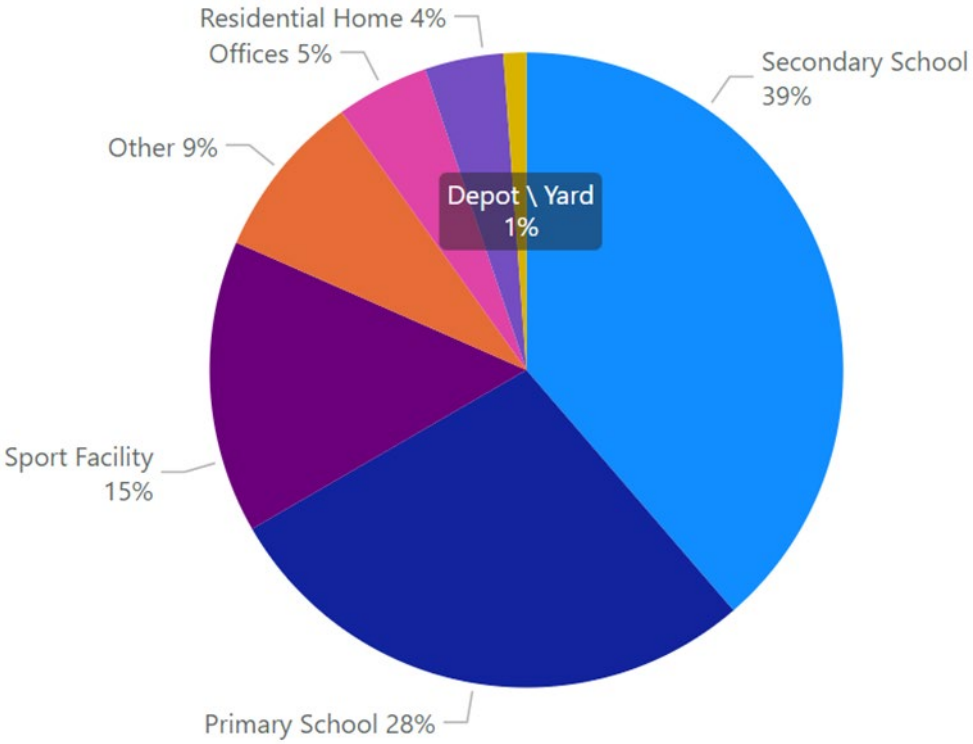

Figure 4 – Heating Consumption by Property Type

- The above pie chart reflects buildings that consume Gas, Oil, LPG & Biomass (Many other buildings utilise electrically based heated systems)
- The combined heat consumption amounts to 92,285,898 kWh annually
- Primary & Secondary Schools account for 67% of heating consumption
- 51% of properties performed worse than benchmark.

10.2 The following table breaks down site type and number which consume typical heating related fuels.

Property Type	Total No	Biomass	Oil	LPG	Gas
Cemetery	**4**			1	
Changing Room / Pavilion	**2**				
Community \ Youth Centre	**13**			1	4
Day \ Resource Centre	**13**				4
Depot \ Yard	**39**		1	2	3

Hall	**8**	1			4
Housing \ Accommodation	**12**	1	1		1
Industrial Type Activities	**14**				
Library	**16**	1	1		2
Museum \ Art Gallery	**2**	1			
Nursery	**2**				
Offices	**51**	4	2		10
PC	**80**				
Pier \ Harbour	**6**				
Primary School	**171**	48	33	1	23
Recycling \ Landfill Centre	**17**				
Residential Home	**21**	8			3
Secondary School	**32**	17	11	5	9
Shop	**4**				1
Special Needs Centre	**4**	1			2
Sport Facility	**35**	6	7		3
Visitor Centre	**8**	1	2		3
Total	**554**	**89**	**58**	**10**	**72**

Table 3: Breakdown and count of heating-based fuel consumption to property type

- Approximately 140 sites currently operate fossil fuel-based heating systems

10.3 Key Takeaway point

- As part of the transition to Net Zero, all fossil fuel-based heating systems will require conversion to a low carbon alternative.

11 Water

Figure 4 shows the water consumption allocation across key property types.

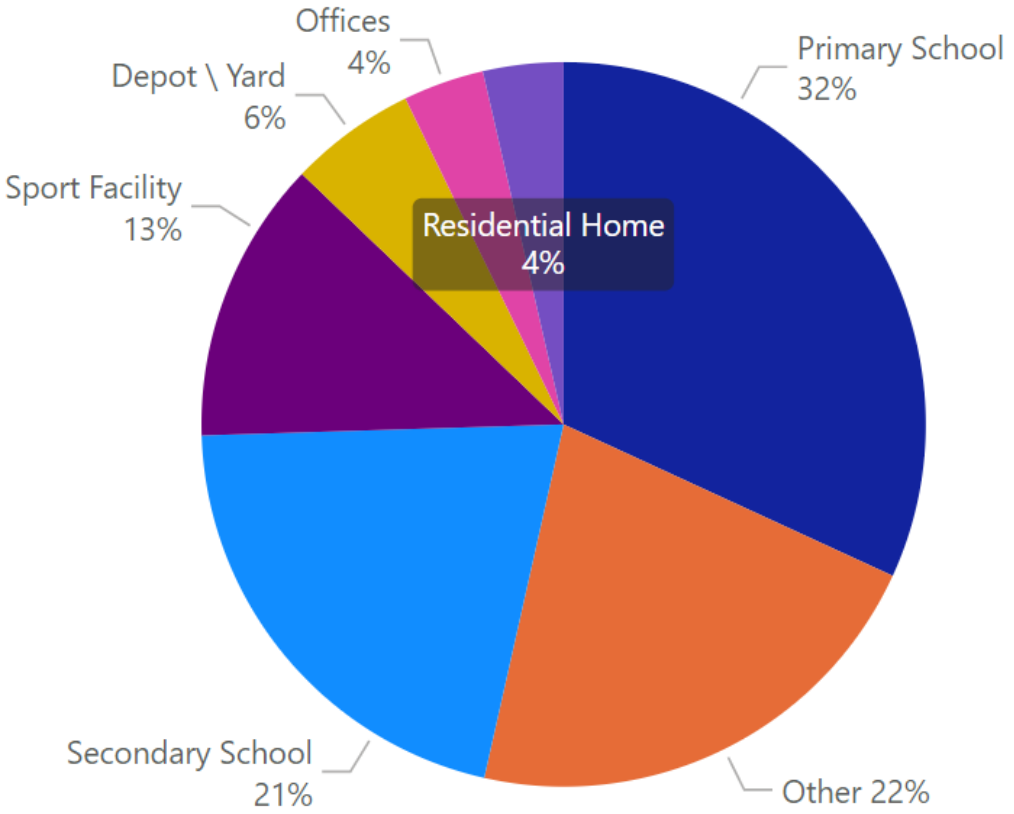

Figure 5 Water Consumption by Property Type

- THC properties consume a total of 460,188m3 of water
- Primary & Secondary Schools account for 53% of water consumption
- 30% perform worse than benchmark.
- 70% are perform better than benchmark.
- 7% of consumption is related to Public Conveniences
- 4% of consumption is related to Cemeteries

12 Annual Cost

12.1 The following graphic shows the cost allocation across key property types.

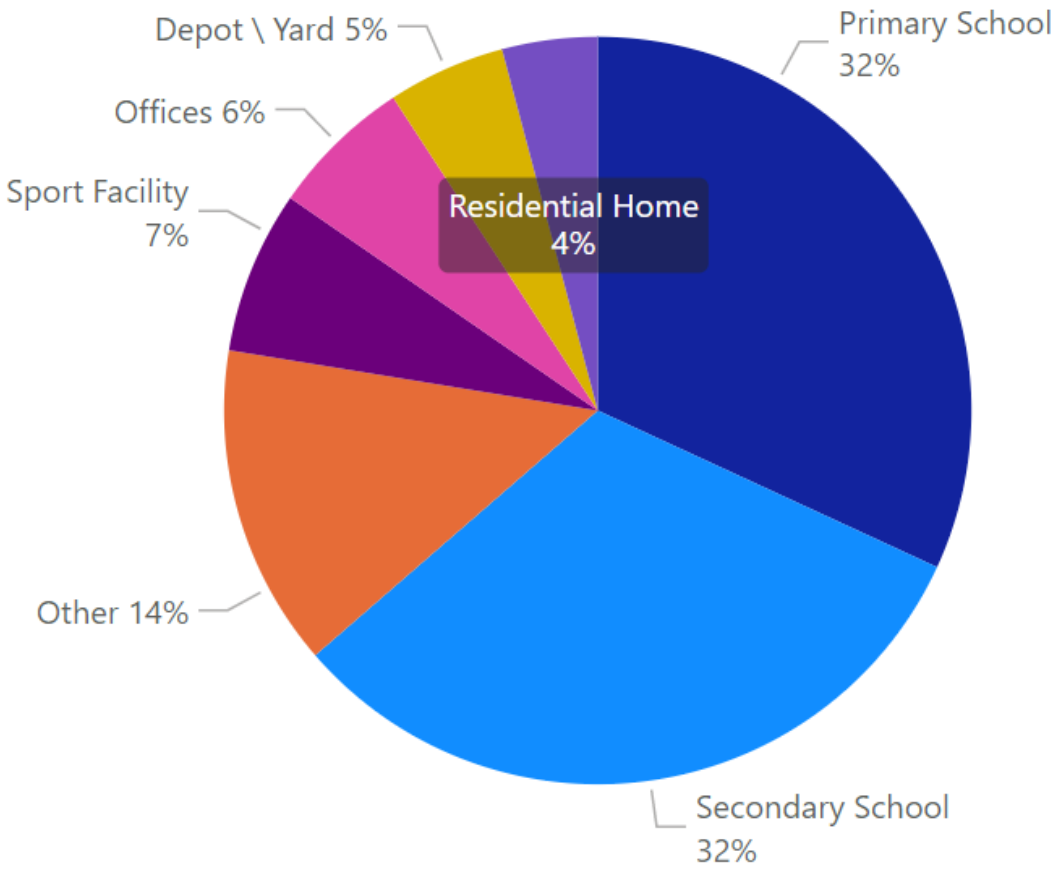

Figure 6 - Electricity Consumption by Property Type

12.2 How and to what extent electricity is consumed, varies across all properties. For some it may be limited to lighting and ICT equipment, whilst for others it may also be utilised for heating, air conditioning, catering, swimming pool hall ventilation etc.

12.3 Commentary

- Highland Council properties include within benchmarking analysis collectively cost £14.1 million annually.
- Primary & Secondary Schools account for 67% of costs
- Costs include both consumption and fixed charges

12.4 The following table details, in order, the annual running cost associated with all property types.

Property Type	Sum of Running Cost (£)
Secondary School	£4,952,523
Primary School	£4,446,650
Sport Facility	£1,218,401
Offices	£731,556
Residential Home	£566,608
Depot \ Yard	£497,083
Visitor Centre	£238,279
Special Needs Centre	£199,577
PC	£164,725
Library	£133,457
Recycling \ Landfill Centre	£131,778
Pier \ Harbour	£123,197
Community \ Youth Centre	£118,084
Day \ Resource Centre	£103,464
Cemetery	£100,858
Industrial Type Activities	£96,276
Museum \ Art Gallery	£90,151
Housing \ Accommodation	£86,015
Hall	£74,288
Shop	£7,398
Nursery	£7,017
Changing Room / Pavilion	£3,559
Total	**£14,090,945**

Table 4 - Ranking of property types by cost

12.5 For the most expensive property group, Secondary Schools, a breakdown of cost and relative cost for individual properties is shown in the figure below

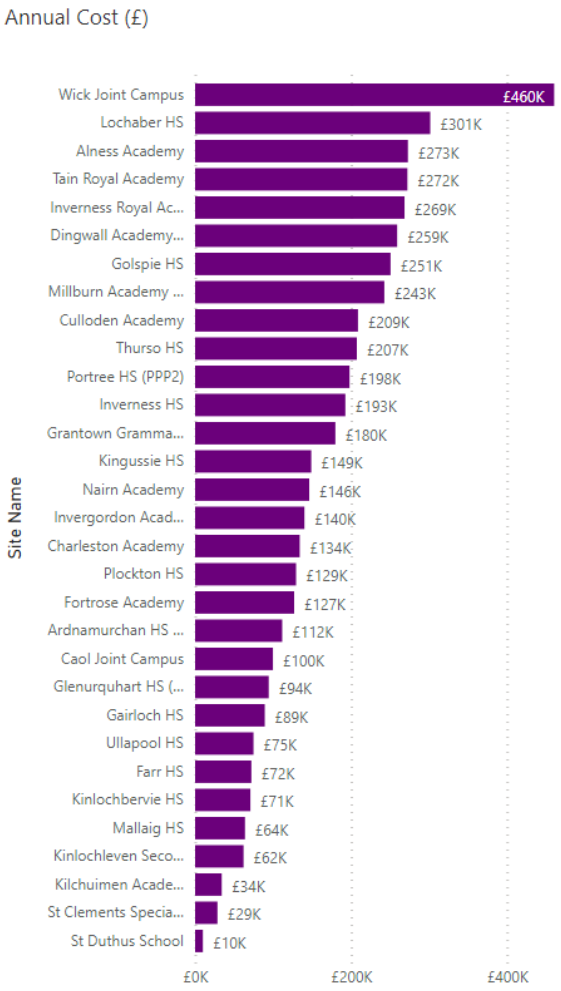

Figure 8 - Secondary school cost ranking (High to Low)

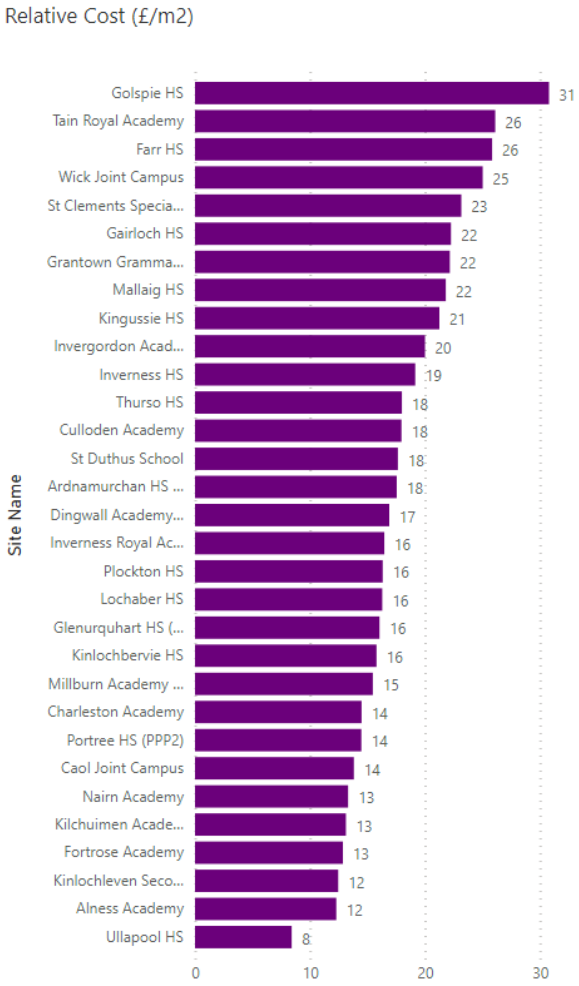

Figure 7 - Secondary school relative cost ranking (High to Low)

12.6 Relative Cost values are based upon a £/m^2 to allow a comparison of different size buildings of the same type. The following table shows the lowest and highest costing property, in relative terms, for each property type.

12.7 Direct comparisons are not accurate and factors such a heating system type, occupation, unknown usage, external contributing factors, all have a bearing on the assessment. However, for those properties at the higher end of the scale, site investigations are recommended.

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	Lowest Relative Cost		Highest Relative Cost	
Property Type	**Site Name**	**£/m²**	**£/m²**	**Site Name**
Changing Room / Pavilion	Bignold Park Changing Pavilion	3.9	7.6	Naver Changing Pavilion
Community \ Youth Centre	Hilton Village	5.5	75.3	SIPS Community Centre
Day \ Resource Centre	Lybster Day Centre	3.3	26.8	Airdferry Res Centre
Depot \ Yard	Brora Depot Buildings	0.7	75.8	Ardelve Roads Depot
Hall	East Church Hall	2.4	23.5	Joss Street Hall
Housing \ Accommodation	23 Balnacraig Road	1.6	95.9	47 Balnacraig Road
Industrial Type Activities	Unit 8B5 River Wynd	0.9	190	Sconser Quarry
Library	Muir of Ord Library	0.2	42.2	Brora Library
Museum \ Art Gallery	Inverness Museum & Art Gallery	18.7	19.3	Highland Folk Museum
Nursery	Bualnaluib Nursery	24.6	54.5	Lochcarron Nursery
Offices	Dingwall Offenders Services Office	3.5	43.6	Tain Service Point
PC	Dunnet PC	1.8	218	Dingwall Athole Court PC
Pier \ Harbour	Gairloch Pier	2.4	35.8	Nairn Harbour
Primary School	Isle of Rum PS	1.7	92.2	Struan PS
Recycling \ Landfill Centre	Invergordon Transfer Station	2.7	349	Inverness Waste Recycling Centre
Residential Home	Arach	2.3	76.5	Caladh Sona Centre
Secondary School	Ullapool HS	8.4	30.8	Golspie HS
Shop	Inverness Market Hall & Arcade	4.8	20.4	14 Grant Street
Special Needs Centre	Caberfeidh Centre	5.7	23.3	Drummond School (PPP2)
Sport Facility	An-Aird Changing Pavilion	1.5	126	Nairn Swimming Pool
Visitor Centre	Bettyhill Visitor Centre	1.5	48.7	Ionad Nibheis Visitor Centre

Table 5 - Low and High relative cost per property type

13 Summary Energy Benchmarking Assessment

13.1 The following table details the percentage of each property type that performs better than a typical property of that type.

Property Type	Carbon	Electricity	Heating	Water
Cemeteries				
Changing Rooms				
Community Centres	78%	67%	80%	57%
Day / Resource Centres	80%	36%	50%	86%
Depots	52%	35%	40%	50%
Town Halls		83%	33%	100%
Housing/Accommodation	86%	38%	100%	
Industrial	60%	50%		29%
Libraries	83%	62%	50%	20%
Museum / Art Gallery	100%	50%	100%	100%
Nursery	50%	50%		100%
Offices	76%	66%	43%	69%
PC	62%	43%		
Pier / Harbour				
Primary School	74%	54%	48%	70%
Recycling/Landfill	38%			
Residential Home	81%	53%	50%	100%
Secondary School	60%	58%	46%	81%
Shop				
Special Needs Centres	67%	100%	67%	100%
Sport & Leisure	77%	75%	45%	75%
Visitor Centres	67%	50%	33%	67%
All	69%	54%	49%	70%

Table 6 - Summary overview of benchmarking performance

13.2 Commentary

- Figures highlighted in green denote more than 50% of that property type for that criteria perform better than a typical building of that type.
- Figures of 100% indicate that all buildings within that property type, for that criteria, perform better than typical.
- There is apprehension that the performance is simply too good to be fully accurate.
- Blank cells indicate benchmarking assessment not undertaken.

14 Commentary and Next Steps

14.1 The figures provide within this report and Appendix 1 are recommended to be considered as indicative only, due to the concerns detailed.

14.2 As the benchmarking process has developed it has become apparent that a greater than expected level of site input and information was required to provide full re-assurance in the stated performance assessments. (Not achievable to facilitate within the timeframe available).

14.3 It is therefore proposed to continue the exercise and to revert back to the Climate Change Committee in October 2023. To address the issue identified, the continuation would include:

- The initiation of a short life working group with representation from the Energy Team, Property, FM staff and HLH to facilitate the collation and understanding of the factors impacting on energy performance within the THC non-domestic estate.
- A refresh of energy data based upon the financial year 2022/23, which will reflect a more stable period and be a truer reflection of actual performances.

14.4 Finalisation of report and associated deliverables would be completed by October 2023.

Designation: **Interim Chief Executive**

Date: **6 March 2022**

Author: **Ronnie Macdonald, Energy Manager**

Appendix 1

The Highland Council

Energy Benchmarking Analysis 2021-22

Energy Team

Original			
Version	**Author**	**Note**	**Date**
4.0	NC/JG/RM	First Issue	07/03/2023
Revisions			
Version	**Author**	**Note**	**Date**

Table of Contents

Figures

Tables

1 Introduction

This report and analysis has been designed to provide an overview of the energy performance of The Highland Council (THC) non-domestic property portfolio. It is hoped that the content will provide a high-level appreciation of how the property portfolio is performed overall, together with key insights and observations.

The report is not intended to provide a definitive assessment and conclusions should not be drawn on individual buildings based solely upon the figures provided. Utility arrangements, building usage, occupation patterns and building occupants are unique to individual buildings and as such, to energy benchmark a property is an initial step in assessing the collective impact of all of these factors. There may be justified reasons as to particularly good or poor performance, and benchmarking facilitates subsequent effort to be focussed on where it has the greatest impact.

1.1 Report Content

This report provides commentary on the THC Property Portfolio, benchmarking process undertaken and the completeness, accuracy and quantity of data available.

With respect to property types, is it evident that the majority (+80%) of energy consumption, cost and carbon is associated with 6 property types. Accordingly, more detailed analysis and graphical information has been provided against these property types. Reference within graphics and tables to “others” reflect the collective of the remaining smaller contributing property types.

Where possible information and commentary has been included for all property types, however, due to limitations in available data and site related factors, further work, including site liaison, is required to complete for all.

Due to the large number of some building types, e.g., Primary Schools, graphical depictions of all sites are not possible within the space limitations of a page. As such graphics may exclude “middle of the range” sites or be replaced with tables.

2 Overview of Benchmarking Process

Given the diverse nature of property type sizes, heating systems and operating practices, performance information has been provided based upon the percentage variance from how a "typical" building of its type would perform. For example, a performance assessment value of 14% for electricity, would indicate that the building consumes 14% more than a typical building, -22% would indicate the building performs better than typical.

A typical building is defined as the median or average building of that type as stated within the Scottish Public Sector Benchmarking Tool.

Benchmarking comparators are available for criteria such as carbon emissions, annual cost, electricity, heating and water, however not all criteria are applicable to all buildings. Table 1 highlights the number of sites evaluated against each criteria.

Benchmark Criteria	Sites evaluated
Carbon	400
Electricity	418
Heating	172
Water	237
Cost	554

Table 1 - Benchmarking criteria vs number of sites evaluated

Carbon and cost are notable as indicators of the combined impact of electricity, heating and water related consumptions.

Cost values include non-consumption related elements such as fixed metering charges. Also, cost comparisons are only applicable if undertaken internally within an organisation, and it should be noted that they are subject to variation as part of supply contract distinctions.

The 2021-22 financial year was used for determination of annual consumptions, being the most recent complete year of data. Where data was unavailable or believed to be inaccurate, reference to historical data was made. It should be noted that the Covid related lockdowns and changes to operating practises may have had an impact on consumptions and emissions over the past 3 years.

Some performance assessment values are out with reasonable expectations, e.g., 70% less than benchmark. Although some of these sites may be considered efficient, the extent of good performance is such that it is likely other factors, such as erroneous site data, estimated consumption information, operating patterns etc, is a significant contributing factor.

A refresh of the exercise in upcoming months, using 2022/23 data, may reflect a more stable period and be a truer reflection of actual performances.

3 THC Property Portfolio

THC non-domestic property portfolio covers more than 1,000 sites with utility supplies.

Following review of available data and validation, 554 were taken forward as part of the benchmarking analysis.

The number of properties benchmarked in each property type is shown in Table 2 below

Property Type	Total No of Properties	Properties Benchmarked
Secondary School	32	32
Primary School	171	171
Sport & Leisure	35	35
Offices	64	51
Depot \ Yard	52	39
Residential Home	21	21
Other - Cemetery	49	4
- Changing Room / Pavilion	2	2
- Community \ Youth Centre	14	13
- Day \ Resource Centre	15	13
- Hall	11	8
- Housing \ Accommodation	50	12
- Industrial Type Activities	25	14
- Library	17	16
- Museum \ Art Gallery	3	2
- Nursery	4	2
- Public Convenience (PC)	81	80
- Pier \ Harbour	21	6
- Recycling \ Landfill Centre	20	17
- Shop	4	4
- Special Needs Centre	4	4
- Visitor Centre	8	8

Table 2 - Property types and number benchmarked

Note – Although Depots are a significant consumer of energy, the lack of standardisation of sites combined with more industrial type activities being undertaken, has meant that only limited benchmarking was undertaken at this stage.

4 Analysis By Criteria

4.1 Carbon Emissions

To permit comparison to published benchmarks, THC carbon emissions were determined using conversion factors defined in the Scottish Public Sector benchmarking tool. These differ to the factors normally applied (e.g., in relation to Net Zero targets and reporting) and accordingly values stated should not be used out with the context of this report.

Figure 1 shows the CO_2 emissions attributable to key property types.

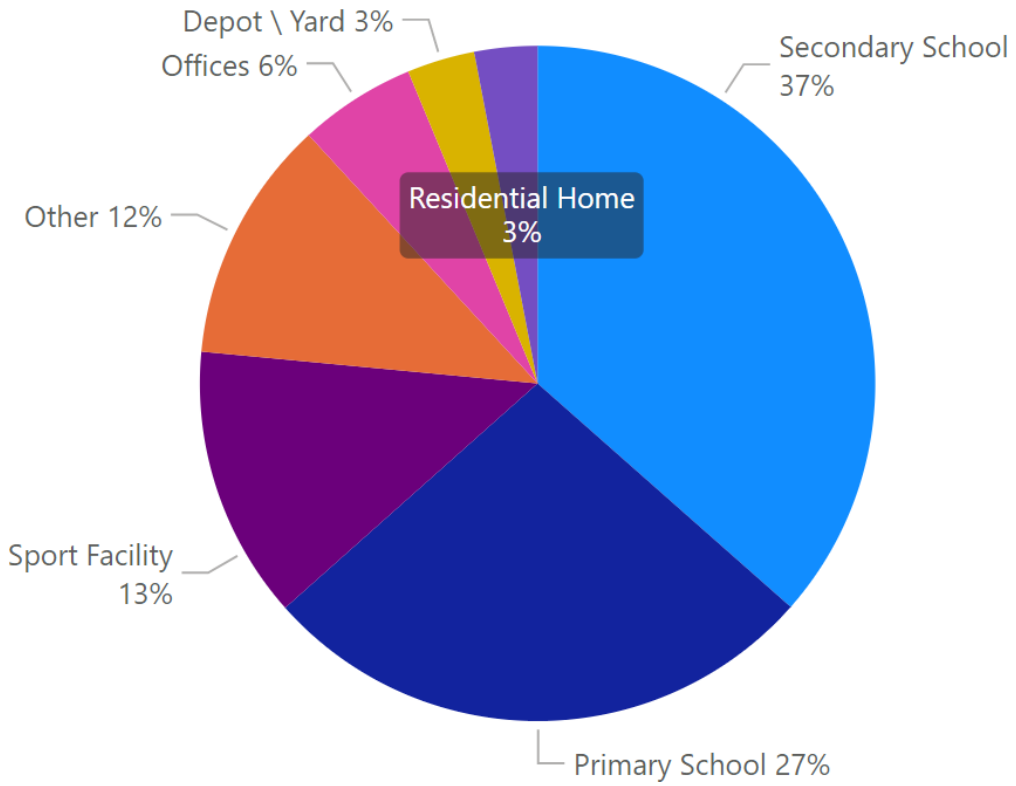


Figure 1 - CO_2 emissions by property type

- THC properties collectively account for carbon emissions of 25,582 tCO_2e
- Primary & Secondary Schools together account for 64% of total carbon emissions
- 31% of properties perform worse than the typical benchmark for a property of that type
- 69% performed better than the typical benchmark

4.2 Electricity

How and to what extent electricity is consumed varies across all properties. For some it may be limited to lighting and ICT equipment, whilst of others it may also be used for heating, air conditioning, catering, swimming pool hall ventilation etc.

Figure 2 shows electricity consumption allocation across key property types.

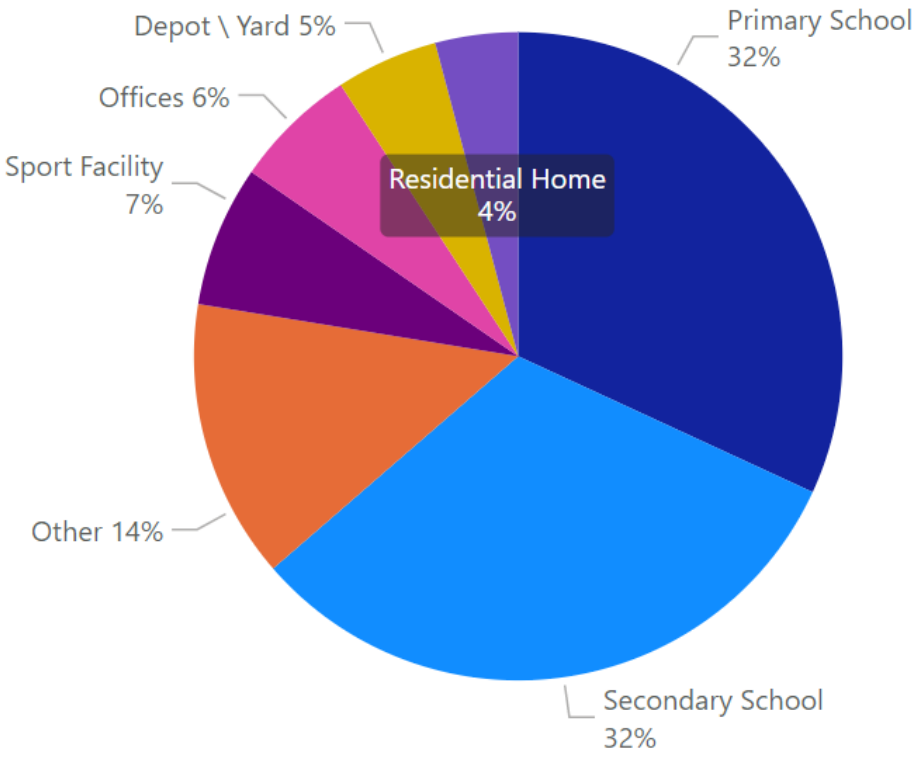


Figure 2 - Electrical consumption by property type

- THC properties collectively consume 46,293,127 kWh of electricity
- Primary & Secondary Schools account for 64% of all electrical consumption
- 46% performed worse than the typical benchmark
- 54% performed better than the typical benchmark
- 59% (247 of 418) buildings are thought to be electrically heated (based upon lack of alternative heating source). However, it has not been possible to verify completely at this stage in the analysis.

4.3 Heating

Figure 3 shows the heat consumption allocation across key property types.

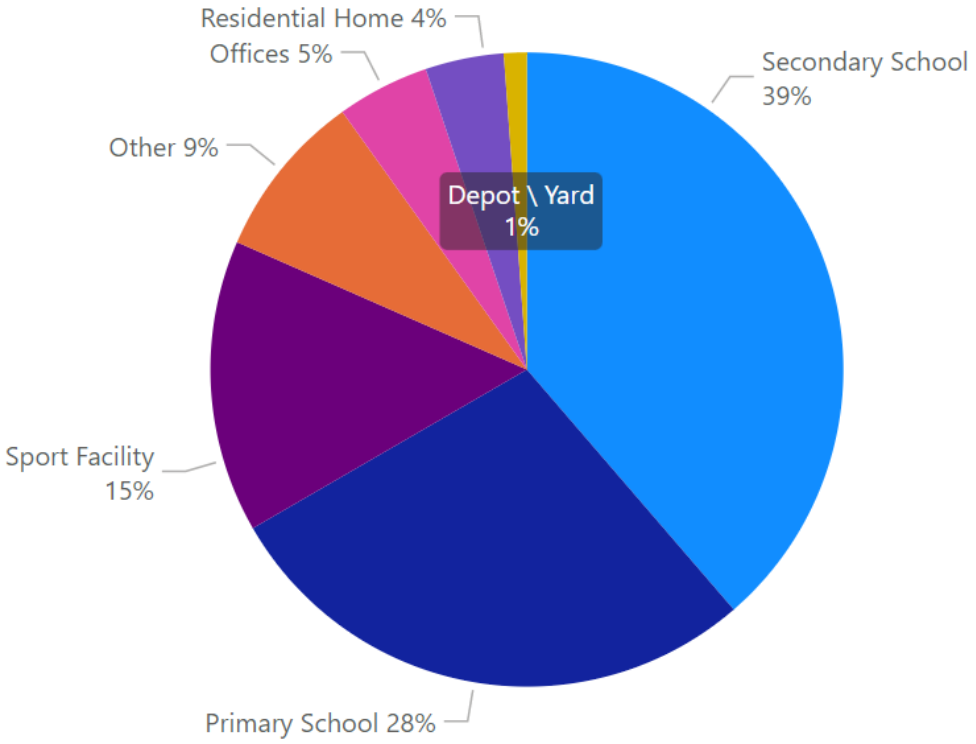


Figure 3 - Heating consumption by property type

- The above pie chart reflects buildings that consume Gas, Oil, LPG & Biomass
    - Many other buildings utilise electrically based heated systems
- The combined heat consumption amounts to 92,285,898 kWh annually
- Primary & Secondary Schools account for 67% of heating consumption
- 51% performed worse than benchmark
- 49% performed better than benchmark

The following table breaks down site type and number which consume typical heating related fuels.

Property Type	Total No	Biomass	Oil	LPG	Gas
Cemetery	**4**			1	
Changing Room / Pavilion	**2**				
Community \ Youth Centre	**13**			1	4
Day \ Resource Centre	**13**				4
Depot \ Yard	**39**		1	2	3
Hall	**8**	1			4
Housing \ Accommodation	**12**	1	1		1
Industrial Type Activities	**14**				
Library	**16**	1	1		2
Museum \ Art Gallery	**2**	1			
Nursery	**2**				
Offices	**51**	4	2		10
PC	**80**				
Pier \ Harbour	**6**				
Primary School	**171**	48	33	1	23
Recycling \ Landfill Centre	**17**				
Residential Home	**21**	8			3
Secondary School	**32**	17	11	5	9
Shop	**4**				1
Special Needs Centre	**4**	1			2
Sport Facility	**35**	6	7		3
Visitor Centre	**8**	1	2		3
Total	**554**	**89**	**58**	**10**	**72**

Table 3 - Breakdown and count of heating-based fuel consumption to property type

- Approximately 140 sites currently operate fossil fuel-based heating systems
    - As part of the transition to Net Zero, these will require conversion to a low carbon alternative

4.4 Water

Figure 4 shows the water consumption allocation across key property types.

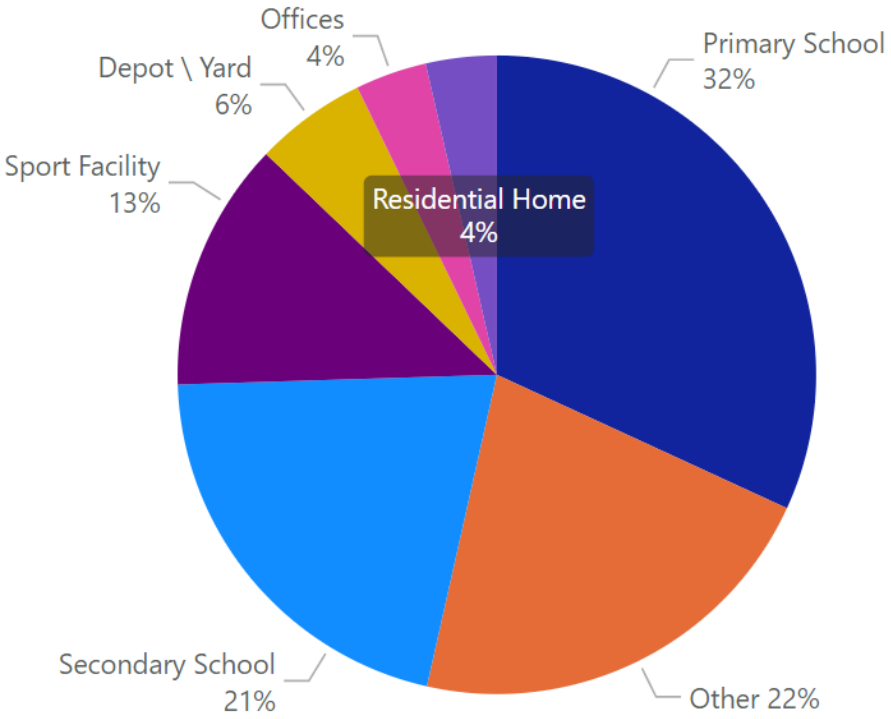


Figure 4 - Water consumption by property type

- THC properties consume a total of 460,188m^3 of water
- Primary & Secondary Schools account for 53% of water consumption
- 30% perform worse than benchmark
- 70% are perform better than benchmark
- 7% consumption is related to Public Conveniences
- 4% consumption is related to Cemeteries

4.5 Annual Cost

Figure 5 shows the cost allocation across key property types.

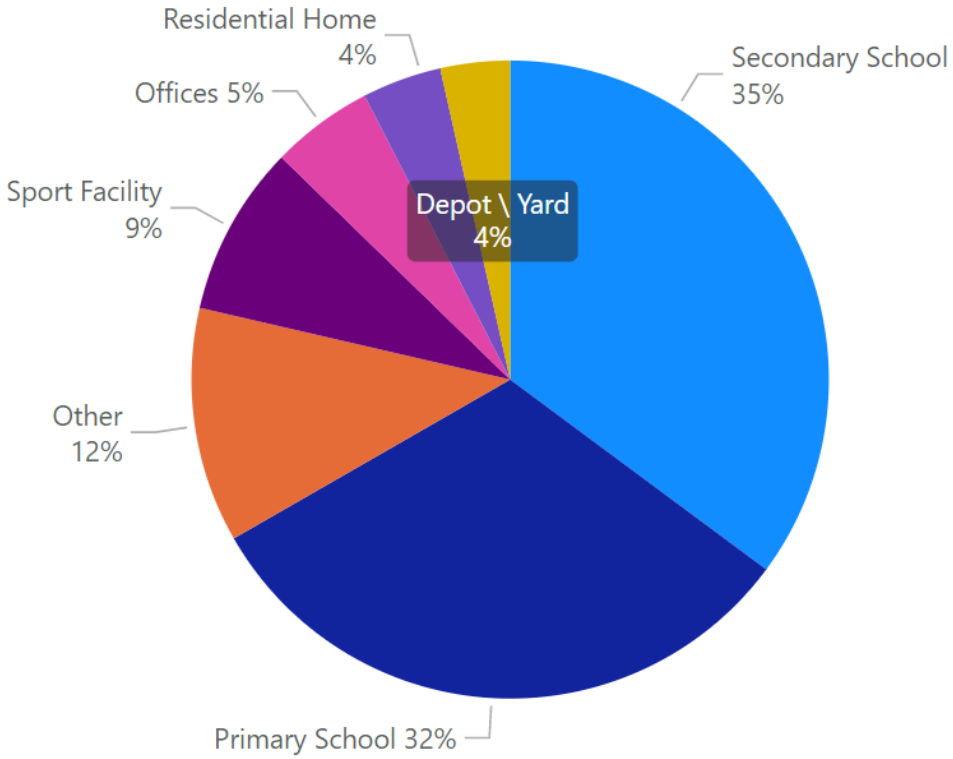


Figure 5 - Annual costs by property type

- Highland Council properties include within benchmarking analysis collectively cost £14.1 million annually
- Primary & Secondary Schools account for 67% of costs
- Costs include both consumption and fixed charges

Property Type	Sum of Running Cost (£)
Secondary School	£4,952,523
Primary School	£4,446,650
Sport Facility	£1,218,401
Offices	£731,556
Residential Home	£566,608
Depot \ Yard	£497,083
Visitor Centre	£238,279
Special Needs Centre	£199,577
PC	£164,725
Library	£133,457
Recycling \ Landfill Centre	£131,778
Pier \ Harbour	£123,197
Community \ Youth Centre	£118,084
Day \ Resource Centre	£103,464
Cemetery	£100,858
Industrial Type Activities	£96,276
Museum \ Art Gallery	£90,151
Housing \ Accommodation	£86,015
Hall	£74,288
Shop	£7,398
Nursery	£7,017
Changing Room / Pavilion	£3,559
Total	**£14,090,945**

5 Analysis by Property Type

5.1 Secondary Schools

THC operate 32 secondary schools, with benchmarking analysis coverage undertaken as shown in the table below.

Benchmarked Criteria	No of secondary schools evaluated
Carbon	30
Electricity	31
Heating	26
Water	21
Cost	32

Table 4 - Secondary schools benchmarked utilities

- The size, age and function of secondary schools varies considerably
  - Floor areas range from 564 m² to 22,209 m²
  - Function variations include

Property type varieties	Amount
Secondary Schools only	24
Secondary Schools with primary schools.*	3
Secondary Schools with swimming pools.	6
Secondary Schools community use as well as education.	1

*Total includes Dornoch Academy

Table 5 - Secondary school types

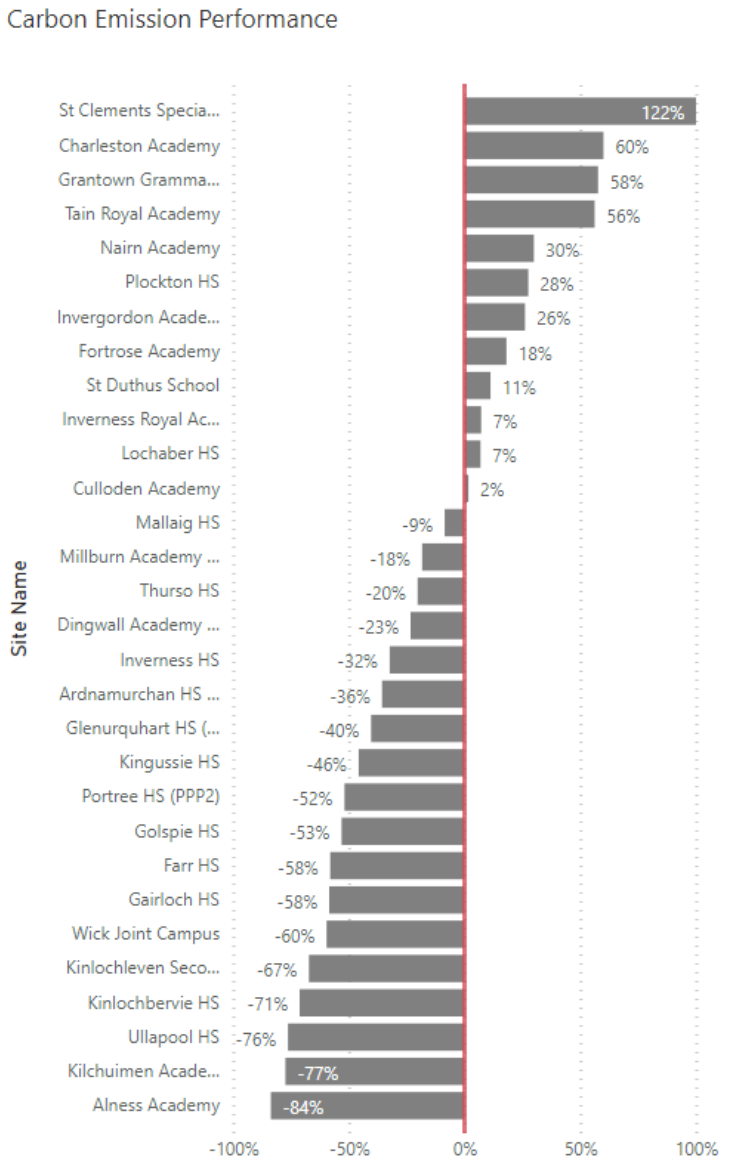
- 25 Secondary schools use more than one fossil fuel on site. Further investigation is required to determine the exact onsite application. However multiple fuel use is typically due to numerous heating systems, catering and/or science.

Primary Heating System	No off
Biomass boilers	17
Oil boilers	8
Gas boilers	5
LPG boilers	2
Electrically Heated	5

Table 6 - Secondary school types

5.1.1 Carbon

- 30 secondary schools collectively emit 9,340,978 $kgCO_2e$
- Secondary schools account for 37% of total carbon emissions
- 36% performed worse than benchmark
- 54% performed better than benchmark
- Biomass heated buildings perform best against the benchmark
- Newer buildings typically perform better than older buildings
- Oil heated premises have higher CO_2 emissions then other heating solutions



Commentary

Poor Performance

St Clements Special School
- Old oil boilers
- Longer operating hours

Charleston Academy
- Old boilers
- Community use also

Grantown Grammar
- Old boilers

Royal Tain Academy & Nairn Academy
- Poor Fabric
- Due to be replaced.

Good Performance

Alness Academy
- New School

- Top four performing have Biomass heating systems along with a well-managed system.

Figure 6 - Secondary school – Carbon emissions against benchmark

5.1.2 Electricity

- 31 secondary schools total 14,701,452 kWh
- Secondary school accounts for 32% of total electricity
- 40% performed worse than benchmark
- 60% performed better then benchmark
- Typically, buildings with traditional electrically heated systems are less efficient
- The use of renewable generation technologies helps to reduce electrical energy consumption

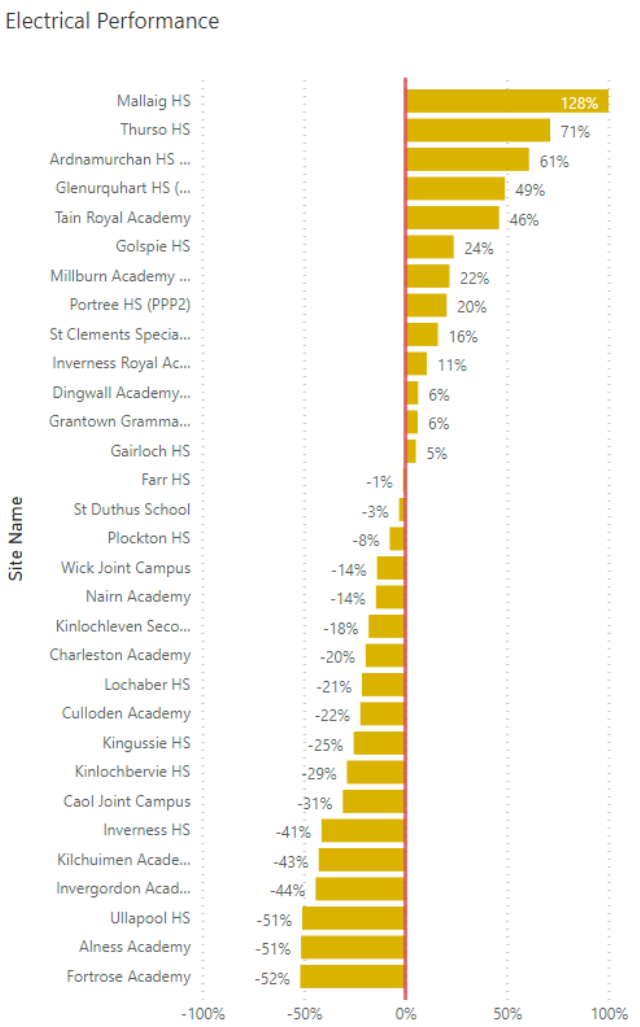


Figure 7 - Secondary school – Electrical performance against benchmark

Commentary

Poor Performance

Mallaig HS
- Poor fabric
- Electric heated
- Poor heating controls

Thurso HS
- Aging electric heating

Ardnamurchan HS
- Electric heated
- Poor heating controls

Glenurquhart HS
- PPP school
- Electric heated
- Poor heating controls

Tain Royal Academy
- Inefficient - due to be replaced

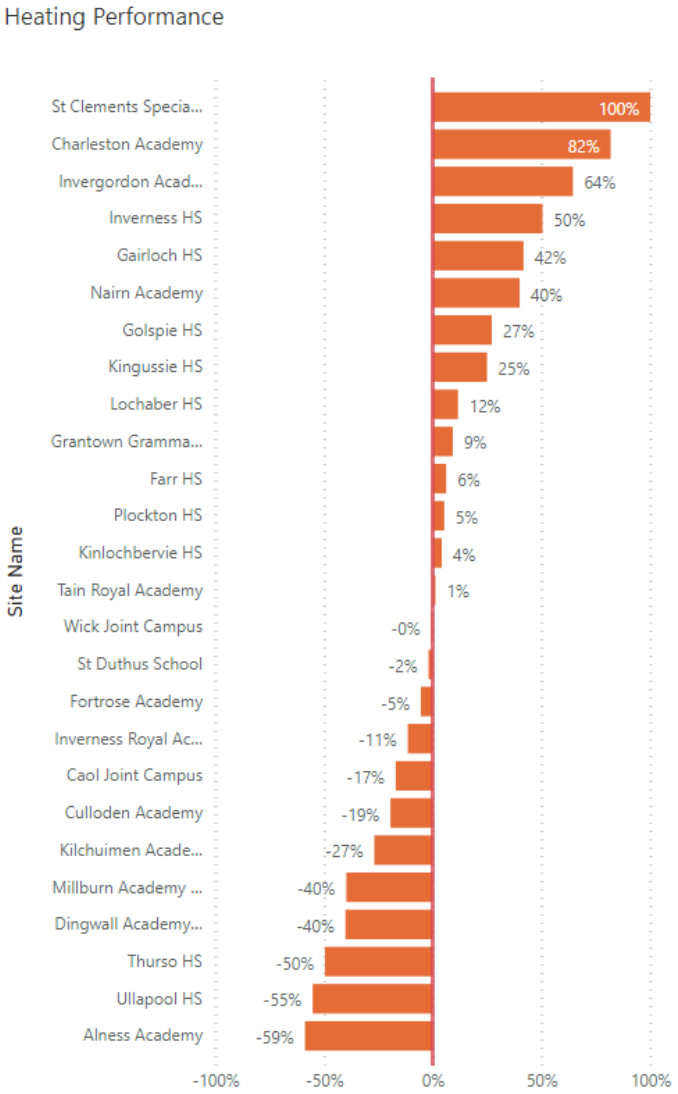
Good Performance

Ullapool HS & Alness Academy
- Modern build
- Solar PV present

Fortrose Academy
- Solar PV present

5.1.3 Heating

- 26 secondary schools collectively consume 35,680,700 kWh
- Secondary school accounts for 39% of all heating energy consumption
- 54% performed worse than benchmark
- 46% performed better then benchmark
- Inefficient aging boilers reduces performance
- Well-designed and controlled heating systems aids performance



Commentary

Poor Performance

St Clements Special School
- Old oil boilers
- Longer operating hours

Charleston Academy
- Operates out with school hours for community use.

Inverness Royal Academy
- Has poor insulation
- Ongoing issues with recently installed Biomass boiler

Gairloch HS
- Heating shared with primary school
- Heat loses from external pipework

Good Performance

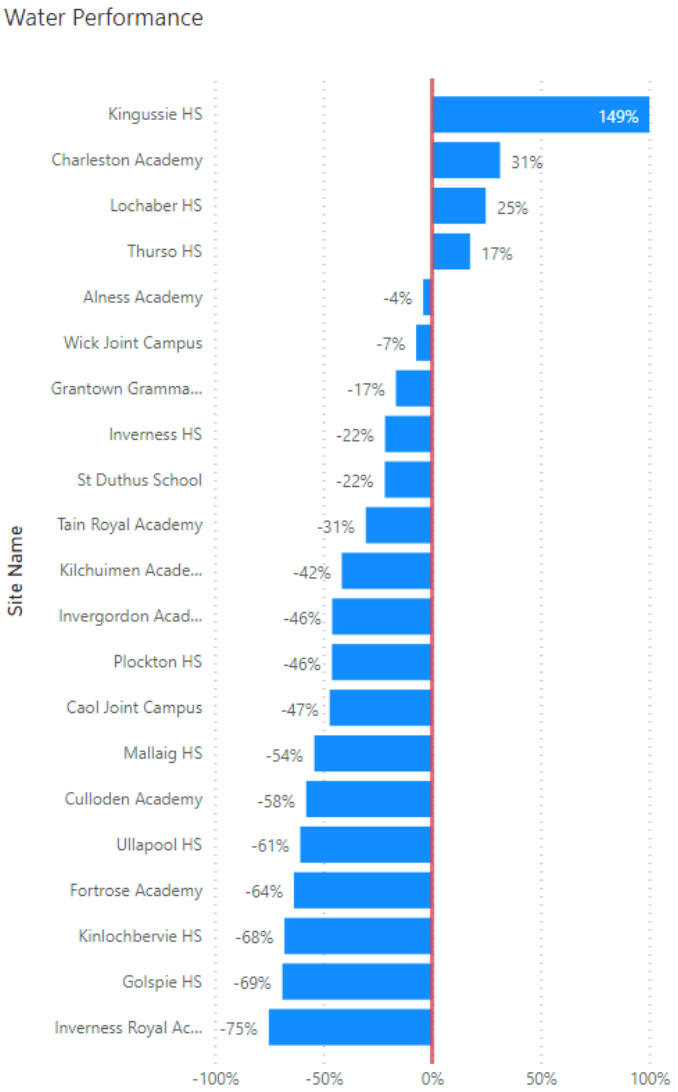
Kilchuimen Academy & Ullapool High school
- Good onsite management

Alness Academy
- New building

Figure 8 - Secondary school – Heating performance against benchmark

5.1.4 Water Performance

- 21 secondary schools consume a total of 96,610 m^3
- Secondary schools account for 21% of total water consumed
- 19% perform worse than benchmark
- 81% perform better then benchmark
- Secondary school which has poor performance compared to benchmark should be investigated



Commentary

Poor Performance

Kingussie HS
- Unknown issue, requires further investigation

Charleston Academy
- Community use

Good Performance

Figure 9 - Secondary school – Water performance against benchmark

5.1.5 Cost

- Total utility costs for the 32 secondary schools amounts to £4.95m
- Secondary schools accounts for 35% of total utility expenditure

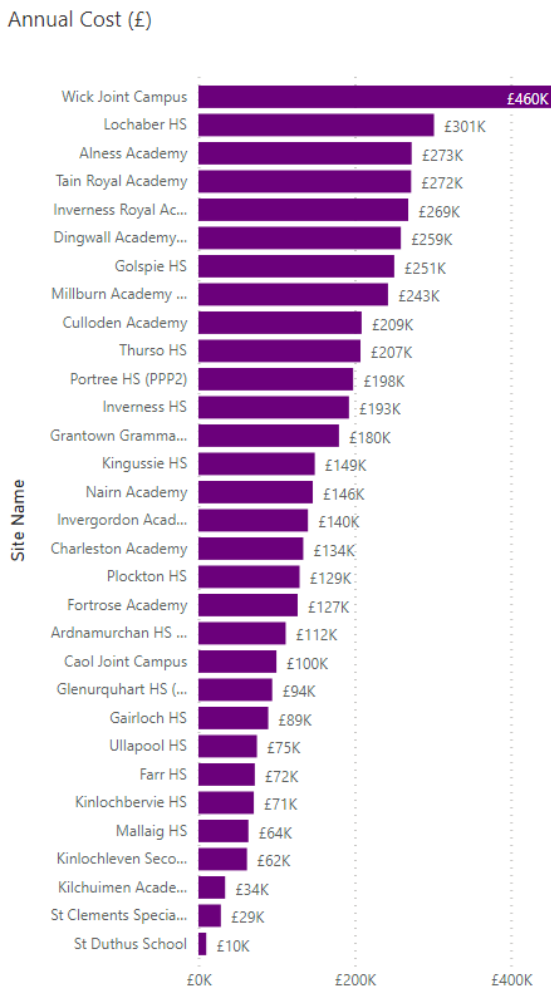


Figure 10 - Secondary school – Annual cost

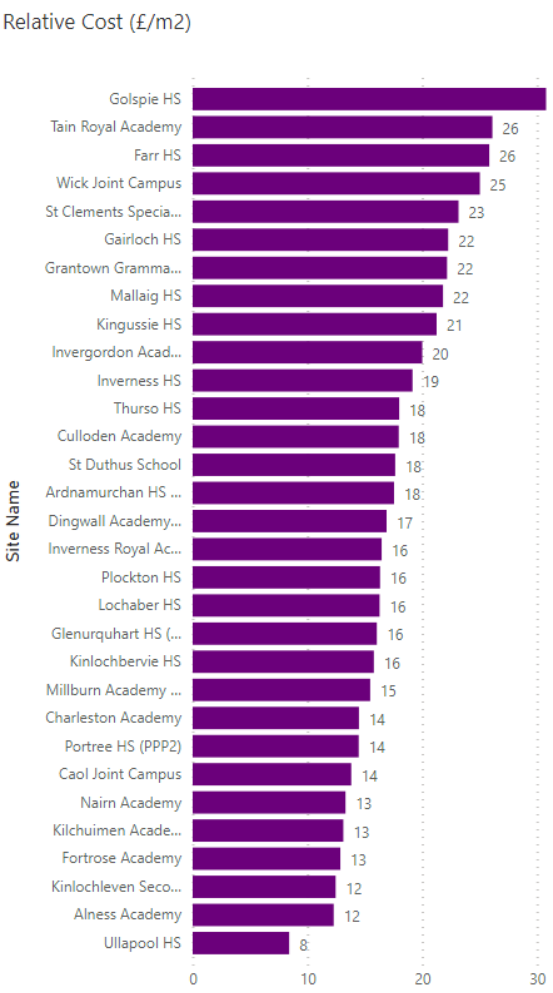


Figure 11 - Secondary school – Relative cost

Commentary

- The three most expensive school to operate in absolute terms are not the most expensive when evaluated in relative terms of £/m²
- The top 10 secondary schools pre annual cost. Except for Wick Joint Campus, Tain Royal Academy and Golspie HS have an operating cost below £16/m²
- Newer schools have lower operating costs
- The annual cost to run a secondary school doesn't directly reflect the size of the school size

5.2 Primary Schools

171 primary schools are included within the benchmarking assessment.

Note: Dornoch Academy & Primary has been attributed to the Primary School benchmark. This will be rectified in subsequent revisions of the analysis.

Benchmarked Criteria	Number evaluated
Carbon	151
Electricity	152
Heating	82
Water	111
Cost	171

Table 7 - Primary school benchmarked utilities

- The size and age of primary schools varies considerably
    - Floor areas range from 152m² to 8,768 m²

Primary Heating System	No off
Biomass boilers	48
Oil boilers	32
Gas boilers	23
LPG boilers	1
Electrically Heated	84

Table 8 - Primary school heating types

- 84 primary schools use more than one fossil fuel on site. Further investigation is required to determine the exact onsite application. However multiple fuel use is typically due to numerous heating systems, catering and/or science.
- 83 primary schools are assumed to be electrically heated

5.2.1 Carbon

- 151 Primary schools total 6,886 tCO_2e emissions
- Primary Schools account for 27% of total carbon emissions
- 26% performed worse than benchmark
- 74% performed better than benchmark

Site Name	CO_2 Performance
Struan PS	156%
Durness PS	155%
Kilmuir PS	112%
Kinlochewe PS	106%
Ferintosh PS	103%
Banavie PS	81%
Lochinver PS	74%
Plockton PS	72%
Auldearn PS	71%
St Joseph's RC PS	51%
Munlochy PS	42%
Glencoe PS	40%
Ullapool PS	37%
St Bride's PS	37%
Mulbuie PS	36%
Tarbat PS	34%
Daviot PS	33%
Edinbane PS	33%
Muirtown PS	28%
Tarradale PS	27%
Stratherrick PS	27%
Crossroads PS	26%
Inshes PS (PPP2)	21%
Craighill PS	20%
Dalneigh PS	19%
Marybank PS	18%
Strathconon PS	16%
Inverlochy PS	14%
Central PS	13%
Deshar PS	8%
Millbank PS	7%
Helmsdale PS	6%
Canisbay PS	6%
Crown PS	4%
Achiltibuie PS	4%
Cromarty PS	2%
Coulhill PS	2%
Lairg PS	0%
Ballachulish PS	0%
Teanassie PS	0%
Inver PS	0%
Smithton PS	-1%
Mallaig PS	-1%
Melvich PS	-1%
Gaelic PS Inverness	-3%
Loch Duich PS	-3%
Lochardil PS	-4%
Glenelg PS	-5%
Holm PS	-8%
Bower PS	-8%
Foyers PS	-8%
Drakies PS	-9%
Rogart PS	-9%
Cannich Bridge PS	-9%
Gledfield PS	-10%
Balnain PS	-11%
Knockbreck PS	-11%
Tomnacross PS	-12%
Carbost PS	-14%
Watten PS	-16%
Scourie PS	-16%
Tore PS	-16%
Cauldeen PS	-17%
Auchtertyre PS	-18%
Ardross PS	-18%
Mount Pleasant PS	-19%
Alvie PS	-19%
Cradlehall PS	-20%
Rosehall PS	-20%
Strathdearn PS	-21%
Poolewe PS	-21%
Bualnaluib PS	-22%
Beauly PS	-23%
Newmore PS	-23%
Duncan Forbes PS	-25%
Aldourie PS	-25%
Strathgarve PS	-25%
Dornoch Academy	-26%
Balloch PS	-26%
Dunvegan PS	-26%
Dunbeath PS	-26%
MacDiarmid PS	-27%
Lady Lovat PS	-27%
Abernethy PS	-28%
Kyleakin PS	-28%
Raigmore PS	-33%
Ardgour PS	-33%
Reay PS	-34%
Knockbreck PS	-35%
Invergarry PS	-35%
Elgol PS	-36%
Thrumster PS	-37%
Bishop Eden PS	-37%
Duror PS	-38%
Milton PS	-39%
Strathpeffer PS	-39%
Bonar Bridge PS	-42%
Staffin PS	-42%
Farr PS	-42%
Broadford PS	-43%
Shieldaig PS	-43%
Miller Academy PS	-44%
Kiltearn PS	-44%
Hill of Fearn PS	-44%
Pennyland PS	-45%
Lochcarron PS	-45%
Raasay PS	-46%
Hilton PS (Inv.)	-47%
Carrbridge PS	-48%
Keiss PS	-48%
Dochgarroch PS	-48%
Kingussie PS	-49%
Tongue PS	-50%
Lybster PS	-51%
Sleat PS	-51%
Kyle PS	-51%
Croy PS	-52%

South Lodge PS	-53%
Brora PS	-54%
Obsdale PS	-58%
Resolis PS (PPP2)	-58%
Inverie PS	-60%
Grantown PS	-61%
Glenurquhart PS	-61%
Golspie PS	-62%
Avoch PS	-62%
Cawdor PS (PPP2)	-62%
Ardersier PS	-63%
Kirkhill PS	-63%

Badcaul PS	-65%
Kinmylies PS	-66%
FW Gaelic School	-67%
Hilton PS (Inv.)	-68%
Edderton PS	-68%
Milton Of Leys PS	-70%
Lochaline PS	-70%
Portree PS	-71%
Rosebank PS	-72%
Ben Wyvis PS	-73%
Castletown PS	-75%
Eigg PS	-76%

Lundavra PS	-78%
Bridgend PS	-78%
Arisaig PS	-78%
North Kessock PS	-79%
Aviemore PS	-81%
Merkinch PS	-81%
Noss PS	-82%
Newtonmore PS	-84%
Dingwall PS	-85%
Gairloch PS	-89%

5.3.1 Electrical

- 152 Primary Schools total 14,759,284 kWh
- Primary Schools accounts for 32% of total electricity consumption
- 46% performed worse than benchmark
- 54% performed better then benchmark

Site Name	Electrical Performance
Struan PS	246%
Munlochy PS	229%
Kinlochewe PS	179%
Auchtertyre PS	177%
Beauly PS	152%
Plockton PS	133%
Kilmuir PS	121%
Milton PS	97%
Glencoe PS	90%
Bonar Bridge PS	88%
St Bride's PS	84%
Inshes PS (PPP2)	80%
Broadford PS	80%
Daviot PS	79%
Edinbane PS	79%
Stratherrick PS	71%
Crossroads PS	71%
Sleat PS	70%
Tarbat PS	69%
Tarradale PS	62%
Miller PS	61%
Marybank PS	59%
Strathconon PS	58%
Lochinver PS	57%
Staffin PS	56%
Carrbridge PS	54%
Deshar PS	46%
Canisbay PS	42%
Gaelic PS (Inv)	41%
Millbank PS	40%
Achiltibuie PS	40%
Kingussie PS	40%
Cromarty PS	37%
Teanassie PS	36%
Ballachulish PS	35%
Inver PS	33%
Auldearn PS	32%
Loch Duich PS	29%
Ullapool PS	27%
Glenelg PS	26%
Foyers PS	25%
Bower PS	24%
Rogart PS	24%
Ferintosh PS	22%
St Joseph's RC PS	22%
Cannich Bridge PS	21%
Gledfield PS	20%
Balnain PS	20%
Tomnacross PS	19%
Knockbreck PS	17%
Golspie PS	17%
Carbost PS	15%
Scourie PS	14%
Obsdale PS	14%
Watten PS	13%
Tore PS	13%
Ardross PS	12%
Grantown PS	12%
Mallaig PS	10%
Ardersier PS	10%
Rosehall PS	8%
Alvie PS	7%
Strathdearn PS	7%
Poolewe PS	6%
Bualnaluib PS	5%
Lochardil PS	4%
Newmore PS	4%
Strathgarve PS	1%
Croy PS	1%
Kirkhill PS	1%
Drakies PS	0%
Dunvegan PS	0%
Aldourie PS	-1%
Dunbeath PS	-1%
Lady Lovat PS	-1%
MacDiarmid PS	-2%
Kyleakin PS	-3%
Lochcarron PS	-4%
FW Gaelic School	-4%
Ardgour PS	-9%
Lochaline PS	-9%
Portree PS	-9%
Reay PS	-11%
Invergarry PS	-11%
Knockbreck PS	-13%
Elgol PS	-13%
Milton Of Leys PS	-14%
Muirtown PS	-15%
Bishop Eden PS	-15%
Inverlochy PS	-16%
Craighill PS	-17%
Dornoch Academy	-17%
Kilchoan PS	-17%
Thrumster PS	-18%
Strathpeffer PS	-18%
Glenurquhart PS	-18%
Mulbuie PS	-20%
Duror PS	-20%
Ben Wyvis PS	-20%
Eigg PS	-21%
Farr PS	-22%
Duncan Forbes PS	-23%
Shieldaig PS	-24%
Hill of Fearn PS	-25%
Pennyland PS	-25%
Rosebank PS	-26%
Raasay PS	-30%
Dochgarroch PS	-30%
Keiss PS	-31%
Kinmylies PS	-32%
Hilton PS (Inv.)	-33%
Tongue PS	-33%
Kyle PS	-33%
Abernethy PS	-34%
Central PS	-35%

Raigmore PS	-35%
Hilton of Cadboll PS	-36%
Lairg PS	-37%
Brora PS	-37%
Lundavra PS	-39%
North Kessock PS	-39%
Kiltearn PS	-40%
Dalneigh PS	-41%
Coulhill PS	-41%
South Lodge PS	-41%
Mount Pleasant PS	-42%
Lybster PS	-43%
Resolis PS (PPP2)	-43%

Bridgend PS	-44%
Edderton PS	-45%
Inverie PS	-46%
Cauldeen PS	-47%
Melvich PS	-48%
Aviemore PS	-48%
Cawdor PS (PPP2)	-49%
Smithton PS	-50%
Castletown PS	-50%
Arisaig PS	-50%
Merkinch PS	-51%
Crown PS	-52%
Badcaul PS	-53%

Noss PS	-53%
Portree Gaelic School	-57%
Balloch PS	-57%
Banavie PS	-58%
Durness PS	-60%
Dingwall PS	-63%
Acharacle PS	-64%
Cradlehall PS	-65%
Achfary PS	-69%
Applecross PS	-70%
Helmsdale PS	-71%

5.3.2 Heating

- 81 Primary Schools total 25,837,966 kWh of heat consumption
- Primary Schools account for 28% of total heating
- 52% performed worse than benchmark
- 28% performed better then benchmark

Site Name	Heating Performance
Edderton PS	175%
Durness PS	132%
Staffin PS	114%
Kingussie PS	89%
Auldearn PS	88%
Castletown PS	67%
Ferintosh PS	62%
St Joseph's RC PS	62%
Banavie PS	61%
Carrbridge PS	59%
Obsdale PS	59%
Abernethy PS	50%
Muirtown PS	46%
Kilmuir PS	45%
Kirkhill PS	44%
Gairloch PS	44%
Dalneigh PS	43%
Arisaig PS	39%
Central PS	33%
Lairg PS	32%
Inverlochy PS	29%
Crown PS	27%
Lochinver PS	24%
Holm PS	21%
Lybster PS	21%

Coulhill PS	20%
Bonar Bridge PS	19%
Smithton PS	18%
Glenurquhart PS	14%
Croy PS	13%
Rosebank PS	11%
Beauly PS	9%
Auchtertyre PS	8%
Mulbuie PS	8%
Milton Of Leys PS	7%
FW Gaelic School	6%
Kiltearn PS	6%
Ardersier PS	3%
Broadford PS	2%
Hilton PS (Inv.)	2%
Inshes PS (PPP2)	1%
South Lodge PS	1%
Ullapool PS	-2%
Cradlehall PS	-2%
Milton PS	-5%
Bridgend PS	-5%
Cauldeen PS	-5%
Grantown PS	-7%
Craighill PS	-7%
Hilton Cadboll PS	-7%
Helmsdale PS	-7%
Golspie PS	-8%
Drakies PS	-10%

Lochcarron PS	-13%
Lundavra PS	-13%
Mallaig PS	-14%
Portree Gaelic Sch	-14%
Balloch PS	-14%
Tarbat PS	-17%
Gaelic PS Inverness	-18%
Melvich PS	-19%
Lochaline PS	-20%
Tarradale PS	-21%
Noss PS	-21%
Ben Wyvis PS	-23%
Avoch PS	-23%
Duncan Forbes PS	-25%
Dingwall PS	-26%
Kilchoan PS	-27%
Merkinch PS	-30%
Millbank PS	-31%
North Kessock PS	-31%
Raigmore PS	-32%
Aviemore PS	-33%
Lochardil PS	-36%
Portree PS	-36%
Mount Pleasant PS	-38%
Miller Academy PS	-40%
Munlochy PS	-50%
Eigg PS	-51%
Sleat PS	-53%

5.3.3 Water

- 111 Primary Schools total 146,627m^3
- Primary Schools account for 32% of water consumed
- 30% performed worse than benchmark
- 70% performed better then benchmark

Site Name	Water Performance
Croy PS	1442%
Hilton PS (Inv.)	335%
Duror PS	251%
Thrumster PS	183%
Raasay PS	162%
Knockbreck PS	141%
Holm PS	138%
Alvie PS	126%
Avoch PS	124%
St Joseph's RC PS	121%
Staffin PS	115%
Glenelg PS	113%
Beauly PS	106%
Inver PS	103%
Lybster PS	102%
Cannich Bridge PS	99%
Broadford PS	77%
Loch Duich PS	70%
Aldourie PS	62%
Lochcarron PS	57%
Applecross PS	52%
Gledfield PS	47%
Dalneigh PS	39%
Raigmore PS	29%
Shieldaig PS	27%
St Bride's PS	19%
Keiss PS	19%
Millbank PS	13%
Kingussie PS	11%
Cradlehall PS	11%
Hilton of Cadboll PS	9%
Tarbat PS	6%
Gairloch PS	2%
Newtonmore PS	-1%
Obsdale PS	-4%
Lochinver PS	-4%

Munlochy PS	-8%
Carbost PS	-9%
Kirkhill PS	-10%
Dunvegan PS	-11%
Muirtown PS	-12%
Kilmuir PS	-14%
Mulbuie PS	-14%
Deshar PS	-15%
Ardersier PS	-17%
Auldearn PS	-18%
Balnain PS	-18%
FW Gaelic School	-20%
Inverlochy PS	-23%
Daviot PS	-25%
Edinbane PS	-26%
Watten PS	-26%
Noss PS	-28%
Grantown PS	-29%
Canisbay PS	-31%
Balloch PS	-31%
Mallaig PS	-33%
Farr PS	-36%
Hill of Fearn PS	-37%
Ben Wyvis PS	-38%
Bridgend PS	-39%
Kiltearn PS	-40%
Cromarty PS	-43%
Foyers PS	-43%
Badcaul PS	-43%
Struan PS	-45%
Central PS	-45%
Dunbeath PS	-46%
Milton PS	-46%
Castletown PS	-47%
South Lodge PS	-47%
Pennyland PS	-50%
Kinmylies PS	-50%
Achiltibuie PS	-51%

Rosebank PS	-51%
Craighill PS	-51%
Stratherrick PS	-52%
North Kessock PS	-53%
Lochardil PS	-53%
Portree PS	-53%
Kyleakin PS	-55%
Aviemore PS	-55%
Glenurquhart PS	-56%
Kilchoan PS	-56%
Smithton PS	-57%
Newmore PS	-58%
Tongue PS	-58%
Tarradale PS	-58%
Drakies PS	-60%
Cauldeen PS	-61%
Strathpeffer PS	-62%
Dingwall PS	-63%
Poolewe PS	-64%
Abernethy PS	-65%
Ullapool PS	-65%
Dochgarroch PS	-65%
Banavie PS	-67%
Knockbreck PS	-68%
Melvich PS	-68%
Mount Pleasant PS	-68%
Sleat PS	-69%
Marybank PS	-70%
Plockton PS	-72%
Ballachulish PS	-72%
Ardgour PS	-72%
Merkinch PS	-73%
Strontian PS	-73%
Bonar Bridge PS	-74%
Bualnaluib PS	-74%
Lochaline PS	-74%
Bishop Eden PS	-75%

5.3.4 Cost

- The total cost to operate 171 Primary School within the Highland Council is £4.45m
- The following graphic has been limited to the top 30 sites to assist readability

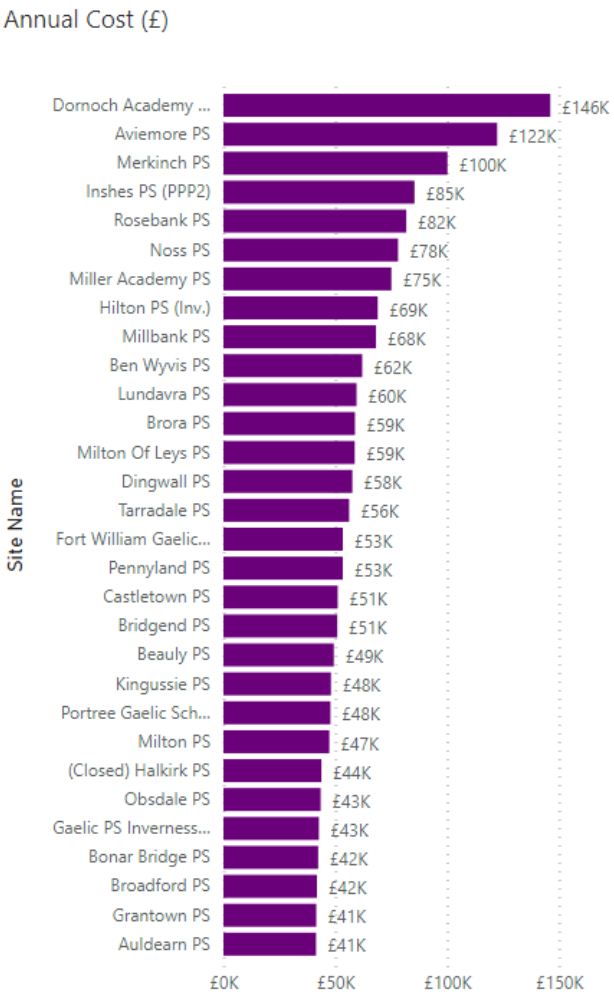


Figure 12 - Primary schools top 30 – Annual cost (£)

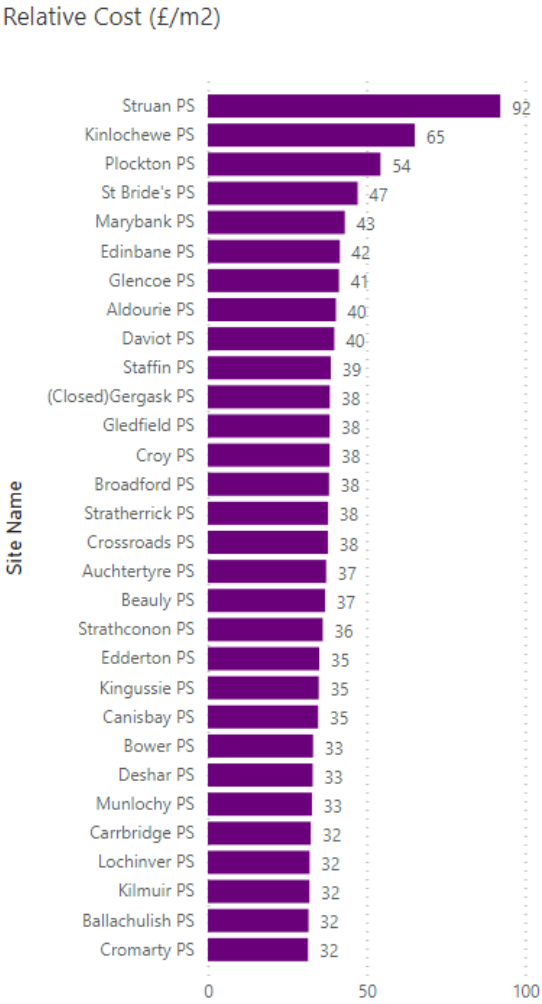


Figure 13 - Primary schools top 30 - relative cost (£/m2)

Commentary

- Primary Schools account for 32% of the estate's total annual costs
- Has been noted that Dornoch Academy & Primary has been incorrectly attributed to the Primary school benchmark. This will be rectified in subsequent revisions of the analysis
- Only 3 out of the 30 worse relative cost performers also appear in the 30 worst annual cost performers. (Beauly PS, Kingussie PS and Broadford PS)
- Gerkask Primary is classed as non-operational however it is still consuming electricity and costing approximately £10k annually

5.4 Sport & Leisure

35 Sport & Leisure facilities are included within the benchmarking assessment.

Benchmarked Criteria	Benchmarked
Carbon	13
Electricity	20
Heating	11
Water	12
Cost	35

Table 9 - Sport facilities benchmarked criteria

- Sport & Leisure facilities comprise building types which have significant variances in expected energy intensities, e.g., swimming pools are the most energy intensive buildings within the THC/HLH property portfolio.

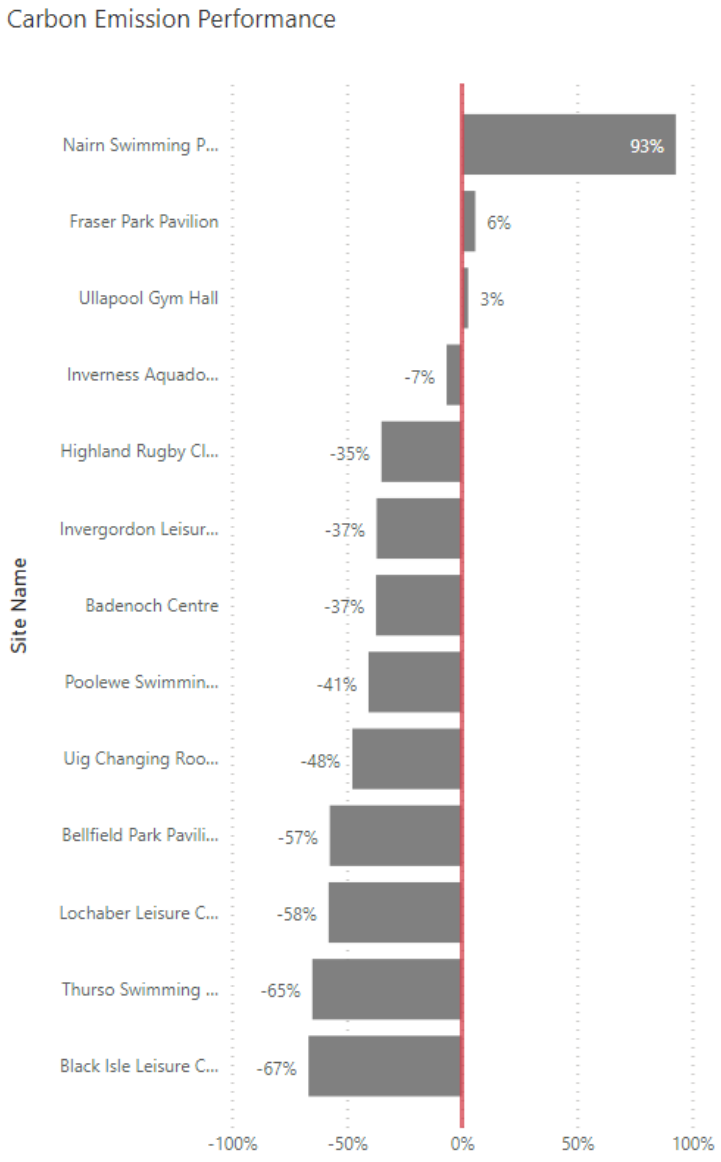
		Criteria				
	No Off	Carbon (tCO_2e)	Electricity (kWh)	Heat (kWh)	Water (m^3)	Annual Cost
Swimming Pool	10	2,630	2,675,035	12,742,374	60,147	£1,019,891
Sports Centre	4	130	295,679	896,518	2,106	£125,370
Pavilions	12	24	77,930	42,841	392	£18,385
Other	9	62	213,504	86,428	1,584	£44,087

Table 10 - Sport & leisure types

- 10 dedicated pools are operated and managed by High Life Highland (HLH)
- A further 6 secondary schools have pools but due to lack of sub-metering the relative efficiencies of these facilities could not be benchmarked.

5.4.1 Carbon

- 13 sports facilities total 3,343 tCO_2e
- Sports facilities accounts for 13% of total carbon emissions
- 23% performed worse than benchmark
- 77% performed better than benchmark
- Using Biomass heating in buildings reduces CO_2 against the benchmark
- Oil heated premises have higher CO_2 emissions then other heating solutions



Commentary

Poor Performance

Nairn Swimming Pool
- Oil Heated

Good Performance

Uig Changing Rooms
- Electrical Heated

Bellfield Park Pavilion
- Electrical Heated

Lochaber Leisure Centre
- Biomass & Oil Heated

Thurso Swimming Pool
- Biomass & Oil Heated

Black Isle Leisure Centre
- Biomass & Oil Heated

Figure 14 - Sport facilities – Carbon emission against benchmark

5.4.2 Electrical

- 20 sports facilities total 3,262,146 kWh
- Sports facilities accounts for 7% of total electricity
- 25% performed worse than benchmark
- 75% performed better then benchmark

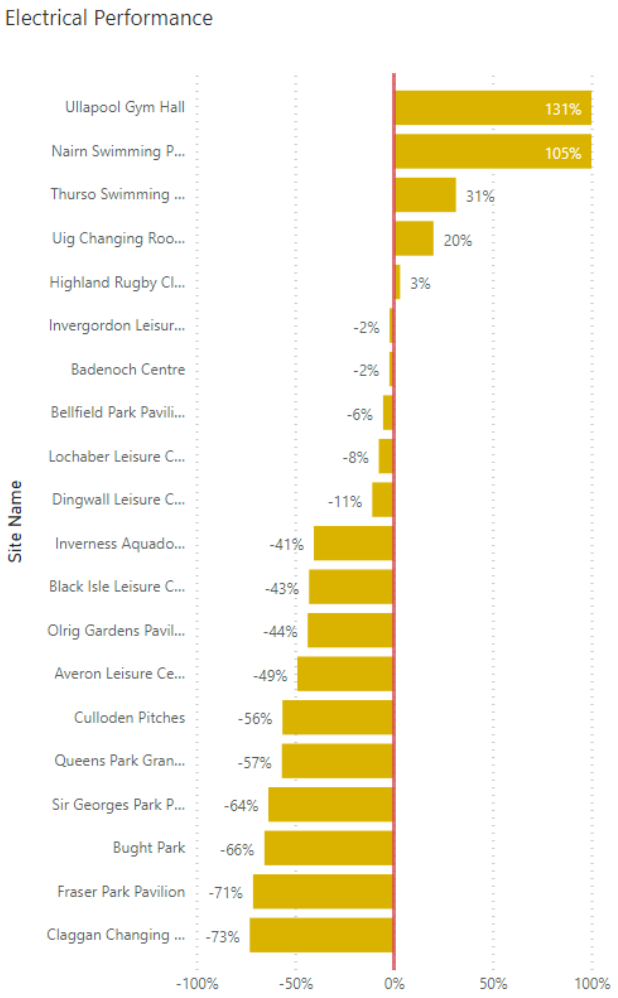


Figure 15 - Sport facilities – Electrical performance against benchmark

Commentary

Poor Performance

Ullapool Gym Hall
- Electrical heated

Nairn Swimming Pool
- Oil heated

Thurso Swimming Pool
- Biomass & Oil Heated

Highland Rugby Club
- Gas heated

Good Performance

Claggan Changing Rooms and Pavilion
- ASHP heated

5.4.3 Heating

- 11 sport facilities total 13,768,159 kWh
- Sport facilities accounts for 15% of total heating
- 55% performed worse than benchmark
- 45% performed better then benchmark

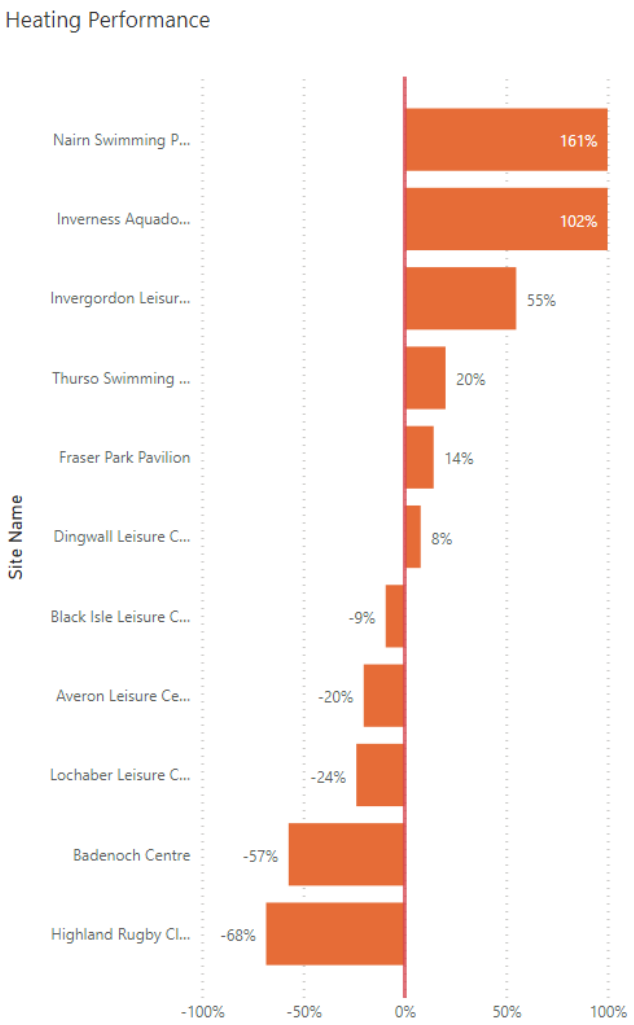


Figure 16 - Sport facilities – Heating performance against benchmark

Commentary

Poor Performance

Nairn Swimming Pool
- Oil Heated

Inverness Aquadome & Sport Centre
- Gas Heated

Invergordon Leisure
- Biomass & Oil Heated

Thurso Swimming Pool
- Biomass & Oil Heated

Dingwall Leisure Centre & Swimming Pool
- Biomass & Oil Heated

Good Performance

Black Isle Leisure Centre
- Biomass & Oil heated

Averon Leisure Centre and Library

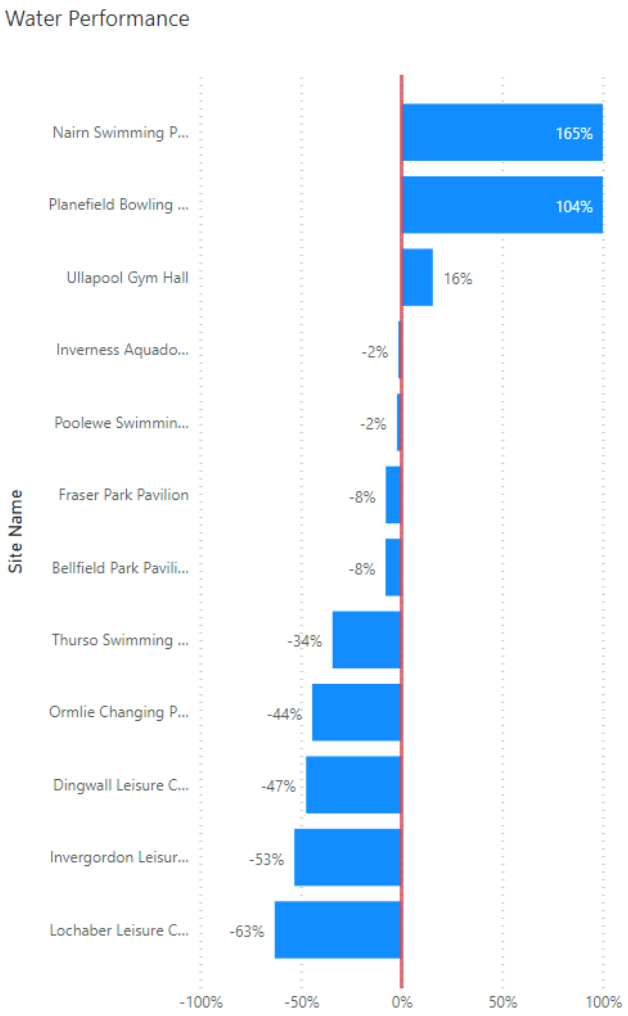
Lochaber Leisure Centre
- Biomass & Oil heated

Badenoch Centre
- Oil heated

Highland Rugby Club
- Gas heated

5.4.4 Water

- 12 sports facilities total 58,131m^3
- Sports facilities accounts for 13% of water consumed
- 25% performed worse than benchmark
- 75% performed better then benchmark



Commentary

Poor Performance

Good Performance

Figure 17 - Sport facilities – Water performance against benchmark

5.4.5 Cost

- The total cost to operate the 35 sports facilities within the Highland Council is £1.22m

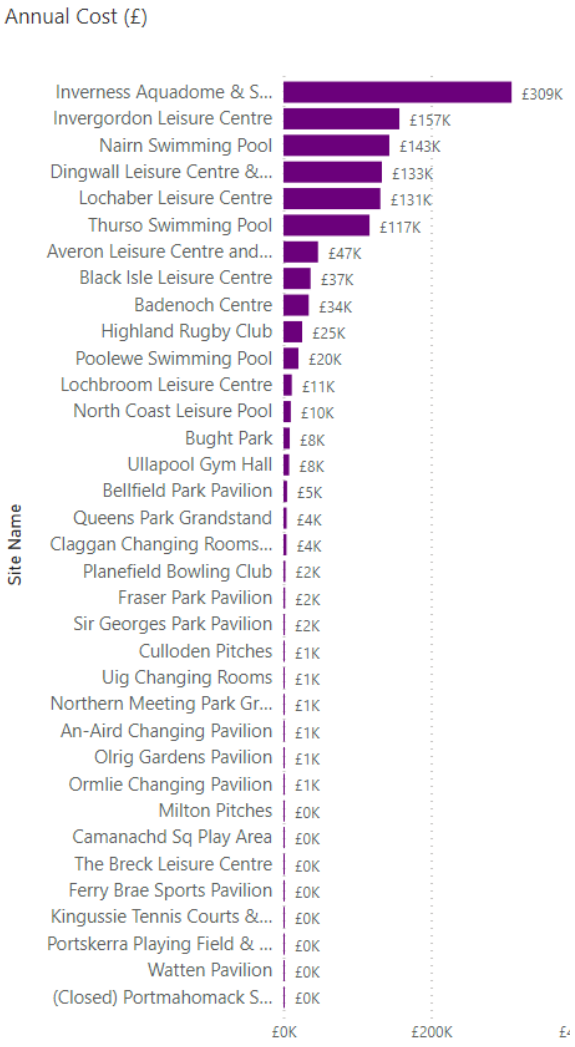


Figure 18 - Sport facilities – Annual cost

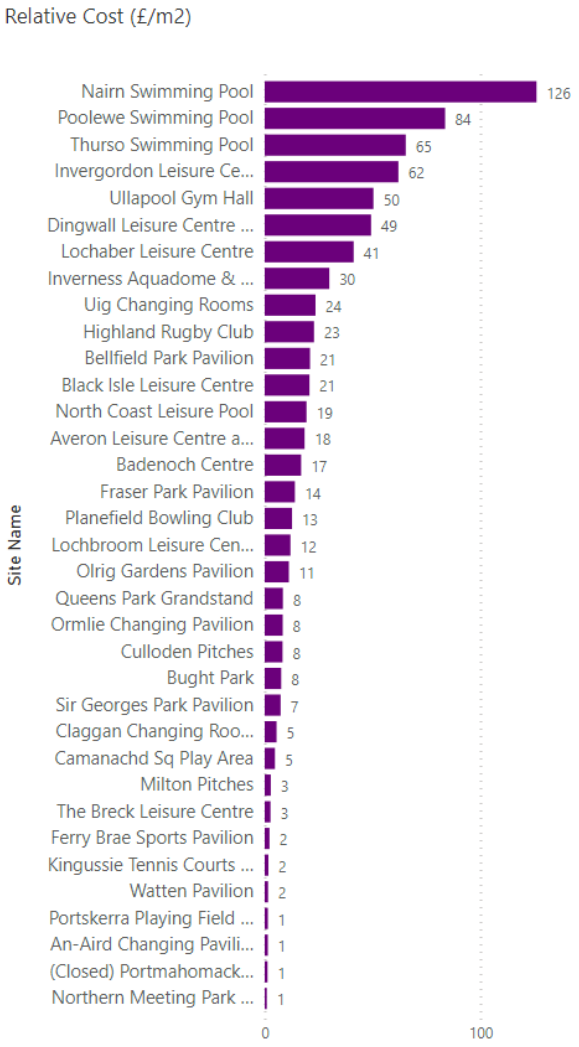


Figure 19 - Sport facilities – Relative Cost

Commentary

- Sports facilities accounts for 9% of total money spent.
- Inverness Aquadrome has the highest annual cost almost double the amount of Nairn Swimming Pool which has the highest running cost per m²

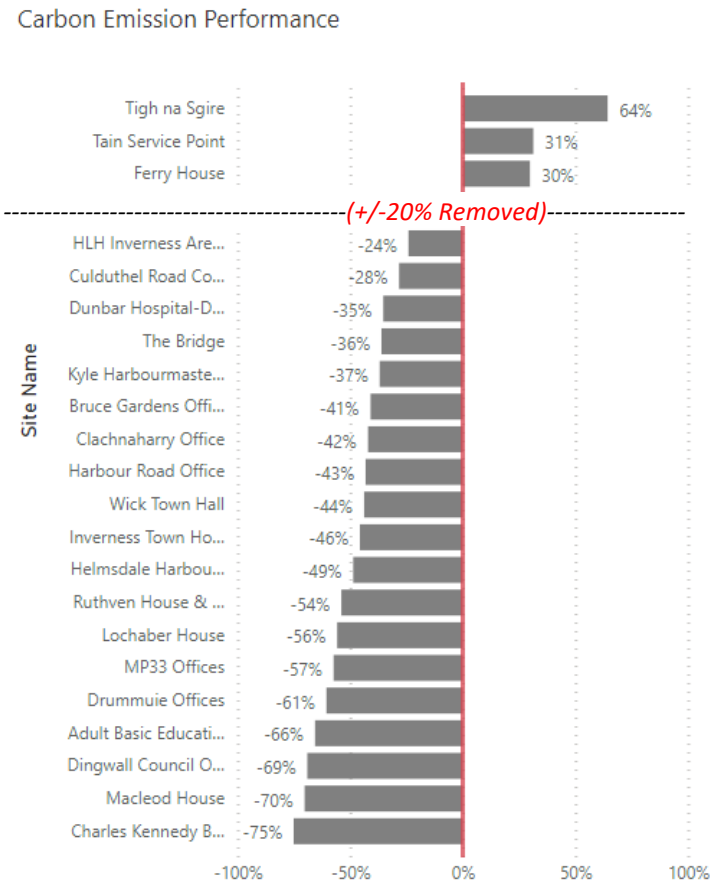
5.5 Offices

There are 41 Offices in The Highland Council estate. The following number of offices have been benchmarked against each Criteria.

Benchmarked Criteria	Number evaluated
Carbon	37
Electricity	41
Heating	14
Water	26
Cost	51

5.5.1 Carbon

- 37 offices total 1,431 tCO_2e emissions
- Offices account for 12% of total carbon emissions
- 34% performed worse than benchmark
- 66% performed better than benchmark
- Biomass heated buildings perform better against the benchmark
- Oil heated premises have higher CO_2 emissions then other heating solutions



Commentary

Poor Performance

Tigh na Sgire
- Old inefficient oil boilers

Tain Service Point & Ferry House
- Electrically heated

Good Performance

Charles Kennedy Building
- Biomass Boilers

Figure 20 - Offices – CO2 emissions against typical (+/-20% removed for clarity)

5.5.2 Electrical

- 41 Offices total 2,849,809 kWh
- Offices accounts for 32% of total electricity consumption
- 34% performed worse than benchmark
- 66% performed better then benchmark
- 19 of the 20 worst performed offices are electrically heated

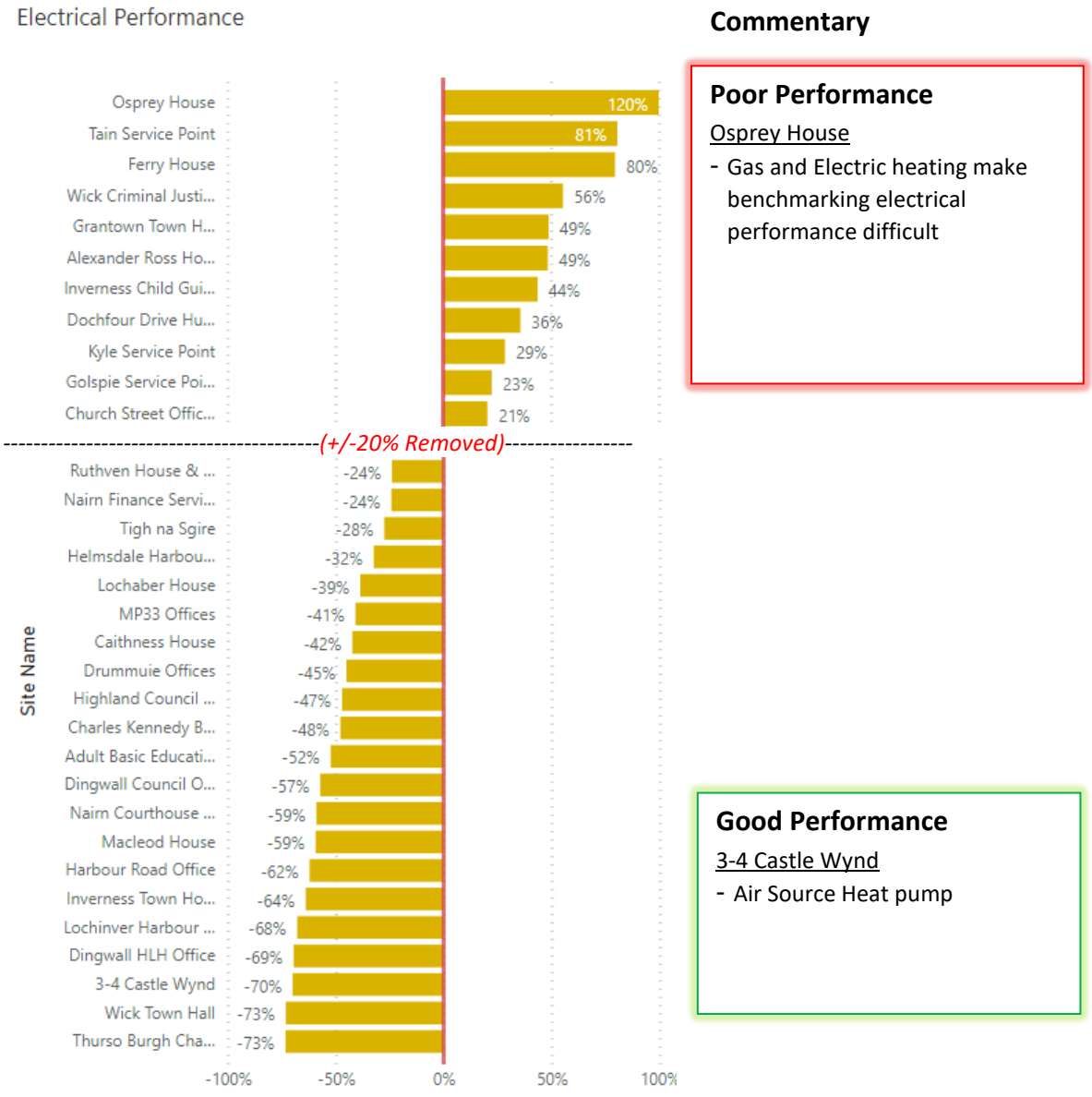
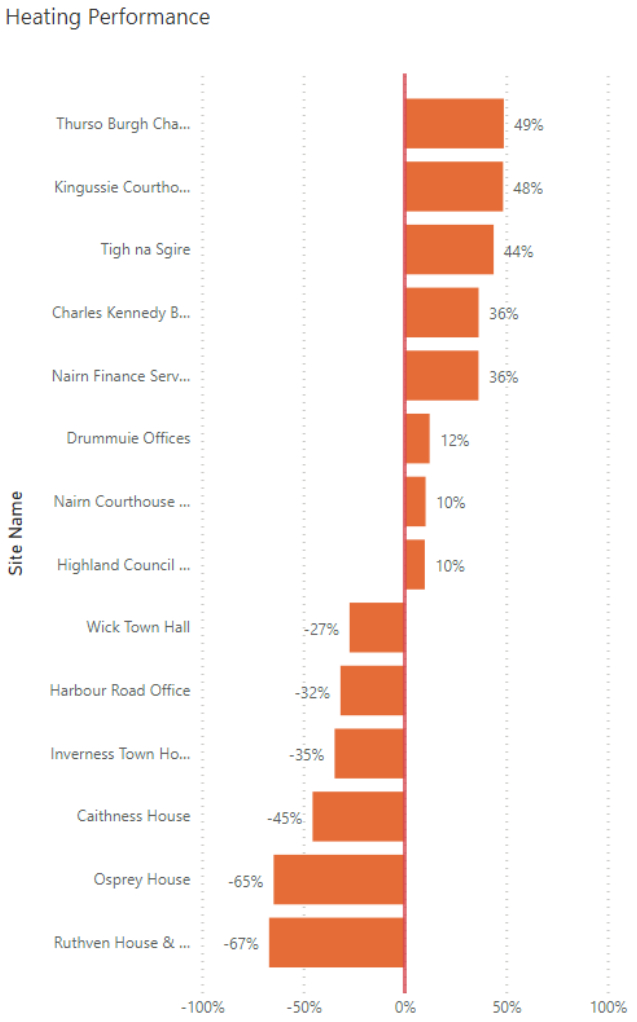


Figure 21 - Offices – Electrical performance against typical (+/-20% removed for clarity)

5.5.3 Heating

- 14 Offices total 4,361,790 kWh of heat consumption
- Offices accounts for 5% of total heating
- 57% performed worse than benchmark
- 43% performed better then benchmark



Commentary

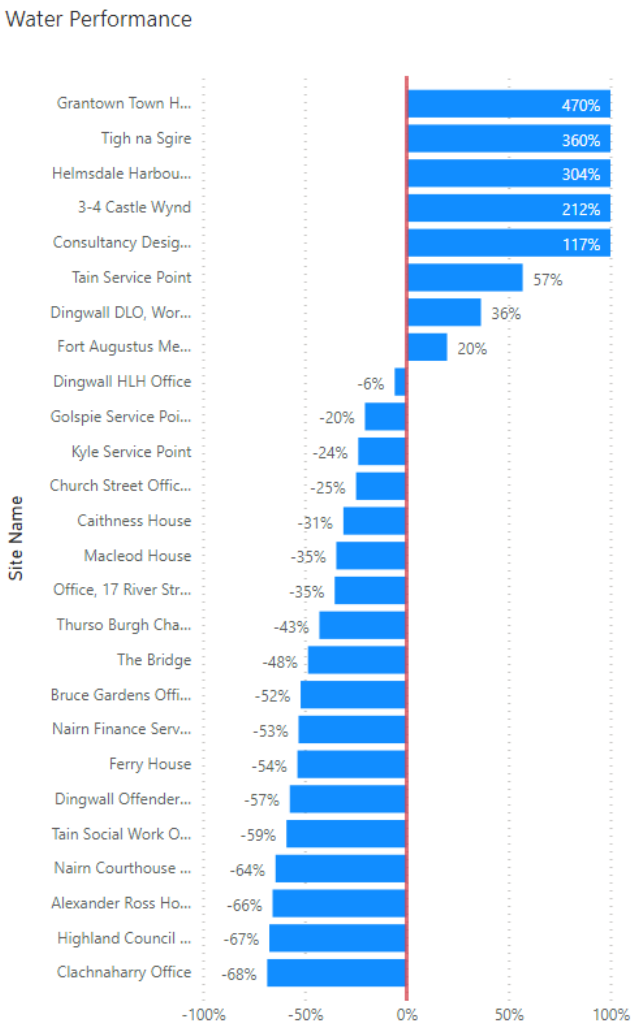
Poor Performance

Good Performance

Figure 22 - Offices – Heating performance against benchmark

5.5.4 Water

- 26 offices consume a total of 16,622 m^3
- Offices account for 4% of water consumed
- 30% performed worse than benchmark
- 70% performed better then benchmark



Commentary

Poor Performance

Good Performance

Figure 23 - Offices – Water performance against benchmark

5.5.5 Cost

- Offices account for 5% of the estates' total annual costs
- The combined cost to operate the 51 Offices within the property portfolio is £732k

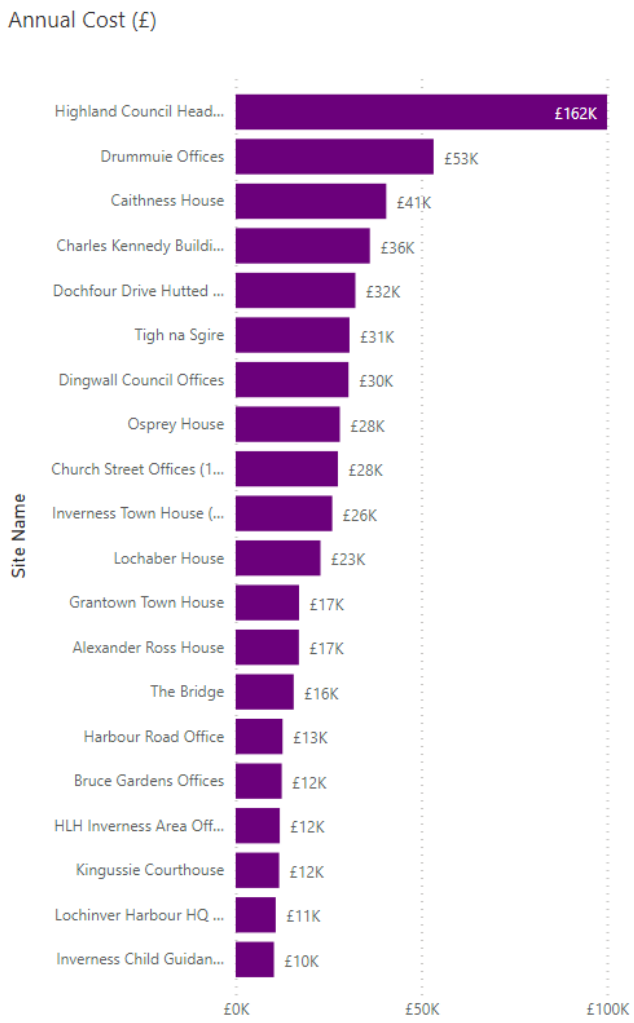


Figure 24 - Offices – Top 20 annual cost

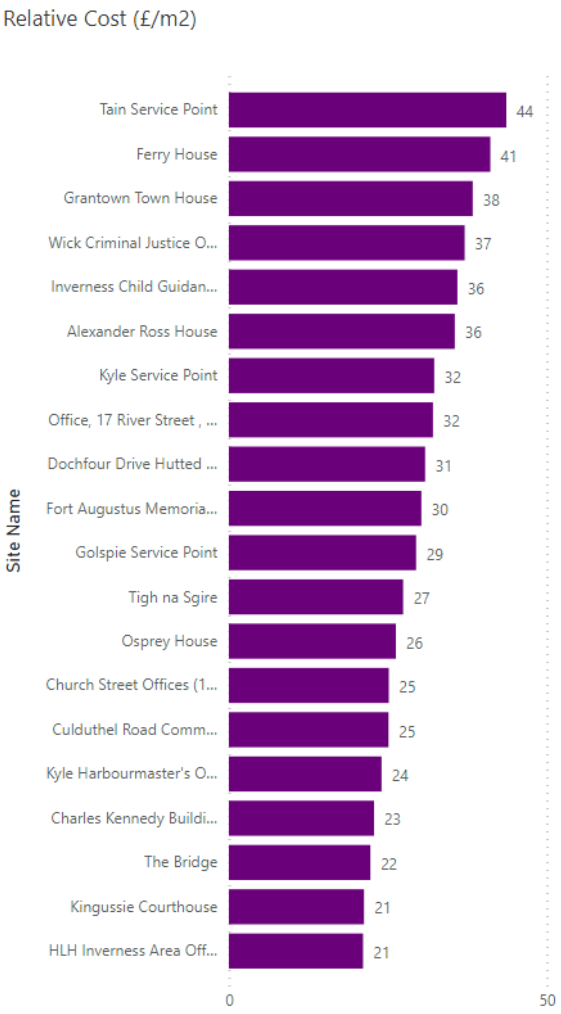


Figure 25 - Offices – Relative Cost

Commentary

- Highland Council HQ has the highest annual cost however it is 34th out of 51 Offices in terms of relative cost (£/m2)
- 22 out of the 30 worst relative cost performers also appear in the 30 worst annual cost performers

5.6 Residential Homes

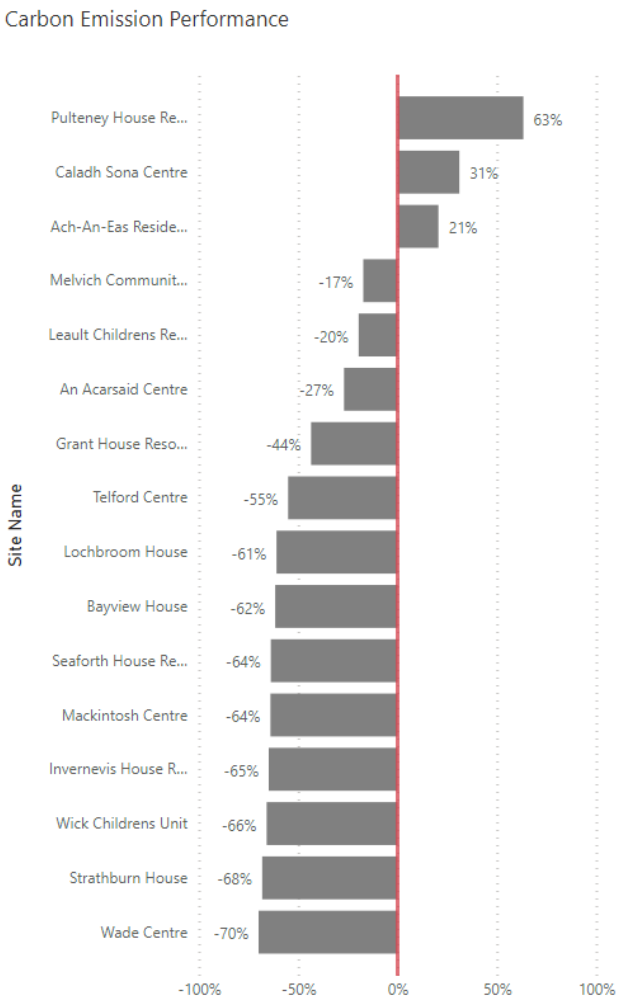
There are 21 Residential Homes in the THC estate.

Benchmarked Criteria	Number evaluated
Carbon	16
Electricity	17
Heating	10
Water	14
Cost	21

Table 11 - Residential homes benchmarked utilities

5.6.1 Carbon

- 16 Residential Homes account for 770 tCO_2e
- Residential Homes accounts for 3% of total carbon emissions
- 19% performed worse than benchmark
- 81% performed better than benchmark



Commentary

Poor Performance

Good Performance

Invernevis House Resource Centre & Wick Children's Unit

- Biomass

Figure 26 - Residential homes – Carbon emission against benchmark

5.6.2 Electrical

- 17 Residential homes total 1,908,721 kWh
- Residential Homes accounts for 4% of total electricity
- 47% performed worse than benchmark
- 53% performed better then benchmark

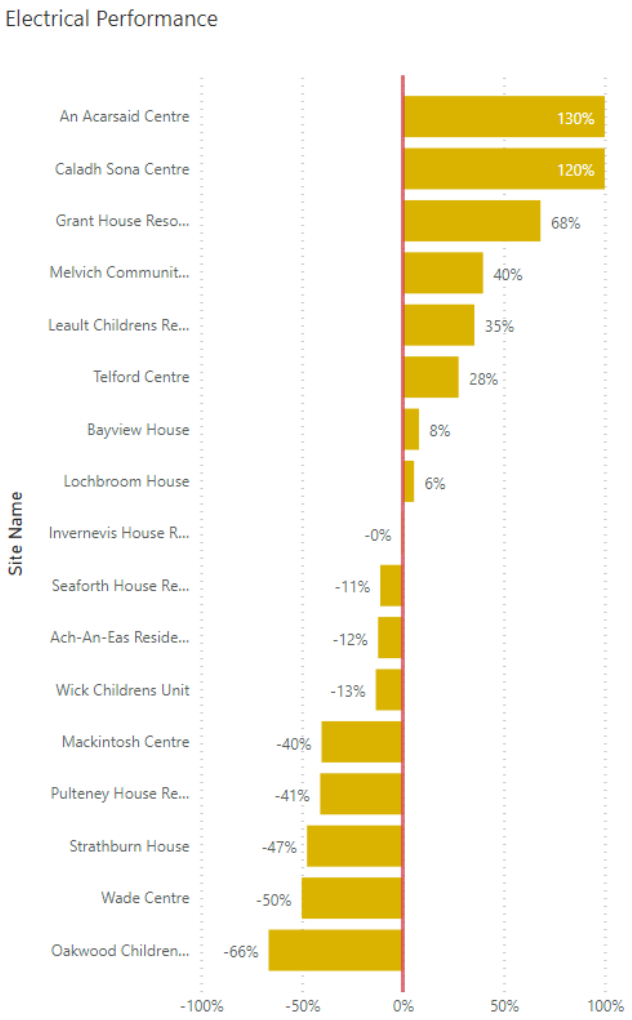


Figure 27 - Residential homes – Electrical performance against benchmark

Commentary

Poor Performance

Good Performance

Mackintosh Centre

- Solar PV present

5.6.3 Heating

- 10 Residential homes total 3,699,314 kWh
- Residential homes accounts for 4% of total heating
- 50% performed worse than benchmark
- 50% performed better then benchmark

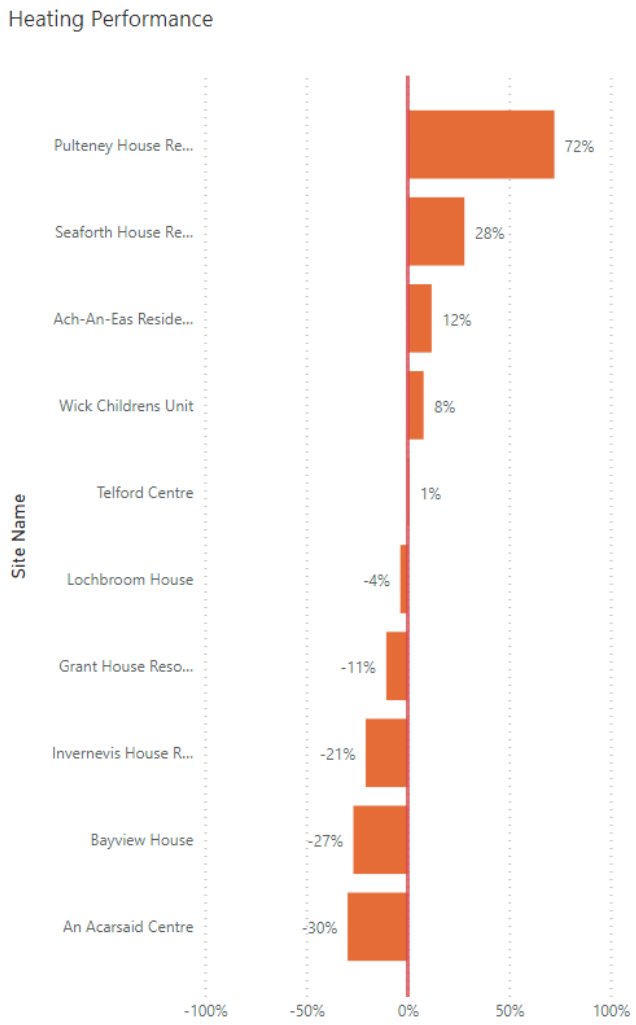


Figure 28 - Residential homes – Heating performance against benchmark

Commentary

Poor Performance

Pulteney House Resource Centre
- Gas Heated

Seaforth house Res
- Biomass

Ach-An-Eas Residential Home
- Gas Heated

Wick Children Unit
- Biomass

Good Performance

Grant House Resource Centre
- Biomass heating

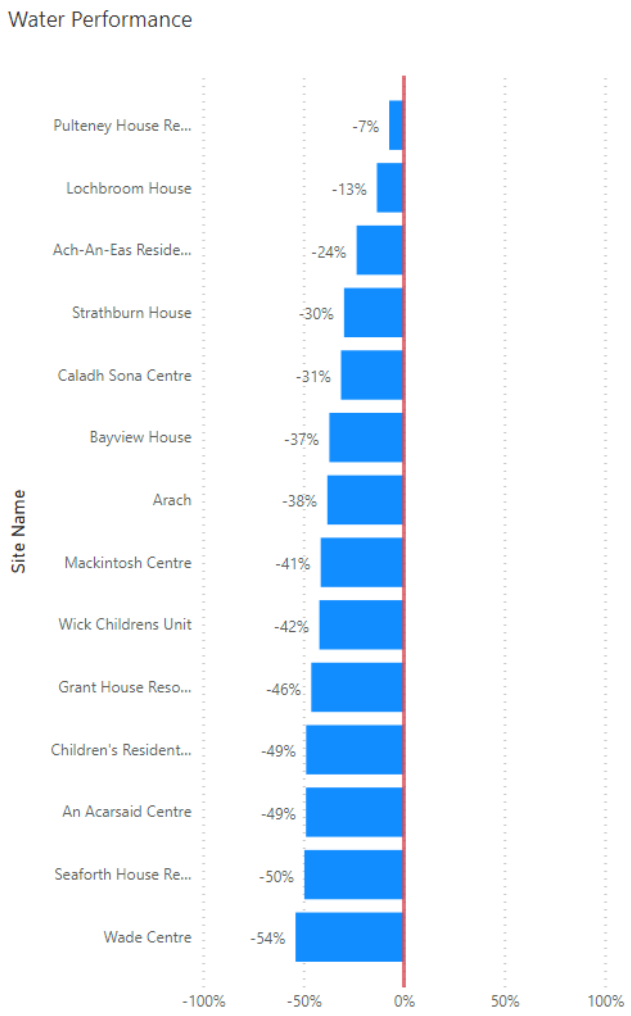
Invernevis House Resource Centre
- Biomass heating

Bayview House
- Biomass Heating

An Acarsaid Centre
- Biomass Heated

5.6.4 Water

- 14 Residential homes total 16,499m^3
- Residential homes accounts for 4% of water consumed
- 100% performed better then benchmark
- All residential homes performed better than typical with respect to water



Commentary

Poor Performance

Good Performance

Figure 29 - Residential homes – Water performance against benchmark

5.6.5 Cost

- The total cost to operate the 21 Residential Homes is £566k
- Residential Homes account for 4% of total expenditure

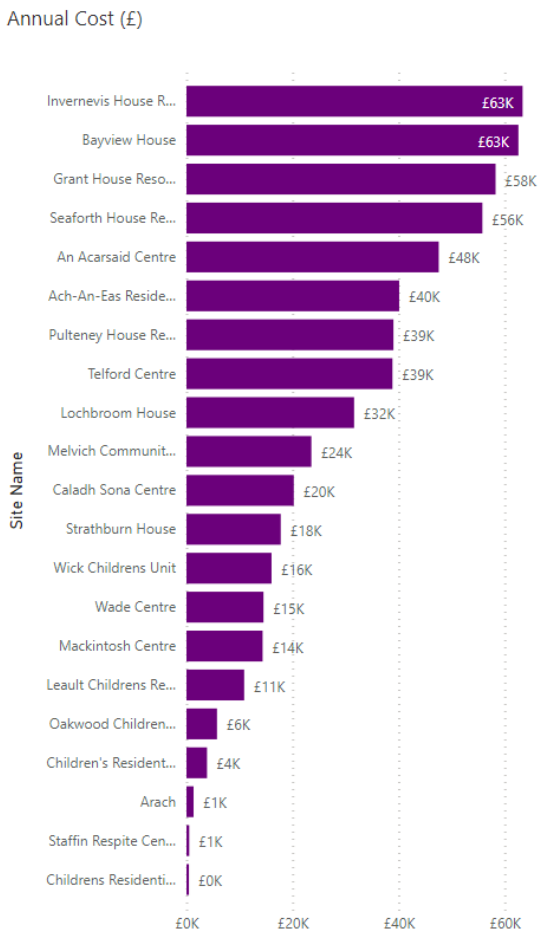


Figure 30 - Residential homes – Annual cost

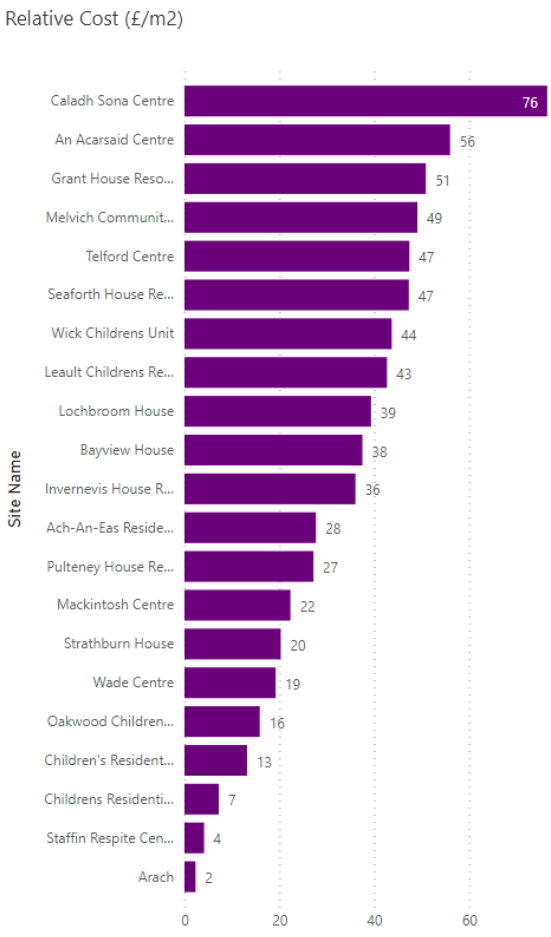


Figure 31 - Residential homes – Relative Cost

5.7 Other

This section captures smaller impacting property groups and contains a more limited analysis.

The following table summarises property type group totals for each benchmark criteria.

	Criteria					
	No Off	Carbon (tCO_2e)	Electricity (kWh)	Heat (kWh)	Water (m^3)	Annual Cost
Depots	39	830	2,357,707	1,078,905	26,031	£497k
Community Centres	13	285	447,150	825,947	6,559	£118k
Day / Resource Centres	13	228	396,622	629,521	4,208	£103k
Libraries	16	246	609,058	551,999	1,310	£133k
Special Needs Centre	4	406	509,205	1,531,197	820	£200k
Crematorium	1	300	210,627	1,009,990	20,508	£100k
Cemetery	48				2,337	£6.3k
Halls	8	239	239,348	433,341	649	£74k
Changing Rooms / Pavilion	2	5	21,045		23	£4k
Housing / Accommodation	12	100	386,978	338,231		£86k
Industrial	14	126	543,721		2,652	£96k
Museum / Art Gallery	2	96	386,091	279,715	3,293	£90k
Nursery	2	9	39,830		77	£7k
Public Conveniences	80	135	525,946		32,855	£165k
Pier \ Harbour	6	163	680,806		15,349	£123k
Recycling \ Landfill centre	17	175	753,765		2,021	£132k

Table 12 - Benchmarked utilities - Other

Where possible, comments and additional information for some property types have been collated below

5.7.1 Commentary

Property Type	Comment
Depots	- The top 5 most expensive depots equate to 55% of the total depot costs (Diriebught Roads, TEC Services (Inverness), Carrs Corner, Dingwall Roads & Portree Roads)
Community Centres	- 57% of the community centres are heated by electricity - Spectrum Centre has the highest relative CO_2 emissions of 74 $kgCO_2e/m^2$ and is the only community centre operating below heating benchmark. - SIPS Community Centre performs 138% below electrical benchmark and cost £75.26/m^2 to operate, the highest of all community centres.

Day / Resource Centres	- Inverness Family Resource Centre performs 48% below benchmark using 362 kWh/m² to heat. - Lochinver Drop-in Centre consumes 140% more water than the typical benchmark
Library	- 75% of library's are assumed to be electrically heated
Special Needs Centre	- Drummond School equates to 72% of the overall annual costs.
Housing\ Accommodation	- Elgin Hostel and Mallaig HS residences make up £75k of the annual costs.
Industrial	- Sconser Quarry and Alness Building Maintenance properties make up £73k of total annual costs.
Public Conveniences	- Public Conveniences account for 7% of water consumed across the estate.

Table 13 - Commentary benchmarked utilities - Other

5.7.2 Libraries

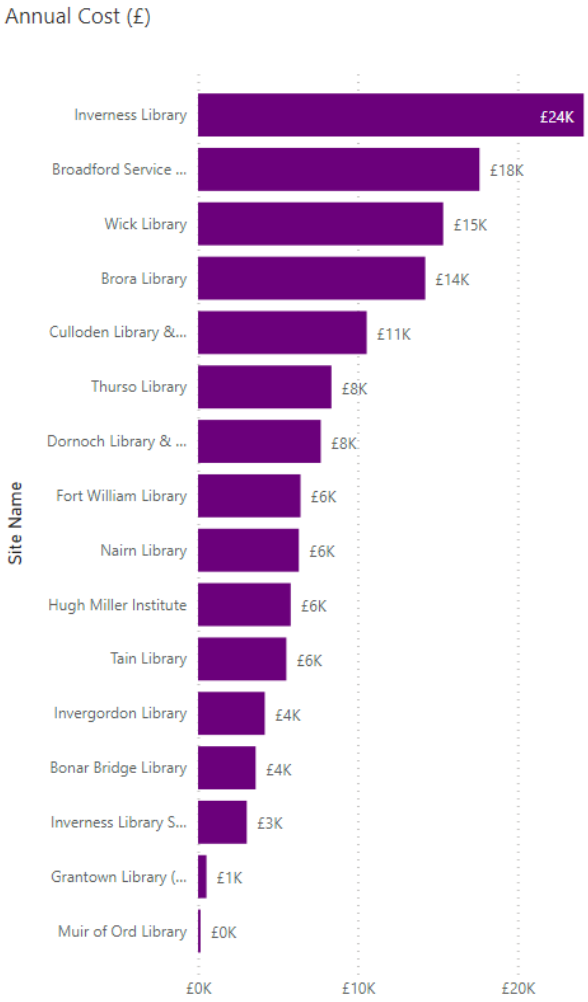


Figure 32 - Library – Annual cost

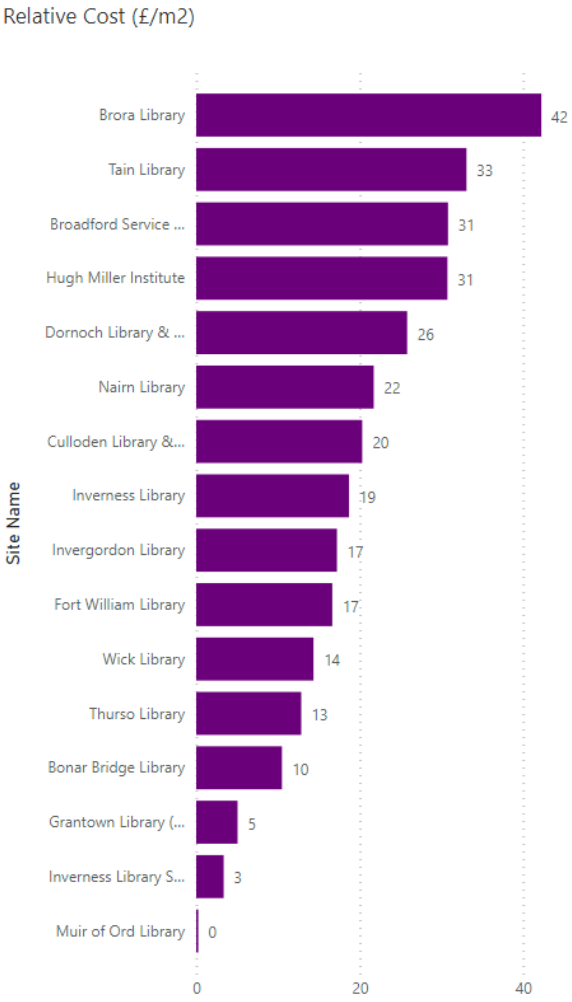


Figure 33 - Library – Relative cost

6 Additional Consumers

6.1 Electric Vehicle Charge Points (EVCP)

In 2021-2022 The Highland Council operated 85 chargers across 51 sites. In total consumption amounted to 793,646 kWh of electricity in 2021-2022, equivalent to 183 tCO_2e.

- Average annual consumption per site was 14,375 kWh
- Highest consumer was Kingussie Gynack Rd , 69,148 kWh

EVCP 2021-2022 Location	No
Alness Academy	1
An Aird Car Park, Camanachd Crescent, Fort William	1
Bayfield Car Park, Portree	1
Bettyhill, Thurso	1
Braeview Court Car Park, Beauly	2
Broadford Public Car Park, Isle of Skye	1
Broom Place, Portree	2
Burnfield Avenue Car Park, Grantown-on-Spey	1
Camaghael Hostel, Fort William	1
Cathedral Car Park, Inverness	1
Coupers Yard Car Park, Helmsdale	3
Court House Lane Car Park, Nairn	1
Dingwall County Buildings	2
Dunrobin Street Car Park, Helmsdale	1
Dunvegan Car Park	1
Durness Tourist Information Centre, Durness	1
Drummuie	2
Fort Augustus Car Park	3
Fountain Street Car Park, Golspie	3
Gairloch Pier	2
Gower Street Car Park, Brora	3
Gynack Road Car Park, Kingussie	1
Highland Council HQ, Inverness	6
Inchvannie Court Car Park, Dingwall	4
Invergordon Leisure Centre	2
Inverness Crematorium	2
Kingussie, Gynack Road	3
Kinlochbervie Car Park	2
Kyleakin Car Park	2
Latheron Lane, Ullapool	1
Lochalsh Leisure	2
Lochcarron Filling Station	1
Lochinver Community Hall Car Park	2
Margaret Street, Inverness	1
Meadows Car Park, Dornoch	1
Memorial Hall Car Park, Roybridge	1
Norseman Car Park, Wick	2
Public Toilet Car Park, B9152 Grampian Road, Aviemore	1
Public Toilet Car Park, Melvich, Thurso	1
Public Toilet Car Park, Scourie	1
Queen Street Car Park, Tain	1
Strathpeffer Square	2
Sutherland Transport Car Park, Lairg	2
Thurso Swimming Pool	3
Tongue Car Park, Tongue, Lairg	1
Tourist Information Car Park, Drumnadrochit	1
Town House, Castle Wynd, Inverness	1
Uig Pier, Portree	1
Victoria Place Car Park, Wick	1
West Bay Car Park, Mallaig	1
Wick Police Station, Wick	1

6.2 Closed Sites

This section captures properties that are currently closed and/or non-operational with ongoing consumption of utilities.

	Criteria					
	No Off	Carbon (tCO_2e)	Electricity (kWh)	Heat (kWh)	Water (m^3)	Annual Cost
Closed Properties	17	36	151,523	1,885	1,289	£31k

Table 14 - Benchmarked utilities - Closed sites

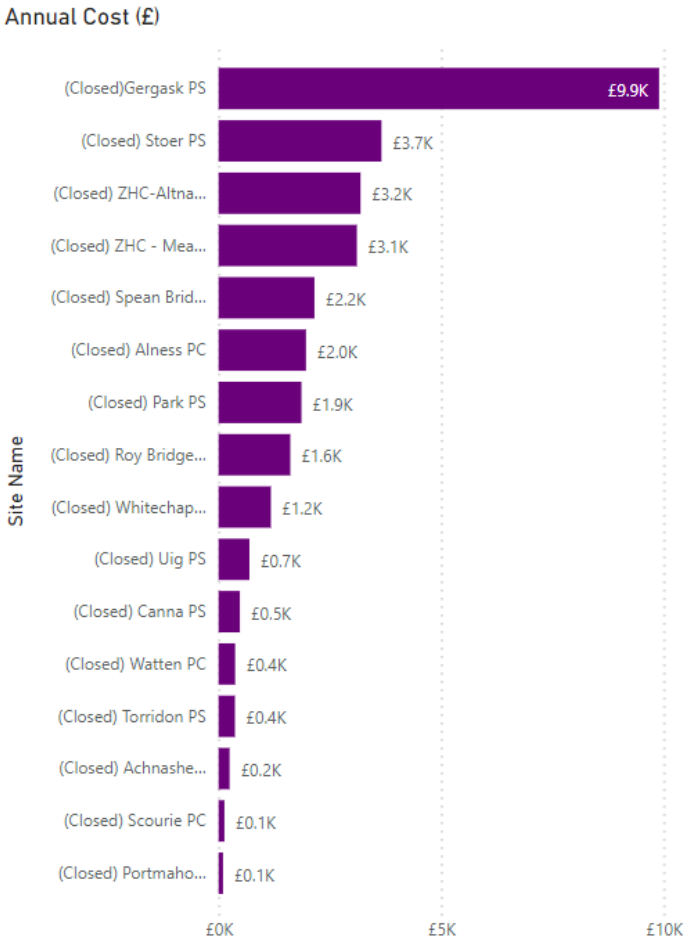


Figure 34 - Closed sites – Annual cost