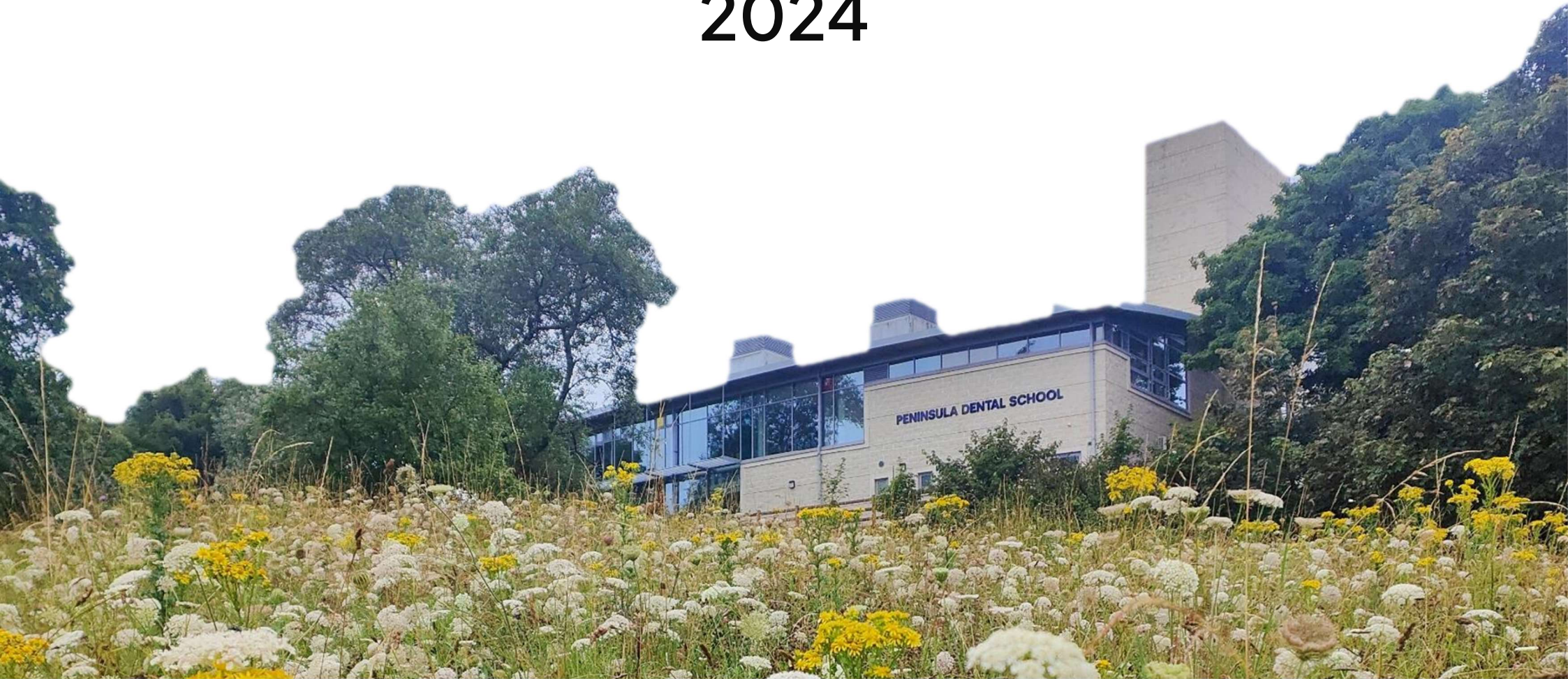




**Peninsula
Dental**
Social Enterprise

Environmental Report 2024



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About this report

This annual Environmental Report relates to Peninsula Dental Social Enterprise's (PDSE's) 2023-2024 financial year (FY) which ran from 1st August 2023 to 31st July 2024.

PDSE is a social enterprise transforming educations and outcomes in dentistry. It is a Community Interest Company (CIC) and a wholly owned subsidiary of the University of Plymouth. PDSE's environmental reporting sits outside of the scope of the University's own annual environmental reporting.

This report is the first comprehensive Environmental Report for PDSE and includes data for FY 21-22 and FY 22-23 (where satisfactory data were obtainable) to give a retrospective view of impacts for the past three financial years.

At the time of writing (September 2024) PDSE is establishing an environmental management system (also referred to as 'an EMS') in alignment with the requirements of the ISO14001:2015 standard for environmental management.

As part of the process of establishing this EMS PDSE's significant environmental aspects and impacts have been mapped, an Environment Policy has been created, environmental objectives established and an Environmental Action Plan (EAP) agreed – the latter laying out PDSE's plans for continuously reducing its environmental impacts, in alignment with its objectives.

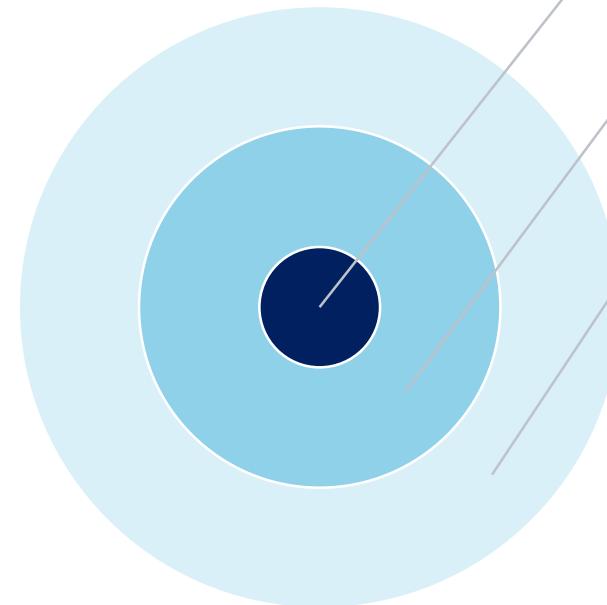
This document and its future iterations represent a key tool for PDSE to evaluate its environmental performance and monitor the effectiveness of its environmental management system. It also allows us to share the status of our environmental progress with interested stakeholders – as a result, it has been written in a way which aims to provide transparent and accessible information to all.

Environmental governance at PDSE

Board level accountability (and monitoring) of the Environmental Management System's efficacy - overseen by the Chief Operating Officer

Sustainability Manager is responsible for the management of Environmental Management System and ensuring it performs to meet its objectives

All staff responsible for upholding commitments of Environmental Policy and working to fulfil PDSE's Environmental Objectives - as per individuals role remits and any particular responsibilities assigned to them through the Environmental Action Plan or other company processes.



Comments from key stakeholders



There can be no bigger challenge to our lives, and even more to our childrens' lives, than the environmental threats to our world. These threats are clear as are the actions needed to deal with them - decarbonise our economy and clear up pollution - but this does not make the actions easy, particularly when there are so many other issues demanding urgent attention.

At PDSE we intend to not only play our part but to be leaders in demonstrating that the necessary actions can be dealt with by incorporating them into our day-to-day work and improvement plans. All of us have a part to play both at work and in our private lives.

I hope that you find the following report interesting and that it inspires you to play your part.

Henry Warren
Chair of the Board



I am pleased to introduce 2024's Environmental Report, marking an important milestone in PDSE's journey towards Environmental Sustainability.

Sustainability is one of PDSE's core organisational values, and this report is a sign of PDSE's commitment to both minimising our environmental impacts and reporting our progress in a transparent way.

The establishment of various baselines in this report is central importance for monitoring our progress as we work towards our environmental objectives.

We have an ambitious year ahead. Amongst other important initiatives, we are working towards achieving ISO14001 accreditation, delivering on various major capital works projects to improve the efficiency of our estate as well as giving much needed focus to our procurement of goods and services,

I look forward to sharing progress on all these initiatives with you, and more, over the next year.

Nathan Findlay
Chief Operating Officer



This report represents the first comprehensive account of PDSE's environmental impacts - it is the starting point from which progress will be evaluated and will form a key annual feature of PDSE's Environmental Management System.

In some areas, data quality has been lacking to be able to establish robust baselines from which future monitoring of progress can be based on. These data issues will each be engaged with in turn in the coming year.

Through its position at the intersection of public healthcare delivery and higher education PDSE has tremendous potential to help accelerate the much-needed transition to Sustainable dentistry.

This annual report is and will become an important tool for helping to realise this potential, through communicating learnings and transferable opportunities to relevant third-party stakeholders in the wider dental and higher education community.

Robert Hinchley
Sustainability Manager

How this Environmental Report sits within PDSE's Environmental Management System

A prerequisite for the establishment of an Environmental Management System is the mapping of environmental 'aspects'¹. PDSE established defined criteria to assess the likelihood and severity of environmental impacts associated with each aspect identified, to provide an overall rating of 'significance' for each aspect. At the time of writing 41 aspects are considered on PDSE's environmental aspects and impact register, of which twelve are currently deemed to meet the defined threshold to class them as 'significant aspects'.

As per the requirements of ISO14001 these 'significant aspects' have been used as the framing around which PDSE's Environmental Objectives are structured. This does not mean aspects which do not meet the threshold to be classed a significant aspect are not considered, however – many aspects that are not currently classed as 'significant' are also directly mapped to PDSE's Environmental Objectives.

In turn, PDSE's Environmental Objectives have been used to inform and shape PDSE's Environmental Action Plan (EAP). The EAP represents the part of PDSE's EMS which defines PDSE's strategy for engaging with, and continuously developing, its environmental performance over time (in alignment with the Environmental Objectives).

This Environmental Report is a key tool monitoring the efficacy of the elements of PDSE's Environmental Management System. The report also serves as important focus to aid ensuring the '*plan, do, check, act*' cycle is closed within the EMS – ensuring an effective, iterative system for maintaining continuous improvement. Where the EMS is found to fall short of meeting the objectives in the Environmental Report, or where opportunities for more effective continuous improvement in environmental performance present, this will be flagged in the Environmental Report for inclusion and action in the EAP.

At the time of writing, PDSE's Environmental Aspects and Impacts Register (the Environmental Compliance Register) and the Environmental Action Plan are maintained within a central document which represents the 'hub' of PDSE's Environmental Management System around which other elements of the system are being built.

PDSE's Environment Policy, Significant Aspects, Environmental Objectives and this Environmental Report are available to view on the [Sustainability](#) section of PDSE's website.

¹An aspect can be seen of as an element of an organisation's activities or products or services that interacts (or could interact) with the environment.

Report layout

The report is structured to provide a view of progress against each of PDSE's Environmental Objectives: as such, the environmental objectives (as they stand at the time of writing) are reported on in turn throughout the document.

To enhance the meaning of the report for all readers commentary on PDSE's actions is also included to provide context on the 'plan, do, check, act' cycle that underpins the environmental progress being reported on.



Derriford Dental Education Facility
Spring 2024

A check in on the environmental state of play at the time of publication

Climate Change

- Last month, September, was the 14th month in a 15-month period for which global-average surface air temperature exceeded 1.5°C above pre-industrial levels ([Copernicus](#), 2024).

Global temperature change: 1850-2023



Graphic credit: [Ed Hawkins](#), National Centre for Atmospheric Science, UoR

Global biodiversity

- Global biodiversity has seen a 73% decline 1970-2020 ([WWF](#), 2024)
- The UK is now one of the most nature-depleted countries on earth ([State of Nature](#), 2023)

Global biodiversity change: 1970-2020



Graphic credit: [biodiversitystripes.info](#) and LPI 2024, Living Planet Index database

PDSE environmental headlines for 2024



Scope 1 emissions of 147 t CO₂e

emissions from combustion of fossil fuels on site
(+4% on FY 21-22 baseline)



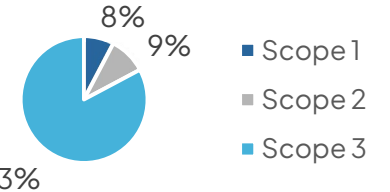
Scope 2 emissions of 182 t CO₂e

emissions from purchased electricity (and heat at Truro)
(+0.4% compared to FY 21-22 baseline)



Scope 3 emissions of 1,578 t CO₂e

representing 83% of PDSE's organisational emissions
(a **baseline** from which to monitor future progress)



The comprehensive view of Scope 3 emissions formed permits visibility of PDSE's overall emissions split – with around **83% in Scope 3** (overall emissions of 1,907 t CO₂e)



Comprehensive view of GHG emissions provides view of GHG intensity metrics for first time:

- **4.4 t CO₂e per student year**
- **56.6 kg CO₂e per patient appointment**

Highlight



-11%

reduction in energy consumption per patient appointment since FY 21-22 baseline
(overall energy consumption of **1.69 GWh** – a **1.5% reduction** on FY 21-22 baseline)



9,700 m³

water consumption – this is consistent with previous years' data (and represents **300 l consumption per patient appointment**)

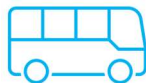


complete, robust waste generation data proved **unavailable** from the various service providers for the full reporting year



14 t CO₂e

business travel emissions
(a baseline from which to monitor future progress)



66 t CO₂e

commuting to work emissions – consistent with previous years. (c.2% commuting mileage being active travel and c.5% public transport – the remainder of mileage from car use)

Highlight



-28%

reduction in inter-site courier emissions compared to the FY 21-22 baseline
(**saving 5.5 t CO₂e**)



850 m²

of greenspaces on the PDSE estate committed to 'no mow' regime from May to July to improve these areas' ecological value

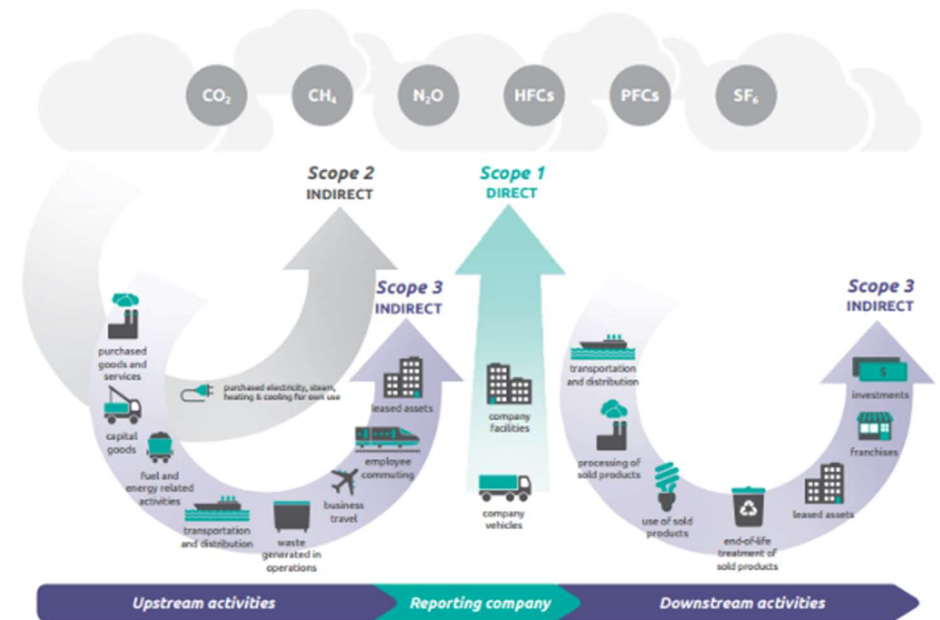
1. Greenhouse gas emissions

PDSE recognises that we face a climate emergency and sees the acute impacts this is already bringing to global society. As a social enterprise, PDSE is keenly alert to the increasingly severe social impacts associated with global heating and climate breakdown and is working to honour its moral responsibility to reduce its greenhouse gas (GHG) emissions in a way which is aligned to the pace of change advised upon in the strongest terms by the scientific community. This is one of the foundational principles of PDSE’s Environmental Policy.

There are many different elements of an organisation’s GHG emissions – some are incurred directly by the organisation’s activities, and some incurred elsewhere, indirectly, as a result of the organisation going about its business. PDSE is working to report on its organisational GHG emissions in full, in alignment with the guidance of the internationally recognised GHG Reporting Protocol (GHGP) and their 22 reporting categories. For those unfamiliar with GHG reporting, a brief is now provided.

GHG emissions are split into three ‘reporting scopes’:

Scope	Type	Description	Example
1	direct	emissions directly created by the company from owned or operated assets	emissions from the burning of gas in PDSE’s boilers
2	indirect	emissions associated to purchased energy	emissions associated to grid purchased electricity, or to the heat purchased at Truro
3	indirect	emissions from everything else – typically where the majority of an organisation’s emissions are located	emissions incurred in the manufacturing of goods PDSE buys, transportation of goods site, business travel (etc)

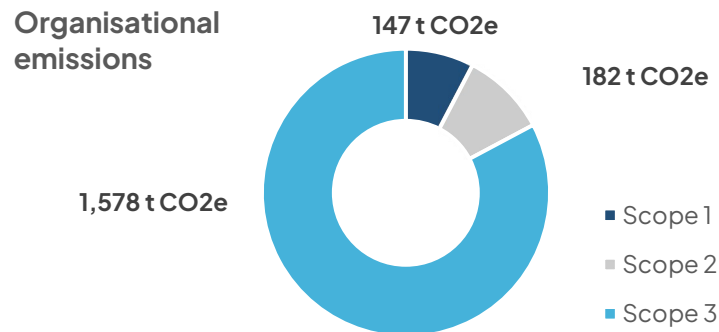


Overview of GHG Protocol scopes and emissions across the value chain
Source: [Greenhouse Gas Protocol Corporate Value Chain \(Scope 3\) Standard](#)

Different GHGs have different atmospheric warming characteristics. To permit simultaneous consideration of the major GHGs the warming potential of GHGs other than CO₂ are often converted into ‘CO₂ equivalent’ (or ‘CO₂e’ for short). This factors in the warming potential of the different GHGs over a 100-year period, in relation to CO₂, to permit a singular view of GHGs and their warming impact being formed. To give an example: methane has an atmospheric warming effect 28 times greater than CO₂ over a 100-year period, 1 tonne of methane emissions thus represent 28 t CO₂e.

High level update on objectives relating to GHG emissions

Environmental objective	[Obj.1a] Achieving net zero in Scope 1 and 2 emissions by 2040 (compared to FY21-22)	[Obj.1b] Achieving an interim reduction in Scope 1 and 2 GHG emissions of 45% by FY 29-30 (compared to FY 21-22)	[Obj.1c] Achieving net zero in Scope 3 emissions by 2050
Takeaways	<p>Scope 1 and Scope 2 emissions have both increased slightly since the baseline year of FY 21-22 (+2%) coming to 329 t CO₂e in FY 23-24.</p> <p>Piecemeal efforts to improve efficiency, as have been progressed in recent years, are valuable and key (and will be stepped on in FY 24-25) but more structural changes to how PDSE's buildings are heated and to the carbon intensity of electricity used in facilities will be essential to achieve both Obj.1a and Obj.1b in full (the importance of this is heightened by the expansion of operations that are planned for)</p>		<p>Comprehensive Scope 3 emissions have been quantified for the first time.</p> <p>For the majority of Scope 3, emissions have been accounted using 'spend based' (rather than 'activity based') reporting. Scope 3 emissions have been found to represent almost 1,600t CO₂e – at over 80% of overall emissions this marks the importance of prioritising this objective in the years to come.</p>
Overall takeaway	<p>A view of GHG emissions for all but 'investments', as per the 22 reporting categories of the GHG Reporting Protocol, has been formed for the first time in the preparation of this report.</p> <p>The view this provides represents an important starting point from which to monitor and assess PDSE's progress towards its defined decarbonisation objectives. Achieving the science-based objectives will undoubtedly require great focus (and investment) in the years to come and the baseline now held (back to FY 21-22 for Scope 1 and 2) will be a key tool to approaching in a data-driven way.</p>		



More detailed reporting on GHG emissions

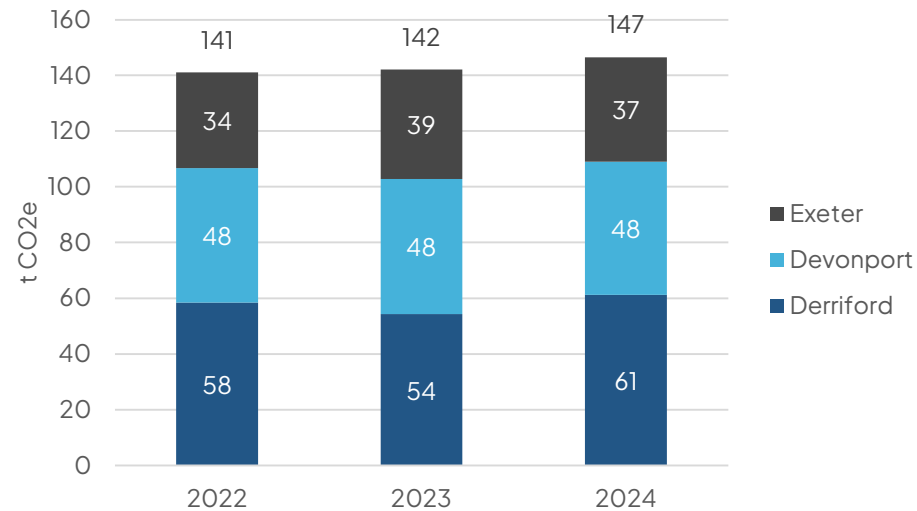
Scope 1 emissions

In FY 23-24, PDSE's Scope 1 (direct) emissions resulted from the combustion of gas in the boilers at each of PDSE's three directly operated sites (Exeter, Derriford and Devonport). No replacement of refrigerant or F-gases² were incurred, nor the combustion of other fuels in year at any of PDSE's sites.

In total, the gas consumed resulted in emissions of 147 tonnes CO₂e. The emissions from gas combustion can be seen to have increased at both Derriford and Exeter since the baseline year of FY 21-22 (by 5% and 9% respectively) whilst remaining consistent at Devonport.

Gas consumption is affected by annual variation in the requirement for space heating, explored further below.

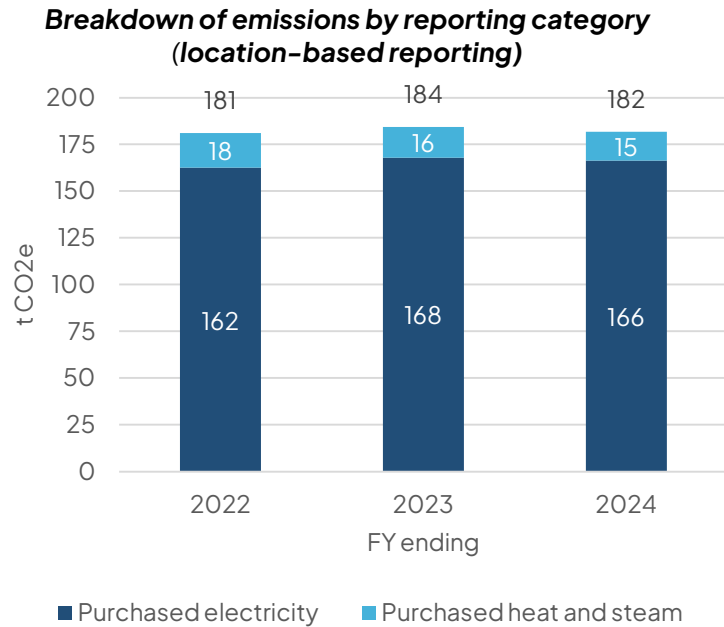
GHG emissions associated to PDSE's gas consumption by site



PDSE's gas boilers at Derriford
(61t CO₂e FY 23-24 - the highest emissions from boiler plant from PDSE's three directly operated sites)

²F-gases are fluorinated gases used in refrigeration, air-conditioning units and heat-pumps – they are tightly regulated owing to their very high greenhouse warming effects if released/leaked to the atmosphere.

Scope 2 emissions



- **The majority of PDSE’s Scope 2 emissions are comprised of emissions associated with the purchase of electricity.** A small proportion also results from emissions associated with the purchase of heat at Truro (our Dental Education Facility at Truro is in a building managed by the Royal Cornwall Hospital Trust).
- **Scope 2 emissions remained consistent with previous years in FY 23–24.** The purchase of electricity and heat energy was 5.5% lower this year than in FY 21–22: however, these savings were nullified by a slight increase in the emissions intensity of UK electricity over the same period (7%). The result was similar overall emissions this year to the baseline year, FY 21–22.

PDSE is working to decrease its Scope 2 emissions by improving energy management and energy efficiency of plant (p15–18) and investing in on-site renewable generation.

- Over the course of the year plans were developed and planning permission was applied for for a 82kWp PV array at Devonport (see image right). Planning permission was granted on the final day of the financial year and the system will be installed in FY 24–25. Installations will then follow at Derriford and Exeter also, in the near future.



What are PDSE’s Scope 2 emissions from a market-based reporting approach?

Owing to the lack of additionality incurred through the procurement of REGOs or ‘Generation Declarations’ PDSE will report location-based emissions by default each year, and objectives will relate to location-based reporting. Where market mechanics change and additionality can be demonstrated, this may change in the future. Three out of PDSE’s four facilities were on tariffs 100% backed by zero carbon generation in FY 23–24: the electricity consumption at Truro was 100% REGO backed³ and at Exeter and Derriford was 100% backed by ‘Generation Declarations’⁴. From a market-based reporting approach PDSE’s Scope 2 emissions were **85 t CO₂e** in FY 23–24 (a reduction in 7 tonnes CO₂e compared to FY 21–22).

³ ‘REGO’ stands for ‘Renewable Energy Guarantee of Origin’ – a scheme to provide transparency to consumers on the proportion of electricity suppliers source from renewable electricity. The scheme provides certificates called REGOs which demonstrate electricity supplied to a consumer has been generated from renewable sources. More information is available from [Ofgem](https://www.ofgem.gov.uk).

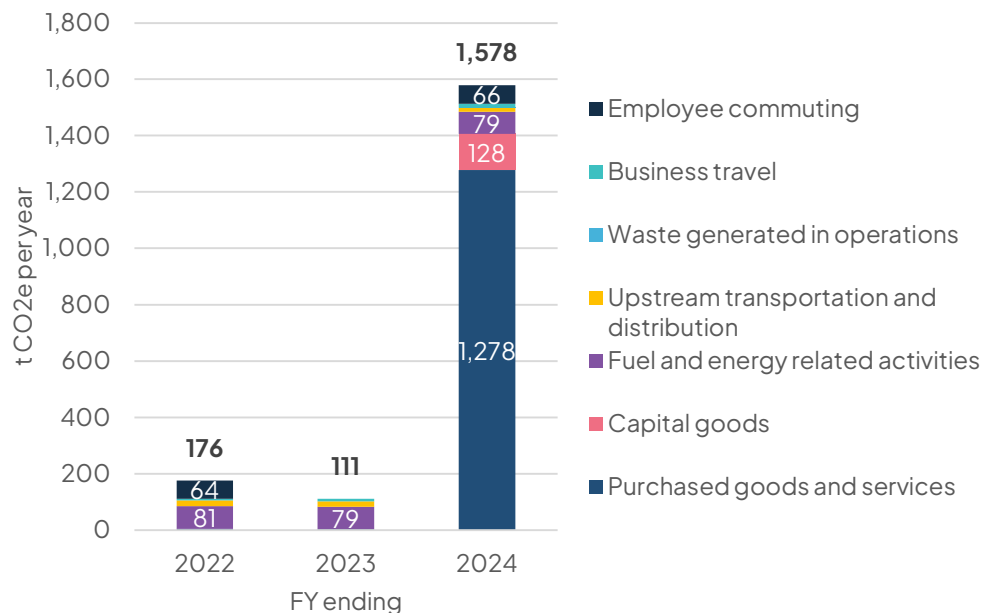
⁴ A ‘Generation Declaration’ is similar in concept to a REGO but for non-renewable zero carbon energy – power derived from nuclear power stations.

Scope 3 emissions

Eight of the 15 reporting categories of the GHG Protocol for Scope 3 emissions apply to PDSE at present, of which all but 'Investments' have been calculated for FY 21-22. This builds on the visibility gained of Scope 3 emissions for FY 21-22 and FY 22-23 significantly. Wherever data were available, emissions were calculated using activity-based approaches.

As is common at present however, particularly for purchased goods, services and for capital goods, spend based reporting methodologies were used for calculating the majority of Scope 3 emissions. For spend based reporting the Higher Education Procurement Association's 'HESCET' reporting model was employed to quantify associated emissions⁵. Spend data has been archived in line-by-line resolution to permit re-calculating using further developed modelling methodologies in the future, if and when such methodologies become available and are suitable for retrospective reporting.

Scope 3 emissions by reporting category



Commentary on Scope 3 emissions breakdown

- **This year's Scope 3 reporting expands on previous year's reporting in a number of key areas**, but especially: 'purchased goods and services' and 'capital goods' (which had not previously been reported on). Combined, these two categories have been found to represent almost 90% of PDSE's Scope 3 emissions and almost three quarters of PDSE's emissions overall.
- It should be noted Scope 3 emissions reporting is now thought to be complete for all reporting categories less 'Investments' – data for relevant investments is being sought to permit retrospective reporting on investments in future years, using FY 23-24 as a baseline for this category, once reporting methodologies develop.
- **When the expanded view of Scope 3 emissions is considered, PDSE's share of emissions that sits in Scope 3 can be seen to be over 80%.** Such a split is similar to that reported by the partner organisations PDSE works most closely, such as University of Plymouth and NHS England. It is slightly higher than the finding by Arup in 2019 that 71% of global healthcare emissions are thought to sit in Scope 3⁶.

⁵ Further information on HESCET model is available on the [EAUC](#) website.

⁶ Arup (2022) Health Care's Climate Footprint – how the health sector contributes to the global climate crisis and opportunities for action.

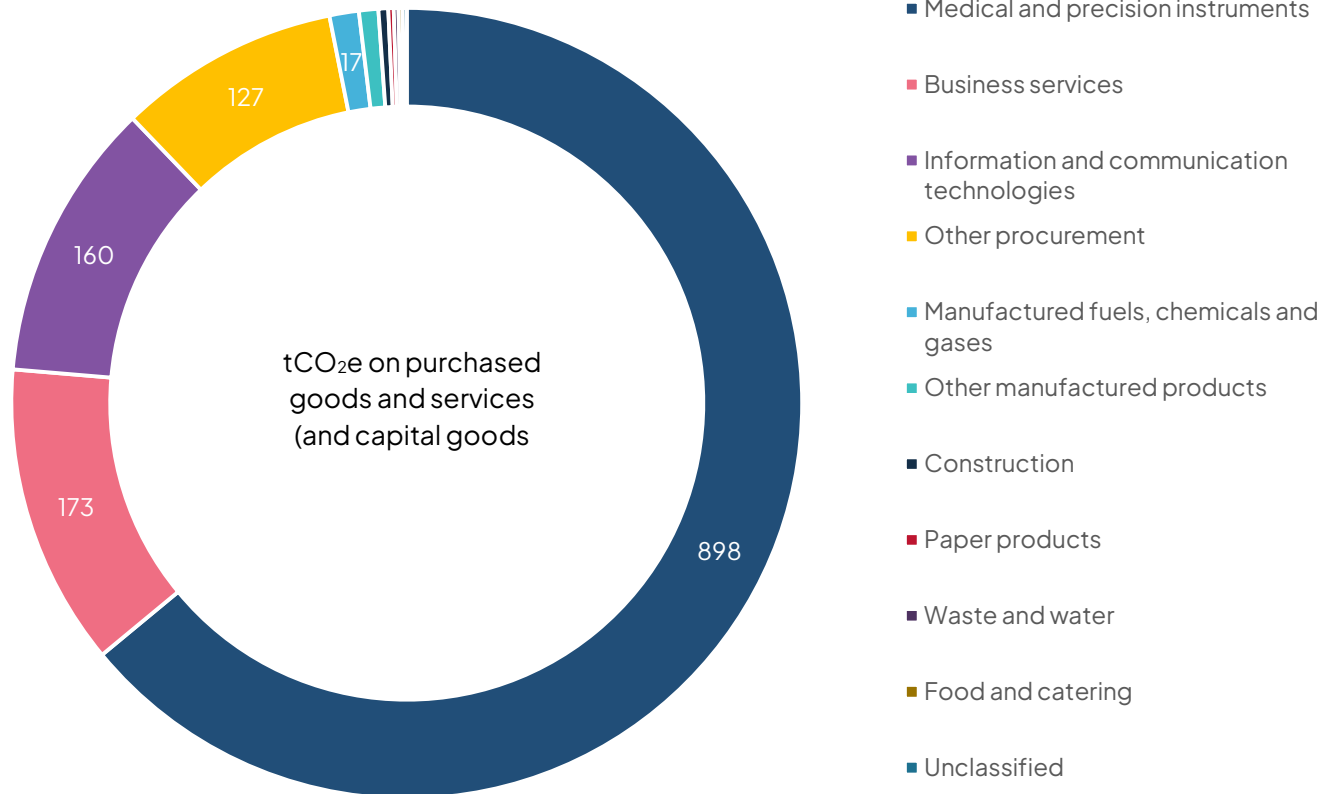
A closer inspection of emissions associated to purchased goods and services and capital goods

As previously noted, spend based modelling was employed to account for GHG emissions associated with the Scope 3 sub-categories of 'purchased goods and services' as well as for 'capital goods'. In FY 23-24 spend on capital goods was 4% of that of purchased goods and services: consequently, the two categories have been combined for presentation in the figure below right.

Approximately two thirds of emissions associated with these two GHGP reporting categories (which in turn, represent three quarters of PDSE's overall organisational emissions) are thought to sit within the sub-category of 'purchase of medical and precision instruments'.

For clarity, this category includes clinical consumables and clinical equipment. The GHG intensity for this category is high in the reporting methodology employed - at around 1kg CO₂e/£ spend. The next most significant sub-category is 'business services' with associated emissions of around 173 t CO₂e.

Please note: as is inherent to spend based GHG reporting, notable generalisations and groupings of spend to particular emissions factors have to be made. With this in mind, when interpreting the results for procured goods and services, it is advised to give foremost meaning to the high-level scale of the figures reported for each category, instead of the precise standing of each.



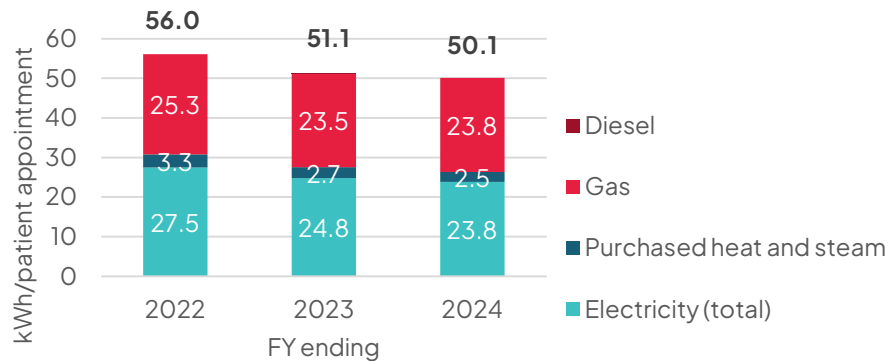
2. Energy management

PDSE recognises on-site energy consumption in its facilities is the principal driver of its direct GHG emissions (as well as a host of other environmental impacts associated to the consumption of energy). It also recognises its energy consumption is affected by activity levels on site: consequently, an intensity-based objective has been established (to reduce energy consumption per unit of activity) – to drive improvements in the efficiency of use of energy on PDSE’s sites.

High level update on energy management	
Environmental objective	[Obj.2a] Reducing energy use of facilities per patient appointment at least 25% by 2030 (compared to FY 21-22)
Takeaways	Considerable progress realised in the two years since the baseline – 50 kWh per patient appointment in Facilities energy use in FY 23-24 (down 12% on the baseline – halfway towards the 2030 target)

Detailed reporting on energy management

kWh facilities energy consumption per patient appointment

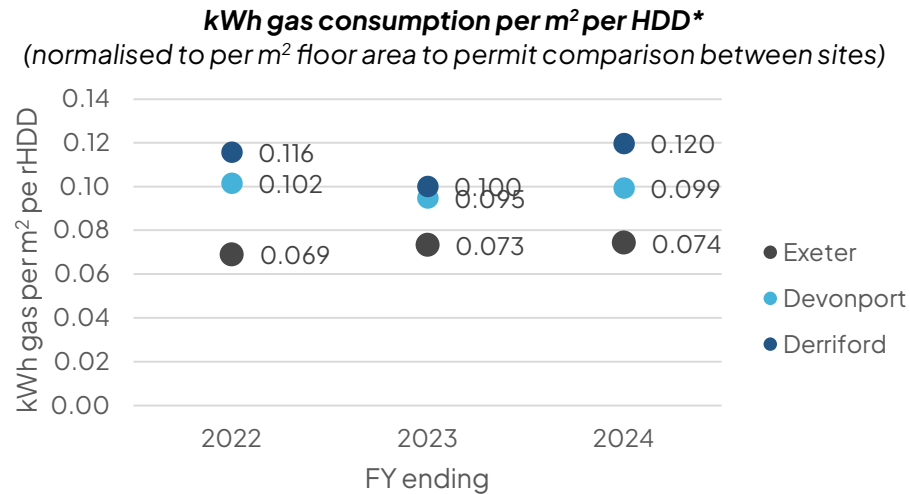


Commentary on energy consumption per patient appointment:

- **The intensity of energy use per patient appointment in PDSE’s facilities has decreased markedly in the two years since the baseline was formed (FY 21-22).** This is thanks both to a slight reduction in gross energy consumption over the two years since the baseline and an increase in number of patient appointments held over the same year (around 10%).
- The reduction seen to date is around 12% – well on the way to the goal of 25% by 2030 and a real highlight of this year’s report.

Reporting on efficiency of gas use

Gas consumption influenced by annual variability in the requirement for space heating – in colder years, more space heating is required. To allow comparison of efficiency of gas use between sites and across years requires adjusting for both heating degree days (HDDs⁷) and the differing sizes of each DEF.



*Using Plymouth as location and an 18°C base temperature for the three sites – it is assumed Exeter's HDDs are, over the course of each year, comparable to the two Plymouth sites.

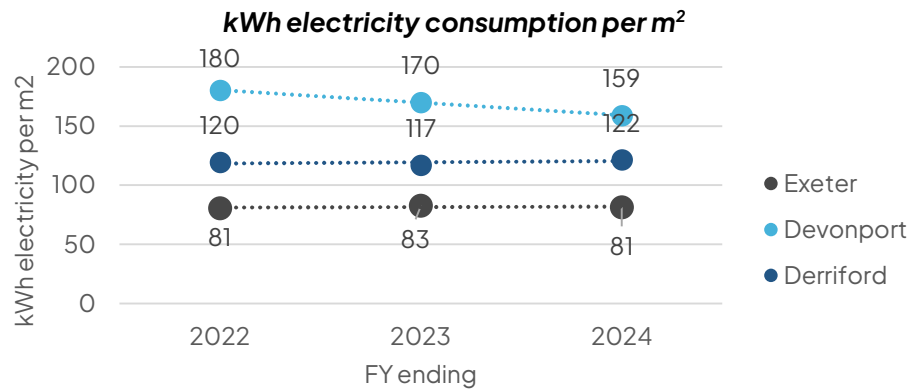
[Truro not featured in the figure as operational control of heating systems not held by PDSE]

- **This analysis shows the efficiency of gas use has slightly deteriorated at both Derriford and Exeter since the baseline year** – seen by the increases in the metric for both sites (of 4% and 8% respectively).
- Another key takeaway is the variability in gas consumption per HDD per m²– both from year to year and from site to site. The variability for Devonport and Exeter is around 7% over the three years for which data is available, whilst Derriford's is much higher at 19%.
- Derriford has, with a clear margin, consistently the highest gas consumption intensity despite it being of most recent construction (and having a ground source heat pump).
- This points to a clear opportunity to refine the operation and control of heating plant at Derriford (and too at Devonport) to realise efficiencies in the use of gas at these sites in FY 24-25 and maximise the value of the GSHP plant at Derriford.

⁷ Heating degree days are a measure of how much (in degrees), and for how long (in days), the outside air temperature was below a certain level. They are commonly used in calculations relating to the energy consumption required to heat buildings.

Reporting on efficiency of electricity consumption

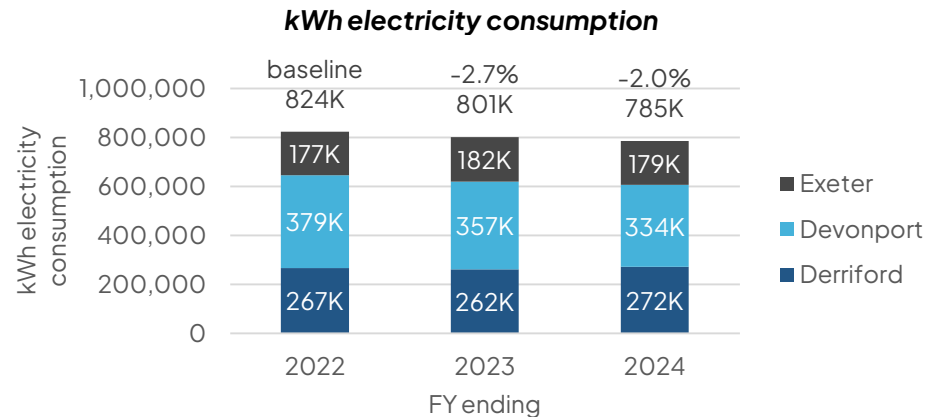
Whilst electricity consumption is linked to the requirement for space cooling, the overall link between electricity consumption and annual cooling demand (in the UK) is less pronounced than between gas consumption and heating degree days. Consequently, a comparable analysis which provides a view of electricity consumption per cooling degree day has not been conducted. Instead, a view of electricity consumption per m² has been formed for each operationally controlled site to provide a comparable view of the intensity of electricity consumption.



[Truro not featured as operational control of major electricity consuming plant (e.g. HVAC) not held]

- From an absolute perspective, across the three operationally controlled sites, electricity consumption has decreased year on year for both of the last two years, since the FY 21-22 baseline.
- Consumption fell by 22,000 kWh (net) in FY 22-23 and a further 16,000 kWh in FY 23-24. This gives a cumulative reduction in electricity consumption since the baseline year of around 4.5% (38,000 kWh).

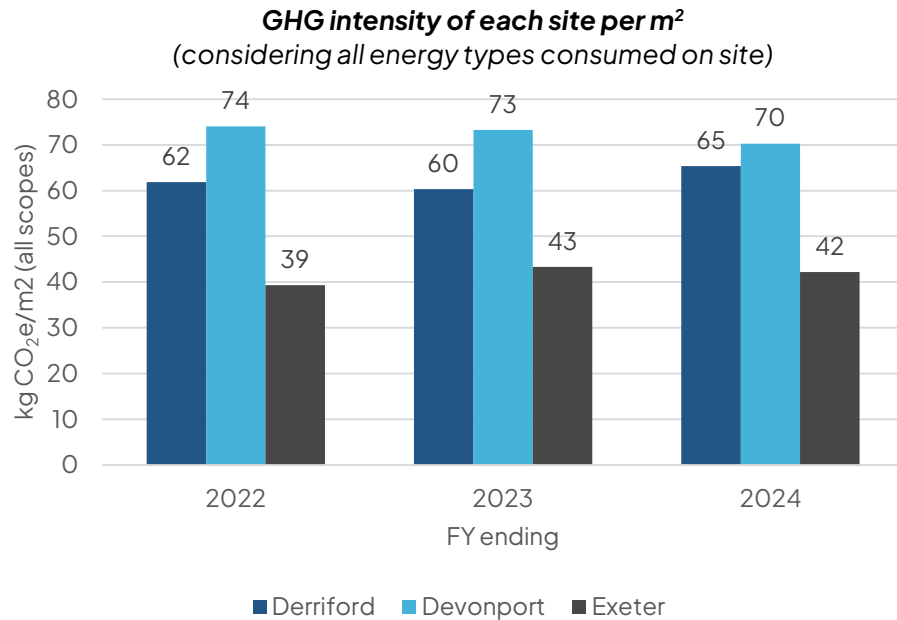
- **This analysis shows the efficiency of electricity use has improved markedly at Devonport over the past two years** (whilst remaining steady at Derriford and Exeter).
- Devonport's intensity of electricity consumption is higher than the other two sites, although it should be noted that PDSE's (electrified) decontamination activities take place at Devonport and consequently the site has significant associated electrical loads that the other sites do not.
- Derriford is also home to significant electrified heating plant, which the other two sites do not have, in the form of its two ground-source heat pump modules.



Providing a GHG perspective on the differing energy efficiency per site

The different intensity of energy requirements (and the relative splits of energy types used) at the different site determines the overall GHG intensity (per m²) of each site.

As the UK's electricity consumption continues to decarbonise, those sites that have a greater proportion of their energy consumption met by electricity will see lower overall GHG intensities associated with the running of their facilities. This will be increased by investments in PV generation at each site, which provide zero carbon electricity that also reduces the amount of electricity purchased from the grid with GHGs associated to it.



- **Devonport has the highest GHG intensity of the three directly operated sites. However, its GHG intensity per m² has decreased over the last two years**, driven by the reduction in electricity consumption seen at the site (discussed above). Devonport is home to PDSE's energy intensive decontamination facilities - although decontamination's equipment is not currently sub-metered collectively, decontamination is thought to increase the building's electricity consumption by around 25%.
- **Derriford's GHG intensity has increased slightly over the last two years**, meaning it is now close to that of Devonport.
- Exeter is by far the most GHG efficient of PDSE's three directly operated facilities with a marked difference in GHG intensity per m² it emits around two thirds of the emissions per m² of the other two sites.
- Truro is not featured in the figure as PDSE does not have operational control of plant, its operation and the fabric of the building.

What has PDSE has been working on to improve efficiency of electricity consumption in FY 23–24?

● LED retrofit

The Facilities team continued to work on the LED retrofit programme in Devonport and Derriford throughout the year:

- 138 fluorescent fittings were replaced with LED equivalents at Devonport. The average reduction in power requirement per fitting (including savings where fewer replacement fittings were required than those taken out) was 60% - meaning a reduction in peak power demand from lighting at the site of around 3.5kW (if replaced lighting were all to be on simultaneously...). The controls at the site have also been simultaneously upgraded to optimise the use of lighting.
- 317 fittings were replaced with LED equivalents at Derriford. The average reduction in power requirement per fitting (including savings where fewer replacement fittings were required) was 56% at Derriford - meaning a reduction in peak power demand from lighting at the site of around 7kW (if replaced lighting were all to be on simultaneously). The controls at the site, like at Devonport, have also been simultaneously upgraded to realise further savings.



*Newly installed LED downlights
at Derriford*

● Plant optimisation

Power analysers (portable electrical metering) were borrowed from the University of Plymouth and employed to monitor the power consumption of the autoclaves in PDSE's decontamination facilities:

- The data pointed to significant savings to be realised from optimising the run operation approach of both units - there is now a lead unit and a standby (fully off) unit wherever throughput requirements can be met from such an approach. This change was adopted in Summer 2024 and is expected to yield savings of around 20,000 kWh electricity per year moving forward.
- The Decon. team also identified opportunities to improve the amount of equipment trays that could be fitted in each autoclave cycle - with each additional cycle incurring approximately 10kWh of electricity consumption this is also a simple but meaningful change to have made.



*PDSE's two autoclaves
at Devonport
(now running 'lead and standby')*

3. Water management

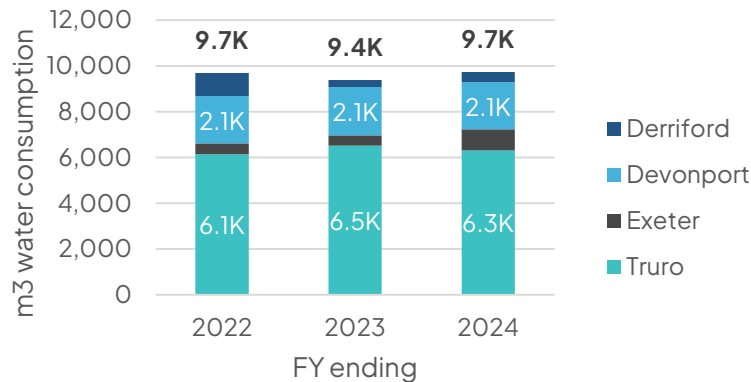
Water consumption is host to a range of environmental impacts and is also a periodically scarce resource in the South West – PDSE’s water consumption is not seen as a ‘significant aspect’ at present but reporting is provided to offer transparency on our performance in engaging with our consumption and promoting resource efficiency.

High level update on water management

Environmental objective	[Obj.3a] Reducing water use of facilities at least 25% by 2030 (compared to FY 21-22)
Takeaways	Absolute water consumption (as per data available) was consistent with FY 21-22 baseline levels however a number of limitations around the robustness of water consumption data are apparent – an action has been raised to address this in FY 24-25.

More detailed reporting on water management

Absolute water consumption reporting by site



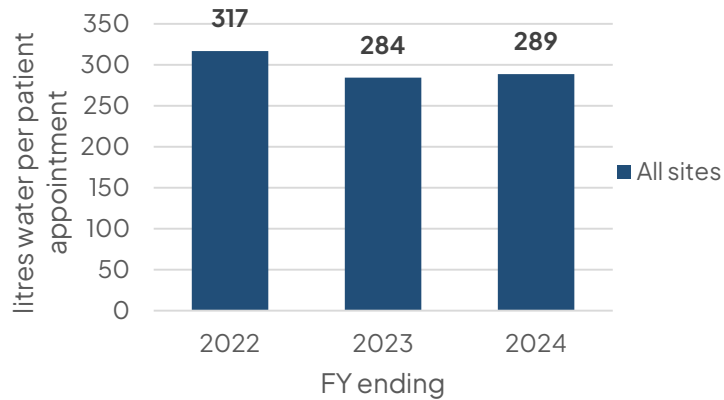
Commentary on consumption

- The reported consumption varies significantly from site to site – from just 452 m³ for Derriford to 6,307 m³ for Truro in FY 23-24.
- Whilst the data suggest stable net consumption levels for the four sites, year on year, the data have a variety of known quality issues. Of particular note is the water consumption apportioning approach used by RCHT at the Truro DEF (which is based on floor area) and known metering issues at both Exeter and Derriford – currently being resolved with South West Water. As a result, it is thought the picture painted here is of (notably) higher than actual consumption being reported for Truro and (likely) under-reporting for Derriford. With this in mind **FY 23-24 reporting for water should be seen as a starting point, with a more robust baseline for each site to be established once improved consumption data is available.**

Give me a sense of scale on this?

- 10,000 m³ of water is around the same tonnage as the HMS Belfast – the battleship moored on the Thames in London
- In terms of volume, it is about three times the volume of PDSE Derriford
- Or this is about same weight of water being consumed each day as the weight of a standard fully loaded bin-lorry

Water consumption per patient appointment



Give me a sense of scale on this?

- 300l is about the same volume as a standard size wheelie bin

Commentary on consumption per patient appointment

- It is hoped that monitoring water consumption per patient appointment, year on year, will be a meaningful metric in monitoring PDSE's efficiency of use of water over time.
- For the data available for the last three years a slight improvement in water consumption per patient appointment can be seen – with FY 23-24 being 9% lower than the figure for two years prior.
- As noted on the previous page, caution should be taken when interpreting the data owing to the known issues affecting the data over the period.
- A clear action is to be raised for FY 24-25 to improve the quality of water metering at first opportunity to aid the ability to meaningfully report on water consumption and efficiency of use.

4. Waste management

Waste management encompasses a range of environmental impacts, including, but not limited to: GHG emissions associated to waste collection and transfer vehicles and GHG emissions associated to the incineration of waste in energy from waste (EFW) and high temperature incineration (HTI) plants.

PDSE's waste management services are not seen as a significant aspect at present however their impacts remain meaningful, and reporting is provided for transparency on our waste generation levels and to provide a view of progress in engaging with associated impacts, over time. A particular focus for PDSE is promoting overall efficiency of use of consumables in our operations and in reducing the generation of infectious clinical waste - which is associated with particularly high environmental impacts per tonne of waste generated.

High level update on waste management

Environmental objective	[Obj.4a] Achieving an 80:20 ratio on offensive waste : clinical infectious generated	[Obj.4b] Reducing the overall mass of waste generated per patient appointment by 20% by 2030 compared to FY 23-24
Takeaways	<ul style="list-style-type: none"> Offensive waste to be introduced to all sites from 1st November 2024 – first year of reporting on this objective to be FY 24-25 	<ul style="list-style-type: none"> PDSE's waste services have been provided by a variety of contractors and sub-contractors over the past three years – whilst some data has been provided of waste generation this data is not available at the consistency required to permit reporting on overall generation levels or evaluate trends in performance over the period (or for a single year in full, either)
Overall takeaway	<p>Provision of robust waste generation data from waste service providers is essential to monitoring our progress in reducing the impacts associated to our generation of waste. Waste generation data has not been provided in a complete fashion for the past three years and so is not reported, to avoid confusion or misinterpretation in meaning.</p> <ul style="list-style-type: none"> this represents an action for FY 24-25: the importance of closer management of third-party suppliers to ensure key management information is provided in a manner compatible with PDSE's ambition to monitoring and continuously improving on its impacts. 	

How has PDSE been working to mitigate impacts associated to waste management in FY 23-24...

- A new waste services contract has been procured to commence 1st November. The ITT was structured to include significant quality weighting on the environmental credentials of bidders and will see responsive site visits introduced (collection vehicles visiting sites only when a pickup is required) plus the introduction of offensive and food waste collections to Derriford, Exeter and Devonport (RCHT handle waste collection at Truro...).
- The quality of our waste signage has been improved and standardised and bins are being consolidated to improve correct segregation.

5. Travel and transport

PDSE’s operations require considerable travel and transport activity– with emissions ranging from those associated with employees travelling to work, to those associated with deliveries (or collections) from our sites to the impacts of patients travelling to appointments. All of these incur (indirectly) environmental impacts and PDSE recognises its responsibility to influence these, wherever possible, to minimise environmental impacts.

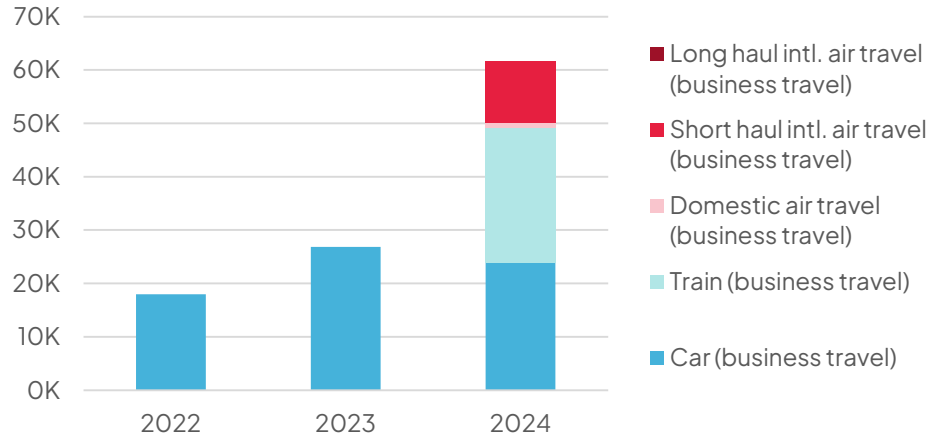
High level update on travel and transport:

Environmental objective	[Obj.5a] <i>Achieving a reduction of 45% in business travel emissions by 2030 (compared to FY 23-24)</i>	[Obj.5b] <i>Achieving a reduction in commuting to work emissions of 45% by 2030 (compared to FY 21-22)</i>	[Obj.5c] <i>Achieving 45% (+) reduction in the GHG emissions of PDSE’s inter-site courier services by 2030 (compared to FY 21-22)</i>
Takeaways	<ul style="list-style-type: none"> Data collected on all forms of business travel for the first time in FY 23-24 (less for bus/coach travel⁸). Business travel emissions of 170kg CO₂e/FTE in FY 23-24 (representing 14t CO₂e overall). 	<ul style="list-style-type: none"> Travel to work survey held early in FY 23-24 which permitted collection of some data - clear opportunities identified to improve the data collection methodology and quality of outputs for future years. The data collected points to commuting to work emissions of 800kg CO₂e per FTE in FY 23-24 (representing 66t CO₂e overall). 	<ul style="list-style-type: none"> Large savings realised in FY 23-24 by adapting courier visit frequency to instrument couriering demand at Exeter and Truro – this has realised an emissions saving of 28% compared to FY 21-22. FY 23-24 emissions of 14t CO₂e.
Overall takeaway	<p>Travel and transport represent a notable area of PDSE’s impacts – incurring around 94t CO₂e emissions in FY 23-24 for commuting to work, the inter-site courier service and business travel alone (deliveries and collections from sites, and other courier services, will incur further transport related emissions).</p> <p>There are a number of opportunities which have been put in place at the start of FY 24-25 (including the introduction of an EV pool vehicle and provision of charge points for car park users at Exeter and Derriford). There are also a number of other opportunities built into the EAP which will start to realise reductions in the coming years in alignment with the three associated objectives.</p>		

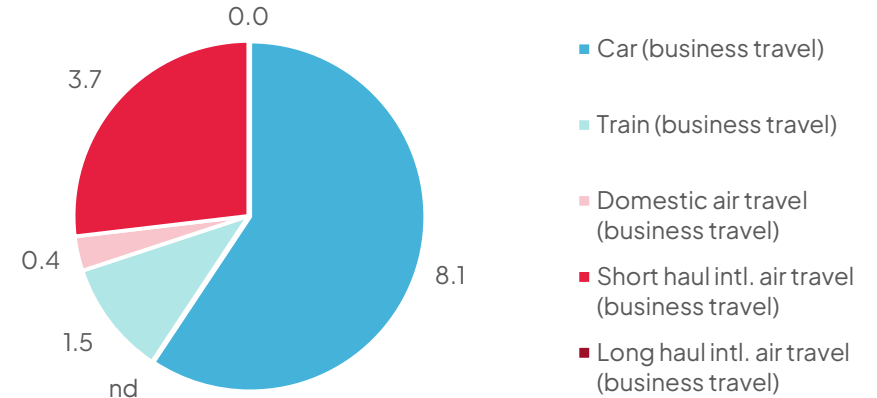
⁸ Bus business travel is incurred by PDSE employees – particularly when employees visit the Truro DEF, however its overall contribution to emissions is thought to be small in relation to the other elements. Notwithstanding this, it will be endeavoured to commence data collection on bus (and coach travel – if incurred) in FY 24-25.

Review of business travel & associated emissions

Business travel mileage



Business travel emissions FY 23-24



Commentary on business mileage

- Data has been collected for the first time for business travel using public transport (except bus travel) for FY 23-24. This complements the car business travel data collected since FY 21-22. The overall travel mileage comes to around 60,000 miles per year for FY 23-24.
- Around 40% of business travel mileage was on public transport – with the remainder split between car (another 40%) and air travel (18%)
- Car business travel fell 10% in FY 23-24 compared to the year prior

Commentary on business travel emissions

- Overall business travel emissions came to 14 tonnes CO₂e – with just under two thirds being accounted for by car travel, around 30% air travel and the remainder rail travel.

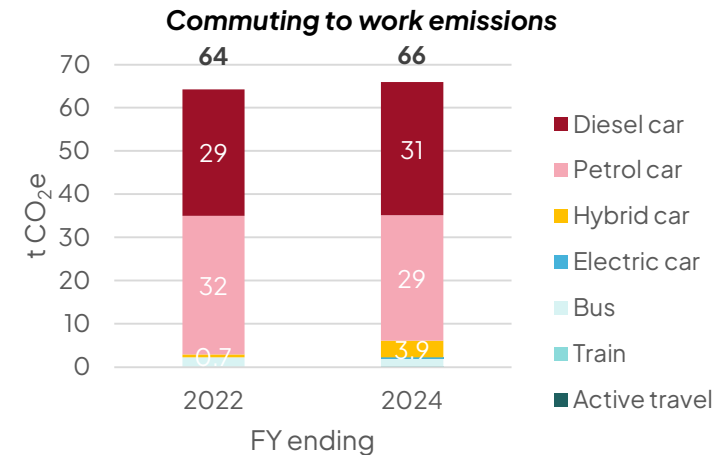
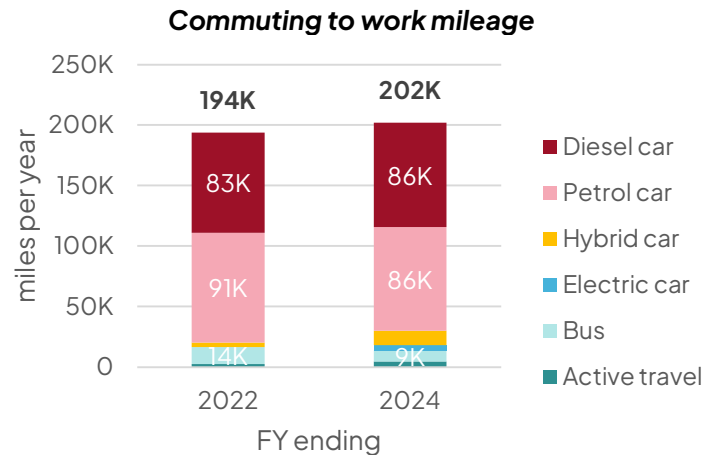
Give me a sense of scale on this?

- The car business travel is roughly equivalent to Lands' End to John O'Groats and back every month
- The total air travel mileage is the same distance as Plymouth to Sydney

Give me a sense of context on the size of business travel GHG emissions?

- Business travel GHG emissions, although notable, are much smaller than commuting to work emissions – around 20% of the size

Review of commuting to work emissions



Commentary on commuting to work mileage

- Overall mileage has increased slightly since the first survey in FY 21-22 – rising around 4% in absolute terms (there was no survey in FY 22-23)
- Per FTE mileage remained consistent at around 2,500 miles per year, on average.
- The overall share of commuting mileage completed by car rose slightly compared to FY 21-22 to around 93% of the overall commuting mileage.
- The share of commuting mileage incurred by petrol and diesel cars falls slightly, from 90% to 85%

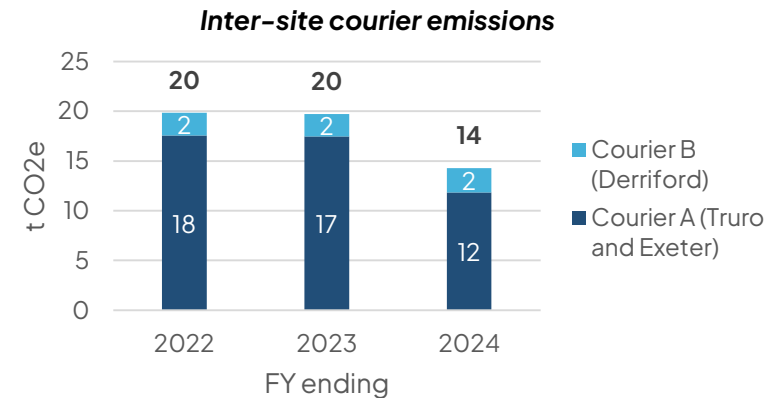
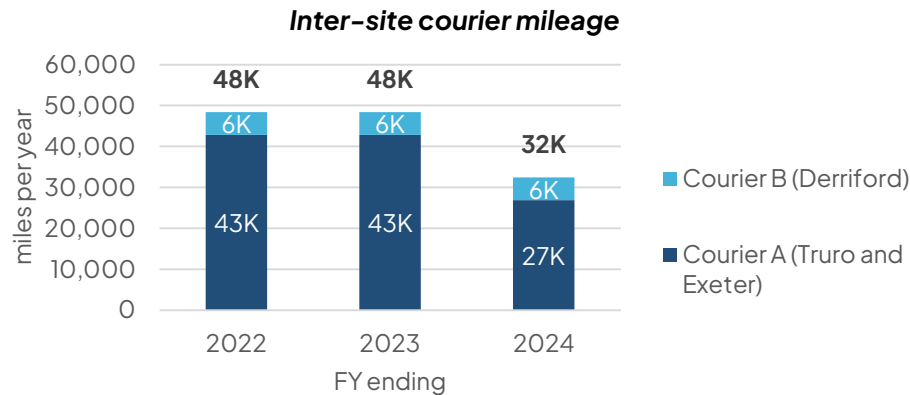
Commentary on commuting to work emissions

- 97% of commuting to work emissions were associated with car commuting in FY 23-24
- The average emissions intensity per mile of this car-based commuting, however, decreased slightly (3%) since the previous survey two years earlier – this is attributable to increased car sharing (rising from around 4% to around 5% of overall car commuting mileage) and the increased use of hybrid and electric vehicles, whose use increased from 2% of mileage in 2022 to 8% in 2024.

Give me a sense of scale on this?

- 202,000 miles is 85% of the distance from the earth to the moon

Review of inter-site courier GHG emissions



Commentary on inter-site courier mileage

- Mileage on the inter-site courier was reduced significantly this year by adopting far more demand responsive visits to Exeter and Truro. In August, for example, the service was reduced to just one visit per week – a third of that of during peak times and reducing mileage by around 400 miles per week.
- Mileage for the Derriford courier remained consistent with previous years – the service remained steady at two trips per day, year-round.

Give me a sense of scale on this distance?

- 32,000 miles per year is equivalent to 1.3 x the circumference earth's equator

Commentary on emissions

- Both courier's use diesel vans to deliver the services at present, with an assumed real-world emissions intensity of around 0.44kg CO₂e per mile.
- Overall inter-site courier emissions are thus around 14 tonnes CO₂e – the majority of this sits with the courier service to Truro and Exeter... Despite being less frequent the visits to these sites incur far higher mileage – one visit to Truro and one visit to Exeter incurs 200 miles (and around 90kg CO₂e)

How does this sit in context to other travel emissions?

- The inter-site courier emissions are comparable in size to business travel emissions (and around 20% of those of commuting to work emissions)

6. Procurement & construction

The procurement of goods and services represents the majority of PDSE's organisational GHG emissions. Although infrequent, construction and refurbishment activities are also associated with very high environmental impacts and so are included in this reporting section.

High level update on procurement and construction

	[Obj.6a]	[Obj.6b]	[Obj.6c]
Environmental objective	Delivering on-going programme of supplier engagement, starting with suppliers understood to have highest GHG emissions of goods & services provided – working with each to reduce impacts of service delivery	Programme of consumables replacement (or removal) with those with lower associated environmental impacts	For newly conceived projects, BREAM 'Very Good' on relevant new build construction and 'SKA Gold' on relevant refurbishment works
Takeaway	Data collected to permit indicative view of emissions per supplier using a spend based approach for FY 23-24- analysis to be conducted shortly, but not complete for this report. Principal clinical consumables supplier engaged with and dialogue now underway around improving impacts of goods procured.	Appraising the environmental merits of differing products has its challenges – the merits of a product at face value may not be backed up in material environmental value... Conducting a robust literature review [A-161] appears crucial to ensure any changes adopted are evidence based and not based on un-substantiated, or superficial credibility.	No new projects initiated since objective established.
Overall takeaway	Procurement of goods and services (including construction) has been established to represent around three quarters of PDSE's emissions – it thus represents a crucial focus for the coming years.		

What are some of the things PDSE has been working on in 2023-2024?

● Efficient consumables use education

An ongoing programme of coaching and instruction to students on efficient use of clinical consumables is underway – with the aim of reducing unnecessary use of clinical consumables.

● Consumables replacement programme

PDSE's principal clinical consumables supplier has been engaged with and asked to provide a view of consumption by mass. Product types with the highest mass are now being targeted for replacement with replacements which are either more efficient to use and/or derived from renewable or recycled materials (as opposed to virgin plastics). A plant based clinical wipe is currently in trial and will be adopted if efficacy is suitable for requirements.

One of the elephants in the room with clinical consumables' consumption...

PDSE uses around **500,000** clinical wipes per year.



7. Education

Through its contact with the UoP’s dental students, thousands of members of the community as well as direct interaction with hundreds of public health and industry stakeholders each year PDSE recognises its potential to realise significant positive environmental impacts through developing and disseminating learnings around sustainable dentistry.

High level update on education

Environmental objective	[Obj.7a] Empowering PDSE employees to take Environmental Sustainability informed decisions in going about their work	[Obj.7b] Leveraging our learnings from our EMS to enrich the UoP’s teaching of Sustainability in dentistry	[Obj.7c] Doubling the number of people engaged through our outreach work compared to 23-24 by 2030	[Obj.7d] Realise our potential to be a leader, facilitator and accelerant of the transition to Sustainable dentistry
Takeaway	Work in progress... Minor deliverables in FY 23-24, with lots more planned for FY 24-25.	Preparation has been underway to complement PDS teaching for Y2s and Y3s in FY 23-24.	Objective very recently set – no update for FY 23-24.	Objective very recently set – no update for FY 23-24.
Overall takeaway	A key opportunity area for positive environmental impacts to be realised in the future. Momentum has been building and preparation underway in the second half of FY 23-24 for many actions to come to realisation in early FY 24-25, these include: holding a Sustainability IPE module for Y2 students, delivering a ‘Introduction to Sustainable Dentistry’ lecture to Y2 students in December 2024, supporting delivery of a ‘Sustainable Dentistry CPD day’ for Y3 students (also in December 2024).			

Some other updates from the last year which don’t fall into a particular section of the report:

● Sustainability Group

PDSE’s Sustainability Group is now in its third year – the group comprises of a ‘Green Guardian’ representative from each site, along with a number of other key representatives from across the organisation (COO, Clinic Manager and Decontamination Team Leader). The group works to identify opportunities for environmental improvement at each site and work together on developing and adopting cross site measures (e.g. standardising waste signage and consolidating bin holdings, to improve waste segregation)

● PDSE ‘Big Clean’ 2024

PDSE hosted its first staff volunteering day in 2024 – three cleaning events were held concurrently (one near Truro, one in Devonport and one in Exeter). Together employees and supportive family members collected around 20 sacks of rubbish.



8. Biodiversity

PDSE recognises the acuity of the ecological emergency faced globally. PDSE recognises it has a range of impacts (and potential impacts) on the ecological emergency and also recognises that many of its upstream and downstream impacts are hard to appreciate fully, at present. As well as upstream and downstream impacts (for example, as are incurred through the procurement of a particular product or service) PDSE also has a range of direct, local impacts - for example, how PDSE looks after and manage the greenspaces at its facilities.

As PDSE's agency to both understand its impacts and act to improve impacts is greatest on our immediate estate it represents the focus of our associated objectives at present. Notwithstanding this, where opportunities are identified to reduce upstream (and downstream) impacts on biodiversity and ecological abundance then PDSE will integrate these and act on these accordingly.

High level update on biodiversity

Environmental objective	[Obj.8a] Champion ecologically considerate grounds maintenance practices at our sites	[Obj.8b] Create new (or expand existing) ecologically rich habitats at each of our sites by 2030
Takeaway	The grounds contractor was instructed to set aside 850m ² of grassed areas from mowing for three months (May to July) this year - to improve the areas' ecological value.	
	In addition, a number of bird boxes were installed and Derriford's green roof was re-seeded, to improve its ecological value, after several years without maintenance.	
Overall takeaway	A start has been made, with further areas to be improved and more ambitious opportunities to develop in the coming years, as per the EAP.	



● **Three months of no mowing saw a range of wildflowers and insects return to areas of PDSE's estate**
(both images July 2024)

“It is no exaggeration to say that what happens in the next five years will determine the future of life on Earth.

We have five years to place the world on a sustainable trajectory before negative feedbacks of combined nature degradation and climate change place us on the downhill slope of runaway tipping points. The risk of failure is real – and the consequences almost unthinkable.”

2024 Living Planet Report, WWF (October 2024)

9. Ethical investment & banking

Indirect environmental impacts associated with investment and banking services are typically very significant⁹. As an organisation with cash reserves and which, like most, facilitates the investment of money in pension services on behalf of its employees, PDSE recognises its responsibility to be mindful of the impacts of how and where it places its money.

GHG impacts associated to PDSE’s use of financial services have not been reported on for FY 23-24 owing to a lack of clarity on best practice for accounting methodology – impacts will be reported on when methodologies develop and the transparency of the impacts of financial services improves.

High level update on ethical investment and banking	
Environmental objective	[Obj.9a] Banks and any investment funds used to achieve MSCI/Sustainalytics rating of ‘BBB’ (minimum) by FY 26-27.
Takeaway	This is a very recently established objective, with actions around it set to commence in FY 24-25.

⁹ See [‘The Global Emissions of the UK Financial Sector’](#) – published by WWF and Green Peace in 2021 for more information around the environmental impacts of financial services.



**Peninsula
Dental**
Social Enterprise

Thank you for your interest

For any questions or queries, please contact
pdse-info@plymouth.ac.uk

Further information available at
peninsuladental.org.uk/sustainability

