



**Swansea University**  
**Prifysgol Abertawe**

# **PATH TO ZERO REPORT**



**2023 - 2024**  
**UPDATE**

## SUMMARY

Emissions in tCO <sub>2</sub> e	Total Scope 1 & 2		Total Scope 3		Total GHG	
2015/16 Baseline	17,603	%	90,260	%	107,862	%
<b>2023/24 Actual</b>	<b>10,788</b>	<b>-39%</b>	<b>69,802</b>	<b>-23%</b>	<b>80,590</b>	<b>-25%</b>
<b>2023/24 Target</b>	10,562	-40%	72,208	-20%	82,769	-23%
<b>2035/36 Target</b>	0	-100%	45,130	-50%	45,130	-58%
Performance	1 & 2		3		Total GHG	
22/23 Actual vs Target	226	2%	-2,406	-3%	-2,180	-3%
Change Since Prev. yr	-1,354	-11%	-13,752	-16%	-15,106	-16%
Change Since 2015:	-6,815	-39%	-20,458	-23%	-27,273	-25%

### Performance 2023/24:

- **39% decrease in total scope 1 & 2 emissions since 2015/16**, just shy of the 2023/24 target of 40%.
- **23% decrease in total scope 3 emissions** since 2015/16 baseline year, ahead of the 2023 – 2024 planned reduction target of 20%.

### Forward plan

- Campus district heat network decarbonisation and renewable energy generation projects commissioned.
- University building fabric and electrical efficiency improvements such as cladding, glazing and smart LED lighting and building management system upgrades scheduled.
- Financial and environmental sustainability plans in place to enable scope 3 emissions reduction.
- Although the university is currently on the net zero pathway, continued financial constraints may impact the attainment of the eventual 2035 targets.



## CONTENTS



## INTRODUCTION

In October 2019, Swansea University declared a Climate Emergency and committed to being Zero Carbon by 2035.<sup>1</sup>

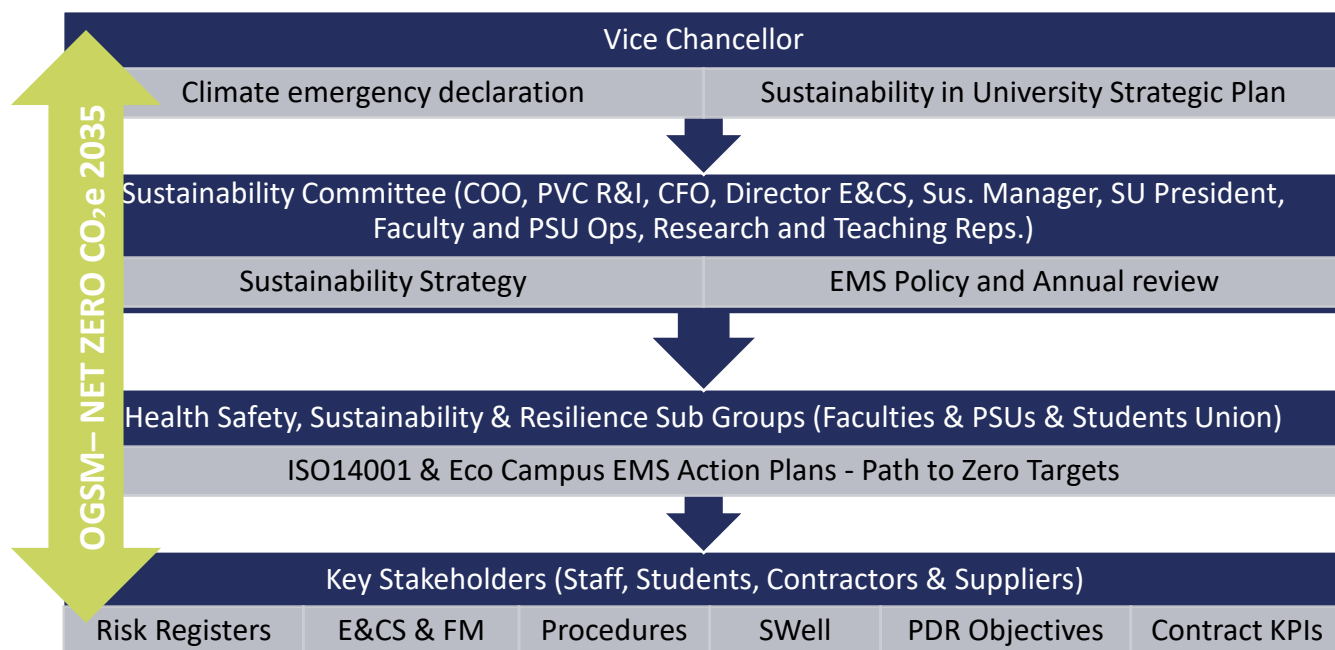
Our [Sustainability and Climate Emergency Plan 2020 - 2025](#) clearly defines our climate emergency targets.



In June 2022 the university published a comprehensive science-based Decarbonisation Action Plan identifying interventions required on our path to zero by 2023. This report was produced in partnership with the Carbon Trust and Welsh Government Energy Service: [Decarb Action Plan Summary Report](#).

This Path to Zero annual report, outlines our GHG emissions performance and progress against our decarbonisation targets and intervention plans. GHG emissions data is aligned with the most recent full academic year: 1<sup>st</sup> August 2023 – 31<sup>st</sup> July 2024.

## GOVERNANCE



**OGSM = OBJECTIVES, GOALS, STRATEGIES AND MEASURE**

<sup>1</sup> Net Zero in scope 1 & 2 as per <https://www.sdgaccord.org/climateletter>

## DRIVERS

### NET ZERO CO<sub>2</sub>E

Key drivers for carbon management and change at Swansea University include:

#### International and national policy

- 2016, Paris Agreement commits international community to reduce GHG emissions to avoid the most severe impacts of climate change.
- 2019, IPCC report on impacts of 1.5°C raise in temperatures highlighting need for urgent climate change mitigation.
- 2019, Swansea University & Welsh Gov. declared a climate emergency and urgent action required.
- 2019, UK committed to achieving net zero GHG emissions by 2050.
- 2021, Swansea University sets 2035 net zero emissions target.
- 2021, COP26, produced Glasgow Climate Pact & agreed Paris rulebook, movement towards measurable actions to lower emissions, improve resilience & provide finance for intervention on 1.5°C goal.
- 2021, Welsh Government set target for public sector to achieve net-zero carbon emissions by 2030.
- 2022, COP27, commitments to limit global temperature rise to 1.5°C. agreement to provide loss & damage fund for vulnerable countries.
- 2023 at COP28, funding for loss & damage announced & acknowledged fossil fuels root cause of climate change, agreement to transition from fossil fuels in energy systems, net zero by 2050.
- 2024 at COP29, New Climate Finance Goal (NCQG) agreed to triple annual climate finance to developing countries to \$300 billion by 2035, with developed countries taking the lead in mobilising this sum & finalized rules for international, high-integrity carbon markets.
- COP29, UK update targets, reduce GHG emissions 81% by 2035 (1990 baseline).

#### Relevant legislation

- Climate Change Act, Environment (Wales) Act (net zero 2050), Energy Performance of Buildings Regulations, The Climate Change (Carbon Budgets & Interim Emissions Targets) (Wales) Regulations
- Guidance: [Public sector net zero reporting guide](#) / [Standardised Carbon Emissions Reporting Framework](#) / [GHG Protocol](#)

#### Reputation

- Climate Emergency Declaration & Zero Carbon Commitment, ISO14001, Green League, People and Planet, 2019 Campus protests & climate strikes.

#### Social & Economic

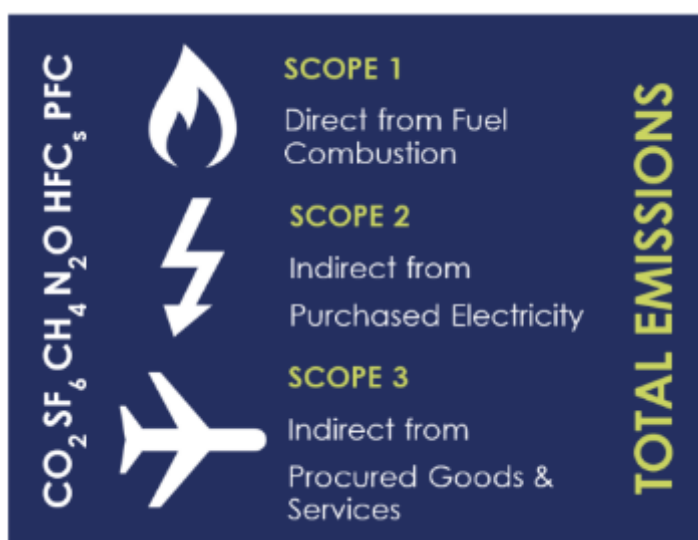
- Revenue & Energy Resilience - Savings on bottom-line & risk from increasing & volatile energy costs
- Research & Innovation (Partners e.g. SPECIFIC)
- [MEDR](#) (formally HEFCW) – Education, Research and Net Zero requirements - [HESA](#) – Estates Management Records (EMR)

## PERFORMANCE

The **boundaries of data** capture for the calculation of Scope 1 and 2 emissions encompass facilities where the University is sole utility procurer. The university follows [GHG Protocol](#), [HE/FE sector](#) and [Welsh Government Net Zero Public Sector guidance](#) for scoping and reporting all emissions including scope 3. This includes Singleton Park campus, Bay Campus and Facilities at Swansea Bay Sport Park. The Higher Education Supply Chain Emissions Tool (HESCET) is used to calculate university supply chain emissions<sup>2</sup>.

In 2015 the University, previously a single campus based at Singleton Park, undertook a 65 acre expansion project opening the Bay Campus, becoming a dual campus university. The Bay campus on the East approach to Swansea City Centre, is a mixture of academic and research buildings which increased the total floor area by 51,574m<sup>2</sup>. Due to this substantial change it was agreed by Higher Education Funding Council Wales (HEFCW) and Swansea University, that **2015 – 2016 would be adopted as the institutions representative carbon management baseline year**.

## TOTAL EMISSIONS TARGETS AND PERFORMANCE



**Scope 1 and 2 target:** Zero carbon for direct emissions (scope 1 and 2) by **2035**, with at least a 70% reduction by 2030<sup>3</sup>. On average 5% reduction annually.

**Scope 3 target:** Achieve (on average) a 2.5% year on year reduction in scope 3 emissions, 50% by **2035** (35% by 2030)<sup>2</sup>. On average 2.5% reduction annually.

**Offsetting policy** in progress.

## ANNUAL NET ZERO BUDGET

The annual university net zero budget is subject to decarbonisation project implementation plans and access to external funding. This is derived from Welsh Government [MEDR annual](#) and project specific net zero capital funding and [project specific grants](#) and [loans administered by Salix finance](#) as part of decarbonisation funds for public and tertiary education sectors in Wales. Net zero budget 2023/24: **£3m** and 2024/25: **£5.87m**.

<sup>2</sup> This includes: Purchased goods and services, Capital goods including building and refurbishment and Transportation of goods to the institution.



## SUMMARY OF PATH TO ZERO PERFORMANCE

Emissions tCO <sub>2</sub> e	Total Scope 1 & 2	Reduction	Total Scope 3	Reduction	Total GHG Emissions	Reduction
15/16 Baseline	17,603		90,260		107,862	
16/17 Actual	18,270	4%	77,610	-14%	95,880	-14%
17/18 Actual	16,152	-8%	46,669	-48%	62,821	-48%
18/19 Actual	15,170	-14%	40,019	-56%	55,189	-56%
19/20 Actual	12,866	-27%	37,433	-59%	50,299	-59%
20/21 Actual	13,247	-25%	34,364	-62%	47,611	-62%
21/22 Actual	11,685	-34%	75,595	-16%	87,280	-16%
22/23 Actual	12,142	-31%	83,554	-7%	95,696	-7%
<b>23/24 Actual</b>	<b>10,788</b>	<b>-39%</b>	<b>69,802</b>	<b>-23%</b>	<b>80,590</b>	<b>-25%</b>
23/24 Target	10,562	-40%	72,208	-20%	82,769	-23%
24/25 Target	9,681	-45%	69,951	-23%	79,633	-26%
25/26 Target	8,801	-50%	67,695	-25%	76,496	-29%
26/27 Target	7,921	-55%	65,438	-28%	73,359	-32%
27/28 Target	7,041	-60%	63,182	-30%	70,223	-35%
28/29 Target	6,161	-65%	60,925	-33%	67,086	-38%
29/30 Target	5,281	-70%	58,669	-35%	63,950	-41%
30/31 Target	4,401	-75%	56,412	-38%	60,813	-44%
31/32 Target	3,521	-80%	54,156	-40%	57,676	-47%
32/33 Target	2,640	-85%	51,899	-43%	54,540	-49%
33/34 Target	1,760	-90%	49,643	-45%	51,403	-52%
34/35 Target	880	-95%	47,386	-48%	48,266	-55%
35/36 Target	0	-100%	45,130	-50%	45,130	-58%
Performance						
23/24 Actual vs Target	226	2%	-2,406	-3%	-2,180	-3%
Change Since Prev. yr	-1,354	-11%	-13,752	-16%	-15,106	-16%
Change Since 2015:	-6,815	-39%	-20,458	-23%	-27,273	-25%

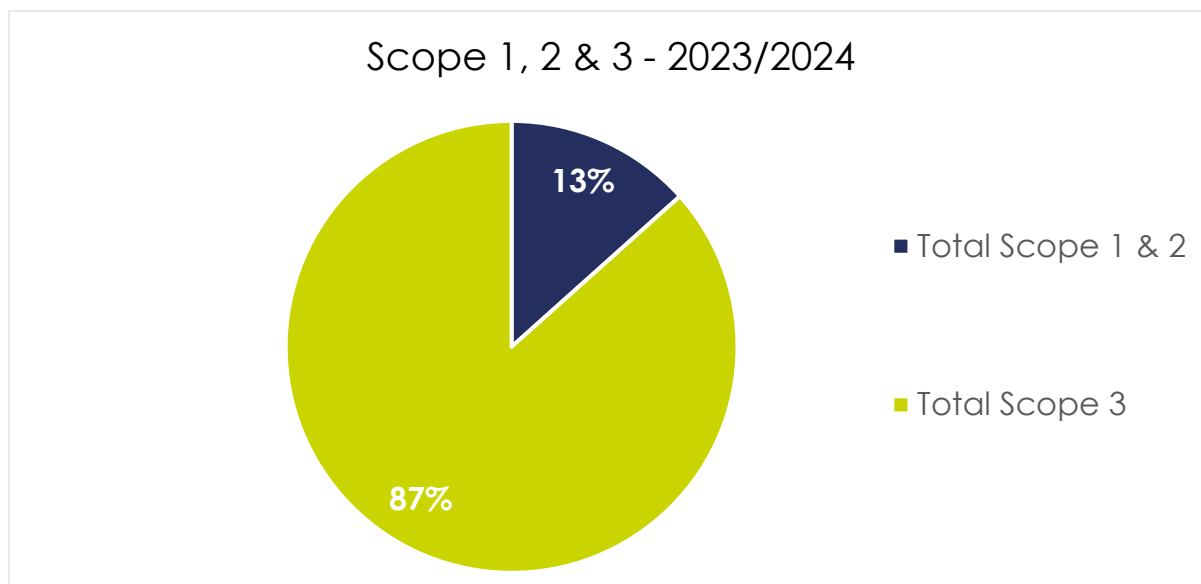
Scope 1 & 2 total emissions tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e):

- **39% reduction since 2015/16**, just shy of the 2023/24 target of 40%.
- **8% reduction in 2023/24** compared to the previous year. A result of net zero decarbonisation projects implementation and optimisation such as: the switch to 'smart' LED lighting, building management efficiencies, roof mounted solar renewable energy generation and use and though replacement of old gas boilers with low carbon and more efficient air source heat pumps.



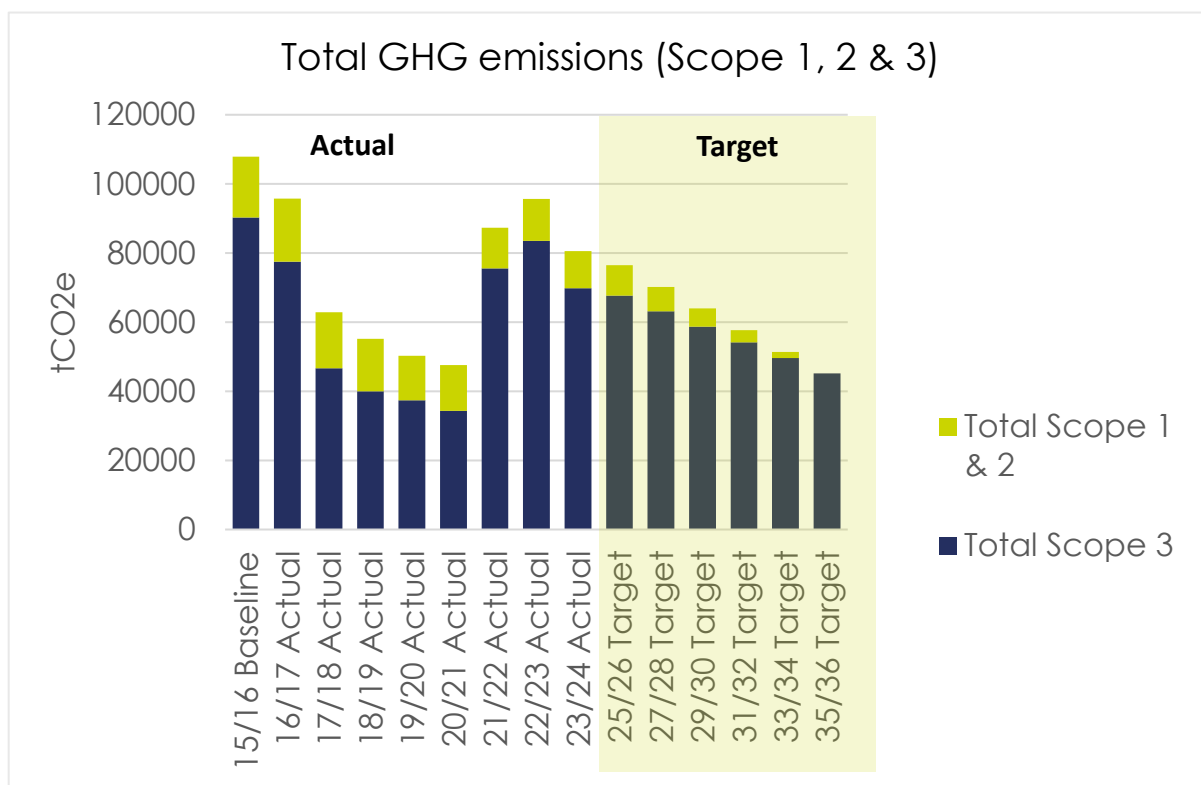
### Scope 3 total emissions tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e):

- **23% reduction since 2015/16**, beyond the target for 2023/24.
- **16% reduction in 2023/24**, compared to the previous year. As a result of reductions in supply chain emissions and student and staff commuting emissions.



### Total GHG emissions

- **25% overall reduction since 2015/16**, beyond the 2023/24 target of 23.3%
- **16% reduction in 2023/24**, compared to previous year as a result of the above stated reductions.



## SUMMARY OF SCOPE 1 &amp; 2 EMISSIONS PERFORMANCE 2015 - 2024

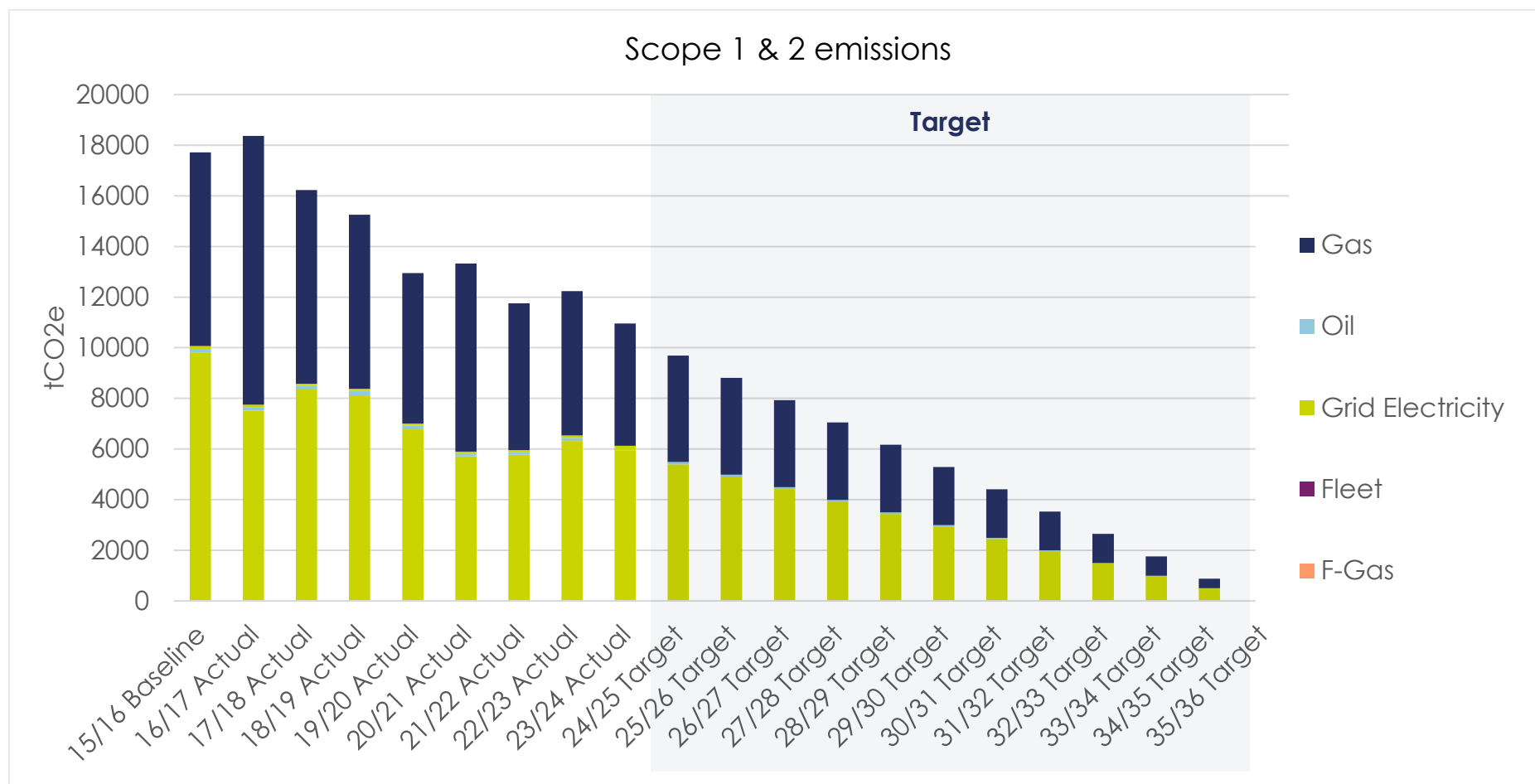
Emissions tCO <sub>2</sub> e	Scope 1				Scope 2		Total Scope 1 & 2	Reduction
	Gas	Fleet	Oil	F-Gas	Grid Electricity	Onsite Solar CO <sub>2</sub> e avoided est.		
15/16 Baseline	7,649	18	162		9,774	114	17,603	
16/17 Actual	10,617	10	139		7,505	98	18,270	4%
17/18 Actual	7,654	9	153		8,335	82	16,152	-8%
18/19 Actual	6,871	4	175		8,120	83	15,170	-14%
19/20 Actual	5,944	2	151		6,770	88	12,866	-27%
20/21 Actual	7,424	5	115		5,703	76	13,247	-25%
21/22 Actual	5,796	6	117		5,766	67	11,685	-34%
22/23 Actual	5,701	5	128		6,308	95	12,142	-31%
<b>23/24 Actual</b>	<b>4,834</b>	<b>12</b>	<b>25</b>	<b>25</b>	<b>5,892</b>	<b>173</b>	<b>10,788</b>	<b>-39%</b>
23/24 Target	4,589	11	97	15	5,864		10,562	-40%
24/25 Target	4,207	10	89	14	5,375		9,681	-45%
25/26 Target	3,824	9	81	12	4,887		8,801	-50%
26/27 Target	3,442	8	73	11	4,398		7,921	-55%
27/28 Target	3,060	7	65	10	3,909		7,041	-60%
28/29 Target	2,677	6	57	9	3,421		6,161	-65%
29/30 Target	2,295	5	49	7	2,932		5,281	-70%
30/31 Target	1,912	4	41	6	2,443		4,401	-75%
31/32 Target	1,530	4	32	5	1,955		3,521	-80%
32/33 Target	1,147	3	24	4	1,466		2,640	-85%
33/34 Target	765	2	16	2	977		1,760	-90%
34/35 Target	382	1	8	1	489		880	-95%
35/36 Target	0	0	0	0	0		0	-100%
Performance								
23/24 Actual vs Target	245	1	-72	10	28		226	2%
Change Since Prev. yr	-866	6	-102	25	-416	78	-1,354	-11%
Change Since 2015:	-2,815	-6	-137	25	-3,882	58	-6,815	-39%

**Scope 1 & 2 emissions tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e):**

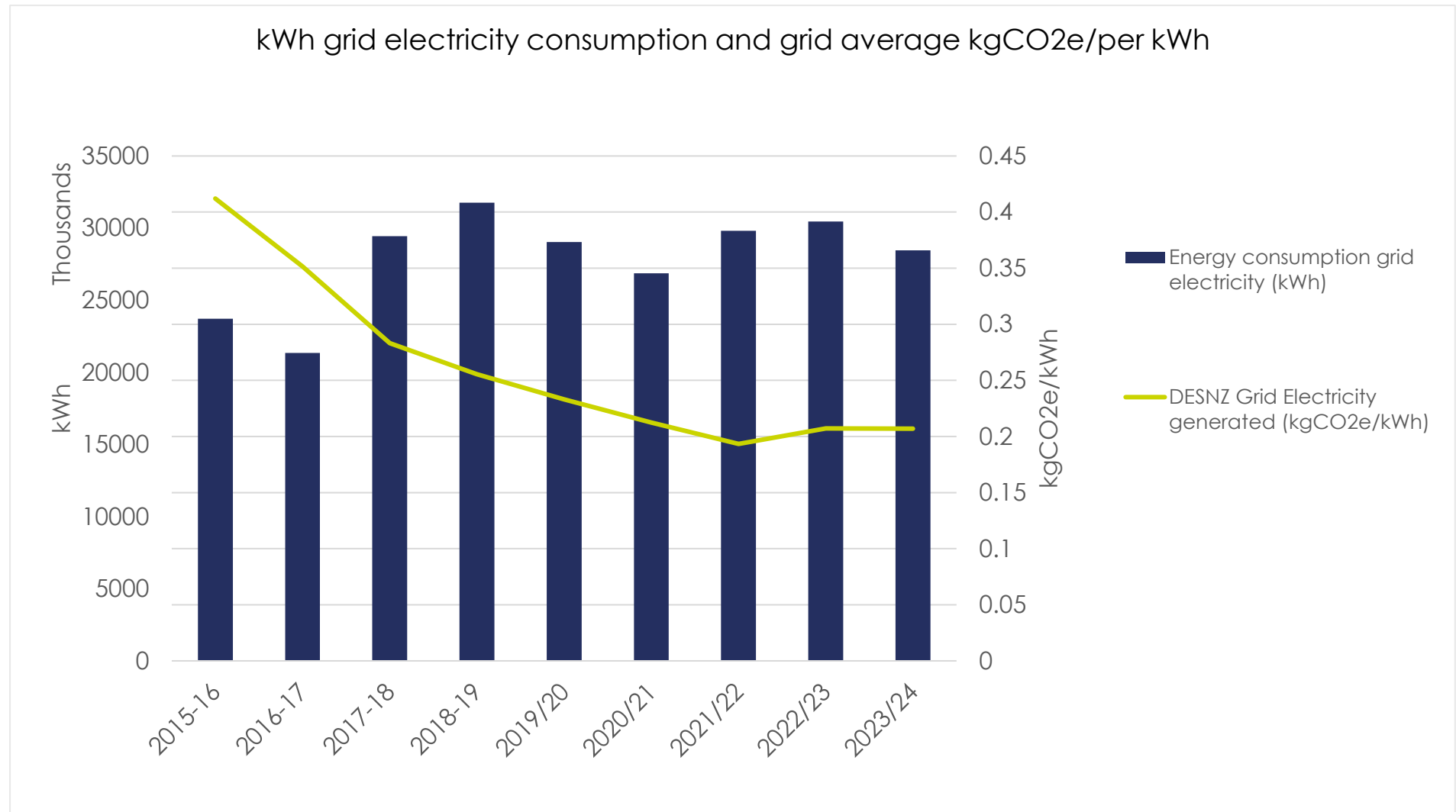
- **40% decrease in electricity** emissions since 2015/16. On target for 23/24
- **38% decrease in gas and oil** emissions since 2015/16. Behind target for 23/24
- **33% decrease in fleet** emissions since 2015. Behind target for 2023/24.
- **Fluorinated Gas (F-Gas)** emissions included in net zero report

University net zero decarbonisation interventions on gas, power and lighting systems, building fabric upgrades and solar renewable installations contributed to **1,354 tCO<sub>2</sub>e reduction** in overall emissions, compared to previous year. A **6,815 tCO<sub>2</sub>e annual reduction**, compared to 2015/16 levels.

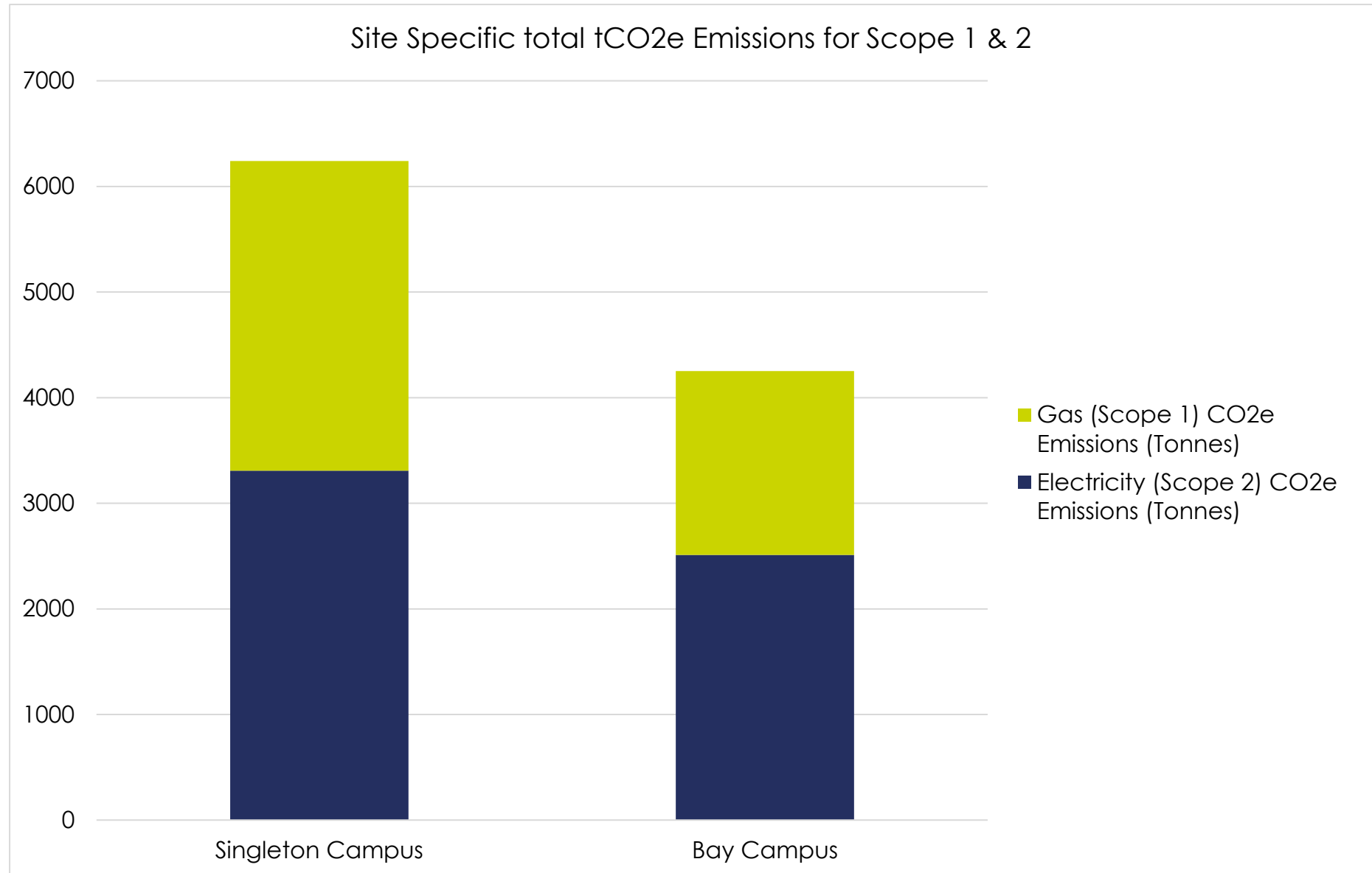


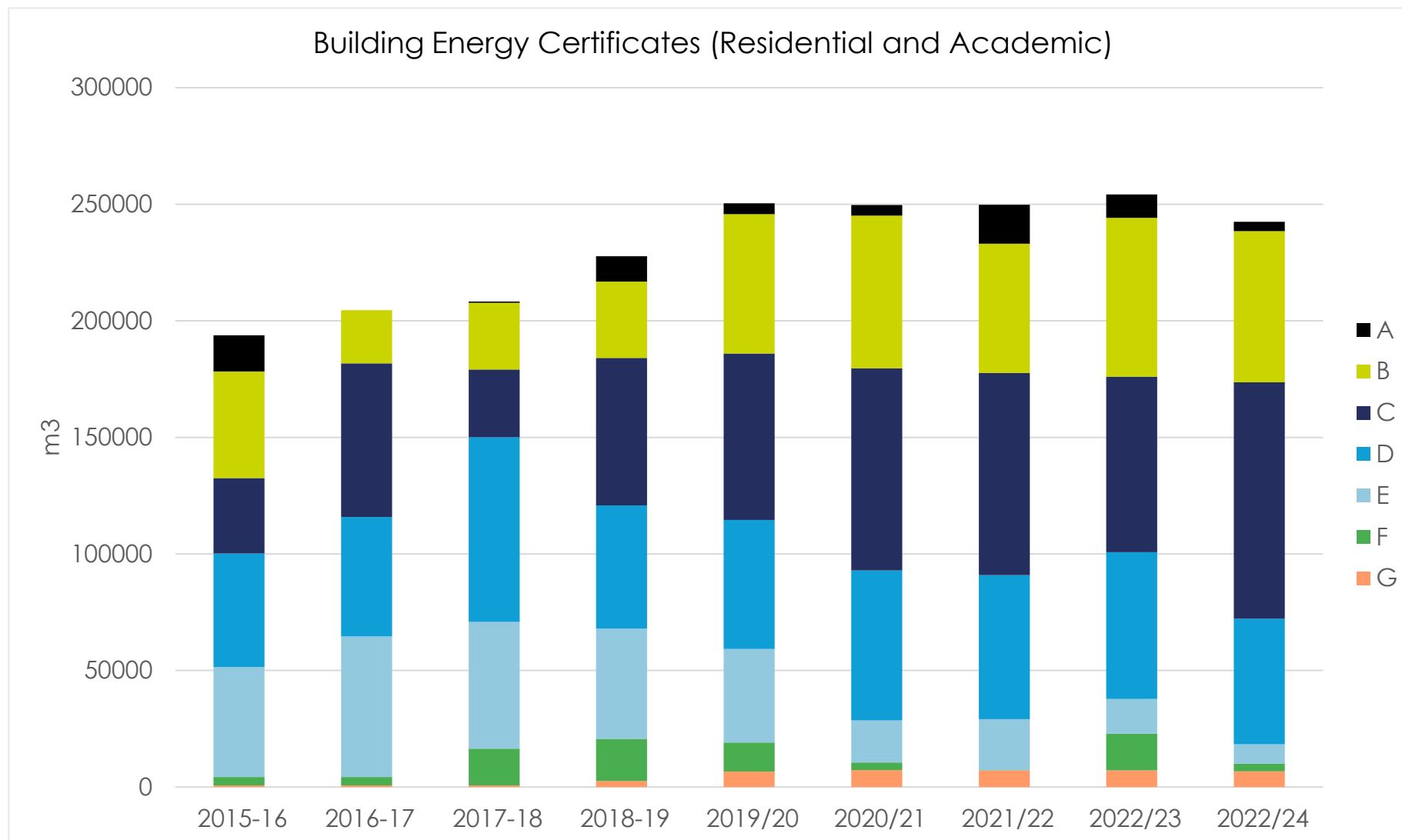


Net zero interventions for heating and fleet in critical path for 2024/25. Though completion of technoeconomic heat decarbonisation report and successful application, [£11.4m Digarbon funding](#) awarded by Welsh Gov. to decarbonise University District Heat Network (DHN) switch gas boilers to electrical air sources heating and improve building efficiency. All in addition to continuation of smart LED lighting, EV charging infrastructure, Building Management System (BMS) and other HVAC upgrades.

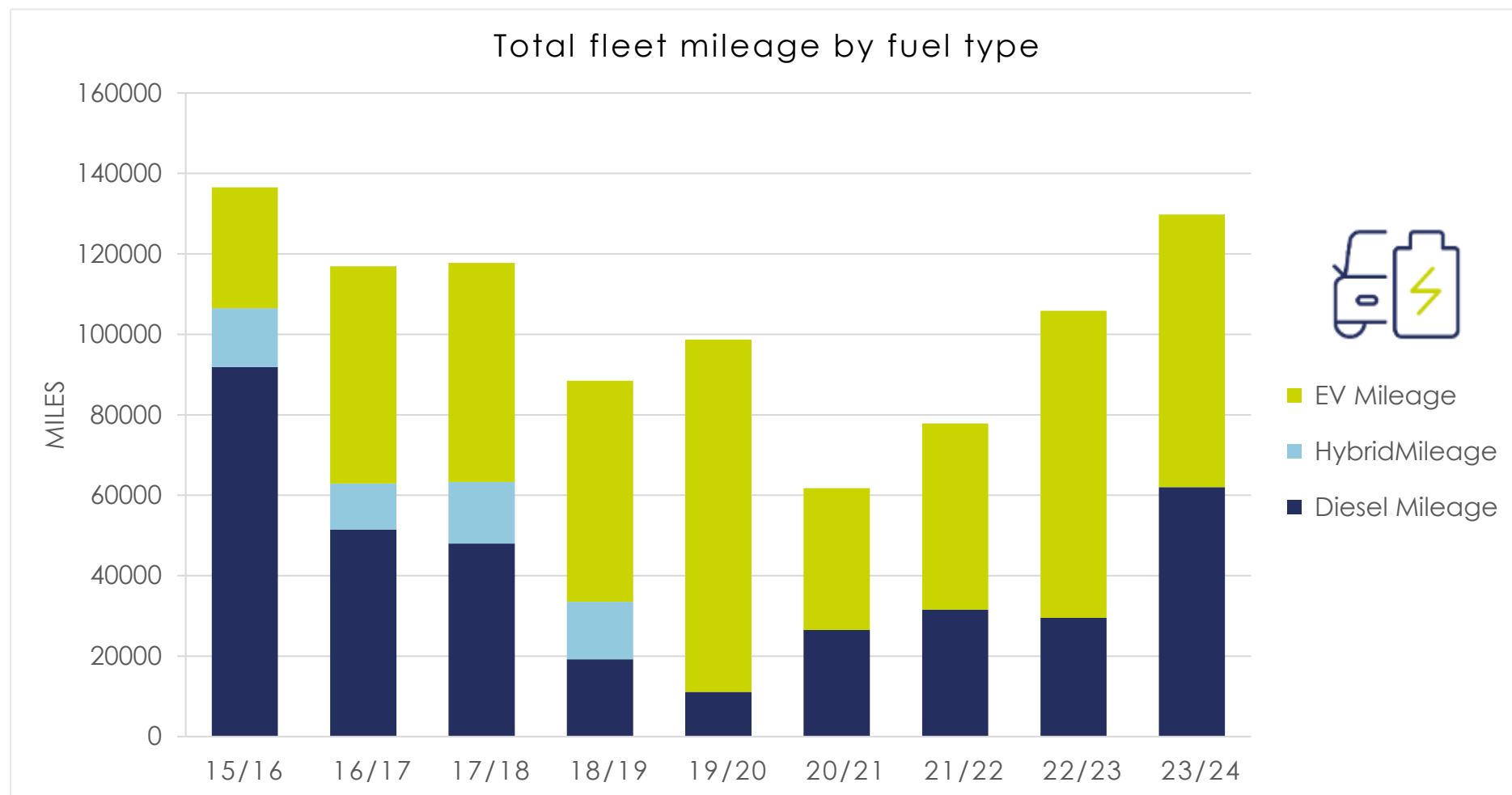


- **7% decrease in grid electricity consumption** compared to previous year through efficiencies and increased onsite renewable energy.
- **0.0117% decrease in grid carbon intensity** per kWh compared to previous year.



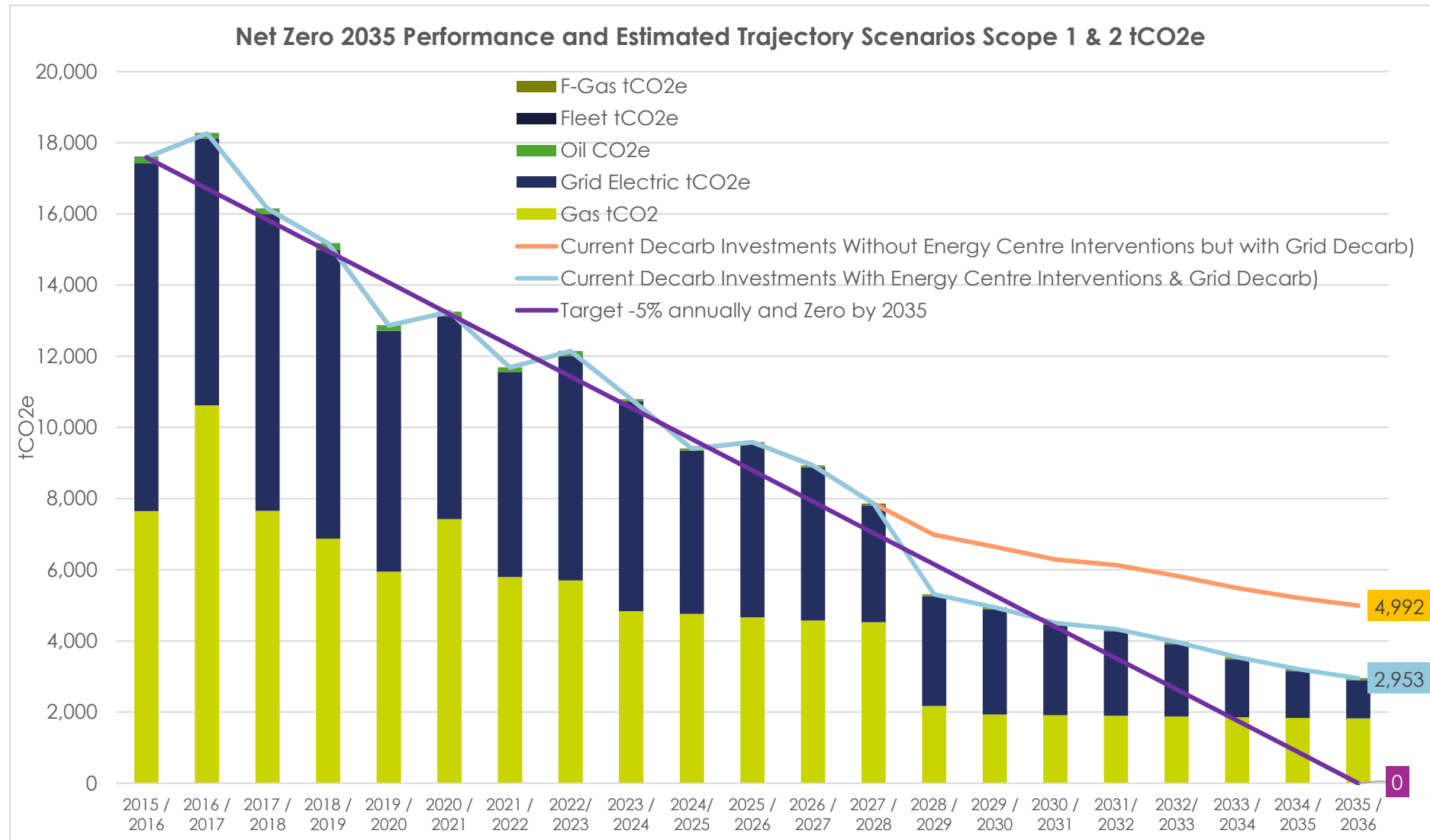


- **28% decrease in buildings energy performance rated D to G** in respective Display Energy Certificates (DEC)
- **11% increase in buildings energy performance rated A to C** in respective DEC

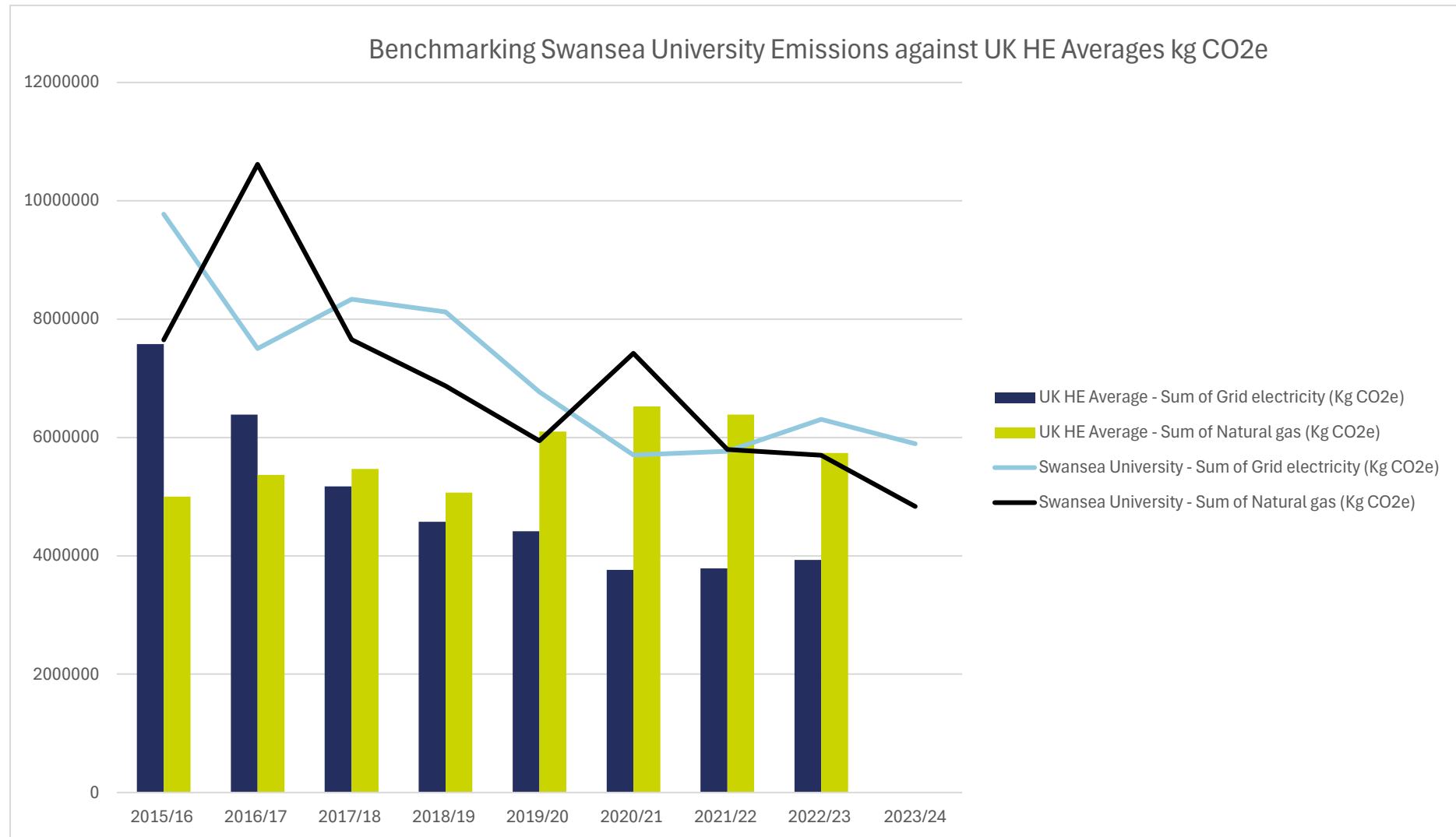


- **52% of mileage in Electric Vehicle (EV) fleet**, Estates and faculties fleet targeted for switching to EV in 2024/25
- **23% increase in total fleet mileage**, and a doubling of diesel fueled mileage has increase overall emissions from fleet by 6 tCO<sub>2</sub>e. Estates and Campus Services – Security and Faculty of Science and Engineering diesel vehicles mileage increases account for these tCO<sub>2</sub>e increases.





**Note: the above estimated graph is for indicative purposes only. projections are subject to several variables which will alter the outcomes.** examples of this are university growth, financial sustainability and external factors such as grid decarbonisation and low carbon technologies and supply chains.

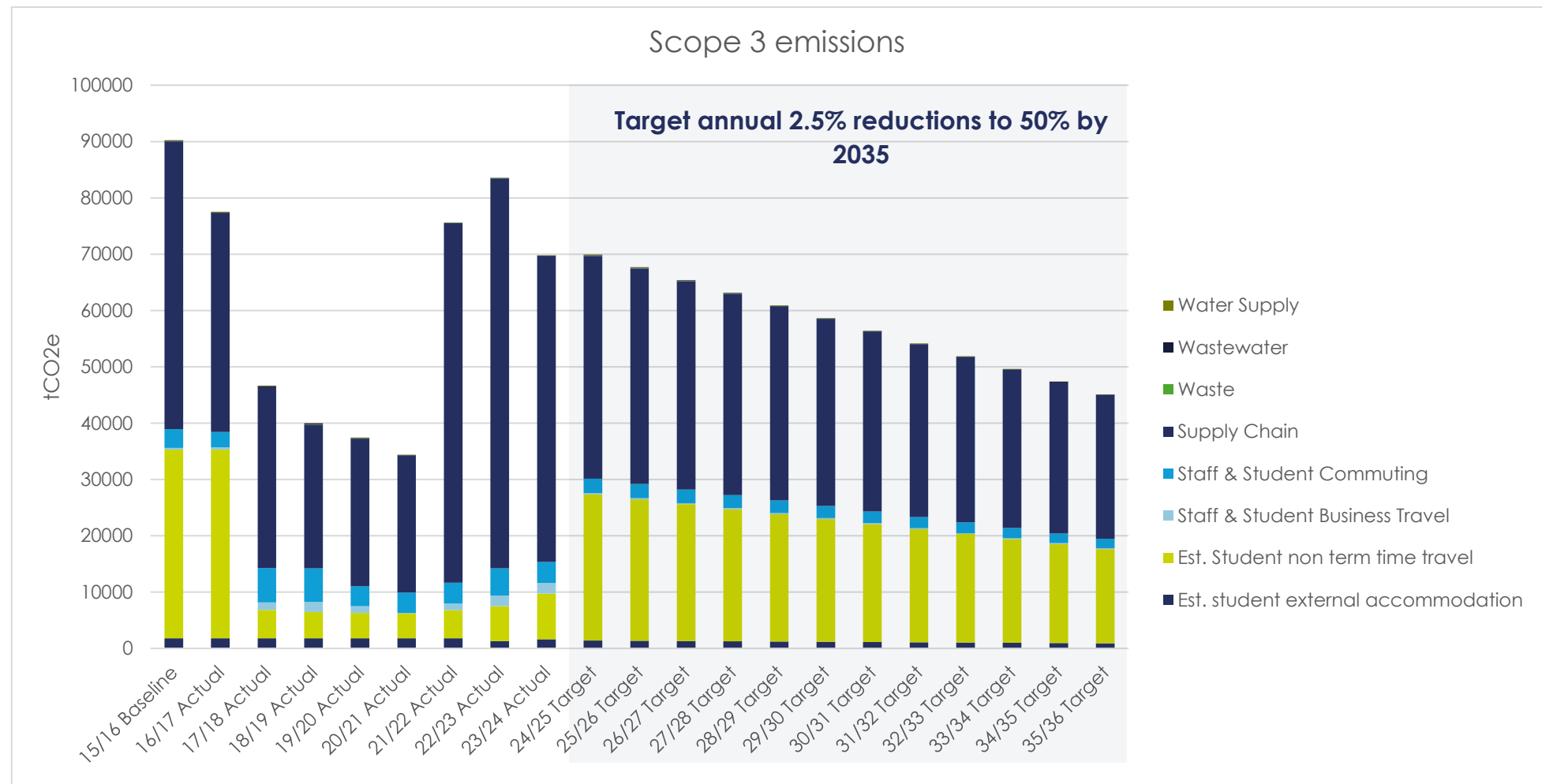


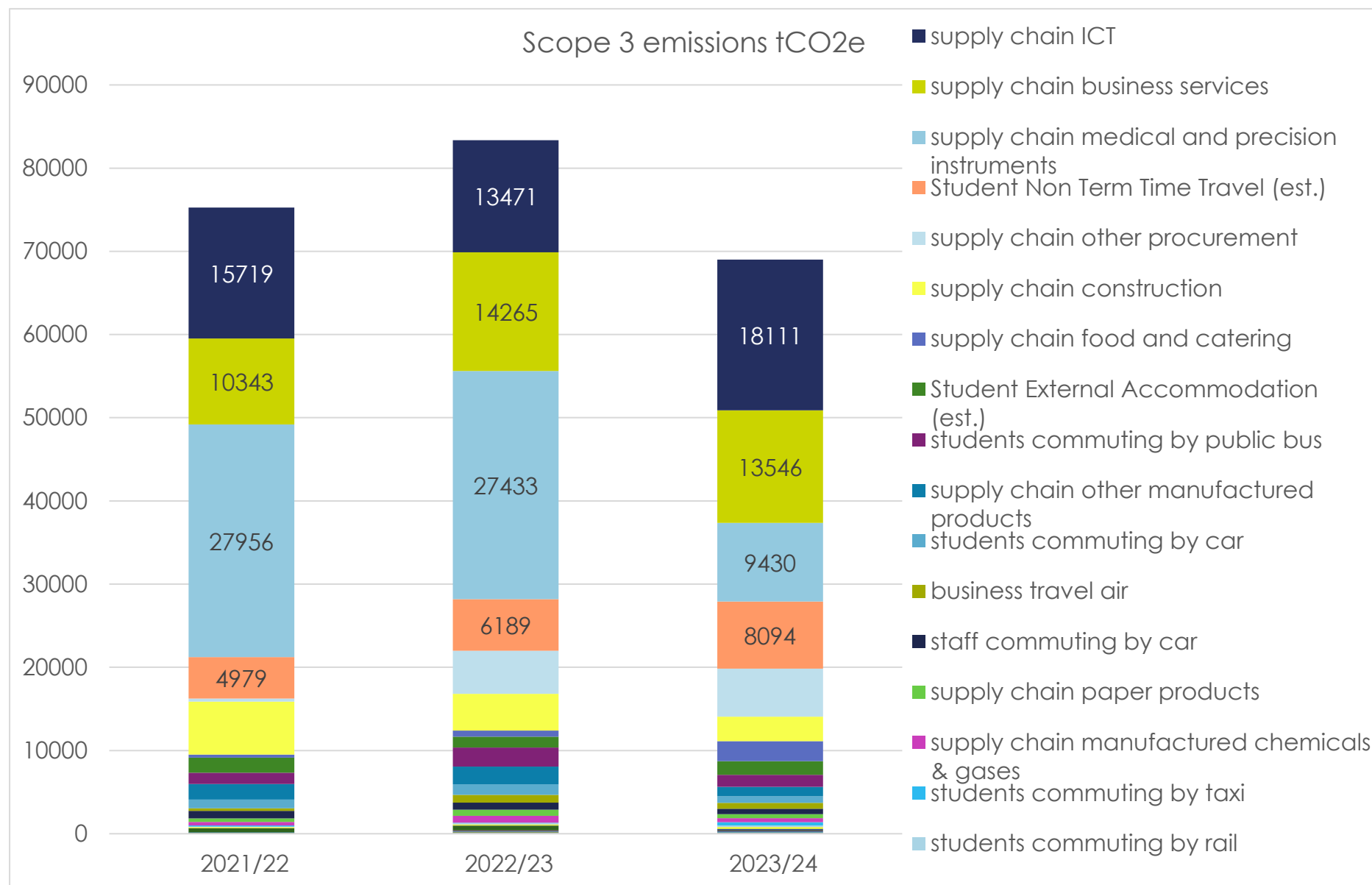
Emissions tCO <sub>2</sub> e	Scope 3								Total Scope 3	Reduction
	Waste	Water Supply	Waste water	Supply Chain	Staff & Student Business Travel	Staff & Student Commuting	Student Non Term Time Travel (est.)	Student External Accommodation (est.)		
15/16 Baseline	41	96	192	51,024	291	3,312	33,478	1,825	90,260	
16/17 Actual	27	98	191	38,770	372	2,753	33,478	1,825	77,514	-14%
17/18 Actual	27	99	195	32,063	1,342	6,104	5,014	1,825	46,669	-48%
18/19 Actual	24	86	168	25,500	1,780	5,994	4,642	1,825	40,019	-56%
19/20 Actual	21	82	161	26,120	1,200	3,552	4,470	1,825	37,433	-59%
20/21 Actual	12	30	52	24,352	82	3,635	4,376	1,825	34,364	-62%
21/22 Actual	17	33	57	63,826	1,199	3,658	4,979	1,825	75,595	-16%
22/23 Actual	29	45	48	69,208	1,880	4,859	6,189	1,296	83,554	-7%
<b>23/24 Actual</b>	<b>5</b>	<b>53</b>	<b>61</b>	<b>54,328</b>	<b>1,913</b>	<b>3,712</b>	<b>8,094</b>	<b>1,635</b>	<b>69,802</b>	<b>-23%</b>
23/24 Target	33	77	154	40,819	233	2,650	26,782	1,460	72,208	-20%
24/25 Target	32	75	149	39,543	226	2,567	25,945	1,415	69,951	-23%
25/26 Target	31	72	144	38,268	218	2,484	25,108	1,369	67,695	-25%
26/27 Target	30	70	139	36,992	211	2,401	24,272	1,323	65,438	-28%
27/28 Target	29	67	135	35,716	204	2,319	23,435	1,278	63,182	-30%
28/29 Target	28	65	130	34,441	196	2,236	22,598	1,232	60,925	-33%
29/30 Target	27	63	125	33,165	189	2,153	21,761	1,186	58,669	-35%
30/31 Target	26	60	120	31,890	182	2,070	20,924	1,141	56,412	-38%
31/32 Target	25	58	115	30,614	175	1,987	20,087	1,095	54,156	-40%
32/33 Target	24	55	111	29,339	167	1,905	19,250	1,050	51,899	-43%
33/34 Target	23	53	106	28,063	160	1,822	18,413	1,004	49,643	-45%
34/35 Target	22	50	101	26,787	153	1,739	17,576	958	47,386	-48%
35/36 Target	21	48	96	25,512	146	1,656	16,739	913	45,130	-50%
Performance										
22/23 Actual vs Target	-28	-24	-92	13,509	1,680	1,062	-18,688	175	-2,406	3%
Change Since Prev. yr	-24	9	13	-14,880	33	-1,147	1,905	339	-13,752	-16%
Change Since 2015:	-36	-43	-131	3,304	1,622	400	-25,384	-190	-20,458	-23%

## SUMMARY OF SCOPE 3 EMISSIONS PERFORMANCE 2015 – 2024

Scope 3 total emissions tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e):

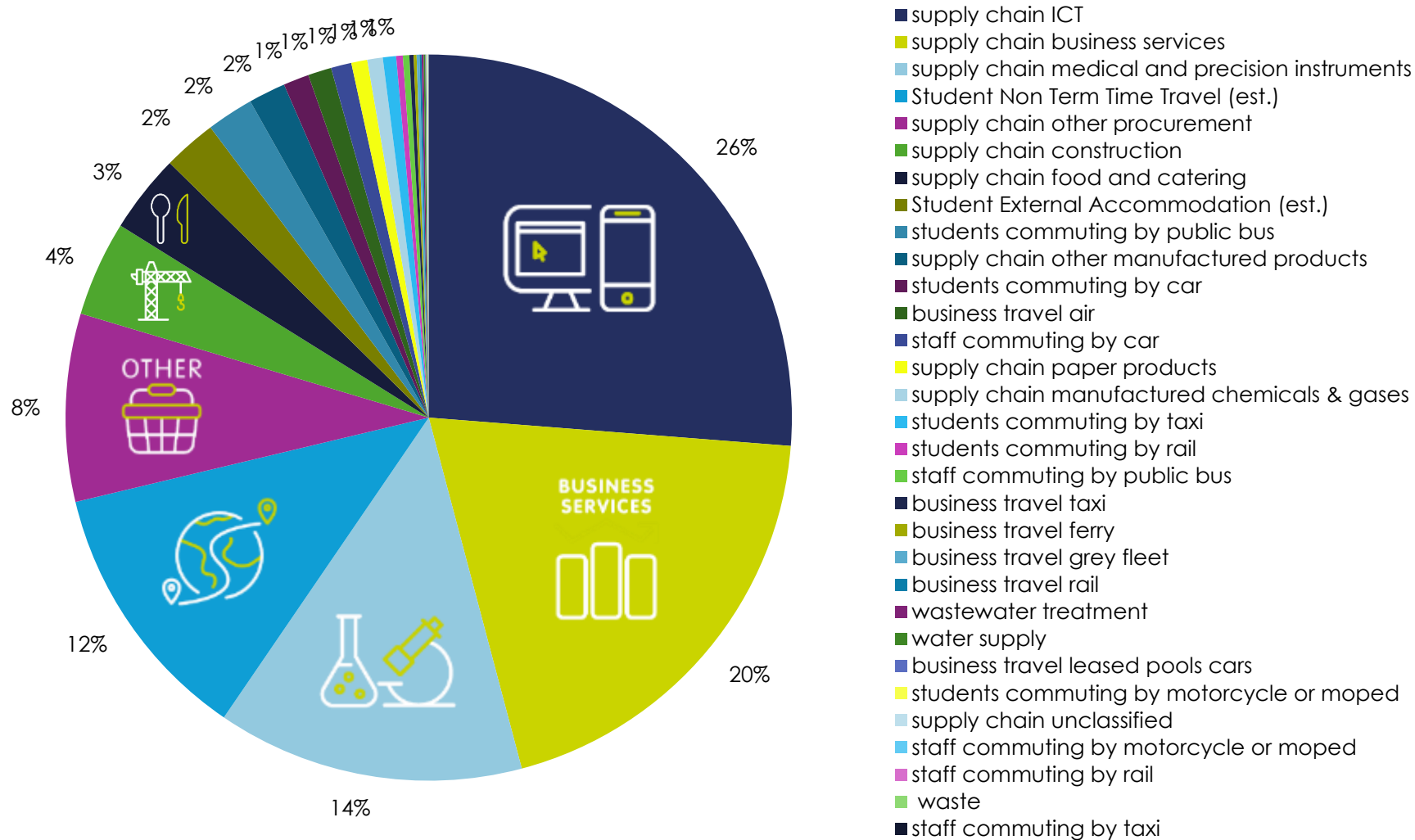
- **16% decrease in total scope 3 emissions** in 2022/23 versus previous year.
- **23% decrease in total scope 3 emissions** since 2015/16 baseline year, ahead of the 2023 – 2024 planned reduction target of 20%.
- **2% decrease in waste, water and wastewater emissions** compared to previous year.
- **22% decrease in supply chain emissions** despite increased supply chain expenditure principally due to reduced medical equipment expenditure (which has a high carbon intensity) compared to previous years.
- **6% increase in University Travel emissions** from business, commuting and student non termtime journeys.
- **26% increase in external UPP Bay Campus student accommodation emissions** compared to previous year.
- 86% of university emissions were scope 3







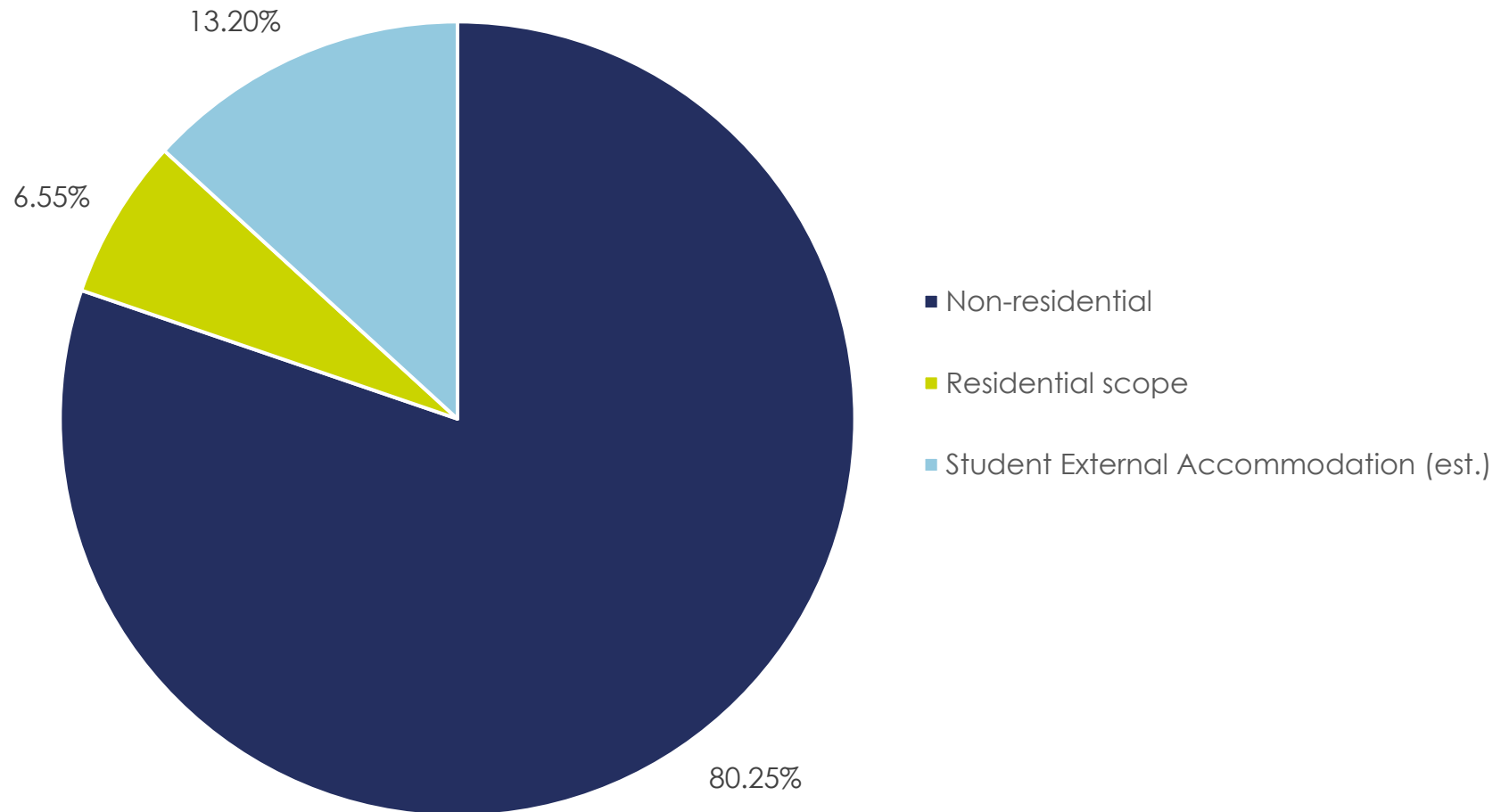
Scope 3 emission sub categories %



## SCOPE 1 & 2 KPIs

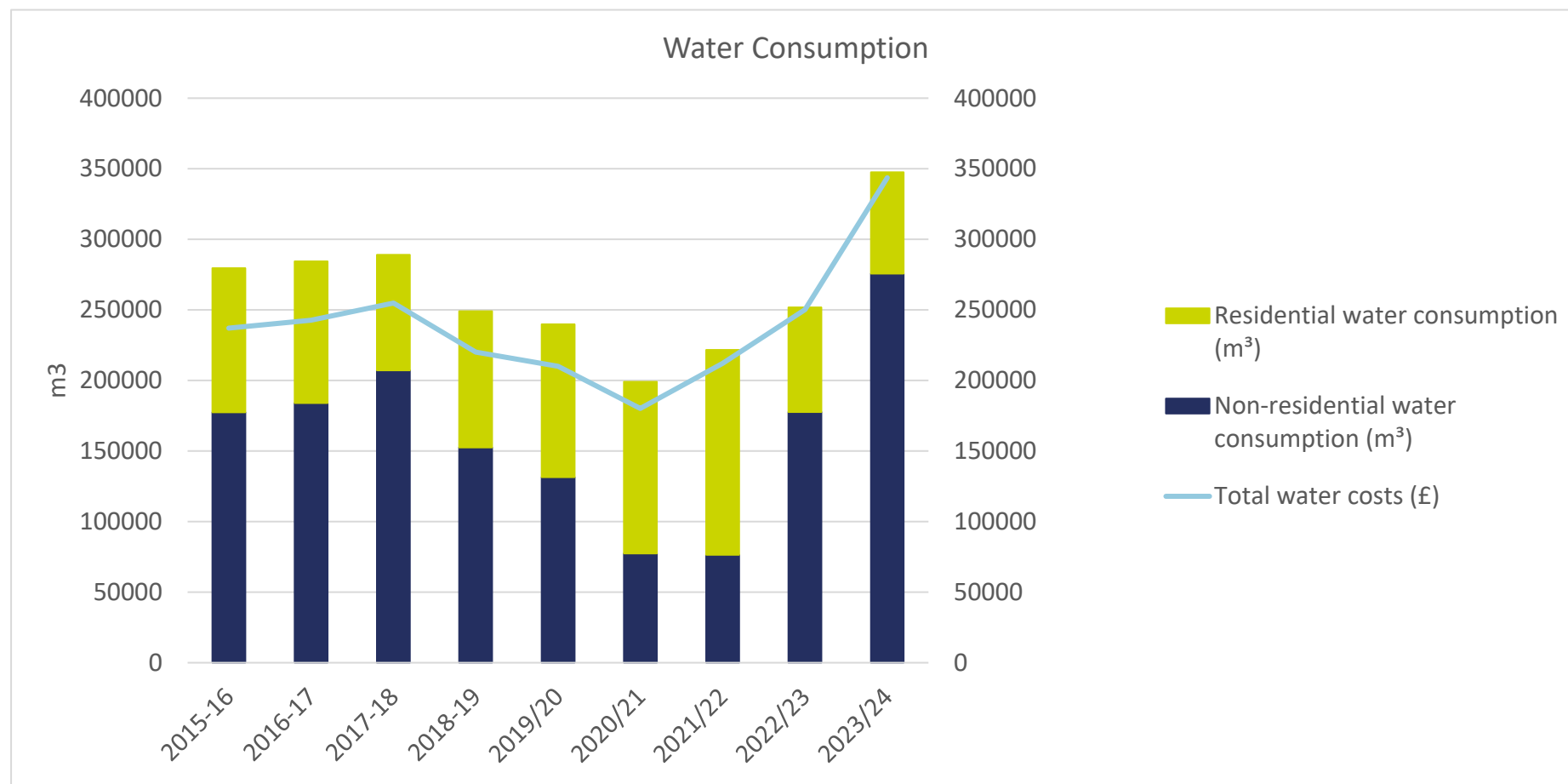
KPI	35/36 Target	25/26 Target	Difference Since Baseline	Annual difference A Vs T	23/24 Actual	23/24 Target	2015/16 Baseline
	100%	50%				40%	
Total scope 1 and 2 carbon emissions (kg CO <sub>2</sub> e)	0	8,792,367	-38.9%	2.0%	10,763,077	10,550,841	17,602,509
Non-residential scope 1 and 2 carbon emissions total (kg CO <sub>2</sub> e)	0	7,211,389	-31.1%	14.9%	9,939,783	8,653,667	14,422,778
In house residential scope 1 and 2 carbon emissions total (kg CO <sub>2</sub> e)	0	1,580,979	-74.3%	-57.2%	811,752	1,897,174	3,161,957
Total scope 1 and 2 carbon emissions (kgCO <sub>2</sub> e) /m <sup>2</sup>	0.00	35.16	-38.4%	2.7%	43.34	42.19	70.31
Total non-Residential scope 1 and 2 carbon emissions (kgCo <sub>2</sub> e) /FTE student	0.00	483.17	-44.1%	-6.9%	540.04	579.81	966.35
Total scope 1 and 2 carbon emissions (kgCO <sub>2</sub> e) / Total income (£)	0.000	0.030	-56.1%	-26.8%	0.026	0.04	0.059
Total scope 1 and 2 carbon emissions (kgCO <sub>2</sub> e) / FTE Staff + Students	0.00	504.50	-51.5%	-14.8%	489.79	605.41	1,009.01
Total residential scope 1 and 2 carbon emissions (kgCO <sub>2</sub> e) / bed spaces	0.00	704.54	-55.9%	-26.5%	621.56	845.44	1,409.07
Total scope 1 and 2 carbon emissions (tonnes CO <sub>2</sub> e) /FTE Students	0.00	0.59	-50.4%	-17.4%	0.58	0.71	1.18
External residential scope 1 and 2 carbon emissions (Kg CO <sub>2</sub> e) (BAY UPP)					1,635,159		1,825,358
Gross Internal area Total HEI (m <sup>2</sup> )					248,335		250,355
Total income (£)					412,637,000		296,292,000
FTE Staff + Students					21,975		17,445
FTE Students					18,406		14,925
Residential bed spaces					1,306		2,244

Percentage of total scope 1 & 2 carbon emissions  
by building type (in house and external)



## WATER

University water consumption targets are aligned with the scope 3 emissions targets at 50% reduction by 2035 from 2015 baseline year.



- **37% increase in supplied water and wastewater emissions compared to previous year**, principally due to a leak identified on Singleton Campus underground pipelines feeding non-residential buildings, which is now repaired.

## BASELINE DECARBONISATION ACTION PLAN 2022

Click on image below for link to plan:





## SINGLETON CAMPUS HEAT DECARBONISATION STUDY

In 2024 the university commissioned a technical and economic feasibility study for the decarbonisation of Singleton Campus Heating.

The study supported by ARUP, considers Swansea University's objective of reaching net zero carbon by 2035 through a feasibility assessment to decarbonise the heat generation on their Singleton Campus.

Singleton Campus has a heat network powered by gas boilers, serving 22 out of 36 buildings with a 6MW capacity.

The feasibility study included: surveying the campus to assess current heating demand, evaluating low-carbon heating technologies, identifying the best location and setup for a new energy centre, developing a model to assess energy use, emissions, and costs, and recommending the most suitable solution for the University's consideration.

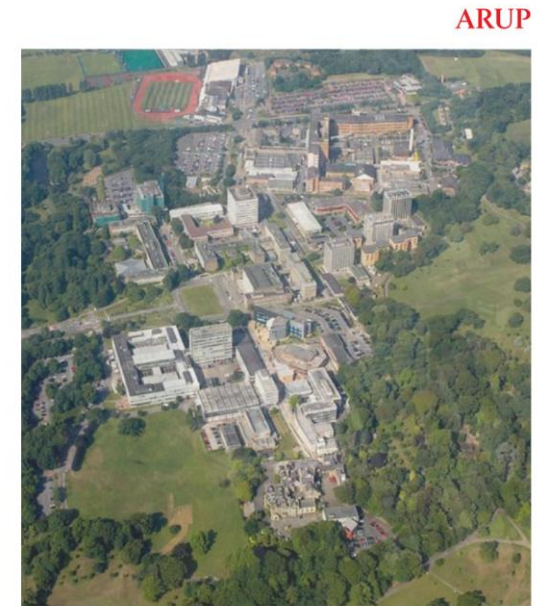
Two decarbonisation solutions were analysed for Singleton Campus:

**Decentralised Scenario:** Air source heat pumps would be installed in each building over 10 years. Low-temperature systems would go into new or refurbished buildings, while high-temperature or cascade systems would be used elsewhere. Implementation would align with the campus masterplan.

**Centralised Scenario:** A new energy centre near the existing one would use 3MW high-temperature modular air source heat pumps and a 3MW electric boiler for peak demand and backup. Most buildings would connect to this network, except Finance and Singleton Abbey.

Swansea University  
Singleton Campus Heat Decarbonisation Study  
Feasibility Report  
Reference:  
P02 | 26 July 2024

This report takes into account the particular circumstances and requirements of our client. It is not intended for use and should not be relied upon by any third party and no responsibility is undertaken to any third party.  
Job number: 209411-00  
Prepared by: ARUP  
2 Westland Street  
Cardiff  
CF10 1AF  
Wales & England  
arup.com



In both cases, the campus would be fully electrified for heating by 2035. Cost and emissions modelling showed the centralised option offers lower carbon emissions, lower capital cost, and lower total cost over the study period.

Based on the relative performance, the centralised option was selected as the preferred option and was developed to a greater level of detail. The internal MEP equipment associated with the new ASHP installation would be housed within the existing energy centre. Due to the modular nature of the proposed heat pumps, there is an opportunity to install the first 1MW worth of heat pump capacity in the short-term to result in an immediate and substantial reduction in carbon emissions. Any installed low carbon heating solution would become the lead producer of heat. Even though 1MW may seem modest compared to the 6MW peak heat demand, it would remove over 50% of the gas consumption from the energy centre.

Compared to business as usual, this intervention would save approximately 1,384 tonnes of CO<sub>2</sub> per year for a capital cost of less than £2.8m. This would account for a 15.3% reduction in the total carbon emissions associated with Singleton Campus.

The centralised solution was agreed as the preferred solution for the decarbonisation of the heat supply to Singleton Campus. In brief, this comprises:

- The addition of 3MW of ASHP capacity located at the existing energy centre.
- The phase out of the gas boilers and eventual replacement with electrical boilers to provide the peak heat demand.
- The addition of buildings not currently connected to the existing heat network.
- The addition of any new-build schemes to the existing heat network.

## Next Steps

The University has been successful in obtaining financial support for the heat decarbonisation intervention through the Welsh Government and **Salix Decarbonisation funding application “Digarbon”**. The application includes the **first 1MW ASHP module** as a standalone project toward the fully decarbonised energy centre. It also covers **building fabric upgrades** to Union House and Margam, **HVAC retrofits** in the Faraday Lecture Block, and **new district heating connections** for Union House and Faraday, forming a comprehensive decarbonisation package.

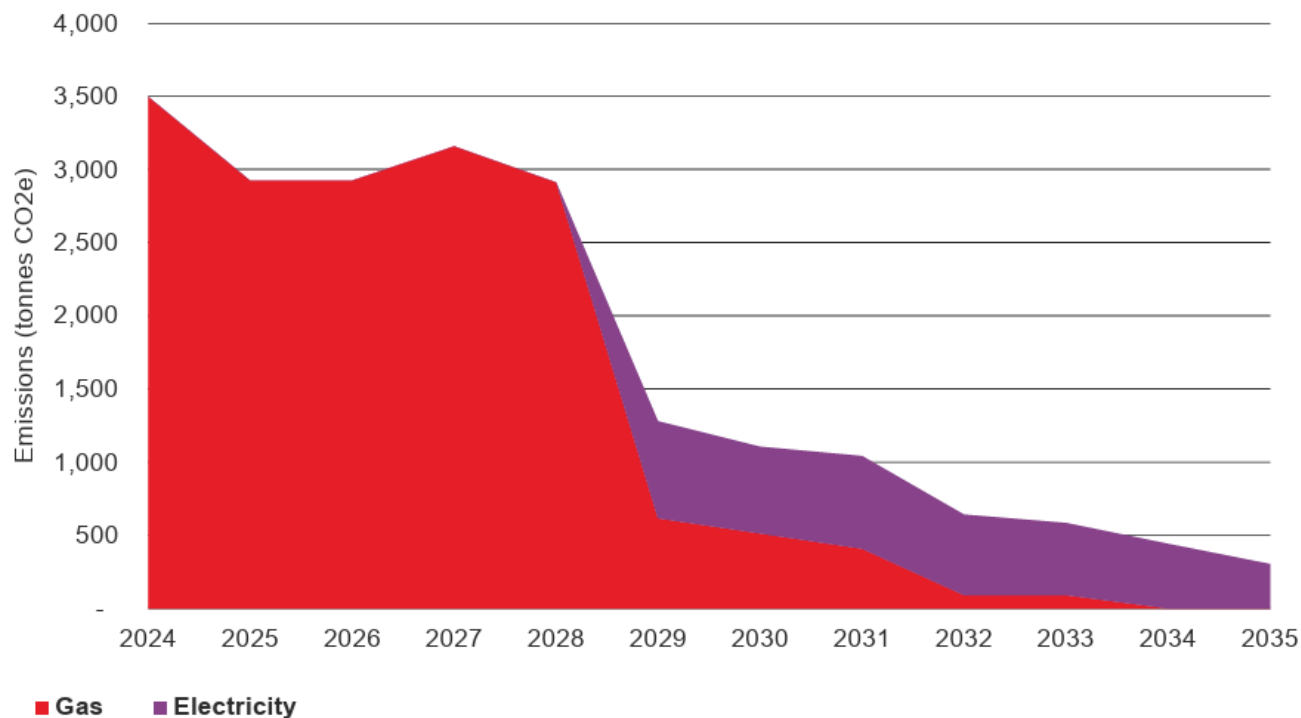


Figure 33 - Forecast carbon emissions associated with heat in the centralised scenario.

## DECARBONISATION ACTION PLAN – 2023/24 UPDATE

MEASURE	PERIOD	OWNER	SCOPE	TARGET REDUCTION	RESOURCE	COST £
SYSTEMS - ENABLERS						
*Carbon Trust – Path to Zero action plan (CE 15. Transition Plan)	Complete 2021/22	Carbon & Energy Manager & Sustainability	1 & 2	All	Sustainability	£48,000
Heat decarbonisation study Singleton campus (ARUP)	Complete 2023/24	E&CS Energy & Carbon Manager & Projects	1, 2 & 3	Gas	E&CS	£114,000
BREEAM In Use and Net Zero Report The College	2024/25	Sustainability Manager & M&G	1, 2 & 3	All	M&G	
EMS & Eco Campus	Ongoing	Sustainability & SU teams	1, 2 & 3	All	Sustainability	£1,000
Net Zero Vision	Ongoing	Sustainability & ISS			HEFCW Sustainability, ISS & FSE	£150,000
E-Carbon Literacy Training Development (Cynnal Cymru) and role out	Ongoing	Sustainability & Climate Change Network			HEFCW Sustainability, & PSPU	£50,000
Energy and Water Treasure Hunts	Ongoing	Energy & Carbon Manager & Sustainability			E&CS	Staff
RENEWABLES						
Solar PV (Elec) Project (1800 roof mounted panels)	Complete 2022/23	Carbon & Energy Manager, E&CS	2	Grid Electricity	Salix	£1,750,000
Y Twyni - Solar PV (Elec), Battery & EV chargers (x5) Project	Complete 2022/24	FSE & E&CS			Research	£500,000
CISM - 3 x Horizontal wind turbines & solar PV	Complete 2022/25				Research	£1,500,000
Maintain & improve existing campus renewables	Ongoing	E&CS	1, 2 & 3	Grid Electricity & Gas	Various	
Sport Centre - Solar PV array upgrade	2023 - 25	E&CS Energy & Carbon Manager	2	Grid Electricity	E&CS	£100,000
Explore CPPA opportunities			1 & 2	Grid Electricity & Gas	E&CS	Staff
Consider opportunities to increase on campus direct wire renewables (Bay & Singleton Campus)					E&CS	Staff
SUBTOTAL						£4,213,000

MEASURE	PERIOD	OWNER	SCOPE	TARGET REDUCTION	RESOURCE	COST £
<b>PROJECTS &amp; EFFICIENCIES</b>						
General lighting upgrades/ controls (T12 & T8 fluorescent to LED) Faraday, Glyndwr, Wallace.	Complete 2022/23	E&CS Energy & Carbon Manager	2	Grid Electricity	E&CS	£328,000
LED Lighting Singleton & Bay (Elec) project (Phase 1)	Complete 2022/23	E&CS Energy & Carbon Manager	2		Salix & E&CS	£3,400,000
Residences BMS controls improvement project	Complete 2022/23	E&CS BMS Manager	1	Grid Electricity, gas & water	Salix	£157,000
Pilot Net Zero Ready Building – Haldane refurbishment (Air Source Heat Pump & Efficient glazing & smart LED lighting)	Complete 2023/24	E&CS Project Officer	1 & 2	Gas & Grid Electricity	E&CS	TBC
Wales National Pool decarbonisation study & action plan	Complete 2023/24	E&CS Projects & SBSP	1 & 2	All	E&CS	
Pilot Net Zero Ready Building – Fulton refurbishment (BRE or RICS)	On Hold	E&CS Project Officer	1, 2 & 3	All	E&CS	TBC
LED Lighting Singleton & Bay (Elec) project (Phase 2)	2023 - 25	E&CS Energy & Carbon Manager	2	Electricity	E&CS	£1,400,000
Pilot heating system replacement/ decarbonisation - Faraday lecture block	2024 - 25	E&CS Project Officer	1	Gas & Elec	E&CS	TBC
LED Lighting Singleton & Bay (Elec) project (Phase 3)	2025 - 26	E&CS Projects and Technical			Salix	£1,500,000
Decarbonisation of Energy Centre/District Heat Network (DHN) Singleton Park Campus	2025 - 2028	E&CS Various - Energy & Carbon Manager	1		Salix	£11,400,000
General BMS upgrades	Ongoing	E&CS BMS Manager			E&CS	£50,000
General sub meter upgrades	Ongoing	E&CS BMS Manager			E&CS	£20,000
Projects building refurbishments with energy efficiency (BRE Fit-Out/ RICS SKA)	Ongoing	E&CS Project Officers			Capital	
EV Fleet & public charging facilities Singleton campus	2023 - 24	E&CS Project Officer & E&CS Sustainable Travel Officer	1	Diesel & Petrol	E&CS	£50,000
General building rationalisation	Ongoing	Director E&CS	1 & 2	Electricity, gas & water	Capital	
<b>SUBTOTAL</b>						<b>£18,305,000</b>



MEASURE	PERIOD	OWNER	SCOPE	TARGET REDUCTION	RESOURCE	COST £			
TRAVEL									
Santander Bike Scheme	Annual	E&CS Sustainable Travel Officer	3	Diesel, Petrol & Wellbeing	E&CS contribute	£25,000			
SWell Travel Buddy app.					Sustainability	£3,000			
British Cycling Ride Leaders training & led rides					British cycling	£3,000			
British Cycling in house Ride Leader Training for staff & student certification.									
On road cycle training & activities to support access to active travel for disabled students					Sustainability	£2,000			
Bike, Safety Switch on event (lights, locks, Hi-Viz.)	£3,500								
Bike to Work & EV Car Salary Sacrifice Schemes	Ongoing	Sustainability & HR	3	Diesel, Petrol & Wellbeing	HR, Finance and Sustainability	Staff			
Tusker Car scheme (including ULEVs)		Sustainability & SU			Sustainability	Staff			
Student Union & Student Travel Training									
Discounted staff & student annual & term time bus passes		E&CS Sustainable Travel Officer	3	Diesel, Petrol & Wellbeing	Sustainability	£199,000			
Free bus travel for HSV students (645)									
Bike Maintenance workshops						3	Diesel, Petrol & Wellbeing	External partners	Staff
Dr bike & bike roadshow								External partners	Staff
Discounted bike purchase		Local providers	Staff						
General fleet improvements		1	Sustainable Travel Officer						
Our Travel Strategy commitments				1 & 3	Sustainability				
SUBTOTAL						£235,500			

MEASURE	PERIOD	OWNER	SCOPE	TARGET REDUCTION	RESOURCE	COST £
WASTE						
Zero Waste to Landfill Carbon Trust Accreditation	Complete 2022/23	Waste & Recycling Officer, Sustainability, E&CS	3	Supply chain, Waste & Fuel	Sustainability & Campus Operations	£2,000
Implement Sustainable Furniture Supplier Agreement (Leasing, remanufacturing services)	Complete 2023/24	Procurement & Waste & Recycling Officer				Staff
WARP-IT	Ongoing	Waste & Recycling Officer, Sustainability, E&CS	3	Supply chain, Waste & Fuel	Sustainability & Campus Operations	£2,000
Play It Again Sports						£1,000
Repair Cafes	Ongoing	E&CS Projects & Waste & Recycling Officer				TBC
Creation of central Recycling Hub at Singleton Campus (to improve efficiency of material management & reduce vehicle movements/collections/emissions)						
Our Working Environment Strategy - Waste & Recycling commitments	2021 - 25	Waste & Recycling Officer, Sustainability, E&CS				
WATER & WASTEWATER						
Sports village water supply repairs & efficiency improvements	Complete 2023/24	E&CS Energy & Carbon Manager	1, 2 & 3	Heating, Electric, Water & Wastewater	E&CS	£1,000
Develop Water Efficiency Action Plan	2024 - 25	E&CS Energy & Carbon Manager	1, 2 & 3	Heating, Electric, Water & Wastewater	E&CS	Staff
Develop & deliver water efficiency awareness & engagement campaign with Dwr Cymru & SOS.	2024 - 25	E&CS Energy & Carbon Manager & Sustainability			Sustainability	£1,284
SUBTOTAL						£7,284

MEASURE	PERIOD	OWNER	SCOPE	TARGET REDUCTION	RESOURCE	COST £
PROCUREMENT						
Update printing & paper policy to deliver efficiencies	Complete 2023/24	Procurement, ISS, E&CS & Sustainability	2 & 3	Electricity, Waste & supply chain	NA	
Update business travel policy to reduce CO2e	2024/25	Procurement, ISS, E&CS & Sustainability	1 & 3	Travel	NA	
LEAF accredited laboratories (Increase No. YoY)	Ongoing	Sustainability & Faculties (Environment Officers)	1, 2 & 3	All	Sustainability	
Sustainability in key tender & contract requirements		Procurement & Sustainability Officers	1, 2 & 3		Various	
Net Positive Futures Supplier Engagement Tool		Procurement & Sustainability Officers	3		HEFCW - HEPCW	
ENGAGEMENT						
SOS SWITCH OFF – Residences engagement	Ongoing	Sustainability	1, 2 & 3	All	Sustainability	£5,850
SWell – Staff & Student engagement support	Ongoing		1, 2 & 3			£30,000
OFFSETING						
<u>Offsetting trial - FSE Biosciences</u>	Ongoing	FSE Prof. & E&CS Sustainability Manager	All	All	Sustainability	TBC
<u>Our Natural Environment strategy - Biodiversity Commitments</u>	Ongoing	E&CS Biodiversity Officer Sustainability				
SUBTOTAL						£35,850
GRAND TOTAL						£22,796,634





Glyndwr solar array, part of 1800 panel install



Y Twyni 5 x EV chargers



Haldane Building, air source heat pump



Bay Campus Library solar array



## Smart led lighting upgrades



# SUSTAINABILITY STRATEGY 2021 – 2025

## OUR CLIMATE EMERGENCY SUCCESSES AND COMMITMENTS

2025 update: strategy currently under review, considering past commitments and successes within context of university opportunities and constraints.

### OUR KEY SUCCESSES (2016-2020)



#### STRATEGIC

We declared a Climate Emergency in 2019 and signed the **Global Universities and Colleges Climate Letter**

Responding to the Climate Emergency – in our operations, teaching, research and Civic Mission - is now a core commitment of the University's **Strategic Vision and Purpose**

**Divestment** of our endowments from all fossil fuel holdings and associated activities in 2019

#### CARBON MANAGEMENT

Negotiations (with regulators) to adopt an **emissions baseline of 2015/16** compared to most institutions' use of 2005 or 2010 – meaning our targets are more ambitious

A publicly available **Carbon Management Plan** for scope 1, 2 and 3 emissions has been published since 2016

Achieved a 100% score for Carbon Management in the 2019 Guardian-published **People and Planet University League**

Developed the **"Path to Zero"** concept and approach for stakeholder engagement around the Climate Emergency

Developed new **corporate procedures** as part of the EMS around key climate impacts including F-gases, waste, business travel and printing

Reduced total University carbon emissions by **9,276 tonnes of carbon dioxide equivalent (CO<sub>2</sub>e)** since baselining (scope 1, 2 and 3), against a backdrop of a growing university (FTE staff and student headcount and teaching space)

Reduced building, utility and fleet, scope 1 and 2 carbon emissions by **2,432 tonnes of CO<sub>2</sub>e** since baselining, against a backdrop of a growing teaching space

#### INFRASTRUCTURE

**16% drop** in CO<sub>2</sub>e from electricity consumption since 2015/16 on target for zero carbon by 2035

All three new buildings in 18/19 achieved BREEAM

Excellent – **The College, Computational Foundry and Engineering North**

**CHP electricity power output** increased from 1.3MWh to 1.7MWh and heat output increased from 0.5MW to 1.5MW

**£1M** investment in small and medium scale energy efficiency projects, including LED lighting, heating controls and utility metering

All individual buildings sub-metered for recording utility use and **consumption dashboards** developed within the Building Management System

Building Energy Performance Rating (DEC Score) improved from **85 in 2016** to **78 in 2020**

Solar PV installed capacity increased from 50KW to 490KW with **2,670,052 kWh of renewable energy generated since 2015/16**, avoiding 376 tonnes CO<sub>2</sub>e and saving £330,000 of imported grid electricity

#### ENGAGEMENT

First university in Wales to actively engage students in **The Student Energy Project (TSEP)** at our Singleton halls, which challenged and educated student residents to reduce energy, carbon emissions and costs. TSEP recorded an annual 4% reduction in electricity consumption, equating to **60,000 kWh and £6k of savings**

**Switch off campaign** run every year with up to 7.5% energy reduction. Since 2015/16 we have engaged over 200 staff and student volunteers in an energy waste hunt, returning to buildings after dark to check and challenge staff and student energy conservation efforts

Visualised management of energy through **Energy Dashboards** to provide staff with information on utility use within buildings

Through the bespoke, award-winning **SWell engagement app**, we engaged over 50% of staff and have nudged behaviours towards lowering our individual and collective carbon footprints, with over 400,000 positive actions completed including: using energy hungry appliances efficiently, reporting equipment faults and leaks, choosing sustainable and active travel methods, avoiding waste and purchasing less

Through the annual **Energy Week** campaign, we have collaborated with the Students' Union to raise awareness on practical ways to save money and reduce carbon footprints, facilitating student-led campus workshops, pop-up games and stalls



Through the **HEAR recognised Sustainability Award**, Week of Work, Go Wales and SPIN placements, we have provided employability skills for over 900 students. This has supported extracurricular engagements in reducing climate impacts through a range of projects including tree planting, water conservation, recycling, avoiding single use plastics, energy conservation and renewable energy generation

## OUR KEY COMMITMENTS (2021-2025)



### CARBON MANAGEMENT

- CE 1. **Scope 1 and 2:** Be **zero carbon** for direct emissions (scope 1 and 2) by 2035, with at least a 70% reduction by 2030 (from 2015/16)
- CE 2. Implement the **Path to Zero** local engagement programme of work to achieve (on average) a 5% year on year reduction in scope 1 and 2 emissions including allocating and setting out clearly how Faculties, PSUs and stakeholders can contribute to emissions reduction
- CE 3. **Scope 3:** Achieve (on average) a 2.5% year on year reduction in scope 3 emissions, 50% by 2035 (35% by 2030)
- CE 4. Develop a programme of work for defining and achieving **scope 3 sub-targets and monitoring programmes** including: business travel, staff and student commuting, waste, water, food and drink, and procurement
- CE 5. Shift **cultural working norms** to increase sharing of offices, hot desking, home and remote working, where practicable and in line with business needs, and adoption of digital platforms to allow optimum use of available space

### INFRASTRUCTURE

- CE 6. 1 MW of **renewable wind** electricity capacity installed at Bay Campus subject to planning, funding and other considerations
- CE 7. A further 300KW of **renewable Solar PV** electricity capacity installed at Bay Campus
- CE 8. A further 1MW of **renewable Solar PV** electricity capacity installed at Singleton Campus
- CE 9. 2MW of low carbon **Power & Heat** capacity installed at Singleton Campus

CE 10. Work with **Welsh Government Energy Service (WGES)** in developing our infrastructure planning to reduce carbon emissions

CE 11. Adopt a minimum requirement for achievement of **BREEAM Refurbishment and Fit Out (RFO)** standard or **RICS SKA rating** associated with university projects

### ADAPTATION

CE 12. A scheme will be developed to enable offsetting of our **unavoidable scope 3** emissions, considering potential verification standards (including but not limited to Gold Standard (GS), ISO 14064 and GHGP)

## CROSS-CUTTING ACTIVITIES – COMMITMENTS

### GOVERNANCE, MANAGEMENT, DECISION-MAKING



- CE 13. We will develop a simple but comprehensive corporate **Sustainability and Climate Emergency Impact Assessment** by which the University is able to consider whole life costs and the "**climate proofing**" of strategies and policies, investments, grant applications, new projects and initiatives
- CE 14. We will facilitate a **Climate Emergency Working Group** (staff and students) to discuss and plan the introduction and delivery of low carbon operations on our campuses
- CE 15. Develop a **budget profile and programme** for scope 1 and 2 zero carbon from 2035 by the end of 2021 (our detailed transition plan)
- CE 16. **Explore funding** with university partners to enable a sequence of investments that decarbonise the energy we use (both small and large scale interventions) and enhance how we run the campus as a smart, integrated, local energy system to enable us to meet our targets
- CE 17. Develop Faculty and PSU based scope 1, 2 and 3 targets as part of their **Sustainability Action Plans (SAPs)** that are reviewed quarterly and reported through an annual management review
- CE 18. Continually improve carbon data reporting and agree **SMART targets** for reducing specific



scope 3 carbon emissions with relevant supply chain contractors and service providers

- CE 19. We will become **explicit and transparent** about areas of our operations and work that have a high carbon impact and ensure these areas make a net contribution towards meeting carbon targets and the UN SDGs

## LEARNING, CAPACITY, SKILLS



- CE 20. Develop a **carbon literacy toolkit**, to enable staff and students to reduce impact from their activities, research and the spaces they use on campus
- CE 21. Support and **develop opportunities to educate, upskill and train** members of the staff and student population and the wider community in relation to carbon management and reducing our individual and collective carbon footprint
- CE 22. Explore opportunities available to develop climate emergency **training packages** as an online resource
- CE 23. Integrate climate emergency and carbon management commitments and aspirations into the **Student Sustainability Award**
- CE 24. Develop a series of learning modules as part of a university-wide **climate emergency outreach programme**, aimed at local feeder primary and secondary schools, colleges and community groups, supported by Discovery and other partners

## COMMUNICATION, ENGAGEMENT, INVOLVEMENT



- CE 25. Draw on **teaching and research** to help find solutions and inspire behavioural change for our university, wider community and beyond
- CE 26. Continue to be an active steering group member of **Low Carbon Swansea Bay**, working in partnership to help deliver a climate emergency response for the Swansea Bay area

- CE 27. Deliver a student and staff engagement programme for carbon reduction and wellbeing that will achieve a **10% reduction in carbon emissions** and be aligned with the University Wellbeing Strategy
- CE 28. Support **Students' Union** societies' extracurricular efforts in this area (e.g. Environment and Ethics, Conservation and Ecology, Tree and People and Planet)
- CE 29. Integrate requirements for climate emergency and carbon management responsibilities and reporting requirements into **job descriptions** for relevant roles across the University
- CE 30. Pursue the inclusion of a **sustainability and climate emergency induction** as a key requirement for all new and returning students

## OUR CONTRIBUTION TO OTHER GOALS

### WELLBEING AND HUMAN HEALTH



- CE 31. Maximise the co-benefits of reducing carbon emissions, climate change adaptation and improving human wellbeing in our work to achieve the Public Health Wales **Corporate Health Standard Gold and Platinum** award and to support the University Wellbeing Strategy

### WELLBEING OF FUTURE GENERATIONS



- NI 4. Levels of nitrogen dioxide (NO<sub>2</sub>) pollution in the air
- NI 11. Percentage of businesses which are innovation-active
- NI 12. Capacity (in MW) of renewable energy equipment installed
- NI 13. Concentration of carbon and organic matter in soil
- NI 14. The Ecological Footprint of Wales

- NI 15. Amount of waste generated that is not recycled, per person
- NI 29. Mean mental wellbeing score for people
- NI 32. Number of properties (homes and businesses) at medium or high risk of flooding from rivers and the sea
- NI 41. Emissions of greenhouse gases within Wales
- NI 42. Emissions of greenhouse gases attributed to the consumption of global goods and services in Wales
- NI 46. The Social Return On Investment (SROI) of Welsh partnerships within Wales and outside of the UK that are working towards the United Nations Sustainable Development Goals



## UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS



See annual carbon emissions data via HESA EMR:  
[HTTPS://WWW.HESA.AC.UK/DATA-AND-ANALYSIS/ESTATES](https://www.hesa.ac.uk/data-and-analysis/estates)

Get involved:  
[HTTPS://WWW.SWANSEA.AC.UK/SUSTAINABILITY/GET-INVOLVED/](https://www.swansea.ac.uk/sustainability/get-involved/)

Contact the Sustainability Team:  
[HTTPS://WWW.SWANSEA.AC.UK/SUSTAINABILITY/CONTACT-US/](https://www.swansea.ac.uk/sustainability/contact-us/)

Review Swansea University, Sustainability Strategy:  
[HTTPS://ONLINE.FLIPPINGBOOK.COM/VIEW/898157623/](https://online.flippingbook.com/view/898157623/)

For further Information on this report: Teifion Maddocks  
Sustainability Manager: [T.H.MADDOCKS@SWANSEA.AC.UK](mailto:T.H.MADDOCKS@SWANSEA.AC.UK)



