

24/04/2026

EMS Audit Review

ENVIRONMENTAL ASSESSMENT, MANAGEMENT AND
AUDITING

LUCA BURGESS (2315074) (2315074)

Table of Contents

1	<i>Introduction</i>	1
2	<i>UWTSD EMS</i>	2
3	<i>Identification of a Key Element of Continual Improvement</i>	3
4	<i>Audit Process</i>	4
5	<i>Audit Findings</i>	5
5.1	Compliance	5
5.2	Non-compliance	5
6	<i>Discussion</i>	7
6.1	Compliance Findings	7
6.2	Non-Compliance Findings	8
6.3	Comparison with other institutions' EMS	9
7	<i>Conclusion</i>	11
8	<i>References</i>	12
	Figure 1: Lights left on Vivian Hall when not in use (Parnaby, 2026).....	5
	Figure 2: Broken radiator valve (Parnaby, 2026).	6
	Figure 3: Monitor left on in Vivian Hall when not in use	6
	Figure 4: Dynevor electricity generation versus consumption (UWTSD, 2025a).....	7
	Figure 5: Example page from Swansea University Environmental Performance Report (Swansea University, 2025)	9
	Figure 6: Equivalent page from University of Wales Trinity Saint David Group Environmental Report (UWTSD, 2024c).....	10

1 Introduction

An Environmental Management System (EMS) is a framework which helps organisations integrate sustainability into decision making (International Organization for Standardization, 2026). It is also a useful tool for businesses to understand, evaluate and mitigate their environmental impacts. Furthermore, an EMS can help a business report inwardly and outwardly on their environmental performance.

Today's world is facing significant environmental issues, with global surface temperature hitting a record high in 2020 (Intergovernmental Panel on Climate Change, 2023). This makes an EMS crucial in today's world by combatting the threat of climate change through setting up a structured approach which allows organisations to monitor their resource usage and identify areas for improvement (Voinea et al., 2020).

Many organisations use EMSs and achieve huge success in their environmental performance. A study conducted on 45 Austrian firms found that firms which implemented ISO standards, a standardised EMS approach, were 165% more environmentally efficient than firms who weren't ISO certified (Schützenhofer, 2021).

This report will combine the findings from the EMS audits carried out at UWTSD buildings with the theory of EMS best practice. The goal of the report is to assess the effectiveness of the current EMS processes within UWTSD, with a focus on energy consumption.

2 UWTSD EMS

The University of Wales Trinity Saint David (UWTSD) uses the Green Dragon EMS. The Green Dragon Environmental Standard is a certificate awarded to organisations which demonstrate effective environmental management and monitor their environmental impact (Green Business Centre, 2026). The EMS is applied in multiple different ways, with the main goal of the EMS being to reduce environmental impact by minimising loss of biodiversity, pollution, use of finite resources and waste production (UWTSD, 2024a).

The UWTSD Group includes the University of Wales Trinity Saint David, Coleg Sir Gâr (CSG) and Coleg Ceredigion (CC). In the past each of the Group's constituent organisations implemented a Green Dragon EMS. Then in 2016, a joint agreement between the University and the Colleges was made to combine the individual EMS systems into one Group EMS, still using the Green Dragon framework. This would cover the scope of all the member organisations' activities, products and services (UWTSD, 2024e).

The UWTSD EMS is unique because it is a multi-site organisation, with different departments in each building due to it being an educational site. This requires an EMS which is broad and covers many aspects to encompass all the different buildings and their respective uses.

3 Identification of a Key Element of Continual Improvement

Continual improvement is a fundamental part of an EMS. It is defined as the ongoing process of enhancing environmental performance, compliance and efficiency. It involves using data, setting objectives and reviewing to enact positive changes. Also, the Plan-Do-Check-Act (PDCA) cycle is used adjacently to go beyond just meeting standards (Peters, 2025).

Energy consumption was identified as a key element during the audit process due to it repeatedly being brought up in discussion with staff members during the audits and scoring 80 in the register of environmental impacts (UWTSD, 2024d), making it a highly significant topic (UWTSD, 2024b).

Energy consumption is a significant environmental topic as it is one of the biggest causes of Greenhouse Gas emissions (Lamb et al., 2021). Currently, 23.4% of the UK's National Grid power comes from gas (Morley, 2026). Therefore, decreasing energy consumption would decrease natural gas extraction, which would improve the environment overall (Shamoon et al., 2022).

The main UWTSD documents related to energy consumption are the Identification of Environmental Aspects and Significance Evaluation (UWTSD, 2024b) and Register of Environmental Aspects documents (UWTSD, 2024d). In the Identification of Environmental Aspects and Significance Evaluation document it explains the method behind how the impacts register scores the significance of environmental aspects, such as energy consumption. The score is measured by multiplying the consequence of the aspect with the likelihood of it occurring using this formula:

Consequence total x Likelihood total = Significance Evaluation Score

With the scores being placed into several bands depending on the final score:

Table 1: Ranking for environmental aspects score (UWTSD, 2024b).

Score	Ranking
40>	High Significance
25-40	Medium Significance
<25	Low Significance

4 Audit Process

Auditing is an essential part of an EMS' continual improvement as it's a way for a business to identify any strengths and weaknesses within their company and adjust their EMS accordingly (Peters, 2025).

Audits were carried out at several UWTSD campuses between February and March 2026 to assess compliance with energy consumption procedures and broader EMS compliance. The campuses selected for audit were the IQ Building, Swansea College of Art (Dynevor campus), and the Dylan Thomas Centre (DTC), providing a mix of academic, administrative, and public-facing buildings. These sites were chosen to provide variation in building function, occupancy levels, and patterns of energy use.

During each audit, staff members present at the time of inspection were selected at random to answer a short series of questions relating to environmental performance. Topics included awareness of the EMS, understanding of Control of Substances Hazardous to Health (COSHH) requirements, day-to-day energy usage habits, and general sustainability practices within their work area. Random selection was used to reduce bias and gain a broader range of staff awareness across departments.

Observational checks were also undertaken during each visit, including inspection of lighting use, equipment left switched on, waste segregation arrangements, and the presence of relevant signage. Notes and findings were recorded either digitally or on paper during the audits, before being uploaded to a shared Microsoft Teams folder. This cloud storage enabled easier collaboration between team members, consistent storage of evidence, and comparison of results across the different campuses.

5 Audit Findings

5.1 Compliance

A positive example of compliance was observed in the IQ building Cwik workshop, where machines were switched off when not in use. As workshop equipment can have relatively high energy demand, this practice helps reduce unnecessary electricity consumption. Similar behaviour was also noted in the Dynevor campus, suggesting that machine shutdown practices may be common across campuses.

A further case of compliance was seen at the Dynevor campus, where solar panels were installed on the roof of the building used for courses such as design craft. The presence of on-site renewable energy generation indicates a proactive approach to reducing reliance on grid electricity and lowering the environmental impact of building operations.

5.2 Non-compliance



Figure 1: Lights left on Vivian Hall when not in use (Parnaby, 2026).

During the audit of Dylan Thomas Centre, the lights in Vivian Hall were observed to be switched on while the hall was unoccupied. Natural daylight from windows provided sufficient light at the time of inspection, suggesting the artificial lighting was unnecessary. The installed lighting also appeared to be older non-LED fittings, indicating potentially higher energy consumption than modern LED lighting.



Figure 2: Broken radiator valve (Parnaby, 2026).

During the audit of the DTC, one radiator valve was found to have a broken valve. While the radiator was still working, the valve could not be adjusted to reduce or stop heating in the room. As heating settings are centrally managed by the estate team, the valve appeared to be the only way of controlling heat output in the room. This may result in unnecessary heating when the room temperature is already sufficient.



Figure 3: Monitor left on in Vivian Hall when not in use

During the audit of DTC in Vivian Hall, there was an unattended monitor which was left on standby mode while the room was unoccupied. This indicated unnecessary electricity consumption when the equipment wasn't in active use. A staff member stated that the monitor was often left on due to the complexity of setting up the system, which allowed for quicker setup before lectures or seminars.

6 Discussion

6.1 Compliance Findings

Machines being switched off when not in use was a practice commonly observed across several UWTSD campuses included within the audit. Equipment ranging from woodworking machinery to digital printers followed a similar pattern of being powered down when idle, suggesting that this behaviour is embedded within day-to-day operational practice. This is significant, as machinery left running unnecessarily can continue to consume electricity and increase overall energy demand. The consistency of this behaviour across multiple sites may indicate a positive organisational culture in relation to energy awareness among staff. Furthermore, no clear EMS documentation was found which specifically instructed staff to switch machinery off when not in use, implying this behaviour may be intrinsic or reinforced through informal workplace norms rather than from formal training.

The presence of solar panels above the Design Craft building at the Dynevor campus was identified as a positive finding, as it shows that the university is actively investing in on-site renewable electricity generation. While the installation of solar PV does not directly equate to improved energy efficiency, it does reduce the environmental impact of electricity consumption by replacing a proportion of grid-supplied energy with renewable power. Figure 4 shows that electricity generation has steadily increased from 2023 – 2025, showing noticeably higher output especially during the summer months than previous years. This upward trend may suggest that additional panels have been installed, panel performance has improved or monitoring has become more accurate. This reflects a proactive approach to carbon reduction and continual improvement pertaining to energy efficiency within the university's EMS.

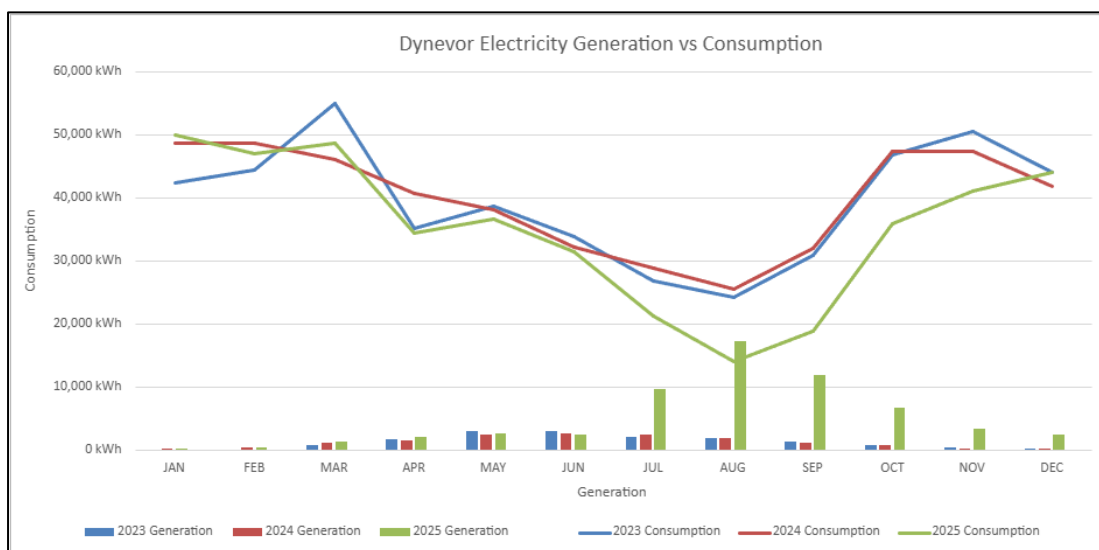


Figure 4: Dynevor electricity generation versus consumption (UWTSD, 2025a).

6.2 Non-Compliance Findings

The lighting left on in Vivian Hall was an example of avoidable energy consumption, particularly as natural daylight was present at the time of the audit. This finding suggests that lighting use was not being actively managed in response to occupancy. Additionally, the lights appeared to be older non-LED fittings which may indicate less efficient infrastructure, potentially increasing electricity use compared with modern LED alternatives (Singh et al., 2015).

A possible contributing factor to this case is the apparent lack of clear guidance on routine energy saving behaviours, such as switching off lights when leaving a room. While documents exist for preventing pollution (UWTSD, 2022) and managing waste (UWTSD, 2025b), that outline best practice, no equivalent guidance was identified for conserving day-to-day energy use. This is despite the use of mains electricity and gas scoring a high 80 in the Register of Environmental Impacts document, whereas recycling of waste materials, under the aspect category of waste management, scoring 60 (UWTSD, 2024d). This could point to a mismanagement in prioritising certain environmental aspects and their respective best practice guidelines.

According to the Institute of Environmental Management and Assessment's (IEMA) EMS briefing, energy management is a key component of a successful EMS as it's a key technique in mitigating climate change. The document suggests trying to reduce both direct and indirect emissions to effectively meet objectives (IEMA, 2018).

Another area for improvement would be providing staff with clearer training on energy-efficient behaviours and the importance of promptly reporting maintenance faults. If staff are unaware of how a broken radiator valve (Figure 2) may contribute to unnecessary energy consumption, they may be less likely to report the issue urgently, resulting in inefficient energy use before repairs are completed.

After reviewing the university's environmental training tracker, there were courses relating to waste management, environmental awareness and sustainability, but no specific training focused on energy saving behaviours or reporting faults to maintenance (UWTSD, 2018). This may be an opportunity to strengthen staff awareness and support quicker corrective action.

Finally, another example highlighting the need for increased staff awareness was the monitor left on standby in Vivian Hall (Figure 3). A lecturer accompanying the audit explained that this practice was followed for convenience, so that equipment would be ready for future teaching sessions or seminars. However, leaving technological devices on standby when not in use can contribute to unnecessary energy consumption, particularly when repeated regularly across multiple rooms. This means that staff may benefit from further training on how to operate room technology efficiently, reducing reliance on wasteful energy practices while still maintaining ease of use.

6.3 Comparison with other institutions' EMS

One way that UWTSD's EMS could improve would be to produce better performance documents which state progress in cutting energy consumption. UWTSD's Group Environmental Report 2023-2024 does well in reporting progress and objectives being met, but it doesn't produce any graphs to visually represent environmental performance and energy consumption data (UWTSD, 2024c). On the contrary, Swansea University's Environmental Performance Report 2025 is a very professional document, which thoroughly reviews its current performance and sets targets for improvement, with graphs and charts to present the data (Swansea University, 2025).

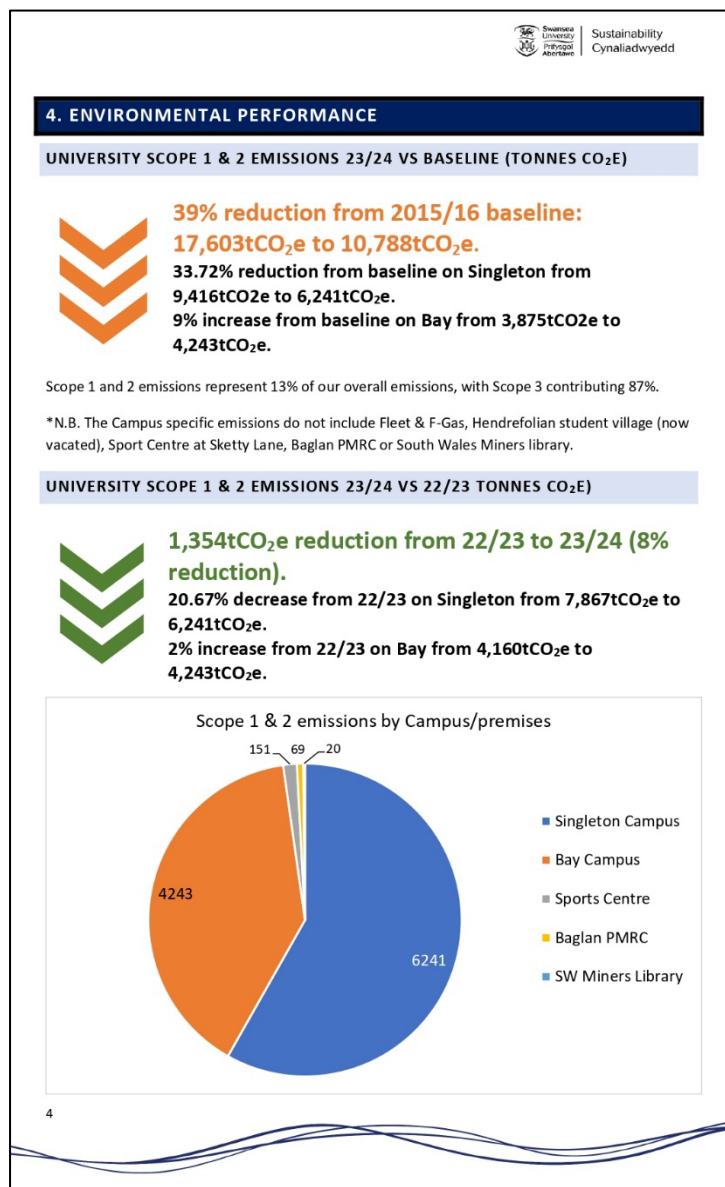


Figure 5: Example page from Swansea University Environmental Performance Report (Swansea University, 2025)

Environmental Performance

Total Greenhouse Gas (GHG) Emissions

For the purposes of consistency, we have normalised the environmental impact of the following performance indicators against carbon emissions. Whilst this does not capture the entire environmental impact of the individual aspects, it provides a consistent measure for annual changes in the size of the impact. The University financial year runs between 1st August and 31st July; therefore, we have also chosen this for our environmental reporting period. Although individual institutions do collect more granular data at an institution and site level, for the purposes of this report, all performance indicators have been aggregated to institution and group level. Due to the varied nature of data collection processes and the availability of data to each organisation in the past, some aspects may be reported to a different level of granularity between institutions.

UWTSD Group calculates carbon emissions using the UK Government GHG Conversion Factors for Company Reporting. The misalignment between emission factors based on calendar year and the academic calendar year used in the Group reporting is accounted for by applying the emission factor with greatest coverage of the academic financial year. For instance, for the academic year 2012/13, 2013 emission factors would be used as this covers January to July, inclusive, in 2013 and only August to December of 2012.

Group Emissions

The following chart provides an overview of Group total emissions.

Group Carbon Emissions	GHG Protocol Scope	2021/2022(tCO ₂ e)	2022/2023(tCO ₂ e)
Gas	Scope 1	2,835.11	2,473
Oil	Scope 1	30.38	2
LPG	Scope 1	0	0
F-Gas	Scope 1	49.88232	0
Fleet	Scope 1	148.02	234
Electricity	Scope 2	1,288	1,745
Water*	Scope 3	15	18.1
Electricity transmission and distribution losses	Scope 3	117.70	150

Figure 6: Equivalent page from University of Wales Trinity Saint David Group Environmental Report (UWTSD, 2024c)

7 Conclusion

This report first established what an Environmental Management System is and what role it plays in supporting organisational sustainability. An EMS enables organisations to integrate environmental considerations into decision-making, monitor performance and pursue continual improvement. The report then examined University of Wales Trinity Saint David's EMS, including its operational context and key supporting documentation.

Energy consumption was identified as a priority area for continual improvement due to its significance as an environmental issue and its high ranking within the university's environmental impacts register. The audit methodology was then outlined, including the timing of inspections and the observational approach used across campus buildings.

Key findings relating to energy consumption demonstrated both areas of compliance and non-compliance. Positive examples included energy-saving behaviours and renewable energy generation, while findings of non-compliance highlighted avoidable energy waste through lighting, broken heating controls and equipment left on unnecessarily. These findings suggest that while UWTSD has a functioning EMS framework in place, stronger staff engagement, clearer best practice guidelines and specific staff training are required to improve upon it further.

Overall, the report concludes that while UWTSD has made progress towards sustainable energy management, further action is needed to ensure its EMS delivers stronger environmental performance in order to build upon the foundations.

8 References

- Green Business Centre. (2026). *Green Dragon Environmental Standard*.
<https://greenbusinesscentre.org.uk/green-dragon-environmental-standard>
- IEMA. (2018). *Driving Climate Actions through Environmental Management Systems*.
<https://www.isepglobal.org/media/isgfmoad/iema-driving-climate-action-through-ems-nov-2018.pdf>
- Intergovernmental Panel on Climate Change. (2023). *IPCC - Climate Change 2023* (P. Arias, M. Bustamante, I. Elgizouli, G. Flato, M. Howden, C. Méndez-Vallejo, J. J. Pereira, R. Pichs-Madruga, S. K. Rose, Y. Saheb, R. Sánchez Rodríguez, D. Ürges-Vorsatz, C. Xiao, N. Yassaa, J. Romero, J. Kim, E. F. Haites, Y. Jung, R. Stavins, ... Y. Park, Eds.). <https://doi.org/10.59327/IPCC/AR6-9789291691647.001>
- International Organization for Standardization. (2026). *The benefits of implementing an environmental management system for your business*.
<https://www.iso.org/climate-change/environmental-management-system-ems>
- Lamb, W. F., Wiedmann, T., Pongratz, J., Andrew, R., Crippa, M., Olivier, J. G. J., Wiedenhofer, D., Mattioli, G., Khourdajie, A. Al, House, J., Pachauri, S., Figueroa, M., Saheb, Y., Slade, R., Hubacek, K., Sun, L., Ribeiro, S. K., Khennas, S., De La Rue Du Can, S., ... Minx, J. (2021). A review of trends and drivers of greenhouse gas emissions by sector from 1990 to 2018. In *Environmental Research Letters* (Vol. 16, Number 7, p. 2). IOP Publishing Ltd. <https://doi.org/10.1088/1748-9326/abee4e>
- Morley, K. (2026). *National Grid: Live*. <https://grid.iamkate.com/>
- Peters, S. (2025, July 25). *Comprehensive Guide to ISO 14001 Continual Improvement*. ISMS.Online. <https://www.isms.online/iso-14001/iso-14001-continual-improvement-explained/>
- Schützenhofer, C. (2021). Overcoming the efficiency gap: energy management as a means for overcoming barriers to energy efficiency, empirical support in the case of Austrian large firms. *Energy Efficiency*, 14(5), 45. <https://doi.org/10.1007/s12053-021-09954-z>
- Shamoon, A., Haleem, A., Bahl, S., Javaid, M., Bala Garg, S., Chandmal Sharma, R., & Garg, J. (2022). Environmental impact of energy production and extraction of materials - a review. *Materials Today: Proceedings*, 57, 936–941.
<https://doi.org/10.1016/j.matpr.2022.03.159>
- Singh, D., Basu, C., Meinhardt-Wollweber, M., & Roth, B. (2015). LEDs for energy efficient greenhouse lighting. In *Renewable and Sustainable Energy Reviews* (Vol. 49, p. 140). Elsevier Ltd. <https://doi.org/10.1016/j.rser.2015.04.117>

- Swansea University. (2025). *Environmental Performance Report 2025*.
- UWTSD. (2018). *Environmental Training Tracker*.
- UWTSD. (2022). *UWTSD Group EMS Environmental Operational Procedure UWTSD Pollution Prevention Plan*.
- UWTSD. (2024a). *Environmental Manual*. 3.
- UWTSD. (2024b). *Identification of Environmental Aspects and Significance Evaluation*.
- UWTSD. (2024c). *Signed TSD Group Environmental Report 2024*.
- UWTSD. (2024d). *UWTSD EMS Environmental System Register of Environmental Aspects 01*. <https://www.sulite>
- UWTSD. (2024e). *UWTSD Group Environmental Management System Procedure*. 4–5.
- UWTSD. (2025a). *Solar PV Dashboard*.
- UWTSD. (2025b). *UWTSD Group EMS Environmental Procedure UWTSD Waste Management*.
- Voinea, C. L., Hoogenberg, B. J., Fratostiteanu, C., & Hashmi, H. B. A. (2020). The relation between environmental management systems and environmental and financial performance in emerging economies. *Sustainability (Switzerland)*, 12(13), 2. <https://doi.org/10.3390/su12135309>