Queen Mary
University of London

Energy and Carbon Reduction Plan

02/2026 - 02/2029

Executive Summary

As a research-intensive institution, Queen Mary University of London ('Queen Mary', 'the University') recognises its responsibility to drive action in sustainability. We also recognise the unique position we are in to contribute to solutions to support climate change mitigation and adaptation. With world-leading researchers across multiple disciplines, and the vast reach we have through our students, staff, and wider community, we can drive progress towards sustainable solutions, staying true to our ambition to be the most inclusive research-intensive university in the world.

This Energy and Carbon and Reduction Plan has been developed to identify the projects and interventions that will be delivered in the next three years to achieve a 20% reduction in energy consumption compared to our 2024/25 baseline. This reduction in energy use will also contribute to a corresponding decrease in energy-related carbon emissions.

The Plan sets out a programme of measures focused on improving energy efficiency across our estate. These include Building Management System (BMS) improvements and upgrades, LED lighting, solar PV installations, and engagement and behaviour change. Together, these measures will reduce energy demand and support our carbon reduction objectives.

Key Objectives

- Achieve an estimated annual energy saving of 8,778,998 kWh in total energy consumption when all ROI projects are complete with additional 3,824,396 kWh savings from low-cost adjustments and 152,099 kWh from sub-metering.
- An estimated utility cost saving of circa £2.2m per year once all projects have been completed (subject to any future changes in energy prices).
- Reduce greenhouse gas emissions by 2,283 tonnes CO_2e annually from ROI projects, low-cost initiatives and sub-metering (1,571, 684.44 and 27.36 respectively).
- Improve energy efficiency and monitoring in facilities, equipment, and processes while maintaining operational performance.

Strategic Priorities:

- Facility Optimisation – Implement lighting upgrades, HVAC efficiency improvements, and advanced building management systems. Use refurbishment projects to improve energy efficiency and decarbonise.
- Equipment & Process Efficiency – Modernise plant and equipment, adopt smart controls, and reduce standby energy losses.
- Behavioural Change & Engagement – Foster energy-conscious practices among staff and students through training, incentives, and awareness campaigns.
- Renewable Integration – Expand on-site renewable generation (solar etc.) and look to increase purchasing of energy from renewable sources (if PPAs are available).
- Monitoring & Reporting – Deploy energy monitoring tools, set performance baselines, and track progress through regular reporting. Make data driven decisions.

Expected Benefits:

- Cost Savings: Estimated annual savings of circa £2.2m from reduced utility bills (plus potential additional savings from further initiatives identified each year to maintain a rolling programme).
- Environmental Impact: Significant reduction in our carbon footprint, contributing to carbon net zero goals and compliance with legal requirements and expectations from various stakeholders.
- Resilience & Reputation: Improved operational resilience, reduced exposure to energy price volatility, and enhanced reputation.

Queen Mary University of London

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Purpose/ context

As a research-intensive institution, Queen Mary, University of London (Queen Mary) recognises its responsibility to drive action in sustainability. We also recognise the unique position we are in to contribute to solutions to support climate change mitigation and adaptation. With world-leading researchers across multiple disciplines, and the vast reach we have through our students, staff, and wider community, we can drive progress towards sustainable solutions, staying true to our ambition to be the most inclusive research-intensive university in the world.

Queen Mary is committed to achieving net zero by 2050 and will continue supporting the Government's net zero ambitions by accelerating the net-positive contributions we make through education, research and engagement.

This Energy and Carbon and Reduction Plan has been developed to identify the projects and interventions we will deliver in the next three years to reduce our energy consumption and energy-related carbon emissions. It also details some of the projects that have been implemented so far.

Our main focus in the near future is to reduce scope 1 and 2 emissions, with a reduction target of 18% in the next three years compared to 204/25 included in the new Sustainability Action Statement published last year.

Some of our priorities include:

- Minimising building energy consumption from heating, cooling and lighting
- Monitoring energy consumption and making data driven decisions
- Reducing energy consumption by repurposing of the estate by new ways of working and adjustment of operational hours where possible
- Engaging and inspiring staff and students to minimise energy consumption
- Identifying opportunities to reduce research related energy consumption
- Using refurbishment projects to improve energy efficiency and decarbonise

Our carbon footprint

In 2024/25 we achieved a 24% reduction in combined Scope 1 and 2 carbon emissions compared to our initial 2018/19 baseline, despite growth of the estate. Emissions fell from 15,469 tCO_2e to 11,808 tCO_2e.

- Scope 2 emissions (electricity production) dropped by 31%, mainly driven by energy efficiency projects targeting our top ten energy consuming buildings and the ongoing decarbonisation of the national grid.
- Scope 1 emissions (direct emissions from gas and fleet) decreased by 11% against the 2018/19 baseline.

Table 1.Carbon footprint year on year for scopes 1 and 2 since 2018/19 baseline (in tonnes CO_2e)

	tCO_2e 2018/19	tCO_2e 2019/20	tCO_2e 2020/21	tCO_2e 2021/22	tCO_2e 2022/23	tCO_2e 2023/24	tCO_2e 2024/25	% reduction against 2018/19 baseline
Scope 1	5,454	5,081	5,261	5,312	4,887	4,796	4,860	11%
Scope 2	10,015	7,733	6,726	6,606	6,286	6,806	6,948	31%
Scopes 1 & 2	15,469	12,814	11,987	11,918	11,173	11,602	11,808	24%

Note: Excludes refrigerants, fuel used in back-up and temporary generators and energy from non-UK campuses.

Comparing 2024/25 emissions against the previous financial year, 2023/24, our emissions increased slightly by 2%, with savings achieved through BMS optimisation and upgrades being offset by energy increases caused by technical faults and a new data centre.

Achievements in previous years

Since 2018/2019, we have carried out a number of energy saving and efficiency projects across our estates, ranging from LED lighting to Building Management System (BMS) installations, upgrades and optimisations. These include but are not limited to the projects listed in table 2.

Table 2. Examples of Energy Efficiency Measures Already Implemented

Campus	Project Title and description	Estimated annual energy saving (kWh)
Mile end	Maynard House BMS and Lighting Upgrade	133,671
Mile end	Varey House BMS and Lighting Upgrade	130,419
Mile end	Richard Feilden House BMS and Lighting Upgrade	76,896
Mile end	Student Union Hub BMS upgrade.	151747
Mile end	Drapers Hall & Qmotion Lighting Upgrade	78,262
Mile end	Beaumont Court BMS and Lighting Upgrade	113,614
Mile end	BMS Upgrade: Arts Two Building	74,268
Charterhouse Sq.	Charterhouse Building Management System (BMS) Upgrade	8,516,730
Whitechapel	BMS Upgrade: Whitechapel Campus	2,086,167
Whitechapel	Lighting Upgrade and Controls: Whitechapel Campus	914,929

A major achievement was the commissioning of the SRIFF Room Data Centre Heat Recovery Project in the Joseph Priestley Building, which began operation in November 2024. With a capacity of 390 kW and an estimated annual recoverable heat of 3,416,400 kWh, this system now supports the Mile End Campus district heating network. It reduces our reliance on natural gas and marks a significant step toward a low-carbon campus.

Energy and carbon reduction plan

This Energy and Carbon Reduction Plan outlines Queen Mary's approach to reducing energy consumption, improving efficiency, and decarbonising energy supply across the university estate in the UK. It aligns with Queen Mary's energy reduction targets and integrates recent infrastructure assessments, capacity constraints, and capital project planning from the 2025 Mile End Infrastructure Review.

Energy consumption profiles

The graphs below show the energy consumption by building for each of our main UK campuses in 2024/25, which is the latest full set of data we have. Both the size and the colour of the bubbles are based on the total kWh energy consumption, with a gradient going from green for low consumption to red for high consumption.

The campus maps are also colour coded, with purple representing academic buildings, brown used for residential buildings and orange for facilities.

Please note that these graphs 1 to 3 show absolute energy consumption, while the graphs 5 to 7, further down, show energy consumption normalised by GIA.

Mile End Campus

Graph 1. Bubble chart showing annual energy consumption by building for 2024/25, Mile End

Whitechapel Campus

Graph 2. Bubble chart showing annual energy consumption by building for 2024/25, Whitechapel

Graph 3. Bubble chart showing annual energy consumption by building for 2024/25, Charterhouse Square

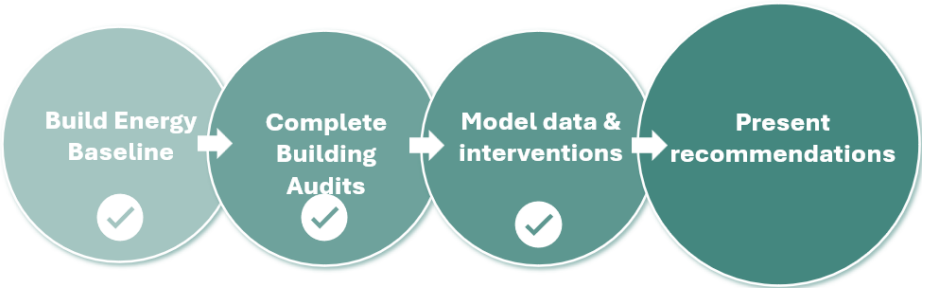
Buildings energy management

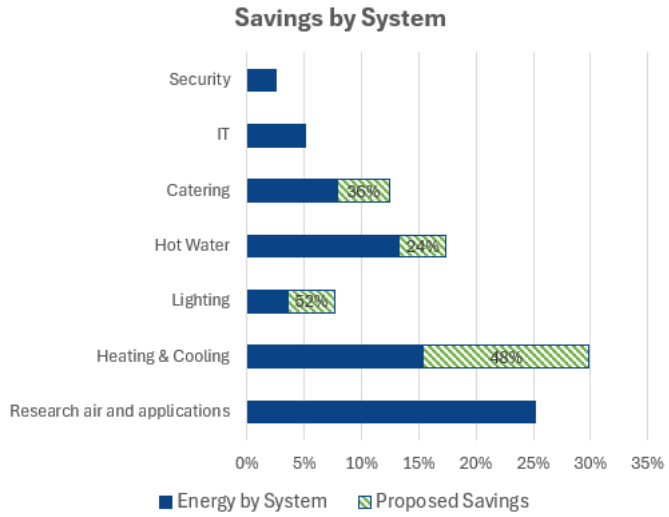
We continue to prioritise the effective management of energy across our buildings. By implementing energy efficiency projects, optimising building systems, and enhancing control through improved scheduling and automation, we are driving reductions in energy use and associated carbon emissions. These efforts support the university's broader sustainability targets and ensure our estate operates more efficiently and responsibly.

Delivery model

Engineering and Estates Management have analysed the consumption patterns and base-load from the data available, typically half hourly, monthly consumption amounts and sub-metering. This would indicate where the consumption savings could be made for electricity and gas.

The Process





Graph 4. Savings opportunities identified by system.

These identified opportunities (Graph 4) will cause a significant reduction in heating & cooling, lighting, hot water, and catering.

To achieve the desired 20% savings against the cost of energy in 2024/25, approximately 11,000,000 kWh will need to be saved across security of the BMS system, IT and Research. This is achieved by upgrading and renewing aged controllers and BMS equipment. Once renewed, Queen Mary can then investigate further options to reduce energy with the new functions modern BMS equipment can then provide.

The Strategy for the next three years is to:

- Connect more systems via LED, BEMS and Smart Sockets, managed via smart sensors and time schedules
- Reduce out of term, overnight and weekend usage through more detailed AM&T, Automation, Monitoring and Targeting. However, focus on increasing and greater automation
- Optimise buildings through an engagement process with building users (Description of Operations)
- Smart Management of core assets (AHUs, Chiller and Boilers)
- Once the estate is optimised, upgrade core generating assets

Annual Energy/Carbon Reduction

Solutions & Methodology

Several Opportunities have been identified to reduce the annual energy usage:

- BMS - Calculated based on site surveys.
- LED lighting upgrades - Calculated based on site surveys.
- Smart Sockets – 3,000 units of 50 Watts reducing from 24/7 usage to 40 hrs/week.
- Unconnected AC Load - 6000 assets identified from F-gas registers, assume 1kw load, 50% power, 60hrs and 40 weeks, 25% savings – 300kWhs per unit saved.
- Quick Win Optimisations - Calculated based on site surveys (top 10 buildings).
- Occupancy Management – 10% Daytime reduction in electricity (following savings from other projects).
- Out of term usage – A 25% reduction in out of term time use (July, August & half of December) against data
- Overnight reduction – Up to 50% reduction in overnight usage across the estate.
- Air Handling Units - A 30% reduction in usage through temp controls and time across core AHU assets.
- Upgrade of Core Assets and Renewables – future savings continually identified to meet target.

Resource Requirements

There is a known cost of c£4m for implementation of Projects that have a ROI (plus provision for out-of-hours and builder's works). There is also an element of just requiring a specialist resource to adjust and re-write Building Management System (BMS) software. Currently Queen Mary University outsources all BMS, including energy management, to a specialist third party, this cost sits within the Engineering revenue budgets.

The approach to the specialist support for identification, proposal and implementation of initiatives should initially sit with a specialist third party due to the number of resources required to undertake an estate wide investigation understanding our c70,000 or so data points whilst maintaining those assets. However, from year 3, we need to strategically move to this being an 'in house' capability. By this time, we will be able to fully understand our Estate and its capability, have identified all future interventions and initiatives and therefore be less reliant on external resources to support us. A specialist resource would be self-funding on continued cost avoidance and efficiencies managing the controls network.

It is anticipated the number of projects will increase as further exploratory work is undertaken. Should an annual budget be set aside for carbon reduction projects be made available, a dedicated Carbon Reduction Project Manager will be required. This will aid accelerating the proposed programme and would be funded from energy savings derived from interventions. It is therefore proposed we develop this capability from within the existing team. Queen Mary's Energy and Sustainability Manager, supported by the technical team, will step into the project management role.

Tackling out of hours consumption

Building Performance Gap & Out of Hours Energy

Immediate opportunities to reduce cost and carbon.

A review has been conducted on the out-of-hours consumption in all buildings across the university's UK Estate, with a view to targeting the buildings with the highest overnight/weekend usage.

Overall, only 41% of Queen Mary's energy is used during its peak occupancy hours of 7am to 7pm on weekdays.

Of the buildings with the highest baseload, we then looked at which buildings had suitable control that would allow us to conduct schedule optimisation at a low cost. Many of these buildings contain critical research spaces, so there may be limitations on reduction opportunities. However, building user engagement is key to understanding the use of research spaces outside of normal working hours.

Heat maps

The below heat maps show what periods of an average week use the most energy. The core occupancy hours of 7am to 7pm on weekdays are outlined in bold. Energy usage during these times accounts for only 41% of Queen Mary's total energy.

Table 3. Electricity heatmap based on average weekly use.

Weekday	Total	00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30	04:00	04:30	05:00	05:30	06:00	06:30	07:00	07:30	08:00	08:30	09:00	09:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30
Monday	96,706	1635	1626	1626	1614	1607	1600	1593	1585	1590	1607	1648	1685	1776	1891	2001	2071	2152	2213	2286	2337	2377	2397	2425	2432	2455	2464	2465	2463	2463	2449	2435	2411	2364	2308	2221	2162	2075	2027	1969	1931	1889	1854	1807	1781	1761	1739	1725	1715
Tuesday	98,003	1699	1686	1676	1663	1655	1640	1637	1632	1635	1651	1691	1727	1816	1923	2037	2105	2191	2254	2330	2381	2423	2440	2463	2477	2497	2495	2497	2487	2483	2471	2454	2420	2378	2328	2231	2171	2084	2031	1972	1932	1886	1851	1805	1779	1751	1740	1720	1708
Wednesday	97,766	1696	1681	1669	1659	1650	1639	1632	1628	1631	1645	1687	1718	1811	1907	2023	2089	2180	2243	2318	2367	2400	2430	2447	2459	2483	2489	2497	2494	2486	2466	2451	2422	2375	2319	2223	2166	2078	2028	1970	1928	1888	1848	1808	1781	1761	1750	1735	1715
Thursday	97,609	1702	1686	1673	1660	1655	1641	1635	1630	1634	1648	1684	1725	1814	1913	2033	2093	2180	2241	2311	2366	2400	2422	2446	2456	2479	2475	2478	2475	2473	2464	2449	2414	2367	2313	2220	2161	2079	2025	1964	1929	1884	1842	1799	1777	1746	1727	1717	1702
Friday	95,723	1688	1672	1668	1657	1649	1640	1636	1625	1629	1645	1681	1715	1807	1900	2007	2068	2142	2200	2261	2313	2353	2365	2388	2402	2422	2428	2429	2420	2413	2398	2381	2350	2300	2251	2152	2093	2010	1957	1908	1867	1832	1793	1750	1726	1706	1692	1674	1662
Saturday	82,030	1646	1636	1627	1618	1612	1601	1596	1591	1588	1581	1593	1593	1621	1633	1671	1683	1709	1725	1741	1755	1776	1783	1794	1801	1810	1817	1822	1816	1811	1812	1807	1809	1801	1785	1778	1768	1762	1746	1734	1716	1695	1686	1673	1659	1654	1641	1635
Sunday	81,660	1626	1623	1612	1602	1596	1591	1583	1576	1574	1571	1576	1579	1602	1612	1646	1659	1676	1694	1711	1723	1743	1752	1766	1780	1793	1805	1811	1809	1813	1809	1811	1808	1814	1806	1799	1786	1786	1777	1761	1748	1730	1709	1698	1684	1670	1663	1655	1643

Table 4. Gas heatmap based on average weekly use.

Weekday	Total	00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30	04:00	04:30	05:00	05:30	06:00	06:30	07:00	07:30	08:00	08:30	09:00	09:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30
Monday	73,606	1174	1159	1151	1133	1123	1118	1110	1103	1166	1209	1228	1521	1424	1544	1735	1852	1804	1815	1842	1858	1869	1879	1890	1865	1871	1865	1861	1865	1866	1842	1824	1817	1772	1739	1699	1681	1615	1518	1473	1443	1398	1370	1333	1260	1246	1235	1227	1222
Tuesday	73,580	1196	1202	1188	1182	1157	1140	1137	1128	1178	1272	1266	1479	1423	1545	1720	1799	1791	1794	1832	1836	1869	1869	1901	1886	1884	1868	1866	1867	1854	1844	1810	1789	1769	1720	1686	1664	1597	1509	1471	1444	1388	1356	1318	1247	1220	1216	1206	1195
Wednesday	74,008	1200	1192	1202	1185	1165	1148	1142	1134	1170	1315	1298	1530	1447	1554	1731	1820	1822	1817	1847	1858	1878	1881	1876	1881	1877	1886	1871	1896	1866	1856	1823	1806	1775	1744	1689	1655	1602	1502	1458	1442	1377	1348	1303	1258	1226	1226	1220	1208
Thursday	74,357	1205	1211	1196	1192	1162	1152	1145	1138	1170	1243	1245	1450	1460	1580	1758	1877	1852	1852	1874	1904	1921	1918	1921	1906	1901	1886	1895	1879	1870	1855	1830	1806	1771	1739	1708	1673	1615	1505	1465	1439	1396	1340	1319	1261	1232	1220	1212	1208
Friday	72,824	1198	1193	1188	1171	1159	1151	1144	1134	1159	1247	1264	1535	1453	1561	1746	1813	1769	1757	1792	1775	1911	1885	1863	1854	1846	1850	1845	1836	1832	1800	1804	1767	1736	1706	1661	1631	1572	1485	1441	1412	1361	1313	1289	1213	1186	1177	1177	1162
Saturday	60,925	1166	1156	1163	1155	1142	1130	1126	1125	1119	1124	1128	1143	1183	1247	1276	1282	1333	1426	1444	1616	1482	1445	1442	1427	1425	1412	1421	1403	1402	1397	1375	1343	1341	1276	1266	1251	1224	1241	1232	1223	1198	1188	1178	1182	1173	1172	1162	1158
Sunday	59,740	1164	1154	1151	1138	1140	1131	1124	1112	1116	1113	1126	1125	1144	1209	1259	1239	1301	1375	1365	1477	1406	1358	1366	1372	1359	1373	1353	1354	1355	1353	1344	1331	1305	1275	1270	1249	1237	1238	1239	1224	1216	1192	1189	1176	1175	1167	1168	1155

Leaderboard

In collaboration with our BMS contractor, we identified the buildings with the highest out of hours consumption.

Table 5. Out of hours energy consumption leaderboard in 2024/25.

		Electricity			Gas		
Building	kWh/GIA	Out-of-hours/ Peak Ratio	Peak hours	Out-of-hours	Out-of-hours/ Peak Ratio	Peak hours	Out-of-hours
Joseph Priestley	15.84	164%	21,022	34,545	205%	12,628	25,898
Wingate	13.66	167%	2,593	4,330	184%	4,854	8,936
Blizard Building	10.71	134%	21,337	28,528	153%	14,322	21,911
SU Hub	9.51	155%	8,202	12,707	129%	3,936	5,068
Innovation Centre	9.04	154%	14,005	21,633	171%	9,026	15,467
Charterhouse	8.1	144%	48,941	70,605	169%	38,141	64,409
Abernethy Building	7.22	136%	4,886	6,624	90%	5,591	5,042
Garrod Building	6.86	125%	5,770	7,221	91%	12,790	11,675
Fogg Building	6.41	156%	9,156	14,277	185%	4,043	7,483
Engineering Building	4.36	147%	10,296	15,152	165%	17,074	28,148
Francis Bancroft	4.18	153%	20,658	31,546	122%	3,576	4,358
Peter Landin/Draper's Bar	3.67	127%	9,774	12,451	54%	2,921	1,583
Library Building	3.33	135%	8,170	11,044	104%	5,597	5,832
Queens Building	2.19	153%	8,191	12,504	141%	3,568	5,044

Bubble Charts - normalised energy usage

The charts in this section show the annual energy usage normalised by GIA for all buildings across the 3 main campuses.

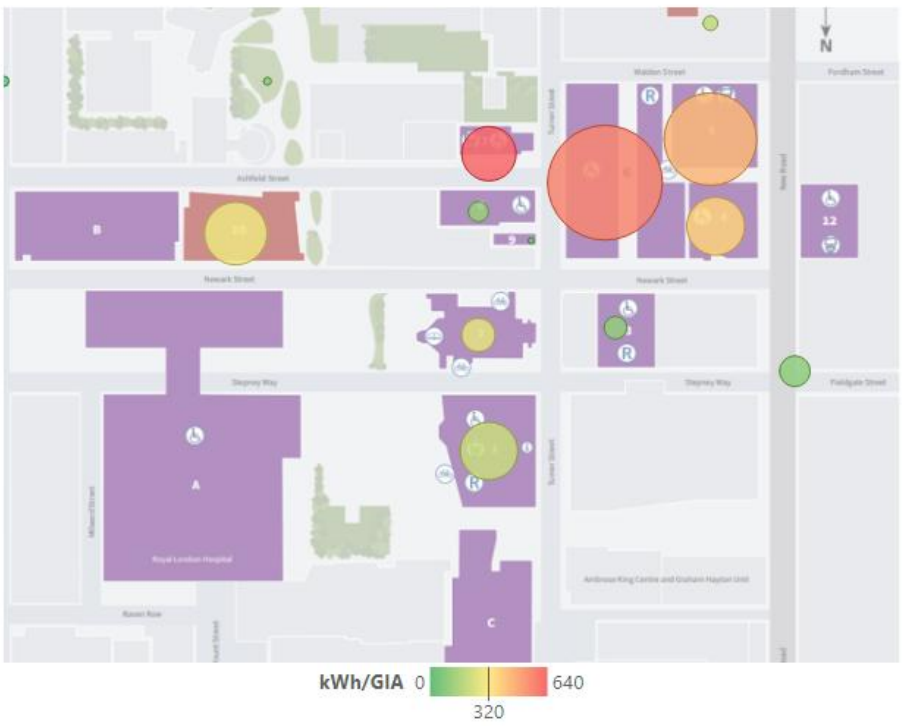
Annual consumption is shown by the size of the bubble, and the colour of the bubbles is based on the performance of the buildings in kWh/m^2 against the benchmark. The CIBSE TM46 energy benchmark for a University Building is 320 kWh/m^2, so all buildings over this are shown in red.

As above, the campus maps are also colour coded, with purple representing academic buildings, brown used for residential buildings and orange for facilities.

Mile End Campus

Graph 5. Bubble chart showing annual energy consumption by GIA for 2024/25, Mile End.

Whitechapel Campus



Graph 6. Bubble chart showing annual energy consumption by GIA for 2024/25, Whitechapel.

Graph 7. Bubble chart showing annual energy consumption by GIA for 2024/25, Charterhouse Square.

Energy Usage Task Force

An Energy Usage Task Force (EUTF) has been established to investigate the university's out of hours energy usage and worse performing buildings. The team is comprised of Queen Mary's Technical Manager, Sustainability & Energy Manager and our incumbent specialist BMS maintenance provider. This is primarily resource led, and a low-cost initiative focused on operating our buildings more efficiently. Energy savings will be delivered within existing maintenance budgets, not capital and is monitored and managed utilising our existing half hourly data against baseline data.

On a monthly basis, the Energy Usage Task Force are to report on savings made and to set targets for the month ahead. Meeting weekly, the EUTF will focus on the top 10 out of hours usage buildings, the top 10 biggest general usage buildings but also support Rapid Improvement Days initiatives by providing building stakeholders reports on their usage together with initiatives to reduce consumption. The team will also concentrate on improving the general efficiency of the building by ensuring our assets are fully operational and efficient through maintenance and reactive failures.

This initiative is to be funded by what our expenditure is now on the reactive response/call outs but also by the savings made on Queen Mary's utility bills.

The EUTF are to ratify the proposed measured savings each month, and each initiative is to be tracked and recorded and, importantly, be fully auditable.

Low-cost initiatives: Total investment: £121,608 | Estimated annual energy savings 3,824,396 kWh and £662,657 cost savings| Annual carbon savings 684.44 tCO_2e (after completion of all proposed low-cost initiatives, carbon savings calculated using 2024 conversion factors).

Additional submetering will also be installed to more accurately measure the impact of the various energy reduction projects and enable better and more granular energy monitoring going forward.

Sub-metering: Total investment: £66,764 | Estimated annual energy savings 152,099 kWh and £21,965 cost savings| Annual carbon savings 27.36 tCO_2e (after completion of all proposed sub-metering projects, carbon savings calculated using 2024 conversion factors).

Energy reduction projects (BMS improvements, smart LED lighting and onsite renewables)

Alongside the EUTF work described above, there will be an investment in BMS and smart lighting improvements. This section provides the rationale for the types of projects being proposed and lists all projects planned for the next three years. Additionally, an opportunity to install solar PV on the roof of the Joseph Priestley Building has been identified.

BMS improvements

Standardisation of BMS graphical data

The current BMS system has a large amount of graphical data available, however due to the changes of BMS service providers over time, the current layouts are non-standardised and can contain confusing amounts of information.

The information available in many instances consists of a multitude of engineering data suitable for a BMS Engineer and not Queen Mary's current maintenance operatives.

The intention is to simplify and standardise the graphical data in conjunction with our BMS contractor to a Trend IQ Vision version. This format will provide a consistent provision of data for maintenance operatives. The engineering data will remain but will only be accessible to the BMS Engineers.

These changes are intended to enable the maintenance team to better understand what the BMS is telling them. This will, in time and with some additional training, ensure they can identify and rectify plant issues in a timelier manner and thus impact energy usage to Queen Mary's advantage.

Smart lighting

Queen Mary is exploring the use of smart lighting systems integrated with occupancy sensors and the BMS as a practical and effective way to reduce energy consumption and improve operational efficiency across our estate.

These systems work by adjusting lighting automatically based on real-time occupancy, meaning lights are only on when spaces are actually in use. When connected to the BMS, this provides estates and facilities teams with greater control and visibility, allowing for more accurate scheduling and helping to spot and address inefficiencies across buildings and zones.

This approach is particularly beneficial in spaces with variable occupancy - such as lecture theatres, meeting rooms, corridors, and washrooms - where lighting is often left on unnecessarily. It also reduces the reliance on manual controls and aligns lighting operation with wider building strategies.

Key benefits include:

- Lower electricity use and energy costs, especially in intermittently used areas
- Improved comfort and safety through responsive lighting
- Reduced maintenance demands, with lighting systems operating fewer hours
- Better data to inform energy and sustainability planning

Smart lighting, when used alongside occupancy detection and the BMS, offers a cost-effective solution that supports both immediate energy savings and our long-term carbon reduction goals.

Prioritised energy and carbon savings – known ROI projects

The smart LED installations are expected to achieve higher savings than those identified below due to the additional energy reduction achieved through shutting down systems in unoccupied areas using sensors. It is, however, very difficult to accurately estimate these additional savings, so these have not been factored in.

The investment projects identified so far include buildings that either require an upgrade to existing controllers or an installation of a BMS network. It is then our intention to repurpose the old controllers into the buildings where we do not currently have a BMS network, (mostly residential). By upgrading/installing BMS controllers we are then able to operate our MEP plant in an efficient and energy saving manner.

ROI projects: Total investment: £3,917,738 + £615,022 (out-of-hours contingency, LED lighting) + £184,506 (provision for builder's works, LED lighting)

Estimated annual energy savings 8,778,998 kWh and £1,521,828 cost savings | Annual carbon savings 1,571 tCO_2e (after completion of all proposed projects, carbon savings calculated using 2024 conversion factors).

Operational changes

Seasonal adjustments

Queen Mary will continue to work closely with building users to optimise heating, ventilation, and cooling (HVAC) systems during holiday periods and out-of-term times such as Christmas, Easter, and the end-of-session breaks. These periods present valuable opportunities to reduce energy consumption by aligning system operation with reduced occupancy and usage patterns.

By implementing targeted scheduling changes and refining system settings in advance of these quieter times, we aim to minimise unnecessary energy use while maintaining comfort and compliance where needed. This collaborative approach helps support our wider energy reduction goals and ensures our buildings operate as efficiently as possible throughout the year.

Adjustment of operational hours and building closures

On top of the seasonal adjustments that we have been fine tuning for a number of years; the University is now looking to identify opportunities for adjustment of operational hours and building closures on Fridays, based on occupancy levels. After strategically installing occupancy sensors in some buildings across all main campuses in 2024, we have gathered enough occupancy data to make data driven decisions.

The overnight closure of the libraries has been implemented as follows:

- Whitechapel Library will be closing between midnight and 8am all year
- Mile End Library will closure between midnight and 8am, with some 24/5 provision for coursework deadlines

It is also proposed to explore the closure of buildings with low occupancy on Fridays to hibernate them for a 3-day weekend.

Estates Strategy

We will be placing greater emphasis on improving space efficiency to support future growth, where needed, and make better use of our existing estate. This will include a comprehensive review of which spaces can be adapted or reconfigured for new uses. Done effectively, these measures could reduce total energy demand or, at the very least, maintain a net-zero impact on overall consumption.

Refurbishments

Any future major refurbishment projects will be expected to meet a minimum BREEAM rating of 'Very Good', reflecting our commitment to sustainability. In support of our decarbonisation objectives, no new fossil fuel-based heating systems will be installed. Instead, buildings will be designed to operate as fully decarbonised assets, maintained in their existing form, or retrofitted to reduce reliance on gas for heating and improve energy efficiency.

The refurbishment and expansion of the Informatics Teaching Lab (ITL) was completed earlier this year. The building is electrically supplied via a new connection from the Engineering Building's metered supply, which is served by an Independent Distribution Network Operator (IDNO) substation. As part of the decarbonisation approach, both space heating and domestic hot water systems in the ITL are now fully electric, aligning with the university's commitment to phasing out fossil fuel use in new and refurbished buildings. The building now has a solar PV array on the roof.

Onsite renewables

There are ongoing considerations to install rooftop solar PV systems on the Joseph Priestley Building and student residences at the Mile End campus, as part of the university's wider decarbonisation strategy. These proposals are subject to further feasibility studies and technical audits to assess viability.

The suitability of each building will depend on factors such as roof size and condition, as well as the potential for integration with existing building services. These installations aim to reduce grid electricity consumption and support progress towards carbon reduction targets.

Key considerations include:

- Available roof area and orientation
- Structural load capacity
- Shading analysis
- Age and design of buildings
- Electrical infrastructure suitability
- Inverter placement and cabling routes within occupied buildings
- Whole-life cost analysis
- Opportunities for integration with smart controls, monitoring systems, or battery storage

Joseph Priestley solar PV

Estimated cost of circa £420k, including reinforcement of the roof, expected to generate around 164 MWh of electricity/ circa £39k savings per annum based on initial surveys undertaken to date.

Data and monitoring

We are working towards hosting and reporting our electricity and gas AMR half-hourly data. The plan is to collect the half-hourly data, store it centrally, and process it through our internal data analysis platform. This will allow us to better track usage trends, identify anomalies, and support more informed decision-making.

The next step will be to use Power BI to report and visualise the energy data, giving us a clearer, more accessible view of energy performance across the estate.

The medium-term goal is to migrate this data and reporting functionality onto the university's Integrated Workplace Management System (IWMS) platform being deployed. This will help bring energy monitoring in line with wider estates operations, enabling a more joined-up approach to asset management, maintenance, and environmental planning (including energy and water monitoring).

In the future, simplified and more engaging Power BI dashboards may be used to show building users the energy consumption associated with their building. Dashboards can be used to illustrate the impact of both improvement projects and actions and efforts from the users. See the Department Energy Roadshows and

Realtime Feedback System engagement interventions in the following section, for examples of how this plan can be realised.

Engagement for Behaviour Change

Engagement is a core component of energy and carbon reduction, as it is crucial for enabling behaviour change. We can't disregard the role of behaviour change in meeting the university's energy and carbon reduction goals. The Committee on Climate Change (CCC) calculated the role of behavioural and societal change in meeting the UK's Net Zero ambition, as part of their work advising on the need to 'build back better' following the COVID-19 pandemic. They found that 43% of the UK's emission reductions require a combination of low-carbon technologies and behavioural changes, with an additional 16% of these reductions coming largely from societal or behavioural changes (see Figure 1 below). [1]

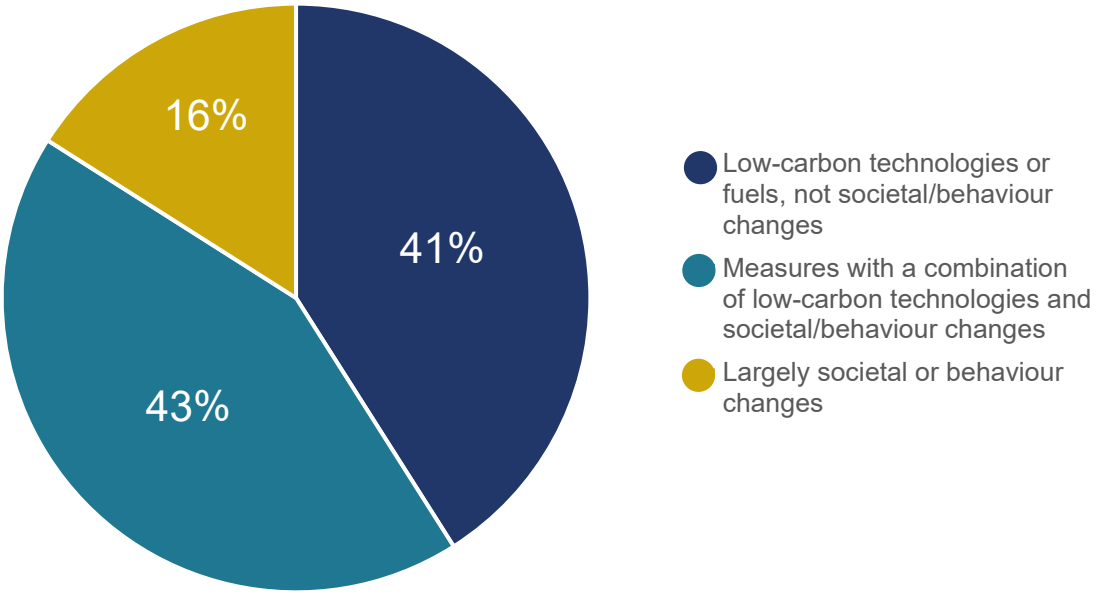


Figure 1: Role of Behavioural and Societal Change [1]

Engagement Objectives

Engage

We recognise the importance of involving individuals in plans and objectives that affect them and rely on changes in their actions and behaviours to succeed. We will use a variety of methods to effectively engage with staff, students, and other relevant stakeholders on the university's energy and carbon reduction plans.

Enlighten

We will support messaging with clear evidence-based information and encourage knowledge-sharing of all forms to increase awareness and best practice. We will deliver clear and regular feedback on the impact of actions taken.

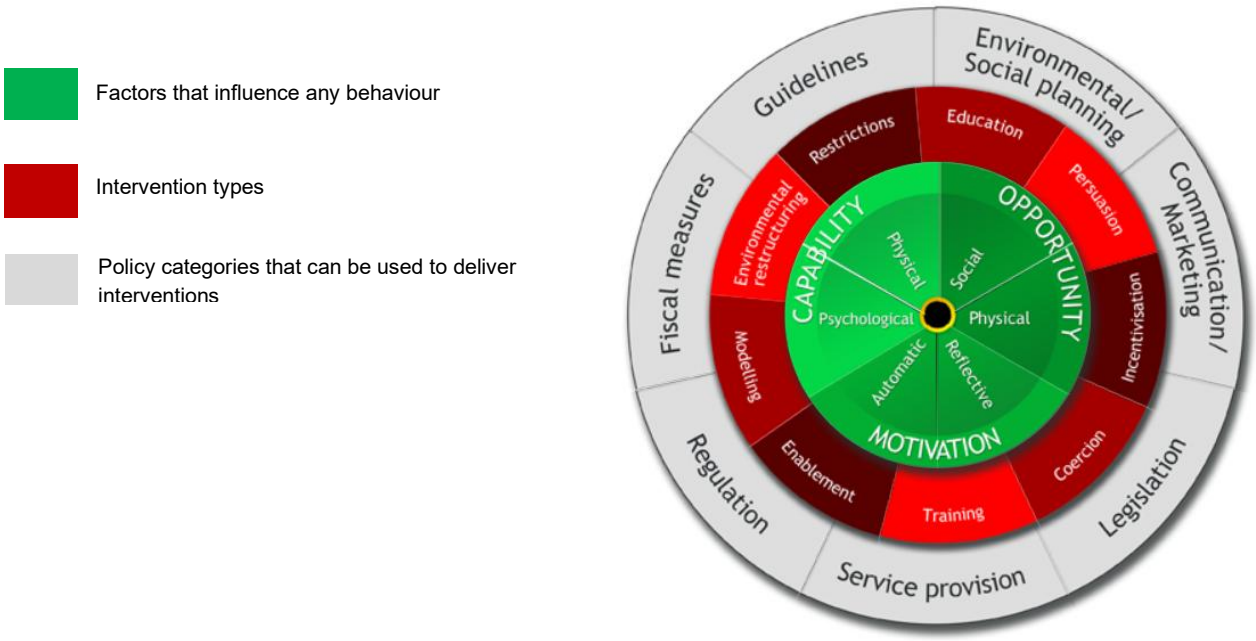
Empower

We will empower and enable large-scale behaviour change by removing existing barriers to change, wherever possible. We will encourage opportunities to go the extra mile, provide practical guidance to help turn ideas into action.

Intervention Planning & Design Process

The planning process is divided into four sections: Research, Engage, Develop, and Deliver. [2] Components of the Behaviour Change Wheel (see Figure 2), a widely used interdisciplinary framework for designing and delivering behaviour change interventions, are incorporated into the relevant sections of this process. A more detailed description of Behaviour Change Intervention Types and Mapping of Intervention Types to appropriate Policy options/Implementation strategies is included in the Appendix.

Figure 2: Behaviour Change Wheel [3]. Interactive version available here.



Research

Research is an important step in this process, as it allows us to meet the target audience where they are to tap into their motivations and drivers, not our own. It also allows us to make an informed COM-B diagnosis. A COM-B diagnosis helps to identify what needs to change in people's Capability (C), Opportunity (O), and/or Motivation (M) to bring about the desired behaviour (B). Figure 3 below provides examples of the kind of question prompts to ask when making a COM-B Diagnosis.

Figure 3: COM-B Diagnosis Prompt Examples [4]

While targeted research into people's motivations and drivers related to energy and carbon reduction has yet to be conducted at Queen Mary, a draft COM-B diagnosis has been made, drawing from existing knowledge. Sources of this knowledge include internal environmental audits, energy-saving working group meetings, building user group meetings, estate strategy priorities, employee/student feedback, and incident reports.

Draft COM-B Diagnosis

Capability: Gaps in knowledge of energy usage and carbon impacts, and/or a lack of understanding of what systems are automated vs locally controlled, and how to operate locally controlled systems.

Opportunity: Infrastructural constraints/issues and space inefficiencies. Lack of social and cultural norms around energy and carbon reduction.

Motivation: Feeling of low importance of personal impact, limited/no feedback on the impact of actions.

However, given the lack of targeted research into people's motivations and drivers regarding energy and carbon reduction, this is included as an intervention, in and of itself, in the first year of this plan. This research will not only offer the chance to verify and/or update the COM-B diagnosis, in doing so, ensuring that the engagement interventions are fit for purpose, but it also presents an opportunity to engage individuals on the topic of energy and carbon reduction.

Engage

Multiple methods of engagement are required, given the diverse number of stakeholders this plan impacts. Inclusivity is also vital to consider when planning interventions, to ensure everyone is comfortable and aware of the expectations and actions required of them. Applying behavioural science principles in the development of engagement initiatives has helped to consider potential blockers as well as solutions to change.

Key engagement mistakes to avoid:

- Focusing only on Education
- Using your motivation to reach other people, instead of their own
- Focusing on the environmental issue and not the issues within your organisation
- Telling without listening

Develop

Step 1: Identify the intervention type/s (referring to the Behaviour Change Wheel) best suited to influence behaviour according to sources of behaviours identified in the COM-B diagnosis above.

Research on the most successful behaviour change interventions for saving energy in the workplace found that, in general, “Interventions which create social and physical opportunities for employees to save energy are the most successful”. [5] In particular, Enablement (both direct support and giving greater control to employees), Environmental Restructuring (especially increasing automated technologies), and Modelling (across various forms of social influence) were found to be particularly successful in achieving desired behaviour change.

- **Enablement** – increasing means or reducing barriers to increase capability or opportunity.
- **Environmental Restructuring** – changing the social or physical context to promote a particular behaviour.
- **Modelling** – providing an example for people to aspire to or imitate.

Another key finding is that the attitudes and engagement of management in interventions and wider organisational change are important factors in successfully achieving wide-scale energy savings in the workplace (alongside the collective actions of employees and, of course, investment in energy-efficient technologies). [5]

Step 2: Design intervention/s to be EAST. The EAST framework is based on behavioural science insights that change is more likely to occur if interventions are Easy, Attractive, Social, and Timely. These principles are outlined in more detail below:

- **Easy** – removing friction and making the behaviours as simple and effortless as possible, e.g. bundling behaviours or breaking bigger actions down into smaller, actionable steps.
    - Is the ask simple and straightforward?
    - Is the desired behaviour the default choice, where possible?
    - Are there additional, unnecessary steps required to fulfil the ask?

- **Attractive** – making the behaviour appealing and engaging, e.g. having localised goals and targets, or highlighting stakeholder requests for change.
    - Do communications attract attention from the target audience?
    - Is the ask personalised, where possible?

- **Social** – recognise the influence of social norms and peer behaviour. This can be integrated through peer-to-peer training, managerial buy-in/support, understanding how actions resonate with others and the co-benefits of actions, and receiving public recognition of actions.
    - Do most people already engage in the desired behaviour? If so, can this be demonstrated to the target audience?
    - Can people commit to the behaviour right away?
    - Are peers within the desired audience set up to progress the ask/action?

- **Timely** – emphasis on delivering messages or prompting behaviours at the right time to have the greatest impact, i.e. communicating *when* people need to know.
    - Are you communicating with your audience when they will be most receptive?
    - How immediate are the benefits of the change?
    - Can people plan for future actions now?

Step 3: Trial. Interventions should be trialled on a smaller scale. The act of doing so is a powerful lever for behaviour change, as it helps remove concerns and negative perceptions that often come with swift, sweeping changes. It provides an opportunity for individuals to be more directly involved in the design and implementation process of interventions through feedback/suggestions, which help to inform any tweaks/adjustments required based on these learnings.

Step 4: Learn and iterate
Learnings don't only come from one source, i.e. feedback/suggestions during trials. A clear process for evaluation is also important. Evaluation can be carried out at any point during the development process using the 'APEASE' criteria - Acceptability, Practicability, Effectiveness, Affordability, Side-effects, and Equity (see Table 4 in the Appendix for more details on the APEASE criteria). This framework was designed to evaluate the feasibility and appropriateness of behaviour change interventions and can be applied to both new and existing interventions.

Deliver
The effectiveness of an intervention can be affected as much by the way it is delivered as by its content. This section is closely linked to the 'T' of EAST, as the desired impact of interventions can also be affected by *when* they are communicated/launched.

There are three aspects of delivery to consider:

- the *source* of the intervention (the individual or organisation delivering it).
- the *mode* of delivery (the implementation strategy best suited to deliver the intervention/s).
- the *schedule* (the timing of the intervention).

Some of the most impactful elements of delivery, specifically concerning behaviour change in sustainability, include:

- **Accountability** – for example, embed the desired behaviour/s into job specifications, recruitment, onboarding, welcome events, etc and/or incorporate regular check-ins.
- **Feedback** – not feedback from individuals about the interventions; instead, this refers to providing feedback to individuals about how their actions are making a difference.
- **Acknowledgement** – this should be both public and social, whether at a team, departmental, and/or institutional level. This links directly with the intervention type, Modelling, highlighted previously as one of the behaviour change interventions found to be most successful for achieving energy savings in the workplace.

Description of Interventions

Year 1: Foundation & Awareness

COM-B Research - Determine the drivers of energy behaviour through surveys, group discussions, and other methods, to uncover what enables or blocks change across the university.

- COM-B Target: All - Capability, Opportunity, and Motivation. This intervention does not directly change behaviour but provides insight into which components need to be targeted in future engagement. It also tests the assumptions in the draft COM-B Diagnosis (see the Research section above).
- Intervention Types:
    - Enablement – providing insight to better target future interventions.
    - Education – informing stakeholders of the behavioural landscape and rationale for intervention choices.
    - Modelling – indirectly, through group discussions surfacing social norms.

- Policy Categories:
  - Service Provision – surveys and discussion groups as services supporting the wider energy and carbon reduction plan.
  - Communication/Marketing – promote participation in the survey.
  - Environmental/Social Planning – behaviour data collection to inform planning.
- Implementation Strategy: Mixed-methods, evidence-informed behavioural research to:
  - Validate or refine current assumptions about Capability, Opportunity, and Motivation (COM-B).
  - Identify differences across roles, departments, and locations.
  - Build engagement by involving staff/students in co-diagnosis.

  Components:
  - Online survey: short, behaviourally-informed; promoted through newsletters, screen messaging, emails, Teams, social media, and printed QR codes.
  - Focus groups: survey embedded into existing team meeting structures across different staff/student groups.
  - Environmental audits: observational studies of energy and carbon-related behaviour in situ.
  - Follow-ups: if needed, to clarify emerging qualitative insights.

  EAST Framework:
  - Easy: < 5-minute surveys, embedded in existing meeting structures, auto reminders, simple format responses.
  - Attractive: prize draw incentives, engaging branding.
  - Social: promoted within groups, participation rate visibility.
  - Timely: incorporated into other interventions such as Seasonal Energy Campaigns and Departmental Energy Roadshows.
- Delivery:
  - Target Audience: All staff and students
  - Leads: Sustainability Team (survey design and analysis); Marketing & Comms (promotion); Academic researchers (support survey design and guidance for focus groups)
  - Modes: Digital (survey platform, screen messaging, QR codes, Teams, newsletters, emails, intranet pages); In-person (focus groups, roadshows, audits, events)

Local Controls Guidance - Providing users with the resources to operate energy controls confidently and consistently, using visual guides, clearer signage, and seasonal prompts.

- COM-B Target:
  - Capability (Psychological) – lack of knowledge about how and when to use local controls
  - Opportunity (Physical) - controls are often unintuitive, poorly labelled, or inaccessible
- Intervention Type:
  - Education – increase understanding of local controls
  - Enablement - remove barriers to appropriate usage
  - Environmental Restructuring – improve access and standardise signage
- Policy Category:
  - Guidelines – develop standardised usage instructions for common controls
  - Communication/Marketing – promote resources and updates
  - Environmental/Social Planning – improve physical signage and consistency of access control
- Implementation Strategy:
  - Identify common control types and develop clear, step-by-step visual guidance.
  - Share guidance via digital access points and QR codes on or near controls.
  - Coordinated, university-wide rollout of stickers/signage at a local level.
  - Reinforce guidance with periodic prompts during seasonal campaigns and before closures/breaks.

  EAST Framework:

  - Easy: Visual, step-by-step guides; simple online access
  - Attractive: Colour-coded stickers; use of icons and imagery
  - Social: Social norm messages and collective framing of responsible use
  - Timely: Prompts aligned with seasonal changes, known high-usage periods, or key breaks
- Delivery:
  - Target Audience: All users of buildings with local energy controls
  - Leads: Sustainability Team (guidance, coordination and promotion); IT (guidance and promotion); Building Managers (local rollout and feedback); Marketing & Comms (design and promotion); Energy Champions (local support, promotion and feedback)
  - Modes: Digital (website, intranet, short video how-to, screen messaging, Teams, newsletters, emails); Physical (Energy Campaign stickers/signage)

Departmental Energy Roadshows - Incorporating tailored energy dashboards, action tips, and peer insights into regular departmental meetings to support practical, peer-led behaviour change.

- COM-B Target:
  - Capability (Psychological) – limited awareness of department-level energy use and appropriate response actions
  - Motivation (Reflective) – low perception of relevance or influence
- Intervention Type:
  - Education - raise awareness of energy use and carbon impact
  - Modelling - highlight positive peer behaviours and testimonials
  - Persuasion - encourage change through positive narratives and team influence
- Policy Category:
  - Communication/Marketing – promote the energy roadshows and key takeaways
  - Service Provision – provide tailored information, guidance and support
- Implementation Strategy:
  - Identify key teams and map meeting structures
  - Embed into existing meetings with dedicated time set aside on the agenda for the roadshow, with the goal to develop capacity needed to provide this service on a regular basis for departments e.g. once a month
  - Develop simple, engaging slide decks and tailored energy use dashboards with Power BI
  - Use roadshows as an opportunity to share other initiatives and gather energy use insights
  - Reinforce takeaways with follow-up emails and check-ins

  EAST Framework:
  - Easy: Simple, relevant dashboards and actionable tips
  - Attractive: Bespoke and engaging insights; direct feedback on relevance and impact
  - Social: Peer testimonials and insights; opportunity for Q&A
  - Timely: Scheduled during existing meetings
- Delivery:
  - Target Audience: Departmental staff
  - Leads: Sustainability Team (content and delivery); Energy Champions (support and delivery); Department Admin (scheduling and access)
  - Modes: Digital (dashboards, presentations, emails, screen messaging, newsletters, Teams, intranet); In-person (roadshow presentations)

Seasonal Energy Campaigns – ongoing University-wide campaigns delivering timely nudges, clear guidance, and visible recognition to build energy-saving as a year-round habit.

Cost estimate: **Total = £3500 - £6000**, (Signage/Stickers/Checklists @ £3000 - £5000) + (Incentives/Recognition @ £500 - £1000).

- COM-B Targets:

  - Motivation (Reflective) – lack of intentional engagement with energy-saving actions unless there's a perceived direct or organisational benefit
  - Capability (Psychological) – lack of clarity on which actions "matter"
  - Opportunity (Physical + Social) – inconsistent cues and norms across different spaces and functions
- Intervention Types:
  - Education – provide actionable knowledge
  - Persuasion – use emotional messaging, impact statements, and feedback
  - Environmental Restructuring & Enablement – provide necessary tools, prompts, and guidance
- Policy Categories:
  - Communications & Marketing – seasonal campaign branding and messaging
  - Guidelines & Service Provisions – checklists, controls guidance, energy use insights, feedback, and other resources
  - Environmental/Social Planning – automated energy saving reminders and scheduling
- Implementation Strategy:
  - Mix of digital and physical comms assets in Year 1, shifting to a digital campaign from Year 2 onwards, once physical comms assets are in place - physical comms assets will have 'evergreen' messaging to ensure they remain relevant and in place long-term.
  - Ongoing, light-touch component through 'evergreen' messaging displayed throughout the year, when the central comms schedule allows.
  - Seasonal campaign push focused on targeted behaviours, with increased messaging and engagement through mixed methods/channels.
  - Pre-campaign
    - 6-8 weeks before - Develop digital & physical comms assets; send assets for print.
    - 4-5 weeks before - Engage key stakeholders & distribute campaign toolkits (plan and objectives, signage/stickers/checklists, instructions for physical asset rollout and peer nominations, Energy Champions programme information, etc).
    - 2–3 weeks before - Launch teaser messages or countdown, confirm plans for local physical asset rollout
  - During Campaign
    - Daily comms push via multiple channels/methods
    - Physical comms asset rollout at local level, prompts – this is a key campaign action
    - Weekly updates/feedback on energy usage
    - Weekly spotlight/broad public recognition of model teams or individuals
  - Post-campaign
    - Report on energy savings and key takeaways/learnings
    - Further recognition of model teams/individuals e.g. letters of thanks from senior leadership, lanyard pins, digital badges, QM vouchers, etc.
    - Collect feedback/suggestions ahead of the next seasonal push

  EAST Framework:
  - Easy: 5 simple, seasonal tips (some will be relevant year-round); consistent layout
  - Attractive: Targeted branding/visual identity, feedback loops, real-world impact
  - Social: Peer nominations and spotlighting, broad public recognition, team recognition
  - Timely: Ongoing with nudges and updated messaging aligned with clock changes and shutdowns/break periods
- Delivery:
  - Target Audience: All staff and students
  - Leads: Sustainability Team (strategy, resource content, delivery, and evaluation); IT (resource content); Marketing & Comms (design and promotion); Energy Champions (local engagement); Depts/Teams (physical comms rollout).

- Modes: Digital (emails, screen messaging, short videos of asks/tips, newsletters, intranet and webpage announcements/banners, social media); Physical (signage/posters, stickers, check lists).

Energy Champions – Establishing a network of Energy Champions, including strategically placed and passionate individuals, to lead energy-saving actions and engagement at a local level to help embed an energy efficient culture at Queen Mary.

Cost estimate (for 3-year programme): **Total = £3500 - £6000**, (Printing/Materials @ £500 - £1500) + (Recognition/Rewards @ £3000 - £4500).

- COM-B Target:
  - Capability (Psychological) – lack of knowledge and skills to confidently engage others about energy-use behaviours or identify energy-saving opportunities.
  - Opportunity (Social) – peer leadership and accountability.
  - Motivation (Reflective) – personal investment in actions; increased engagement when driven by peers who are empowered and recognised for driving sustainability, rather than policing it.
- Intervention Type:
  - Education/Training – provide knowledge, skills, and confidence to act.
  - Modelling – demonstrate and normalise behaviours through peer-to-peer influence.
  - Enablement – reduce barriers through structure and support.
  - Environmental Restructuring – basic energy audits and physical comms asset monitoring.
- Policy Category:
  - Guidelines – clear responsibilities, checklist of actions, onboarding packs.
  - Service Provision – training, resources, coordination of network, ongoing support.
  - Communication/Marketing – internal promotion, visibility through comms channels.
  - Environmental/Social Planning – embed into strategic roles tied to space usage.
- Implementation Strategy:
  - Phase 1: Design & Recruitment
    - Identify strategic roles: building managers, Residence Assistants (RAs), Students Reps, security staff, middle management/line managers.
    - Send invitations highlighting purpose, value, and non-policing nature of the role.
    - Ensure line manager buy-in to integrate champion work into core responsibilities.
  - Phase 2: Training & Role Definition
    - Provide a half-day training workshop (in-person or hybrid) covering:
      - QMUL's carbon and energy objectives
      - Behaviour change & engagement basics
      - How to lead/support Dept Energy Roadshows & Building Blackout events
      - Interpreting basic energy data
      - Conducting walk-through energy audits
      - Acting as “first response” to local energy issues (local controls guidance)
      - Relaying local feedback on interventions to the central team
      - Monitoring of physical comms assets
  - Phase 3: Activation & Support
    - Launch quarterly check-ins and email updates
    - Champions receive monthly “Nudge Packs” with:
      - Digital comms templates
      - One seasonal action prompt
      - Recognition shout-outs
  - Phase 4: Feedback & Recognition
    - Quarterly review calls to gather feedback and suggestions

    - Digital badge and termly thank-you email from Sustainability Team and/or Senior Leadership
    - Recognise standout champions in newsletters, town halls, university-wide channels

  EAST Framework:
    - Easy: Clear role responsibilities; all materials/resources provided.
    - Attractive: Official role title and digital badge; involvement in strategic sustainability work & engagement; upskilling/professional development opportunities; early access to information
    - Social: Peer-driven; regular network meetings; public recognition
    - Timely: “Nudge packs” synced with other interventions, where relevant (e.g. seasonal energy campaigns); invitations to join network and trainings undertaken pre-campaign launches
- Delivery:
    - Target Audience: Building Managers (have operational control and access to Estates); RAs (engage students who live on campus); Security (present after hours/weekends; need to support Blackout events); Middle Management (influence teams and local norms); Line Managers/Coordinators (close to staff who can take action day-to-day).
    - Leads: Sustainability Team (coordination, guidance/resources, training); Management (nominations, local implementation); Marketing & Comms (design and promotion).
    - Modes: Digital (screen messaging, newsletters, emails, intranet and webpage announcements/banners, social media, Teams channel); Physical (hard copies of resources may be more suitable for certain individuals/teams); In-person/hybrid (training, events, network meetings).

Blackout Building Events* - Coordinated, collaborative switch-off events in targeted buildings to raise awareness of wasted energy and encourage behaviour change through structured downtime, compelling feedback, and increased participation.

Cost estimate: **Total = £500 - £800** (Recognition/Incentives, including food and refreshments).

- COM-B Target:
    - Opportunity (Physical & Social) – physical and social prompts, procedural and social support, and structured downtime needed to act.
    - Motivation (Reflective) - encouraged through feedback that connects action to impact.
- Intervention Type:
    - Enablement - make it easier for people to act by providing the right conditions (e.g. reminders, support tools).
    - Environmental Restructuring - change the physical and procedural environment to support desired behaviours (i.e., building access, signage, default switch-offs).
    - Persuasion – shock factor from feedback; comms and feedback encourage participation and norm reinforcement.
- Policy Category:
    - Guidelines - provide switch-off protocols, building closure guidance, and event toolkit for building users.
    - Environmental/Social Planning - operationally close or reduce services in selected buildings.
    - Communication/Marketing - promote blackout events, provide feedback, celebrate success.
- Implementation Strategy:
    - Intervention to span across all 3 years, decreasing in frequency, but increasing in scale as the years progress, with the aim to have up to 3 events in the first year.
    - Start small to build interest, gather evidence, and test operational needs – focus on 1-2 buildings per event, ensuring at least one high-energy-use building.
    - Targeted volunteer recruitment from building users of the targeted building/s.

  EAST Framework:
    - Easy: Switch-off checklist & event guide emailed to participants in advance; pre-written comms templates for Depts; clear signage at exits ("Have you switched off?")

    - Attractive: Before/after energy saving results sent via visual dashboards/infographic; targeted messaging to users of the building; countdown to blackout event
    - Social: Team event; public recognition of volunteers
    - Timely: Scheduled before weekends/university breaks - prompt start to ensure prompt finish; reminders 48h and 2h in advance; results shared shortly after
- Delivery:
    - Target Audience: Building users of selected buildings, expanding to all staff/students in following years
    - Leads: Security/Building Managers (building access and closures); Sustainability Team (coordination and resource development); IT Services (automated reminders/system switch-offs and resource development); Marketing & Comms (design and promotion); Energy Champions (encourage participation and event support); Depts/Teams (encourage participation, cascade messaging and resources); Management/Leadership (encourage participation and buy-in)
    - Modes: Digital (emails, newsletters, webpage and intranet banners/announcements, social media, links to resources and guidance, screen messaging/countdowns, MS Teams); Physical (individuals may choose to print off certain resources e.g. audit checklists); In-person (pre-during-post event support)

Year 2: Scaling & Space Efficiency Integration

Seasonal Energy Campaigns, Departmental Energy Roadshows, and the Energy Champions programme will continue from Year 1, with Seasonal Energy Campaigns shifting focus to a digital-only, paperless campaign from this year onwards.

Blackout Building Weekends* - An expansion of the Blackout Building Events intervention in Year 1, with most of the information remaining the same, except for the implementation strategy and resultant cost estimates - these changes are outlined below.

Cost estimate: **Total = £4000 - £6000**, (Recognition/Incentives, including food and refreshments).

- Implementation Strategy:
    - Expand the scale of events to include all major non-residential buildings at Mile End Campus, with the aim to have up to 2 events in the year.
    - The focus is on growing participation, normalising behaviour, and embedding a responsible, ‘switch-off’ culture. There is the opportunity to link these events to space rationalisation plans such as trialling full closures of under-used buildings to gather data for future mothballing.
    - Events will include a wider set of stakeholders when planning closures, with the goal to pre-schedule events well in advance, taking into account timetabling and, where applicable, the space rationalisation timeline.
    - The expansion of the event will require increased resource and recognition to attract participants at scale, such as food/refreshments, QM vouchers/prize draws, guest speakers, etc.

Space Sharing & Clustering Campaign** - Supporting key focus areas in the estates strategy by encouraging and supporting staff to embrace the co-benefits of shared spaces e.g. reduced energy use, enabling collaborative, low-carbon ways of working.

- COM-B Target:
    - Opportunity (Physical) – physical access to shared, bookable, or reconfigured spaces is needed to act differently.
    - Motivation (Reflective) - there may be emotional or practical resistance to sharing space/change, or unawareness of the benefits.

- Intervention Types:
    - Environmental Restructuring - changing the physical environment (shared desks, open-plan, hot-desking).
    - Persuasion - positively influence attitudes through mixed methods of communication/engagement.
    - Enablement - reducing barriers through online tools and support.
- Policy Categories:
    - Environmental/Social Planning – planning and implementing shared space layouts, clustering zones.
    - Communication/Marketing – campaign messages, briefings, and visibility of success stories and benefits.
    - Guidelines – clear procedures and guidance for sharing and booking spaces.
- Implementation Strategy:
    - Provide clear, regular communications and updates.
    - Promote the co-benefits of space efficiency (comfort, collaboration, energy and carbon savings, decluttering – connection to 5S methodology).
    - Tie messaging to specific changes or phases of the estates strategy, building moves or refurbishments.
    - Develop resources such as FAQs, etiquette guidance, and a feedback loop system through surveys, user stories, and energy use dashboards, for shared spaces.

  EAST Framework:
    - Easy: centralised space booking platform; pre-move toolkits for staff.
    - Attractive: visuals of energy, carbon, and cost savings; highlight co-benefits (energy and carbon savings, improved facilities, community, comfort, collaboration).
    - Social: share cluster success stories; recognition for early adopters; peer testimonies.
    - Timely: connected to estates strategy phases; launched before moves/refurbs; cascade messaging during pre-move briefings/team meetings
- Delivery:
    - Target Audience: staff and students impacted by the estates strategy, building moves, or refurbishments
    - Leads: Estates Management (priorities, space planning, guidance); Sustainability Team (campaign messaging, impact reporting, guidance); HR (wellbeing framing, support materials); Marketing & Comms (design and promotion); Operations Teams (peer influence, gather feedback)
    - Modes: Digital (emails, intranet and webpage announcement/banners, guidance and resources, newsletters, short videos, signage and messaging); In-person/hybrid (staff briefings/team meetings, space planning drop-ins)

Digital Reward Scheme (optional, to explore if feasible) – A gamified, mobile-first app that motivates staff and students to take low-carbon actions by making sustainable behaviours easy, social, and rewarding, with real incentives and real-world impact.

Cost estimate (app developed in-house by EECS students/faculty, with all required software already available): **Total = £8000 - £13000**, (Rewards Budget @ £8000 - £11000) + (Recognition/Compensation for creators @ £0 - £2000).

- COM-B Targets:
    - Motivation (Automatic & Reflective) – build automatic motivation (gamification, rewards) and reflective motivation (through visible progress and environmental values) to make low-carbon choices more appealing and habitual.
    - Opportunity (Social & Physical) – help build new social norms and make it easy to see what actions are possible and valued in a low-carbon environment.
- Intervention Types:

    - Incentivisation – provide rewards for implementing low-carbon change
    - Enablement – remove barriers by prompting and supporting actions
    - Persuasion – encourage action through feedback, goals, and reminders
- Policy Categories:
    - Communication/Marketing – mixed methods of digital communication channels; in-person/hybrid/online events
    - Service Provision – the app itself acts as a behavioural change service and support system
- Implementation Strategy:
    - A mobile-first app with Queen Mary branding and single sign-in that encourages and rewards individuals for taking actions to reduce their carbon footprint.
    - Specified set of actions that earn points, covering a range of topic areas to make taking action more widely accessible. Examples of actions include:
        - Turning off lights/equipment
        - Conducting basic energy/waste audits
        - Using more active forms of travel – walking, cycling or public transport
        - Choosing plant-based food/drink options
        - Attending relevant sustainability events/workshops
        - Completing relevant training or volunteer work
    - Verification methods for points will depend on the action, with the potential for some to be automated.
    - Points can be redeemed for Queen Mary vouchers or discounts.

  EAST Framework:
    - Easy: quick action logging; auto-filled forms; templates and reminders
    - Attractive: visually engaging through animations and progress tracking; surprise rewards and bonuses
    - Social: leaderboards; share features
    - Timely: notifications/reminders aligned with holidays/closures, promote app during other interventions and events
- Delivery:
    - Target Audience: staff and students
    - Leads: Sustainability Team (coordination, content development, inductions); EECS/IT Services (technical build, support); Marketing & Comms (promotion and design); Energy Champions (peer engagement).
    - Modes: Digital (mobile app, screen messaging, QR codes to download, emails, newsletters, website and intranet banners/announcements)

Year 3: Embedding & Institutionalisation

Seasonal Energy Campaigns and the Energy Champions programme will continue from Year 1 and 2, with Seasonal Energy Campaigns remaining digital-only/paperless.

University-wide Blackout* - This is further expansion of Blackout Building Events in Year 1 and Blackout Building Weekends in Year 2. Again, most of the information remains the same, except for the implementation strategy and resultant cost estimates - these changes are outlined below.

Cost estimate: **Total = £6000 - £8000**, (Recognition/Incentives, including food and refreshments).

- Implementation Strategy:
    - Expand scope to include all major non-residential buildings across all campuses, with the aim to deliver 1 major university-wide event in the year.
    - Focus on demonstrating large scale action and impact and assess long-term viability of the intervention.

- Building on from planning actions and timetabling considerations in Year 2, this event will be integrated into the academic calendar, with institution-wide briefings via Senior Leadership or Heads of Depts.
- The introduction of a Real-time Feedback System in Year 3, will allow for real-time energy monitoring to be displayed live.
- The need for increased resource and recognition in Year 2 continues into Year 3. The scale of this event also provides the opportunity for increased recognition for the university with the event being highlighted in external media channels.

Embedding Accountability - Making energy-saving a part of everyone's job by building clear, visible responsibilities into roles, workflows, and leadership culture. Accountability measures are to be considered and incorporated into engagement interventions throughout the three years. This intervention highlights a more targeted push to formally embed accountability into institutional and procedural structures.

- COM-B Targets:
  - Opportunity (Social & Organisational) – social and procedural structures and cues (e.g. job specs, workflows, induction) help enable consistent action and follow-through
  - Motivation (Reflective & Automatic) – enable reflective motivation through formal role ownership and automatic motivation through habit formation over time.
- Intervention Types:
  - Environmental Restructuring – embed behaviours into organisational systems and structures.
  - Education & Enablement – provide training and guidance for what is expected in roles; establishing norms and structural support for change.
  - Persuasion – frame accountability as a core value aligned with institutional sustainability goals.
- Policy Categories:
  - Guidelines – job description and other templates; onboarding materials; clear, structured role expectations for managers; included in handbooks.
  - Regulation – internal policy embedding energy and carbon requirements/responsibilities across all roles, with more specified requirements for certain roles (sustainability team, lab management, ops managers, security, line management)
  - Service Provision – providing support materials, training, and checklists to enable compliance.
- Implementation Strategy:
  - Integrate explicit energy and carbon responsibilities into job descriptions, induction processes, and performance reviews.
  - Leadership modelling - encourage and enable leadership/management to lead by example, and to include energy and carbon actions in updates or meetings.
  - Develop guidance for line managers and departments on energy and carbon accountability.
  - Pilot with selected departments before full rollout.

  EAST Framework:
  - Easy: onboarding templates provided; guidance and checklists for HR and management.
  - Attractive: emphasise the social component, shared responsibility ('we are all in this together')
  - Social: share success stories – public recognition of shared responsibility in action
  - Timely: onboarding process; performance reviews/appraisals; annual refresh for key individuals
- Delivery:
  - Target Audience: New and existing staff
  - Leads: HR (content development, onboarding, inductions); Sustainability Team (guidance, content development, overall coordination); Management (local implementation and integration, model behaviour); Senior Leadership (model behaviour, champion accountability and buy-in)

- Modes: Digital (templates, guidance, inductions, onboarding materials, emails, newsletters, intranet and webpage banners/announcements/links); In-person/hybrid/online (inductions, team meetings, town halls, manager briefings, appraisals)

Realtime Feedback System – Integrating energy use data into simplified and engaging energy dashboards that give staff and students real-time visibility of their energy use, making energy-saving behaviours easy, timely, and rewarding.

- COM-B Targets:
  - Motivation (Automatic & Reflective) – real-time feedback helps people see the impact of their actions, increasing reflective and automatic motivation.
  - Capability (Psychological) – demonstrate how reductions can be achieved and normalise behaviours.
- Intervention Types:
  - Incentivisation – motivate reductions through social comparisons and recognition.
  - Persuasion – engaging visuals and comparisons encourage energy-conscious decisions.
  - Enablement/Education – reduce barriers and provide real-time data to help take more immediate/timely action.
- Policy Categories:
  - Communication/Marketing – promote awareness of the system and its benefits
  - Service Provision - the feedback system is a new service in and of itself, that enables energy-saving behaviours by providing real-time, relevant information
- Implementation Strategy:
  - Pilot with select buildings, implement feedback and learnings before expanding university-wide.
  - Quarterly emails sent to Faculty Ops Managers, Building Managers, and other relevant individuals, with a summary of energy usage, progress highlights, and targeted actions.
  - Employees have access to simplified, engaging dashboards with the ability to manipulate a basic/finite set of data to check or compare results.
  - Introduce email ‘nudges’ when performance spikes (e.g. if usage jumps unexpectedly).
  - Recognition and celebration of reductions.

  EAST Framework:
  - Easy: simple, visual dashboards; step-by-step dashboard and data guidance; email summaries; QR codes on comms materials
  - Attractive: progress towards targets displayed widely; colours, icons/emojis, and animations used to make dashboards engaging
  - Social: recognition and celebration of reductions (broadly and locally)
  - Timely: real-time data allows for real-time action; alerts before peak energy periods; display real-time impact immediately following seasonal campaigns or blackout events.
- Delivery:
  - Target: All building users (staff and students)
  - Leads: Sustainability Team (dashboard and data management, guidance, impact analysis, comms coordination); Marketing & Comms (promotion and recognition); IT Services (support)
  - Modes: Digital (Power BI dashboards, screen messaging, guidance, QR codes, MS Teams, emails, newsletters, intranet banners/announcements)

*The continuation and expansion of Blackout interventions will depend on the volunteer interest and impact of prior events.

**The key focus areas of the Estates Strategy are included below, along with how engagement and behaviour change interventions can be aligned to support these priorities:

1. **Addressing backlog maintenance and building condition issues** - Use interventions (such as user feedback and department energy roadshows) to help inform, justify and prioritise upgrades.
2. **Increasing space efficiency through mothballing, dept clustering, etc**. - Combine behaviour change with infrastructure change, using change management and social norms strategies to provide structure and support, reduce resistance, and increase successful adoption and experience.

Summary Intervention Timeline and Costs

Summary Timeline

The timeline below shows the proposed interventions across three years and is aligned with a standard calendar year (January to December). A few notes to support interpretation of the timeline:

- A gradient fill is used for most interventions to reflect an initial pilot or soft-launch phase, or a period of reduced capacity, with the expectation that these activities will expand, evolve, or become more embedded over time.
- The Seasonal Energy Campaign is divided into two subcategories:
    - Ongoing: Light touch, ‘evergreen’ messaging promoted throughout the year as space in the central comms calendar allows. The colour used matches that of Seasonal Nudges but is partially transparent to reflect the light-touch approach.
    - Seasonal Nudges: Increased, targeted, and time-sensitive communications aligned with seasonal shifts/clock changes, and shutdown/holiday periods — suggested delivery in March, June, October, and December.
- The blocks for each Blackout intervention — Blackout Buildings, Blackout Weekends, and the University-wide Blackout — indicate one-month windows in February, June, and October, as applicable.
    - The February window aligns with QM’s Climate Action Week.
    - The October window leverages the typically higher engagement seen at the start of the academic year and aligns with the Seasonal Nudge in the Energy Campaign.
- Interventions such as Energy Campaigns, Energy Champions, Digital Reward Scheme, and the Real-Time Feedback System are designed to be sustained beyond the initial three-year period, depending on their continued value toward achieving energy and carbon reduction goals.

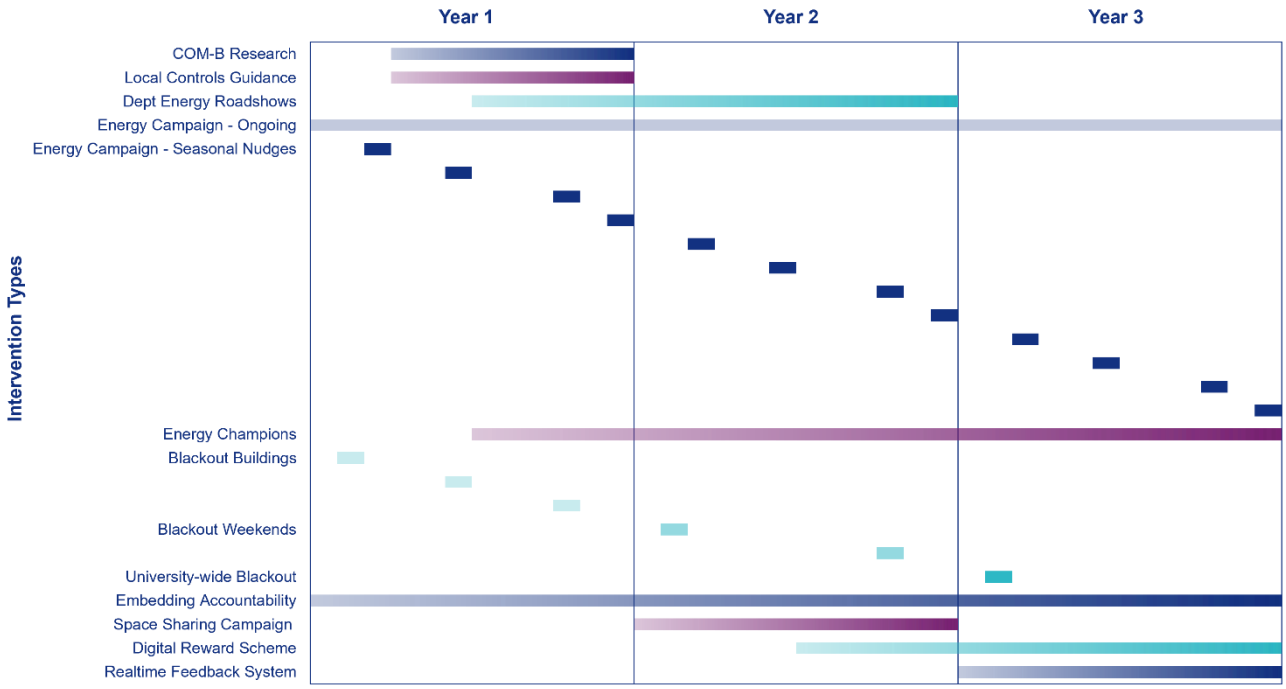


Figure 4: Engagement Intervention Summary Timeline

Summary of Cost Estimates

The below table provides a rough estimate of the total cost estimates across the 3-year plan for all applicable interventions. In general, costs come from two categories - Printing/Materials and Recognition/Incentives. Rough estimates have been made given the information and knowledge at hand, as well as accounting for inflation as years progress. It is difficult to provide a more accurate estimate without confirming details, such as capacity and approved suppliers, this is especially true for the Digital Reward. Rewards and recognition costs also depend largely on the level of interest and involvement in the intervention, which won't be known until they are in place.

The inclusion of a Digital Rewards Scheme is based on two assumptions – a) IT Services and/or the School of Electronic Engineering and Computer Science (EECS) have the capacity to create the app, and b) all the required software is already on hand.

Table 6. Summary of Cost Estimate Totals (engagement and behaviour change initiatives).

Intervention	Cost Estimate (Totals)
Seasonal Energy Campaigns	£3,500 - £6,000
Energy Champions	£3,500 - £6,000
Blackout Building Events	£500 - £800
Blackout Building Weekends	£4,000 - £6,000
University-wide Blackout (optional and dependent on success)	£6,000 - £8,000
Digital Reward Scheme (optional)	£8,000 - £13,000
GRAND TOTALS	**£25,500 – 39,800 (Digital Reward)** **£17,500 – 26,800 (no Digital Reward)**

Engagement & Communication Methods

As mentioned previously, multiple methods of engagement are required given the diverse range of stakeholders affected by this plan. Queen Mary has access to several methods, which is important given the variety of interested parties (or stakeholders) relevant to this plan, the importance of behaviour change in achieving our goals, and the role of repetition in reinforcing messages - research suggests people need to encounter information 5–7 times for it to move from short to long-term memory. It is therefore important to use all available methods and resources to reach the broadest possible audience.

The table below provides an overview of stakeholder groups, along with the engagement and communication methods that are or could be most relevant to them.

Table 7. Engagement and communication methods per stakeholder group.

Interested Party	Engagement & Communication Channels
Students	
Current	~ Physical comms assets - posters, signs, sticker prompts, handouts ~ Digital comms assets - screen messaging, digital signage, social media posts, website & intranet banners/announcements/articles ~ Events (in-person & online) ~ Word of mouth (Course Reps, RAs, Clubs & Societies, Student Council) ~ Email ~ Newsletters (ResiLife, QMSU, Queen Mary Student, Faculty) ~ Handbooks ~ Meetings (Clubs & Societies, Student Council, ResiLife, QMSU) ~ Inductions & Training (RA Sustainability Induction, Energy Champions, Lunch & Learns) ~ MS Teams announcements ~ Press stories
Prospective	~ Physical comms assets - posters, signs, sticker prompts, leaflets/fliers, handouts ~ Digital comms assets - screen messaging, digital signage, social media posts, website banners/announcements/articles ~ Events (in-person & online) ~ Press stories
Staff	
All (academic, research, professional services)	~ Physical comms assets - posters, signs, sticker prompts, handouts ~ Digital comms assets - screen messaging, digital signage, website & intranet banners/announcements/articles ~ Events (in-person & online) ~ Onboarding/Inductions ~ JDs & employment contracts ~ Training/CPD (ISEP courses, Lunch & Learns, TBTs, Energy Champions) ~ Word of mouth (Internal Comms Network/Meetings/Energy Champions) ~ Newsletters (e-Bulletin/Faculty/Institute/School/Dept) ~ Email ~ Meetings (Town Halls/IC Network/BUG/Faculty/Institute/School/Dept/Team) ~ MS Teams announcements ~ LEAF (Research) ~ Press stories
Contractors	
Carbon Numbers	

Electrical/Generators (Dennis Johns, G&D Higgins)	~ Email & phone ~ Meetings (in-person & online) ~ Tendering requirements, contractual agreements ~ Site inductions ~ Documentation - policies, action plans, procedures, commitments ~ Comms assets on site - posters, signs, sticker prompts, screen messaging, digital signage ~ Press stories
Other external contractors + sub-contractors	
Others	
Regulators/Authorities (OfS, Local Councils, GLA)	~ Documentation - policies, action plans, procedures, commitments ~ Meetings (in-person & online) - TH Climate Partnership & Alliance, GLA working groups ~ Events (in-person & online) ~ Digital comms assets - social media posts, website banners/announcements/articles ~ Email ~ Press stories
Funding Bodies (UKRI, NIHR, CRUK, Wellcome Trust, etc)	~ Documentation - policies, action plans, procedures, commitments ~ Events (online & in-person) ~ Meetings (in-person & online) ~ Digital comms assets - social media posts, website banners/announcements/articles ~ Email ~ Press stories
Ranking Bodies (People & Planet, QS, THE)	~ Documentation - policies, action plans, procedures, commitments ~ Digital comms assets - social media posts, website banners/announcements/articles ~ Email ~ Meetings (in-person & online) ~ Press stories
Suppliers	~ Email & phone ~ Meetings (in-person & online) ~ Contractual agreements/requirements ~ Online documentation - policies, action plans, procedures, commitments ~ Digital comms assets - social media posts, website banners/announcements/articles ~ Press stories
HE Networks (EAUC, London Higher)	~ Online documentation - policies, action plans, procedures, commitments ~ Events (online & in-person) ~ Meetings (in-person & online) ~ Digital comms assets - social media posts, website banners/announcements/articles ~ Email ~ Press stories ~ Award programmes e.g. Green Gown Awards
Interface	~ Annual External ISO 14001 Audit ~ Documentation - policies, action plans, procedures, commitments ~ Comms assets - posters, signs, sticker prompts, screen messaging, digital signage, social media posts, website banners/announcements /articles ~ Email ~ Press stories

Visitors	~ Comms assets - posters, signs, sticker prompts, screen messaging, digital signage, social media posts, website banners/announcements/articles ~ Documentation - policies, action plans, procedures, commitments ~ Press stories

Energy efficiency in research

Research activities can use a considerable amount of energy with laboratories being one of the largest energy-hungry sectors due to its use of energy intensive specialised equipment that frequently cannot be switched off, temperature and ventilation requirements and intensity of operations, typically consuming 3 to 10 times more energy per square meter than an academic or office building. Data storage and computing activity from dry labs also consumes high amounts of energy, although some of these are outsourced to cloud computing services.

The main hight energy consumption equipment that we are looking to focus on are ultra-low temperature freezers (ULTF) and fume hoods, with other equipment being tackled through the implementation of LEAF requirements. The Blizard Institute has already increased the temperature of most of their ULTF from -80°C to -70°C, which has resulted in a reduction in electricity use.

Responsibilities and reporting

Responsibility for the delivery of this plan is shared between the Sustainability and Engineering Teams, with Procurement supporting the management and delivery of tender processes. Campus Maintenance Managers participate and support low-cost initiatives, with our BMS contractor also supporting the energy management and identification of improvement projects.

The business plans for each set of projects are discussed and approved by the Energy and Carbon Reduction Operations Group/Board, which meets every 6 weeks and operates under the governance of Infrastructure Strategy Group (ISG). The Board and is Chaired by the Associate Director of Engineering and Estates Management, and formed by the Lead Engineer, Head of Environmental Sustainability, Director of Procurement, Procurement Category manager for EAF and Senior Finance Manager.

Progress on the delivery of the plan is reported to the Energy and Carbon Reduction Operations Group/Board and the Sustainability Committee. The Energy and Carbon Reduction Operations Group/Board also reviews savings achieved by the projects already implemented and assesses if these are in line with forecasts.

Potential collaborations

Sector collaborations

Welsh Aude group out of hours pilot

After a fruitful visit to Cardiff Metropolitan University this summer to meet with their Chief Officer University Environments and Property, we have expressed interest in participating in a forthcoming building-level benchmarking project. This will be in collaboration between AUDE, the Welsh Government Energy Service, The Energy Consortium (TEC), the Chartered Institute of Building and Energy Sparks.

We are lucky to have now been invited to integrate the first pilot project alongside the Welsh group and Oxford Brookes University.

The project intends to build on the Cardiff Met “Halve the Half” initiative that aims to reduce the out-of-hours energy consumption.

TEC have already run an out of hours energy analysis for the data they hold (70% of UK universities), finding that over 55% of energy is used outside of 7am-7pm Monday-Friday. This out of hours consumption may

indicate wastage, especially if associated with buildings where activities happen during typical working hours. Research intensive buildings, however, may still require significant energy usage outside of working hours. Further meter by meter analysis by TEC will determine where consumption is legitimate and identify areas of wastage.

Next Steps

Queen Mary has already confirmed that we would like to take part in the pilot and have therefore granted permission for sharing of our energy data and any analysis or reports produced by TEC.

The next step will be to provide additional information on what is supplied by each meter and offer additional submeter analysis if needed. The project is intended to show the high-level opportunities and benchmarks so that more detailed analytics and energy audits can be prioritised.

Appendix: Engagement for behaviour change

Table 1: Behaviour Change Intervention Types [3]

Intervention Type	Description
Education	Increasing knowledge and understanding by informing, explaining, showing and providing feedback
Persuasion	Using words and images to change the way people feel about a behaviour to make it more or less attractive
Incentivisation	Changing the attractiveness of a behaviour by creating the expectation of a desired outcome or avoidance of an undesired one
Coercion	Changing the attractiveness of a behaviour by creating the expectation of an undesired outcome or denial of a desired one
Training	Increasing the skills needed for a behaviour by repeated practice and feedback
Restriction	Constraining performance of a behaviour by setting rules
Environmental Restructuring	Constraining or promoting behaviour by shaping the physical or social environment
Modelling	Showing examples of the behaviour for people to imitate
Enablement	Providing support to improve ability to change in a variety of ways not covered by other intervention types

Table 2: Mapping of Policy Options to Intervention Types [3]

	Guidelines	Environmental & Social Planning	Comms & Marketing	Legislation	Service Provision	Regulation	Fiscal Measures
Education	x		x	x	x	x	
Persuasion	x		x	x	x	x	
Incentivisation	x		x	x	x	x	x
Coercion	x		x	x	x	x	x
Training	x			x	x	x	x
Restriction	x			x		x	
Environmental Restructuring	x	x		x		x	x
Modelling			x		x		
Enablement	x	x		x	x	x	x

Table 3: APEASE Criteria for Assessing Interventions [3]

APEASE Criteria	Description
Acceptability	How far is it acceptable to key stakeholders? This includes the target group, potential funders, practitioners delivering the interventions and relevant community and commercial groups.
Practicability	Can it be implemented at scale in the intended context, with available material and human resources? What would need to be done to ensure that the resources and personnel were in place, and is the intervention sustainable?
Effectiveness	How effective is it (likely to be) in achieving the policy objective(s)? How far will it reach the intended target group and how large an effect will it have on those who are reached?
Affordability	How far can it be afforded when delivered at the scale intended? Can the necessary budget be found for it? Will it provide a good return on investment?
Side effects	What extraneous adverse (or beneficial) outcomes might it lead to? How important are they and what is the likelihood that they will occur?
Equity	How far will it, or is it likely to, increase or decrease differences between advantaged and disadvantaged sectors of society?

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Figures

- Figure 1: [1] slide 13, Source: CCC Analysis.
- Figure 2: [3] page 9.
- Figure 3: [4] page 14.

Tables

- Table 2: [3] page 36.
- Table 3: [3] page 48.
- Table 4: [3] page 18.

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