

Sustainability Committee Meeting

Date: 13 May 2022

Time: 10:00 Hours to 12:00 Hours

AGENDA

SN	Items	Paper	Lead	Overview
1.	Apologies	NA	P. Lloyd	<ul style="list-style-type: none"> Information
2.	Draft Minutes 24 January 2022	NA	P. Lloyd	<ul style="list-style-type: none"> Approval
3.	Action Log and Matters Arising	NA	P. Lloyd	<ul style="list-style-type: none"> Discussion Escalation Assurance
4.	Draft Minutes EMS Annual Review 1 April 2022	NA	P. Lloyd	<ul style="list-style-type: none"> Discussion Escalation Assurance
5.	Action Log and Compliance Tracker	NA	P. Lloyd	<ul style="list-style-type: none"> Discussion Escalation Assurance
6. Education for Sustainable Development: Teaching and Research				
6a.	Ferroelectric Nanocomposites for Enhanced Solar Energy Efficiency Update May 2022	Presentation	J. Briscoe	<ul style="list-style-type: none"> Information Discussion
6b.	Research, Education and Green Campus	Presentation	H. Wang	<ul style="list-style-type: none"> Information Discussion
6c.		Presentation	H. Brogger	<ul style="list-style-type: none"> Information Discussion
7. Environmental Sustainability Action Plan (ESAP)				
7a.	Environmental Sustainability Action Plan Update	SC.22/09	P. Tamuno	<ul style="list-style-type: none"> Discussion Escalation Assurance
7b.	Environmental Sustainability Performance Update: Students' Union	SC.22/10	T. Stockton	<ul style="list-style-type: none"> Information Discussion Assurance
8. Energy Monitoring and Management Update				
8a.	Energy Performance and Management Report	SC.22/11	P. Tamuno	<ul style="list-style-type: none"> Discussion Escalation

SN	Items	Paper	Lead	Overview
				<ul style="list-style-type: none"> • Assurance
9. Other Business				
9a.	Any Other Business	NA	P. Lloyd	<ul style="list-style-type: none"> • Information • Discussion • Escalation • Actions
Date of Next Meeting: Friday 13 July 2022 (14:00 Hours to 16:00 Hours)				



Environmental Sustainability Action Plan: Update

Outcome requested:	<p>That the Sustainability Committee should:</p> <ul style="list-style-type: none"> • Consider this report • Consider issues that should be escalated • Take assurance of this report
Executive Summary:	<p>This report fundamentally gives insight into our current environmental sustainability frameworks, the outcome of our inaugural GreenMary Sustainability Fund and information about our scheduled 2022 Sustainability Week.</p>
Alignment with: <ul style="list-style-type: none"> • QMUL Strategy • Internal Policies/Regulations • External Statutory Requirements 	<ul style="list-style-type: none"> • Queen Mary's Environmental Policy 2021 • Queen Mary's Environmental Sustainability Action Plan (2020-23) • The Environmental Protection Act 1990 • The Environment Act 1995 • The Clean Air Act 1993 • The Climate Change Act 2008 • Environmental Permitting Regulation (England and Wales) 2016
Consideration of Strategic Risks:	<ul style="list-style-type: none"> • Regulatory compliance • Reputation
Subject to Prior and Onward Approval by:	<ul style="list-style-type: none"> • Estate Strategy Board
Confidentiality and Distribution:	Not Restricted
Equality Impact Assessment:	Not Applicable
Author(s) :	Philip Tamuno, Head of Sustainability
Date:	13 May 2022

Environmental Sustainability Action Plan: Update

Overview

This report fundamentally gives insight into our current environmental sustainability frameworks, the outcome of our inaugural GreenMary Sustainability Fund and information about our scheduled 2022 Sustainability Week.

Environmental Sustainability Frameworks

Our current environmental sustainability frameworks are made up of:

- Environmental Sustainability Action Plan (ESAP) 2020-23
- Environmental Policy 2021
- Heat Decarbonisation Plan 2022
- Environmental Management System 2022

Environmental Sustainability Action Plan (ESAP) 2020-23

Our ESAP 2020-23 was developed as the main framework on which we are currently responding to current environmental risks, environmental crisis and optimise current and emerging environmental opportunities. This plan also contain our declaration to support the delivery of the United Nations Sustainable Development Goals (UN SDGs) as well as monitor and report our performances towards these international goals.

Our ESAP 2020-23 contain our short-term targets and long-term aspirations including corresponding resources required to deliver these targets and aspirations. The key performance indicators within this plan are currently used to monitor and report our environmental sustainability performances.

One of the main commitments within this plan is our six-year 30% carbon reduction target against our 2018/19 baseline. The indicative cost to deliver the building energy use aspect of this target was approximately £8 million and we are pleased to report that we have over the last two years invested approximately £3 million on energy efficiency projects to support the delivery of this target. We have continued to monitor the performances of the completed and commissioned projects against projected energy reduction. We are aware that the closure and

restricted operations associated with the COVID-19 pandemic have positively skewed the energy used across our campuses compared to our baseline.

We are also pleased to report that we have delivered the resources commitment within our ESAP 2020-23 by recruiting two additional staff (Sustainability and Energy and Sustainability and Environment Managers) to support the delivery of this plan. Furthermore, over the last two years, we have delivered the Foundation Certificate in Environmental Management course to 24 staff members (including four members of the Sustainability Team) and 22 of these staff members successfully completed this course and were admitted as Associate Members of the Institute of Environmental Management and Assessment (IEMA). These staff have taken on varied responsibilities in support of delivery our environmental sustainability commitments.

We are currently working towards developing our long-term environmental sustainability strategy by December 2023.

Environmental Policy 2021

Our 2021 environmental policy summarises our current commitments to continue to comply with all relevant environmental regulations and standards, continue to improve our environmental performances, deliver our short-term six-year 30% carbon reduction against our 2018/19 baseline, attain ISO 14001:2015 environmental management system (EMS) certification and integrate good environmental practices into all areas of our operations.

Our environmental policy was approved by our Senior Executive Team (SET) and it is due for review by 15 November 2022. This policy will be reviewed based on our strategic priorities as well as the significant areas in which we interact and impact on the environment.

Heat Decarbonisation Plan (HDP) 2022

One of the commitments within our environmental policy is that we intend to attain net zero by 2050. In line with this aspiration, we applied and successfully attracted £124,399.20 from the Low Carbon Skills Fund Phase 2 (LCSF2). This grant has been used to access the required technical expertise to develop our current heat decarbonisation plan. Thirty-one low carbon, heat decarbonisation and associated projects have been prioritised and quantified. The total capital cost of implementing these initiatives is approximately £9.3 million with associated annual savings of £199,400 per annum (from 2,247,099 kWh natural gas, 355,060 kWh electricity and 82,549 kWh of heating oil).

In addition to these prioritised and quantified initiatives, a hydraulic digital twin has been generated for all 56 buildings that were surveyed in the course of developing our HDP 2022. This tool is available to be used to support the delivery of our long-term net zero aspiration. The implementation of the initiatives within our HDP will be prioritised based on building carbon intensity, technical feasibility, ease of implementation, current and future building use and return on investment (ROI).

Environmental Management System 2022

Our Environmental Management System (EMS) was developed based on the EcoCampus phased approach to implementing ISO 14001:2015 EMS. Attaining ISO 14001:2015 certification is one of our priorities to embed good environmental practices across all areas of our operations as well as provide assurance that we continue to comply with all relevant regulations and standards.

Specifically, our EMS is being used as a flexible and adaptive framework to support the delivery of our objective to:

- Comply with all relevant regulations
- Fulfil our compliance obligations
- Continue to improve our environmental performance
- Environmental protection, including pollution prevention
- Continually improve our EMS for the purpose of enhancing our environmental performance

We are pleased to report that we were successful at the Stage 1 of our ISO 14001:2015 EMS certification audit that was conducted on 3 May 2022. Stage 2 of this audit has been scheduled to be conducted between 25 and 27 May 2022.

GreenMary Sustainability Fund: Staff and Student-led Initiatives

One of the actions from our 2021 Sustainability Week was that we launched our GreenMary sustainability fund. This scheme aligns with our commitment to support staff and student-led environmental sustainability initiatives.

Out of the 11 expression of interests that we received in response to our inaugural GreenMary Sustainability Fund; 7 of these were considered for funding, but only five of these 7 successful applicants completed and returned their acceptance forms.

Below are the projects and initiatives that are being funded during the current academic year.

- Recycling of disposal gloves in the Blizzard Institute Laboratories (£389.62): Coordinated by Alicia Ellison (Acting Deputy Laboratory Manager, Blizzard Institute)
- NHS Sustainability Day (£500): Coordinated by Dr Joele Booth (NIHR Academic Clinical Fellow in Dental Public Health, Dental Core Trainee, School of Medicine and Dentistry)
- Forget Fast Fashion (FFF): Tow Swap-not-Shop Events (£500): Coordinated by Roxanne Travers (Undergraduate Student, School of Politics and International Relations)
- Staff Wellbeing Gardening (£292.99): Coordinated by Zita Patai, Lecturer in Psychology
- Sustainable Bicycle Tube Project (£440): Coordinated by Giovanni Santagiuliana (Polymer Research Manager, School of Engineering and Materials Science)

We look forward to receiving and sharing the reports of the outcomes of these schemes.

Sustainability Week 2022

As a follow-up to our successful inaugural sustainability week, we are currently working towards celebrating our 2022 sustainability between 17 and 21 October 2022. We are therefore encouraging all members to participate in our 2nd Sustainability Week.

Conclusion and Recommendations

That the Sustainability Committee:

- Consider this report
- Consider issues that should be escalated
- Take assurance of this report



Environmental Sustainability Performance Update: Students' Union

Outcome requested:	That the Sustainability Committee should: <ul style="list-style-type: none"> • Consider this report • Take assurance of this report
Executive Summary:	An update on sustainability activities undertaken by Queen Mary Students' Union and student groups in 2021-22
Alignment with: <ul style="list-style-type: none"> • QMUL Strategy • Internal Policies/Regulations • External Statutory Requirements 	<ul style="list-style-type: none"> • Queen Mary's Environmental Policy 2021 • Queen Mary's Environmental Sustainability Action Plan (2020-23)
Consideration of Strategic Risks:	<ul style="list-style-type: none"> • Reputation
Subject to Prior and Onward Approval by:	<i>Not Applicable</i>
Confidentiality and Distribution:	<i>Non-restricted</i>
Equality Impact Assessment:	<i>Not Applicable</i>
Author(s) :	Thomas Stockton, Sustainability Coordinator
Date:	13 May 2022

Environmental Sustainability Performance Update: Students' Union

Overview

The Students' Union and student groups have undertaken a range of collaborative sustainability projects during the current 2021/22 academic Year. Please see some highlights below.

Reuse Scheme

The termly Reuse Scheme, collecting donations from departing students of unwanted but usable items continued. At the September Reuse Fair, 866kg of items were saved from wasting avoiding emissions totalling 25kgCO_{2e} & benefitting 590 attendees (91% were very happy or happy with the scheme). After collections in December 2021, the January 2022 Reuse Fair saw 381kg of items saved, 15kgCO_{2e} avoided & 221 attendees. Both periods also saw substantial donations of unopened food to Bow & Bethnal Green Foodbanks. This scheme is made possible by vital contributions from colleagues in Residential Life, Housing Services, Global Opportunities, Estates and the Porters.

The British Heart Foundation (BHF) banks on campus which collect clothes and other items for BHF stores year-round saw over 800 bags of donations April to September 2021, totalling 6.6 tonnes of waste saved and raising an estimated £11,648 for BHF research once resold in shops.

Students' Union Green Week

Green Week is an annual celebration of all things sustainability with a weeklong programme developed by the student-run Sustainability Board within the Students' Union which was revived this year after a several year hiatus.

Held between 14 and 18 February 2022, this year saw a range of events taking place across campus and online including:

- Students across campus made the most of our 20% meat-free Monday discount, before joining us for a Green Social at Ground Café.

- We explored sustainability careers through a Skills Award session and Sustainable Careers Panel in collaboration with the Queen Mary Careers and Enterprise Team with guests including representatives from Greater London Authority, the OECD and sustainability experts.
- As part of LGBT+ History Month, Sustain@BL Society celebrated the intersectionality of environmental issues through a Queer Climate Festival.
- For a special Canal Clean-up, student volunteers put on waders and headed into the partially drained Hertford Union Canal to support the Canal and River Trust's work to keep waterways clear of plastic and other waste.

Student Groups, Representatives and Awards

The Students' Union elects a Sustainability Officer for both Mile End and Whitechapel campuses each year who sit on Student Council and develop year-long activities and action plans.

In recent years, a new body, the Students' Union Sustainability Board has also been established as a sub-group of Student Council. This year, the Board's 5 student representatives met 4 times and worked with other student societies on projects including a food drive for Bow Foodbank, collecting over 400 items, planning Green Week activities, and working with colleagues towards updating the University's Ethical Investment Policy alongside meeting investment managers.

Canal Clean-Ups

Delivered regular canal cleans of the Regent's Canal alongside campus as part of a partnership agreement with the Canal and River Trust. 13 canal clean-up events were held across the year, attended by 120 student volunteers with some sessions led by trained student volunteer leaders.

Biodiversity Volunteering and Gardening Activities

Activities with the Grounds Team developed a programme of Biodiversity volunteering activities for students at the Green Mary Gardens (allotments) on campus. With 6 volunteering sessions welcoming 70 students held between September and November 2021 including planting winter salad veg, a guided foraging walk, making bird boxes and tree care. Activities resumed in April 2022 planting lettuce, tomatoes and onions in collaboration with Jack Johnson, one of the grounds Operatives.

Cycle Pods

Students' Union staff worked with security and capital projects to establish a registration system for the new secure cycle pods added to Mile End campus, accommodating nearly 80 bikes at any one time. Staff and students can now register for access via the sustainability website and receive an access code.

Sustainability in the Curriculum Projects

Students' Union staff supported several sustainability in the curriculum projects this year both as lead and support. These included:

- SBM Sustainability Challenge: Alongside University sustainability staff, creating a campus-based sustainability challenge for a first year SBM Business module led by Georgy Petrov. Students worked in teams to propose solutions to sustainability challenges in QM's waste & recycling as well as food policy using live campus data. This module was delivered to over 400 students and feedback was given in person during their assessed challenge presentations.
- Living Laboratory: supporting Lisa Belyea and Kate Heppell from the School of Geography with a 'Living Laboratory' concept project development. The core idea being to bring sustainability focussed research into the Queen Mary campus itself and local community to allow students and staff collaboration. Activities so far have included a concept development workshop with 30 students & staff as well as an air pollution monitor workshop with a visiting academic.
- A new category in the Education Awards, jointly delivered with the University, recognised Education for Sustainable Development.

Shortlist:

- Dr Stefania Di Ciò (SEMS)
- Dr Ana Jorge Sobrido (SEMS)
- Chris Sutton
- Biology Teaching Technical Team (SBBS)

Winner: Chris Sutton (School of Mathematical Sciences) for his project empowering student interns to explore opportunities to embed sustainability in the Maths curriculum.

Conclusion and Recommendation

That the Sustainability Committee should:

- Consider this report
- Take assurance of this report



Energy Performance and Management Report

Outcome requested:	That the Sustainability Committee should: <ul style="list-style-type: none"> • Consider this report • Consider issues that should be escalated • Take assurance of this report
Executive Summary:	<p>The monitoring of the energy used across our buildings is aligned with our six-year, 30% carbon reduction target as well as for the purpose of identify opportunities to reduce our carbon footprint. Appendices 1 to 6 summarises</p> <ul style="list-style-type: none"> • The electricity and gas used across our UK campuses • Our electricity and gas spend • Our electricity and gas unit rates <p>This report also gives an insight into the current performances of the projects that we funded via our Salix Tranche 3 loan.</p>
Alignment with: <ul style="list-style-type: none"> • QMUL Strategy • Internal Policies/Regulations • External Statutory Requirements 	<ul style="list-style-type: none"> • Queen Mary's Environmental Policy 2021 • Queen Mary's Environmental Sustainability Action Plan (2020-23) • The Climate Change Act 2008
Consideration of Strategic Risks:	<ul style="list-style-type: none"> • Resource Efficiency • Reputation
Subject to Prior and Onward Approval by:	<i>Not Applicable</i>
Confidentiality and Distribution:	<i>Non-restricted</i>
Equality Impact Assessment:	<i>Not Applicable</i>
Author(s) :	Philip Tamuno, Head of Sustainability
Date:	13 May 2022

Energy Performance and Management Report

Overview

The monitoring of the energy used across our buildings is aligned with our six-year, 30% carbon reduction target as well as for the purpose of identify opportunities to reduce our carbon footprint.

Appendices 1 to 6 summarises

- The electricity and gas used across our UK campuses
- Our electricity and gas spend
- Our electricity and gas unit rates

This report also gives an insight into the current performances of the projects that we funded via our Salix Tranche 3 loan.

Trend: Electricity Performance

Figures 1 and 2 show the trend in the electricity we used and spend respectively between the 2018/19 academic and 2021/22 (August 2021 to March 2022).

The current trend is our electricity performances have been compared to our:

- 2018/19 baseline consumption
- 2020/21 spend
- 2021/22 forecast spend and consumption

Consumption:

- We are in line to achieve a 10% reduction in the electricity we use during the current academic year compared to our 2018/19 baseline (33,856 MWh compared to 36,192 MWh)
- Our current year-end electricity consumption is projected to be 8% higher than the electricity we used during the 2020/21 academic year (33,856 MWh compared to 31,324 MWh). This implies that we may be returning to pre COVID-19 pandemic electricity usage levels.
- The electricity we use during the current academic year is projected to be 8% lower than forecast (33,856 MWh compared to 36,828 MWh)

Spend:

- Our current year-end electricity spend is projected to be 5% higher than our 2018/19 baseline (£5.64 million compared to £5.35 million)
- Our current year-end electricity spend is projected to be 31% higher our 2020/21's electricity spend (£5.64 million compared to £4.31 million). This is attributable to the 25% increased unit rates that we currently pay since October 2021 (from 13.86 p/kWh to 17.39 p/kWh)
- Based on current performance, our year-end electricity spend is projected to be 6% lower than forecast (£5.64 million compared to £5.99 million)

Figure 1: Trend in Electricity Used (MWh)

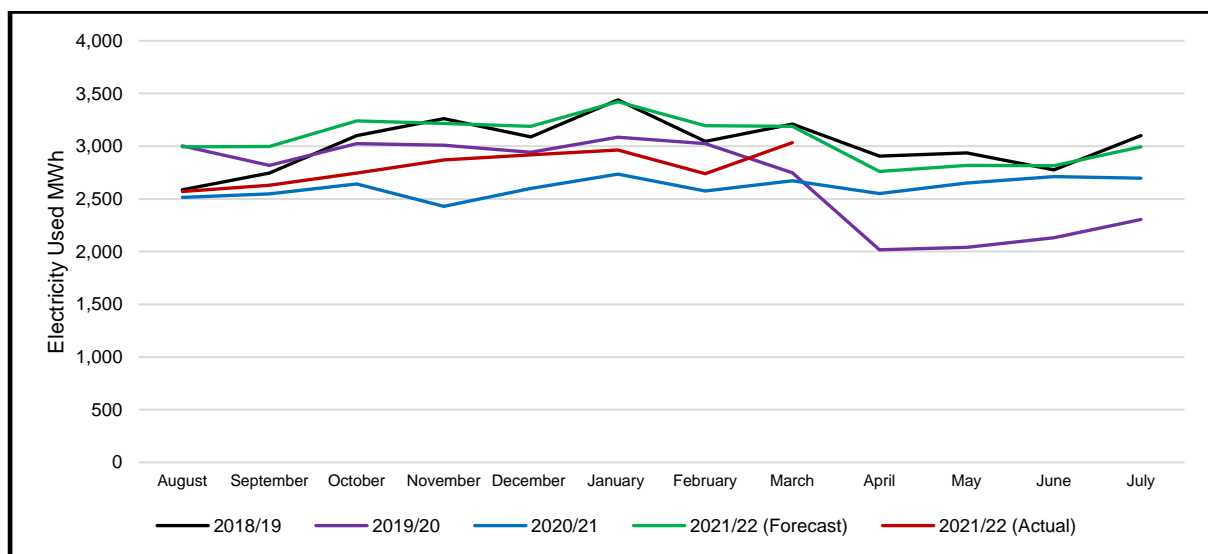
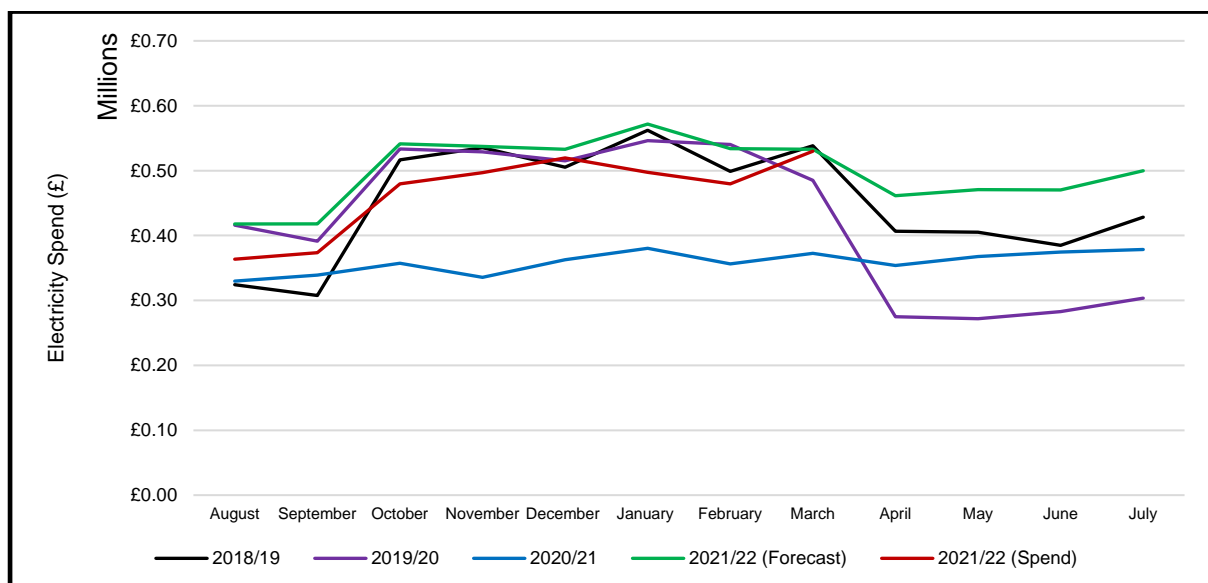


Figure 2: Trend Electricity Spend (£)



Trend: Gas Performance

Figures 3 and 4 show the trend in the gas we used and spend respectively between the 2018/19 academic and 2021/22 (August 2021 to March 2022).

The current trend in our gas performances have been compared to our:

- 2018/19 baseline consumption
- 2020/21 spend
- 2021/22 forecast spend and consumption

Consumption:

- We are in line to achieve a 13% reduction in the gas we use during the current academic year compared to our 2018/19 baseline (29,882 MWh compared to 34,021 MWh)
- Our current year-end gas consumption is projected to be 3% lower than the gas we used during the 2020/21 academic year (29,882 MWh compared to 30,958 MWh). This implies that we will be carrying out further analysis of this performance for the purpose of identifying buildings that have contributed to this performance improvement.
- The gas we use during the current academic year is projected to be 5% lower than forecast (29,882 MWh compared to 31,601 MWh)

Spend:

- Our current year-end gas spend is projected to be 31% higher than our 2018/19 baseline (£1.29 million compared to £0.99 million)
- Our current year-end gas spend is projected to be 104% higher than our 2020/21's gas spend (£1.29 million compared to £0.63 million). This is attributed to the 69% increased unit rates that we currently pay since October 2021 (2.17 p/kWh compared to 3.66 p/kWh).
- Based on current performance, our year-end gas spend is projected to be 12% lower than forecast (£1.29 million compared to £1.46 million)

Figure 3: Trend in Gas Used (MWh)

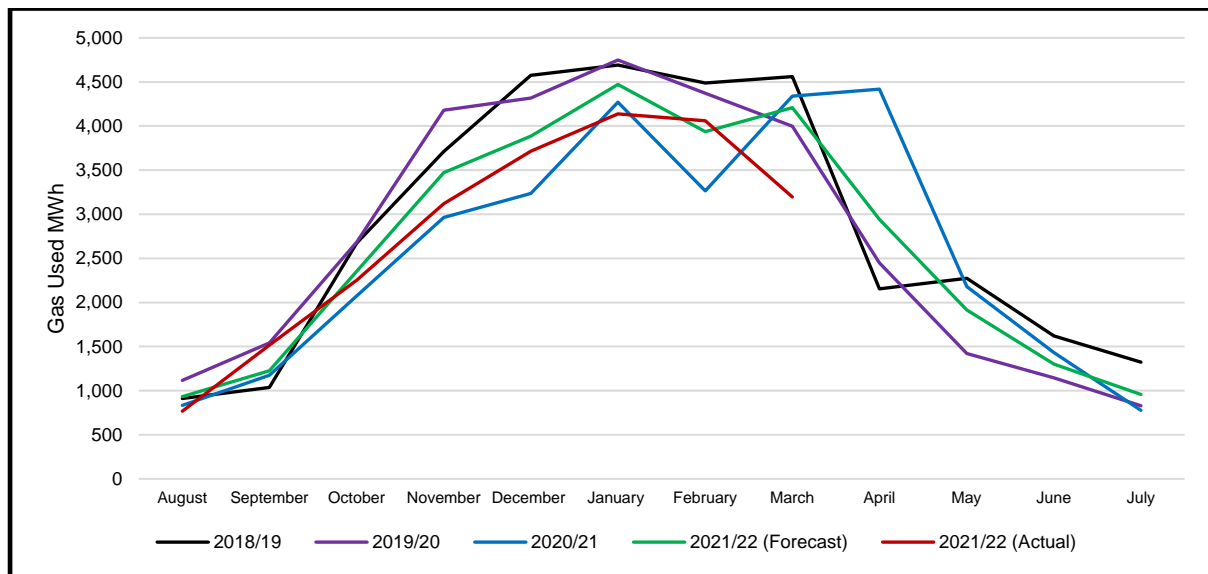
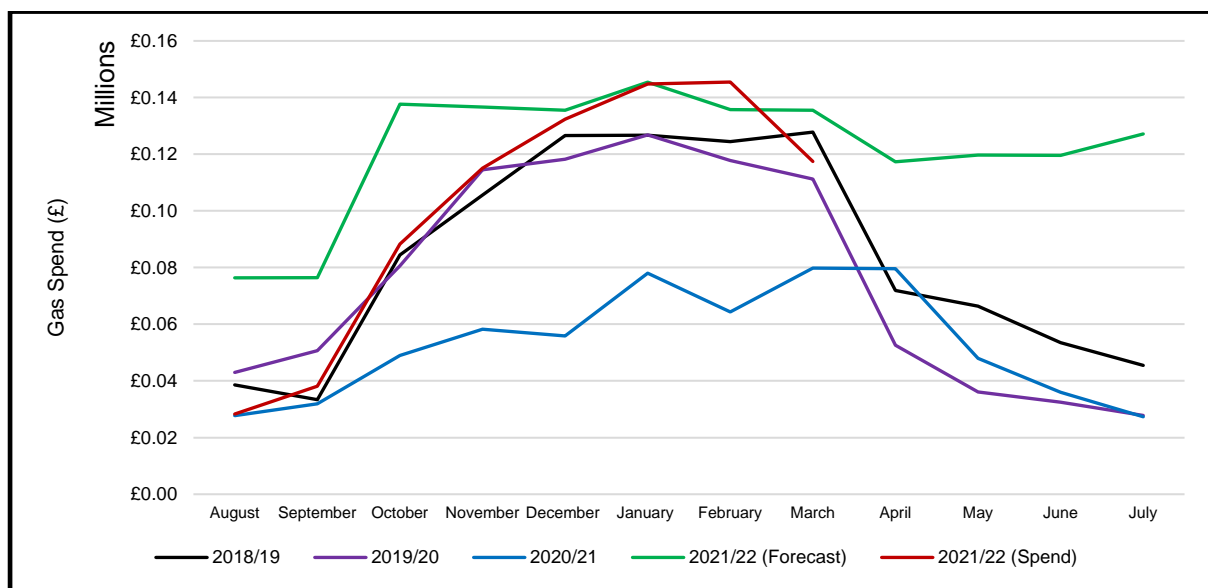


Figure 4: Trend Gas Spend (£)



Salix Tranche 3 Projects: Performance

We secured a £2,465,509 (£2.46 million) an interest free energy efficiency loan from Salix in March 2020. This loan has been used to implement energy reduction projects across 14 of our buildings. Figures 5 and 6 show the aggregated electricity and gas profiles of these sites compared to the baseline.

We have continued to monitor the performances of these projects against projected energy savings. Figures 5 and 6 show the comparison between expected electricity and gas savings from these projects. The performance of these projects may have been positively skewed by the lock-

downs and our partial operations associated with the COVID-19 pandemic. Specifically, the electricity and gas used across our UK campuses had reduced by 10% and 13% respectively. This implies that we would have to continue monitoring the performances of these projects at least 24 months post-completion to gain a better insight into the performances of these projects.

In the interim these projects could be attributed to contribute to 2,352 MWh/year compared to projected 2,045 MWh/year electricity savings (15% higher than projected) and 2,352 MWh/year compared to 4,131 MWh/year gas savings (88% less than projected). Appendices 7 to 9 contain comprehensive electricity and gas data of these 14 buildings.

Figure 5: Salix Tranche 3 Performance: Trend in Electricity Consumption

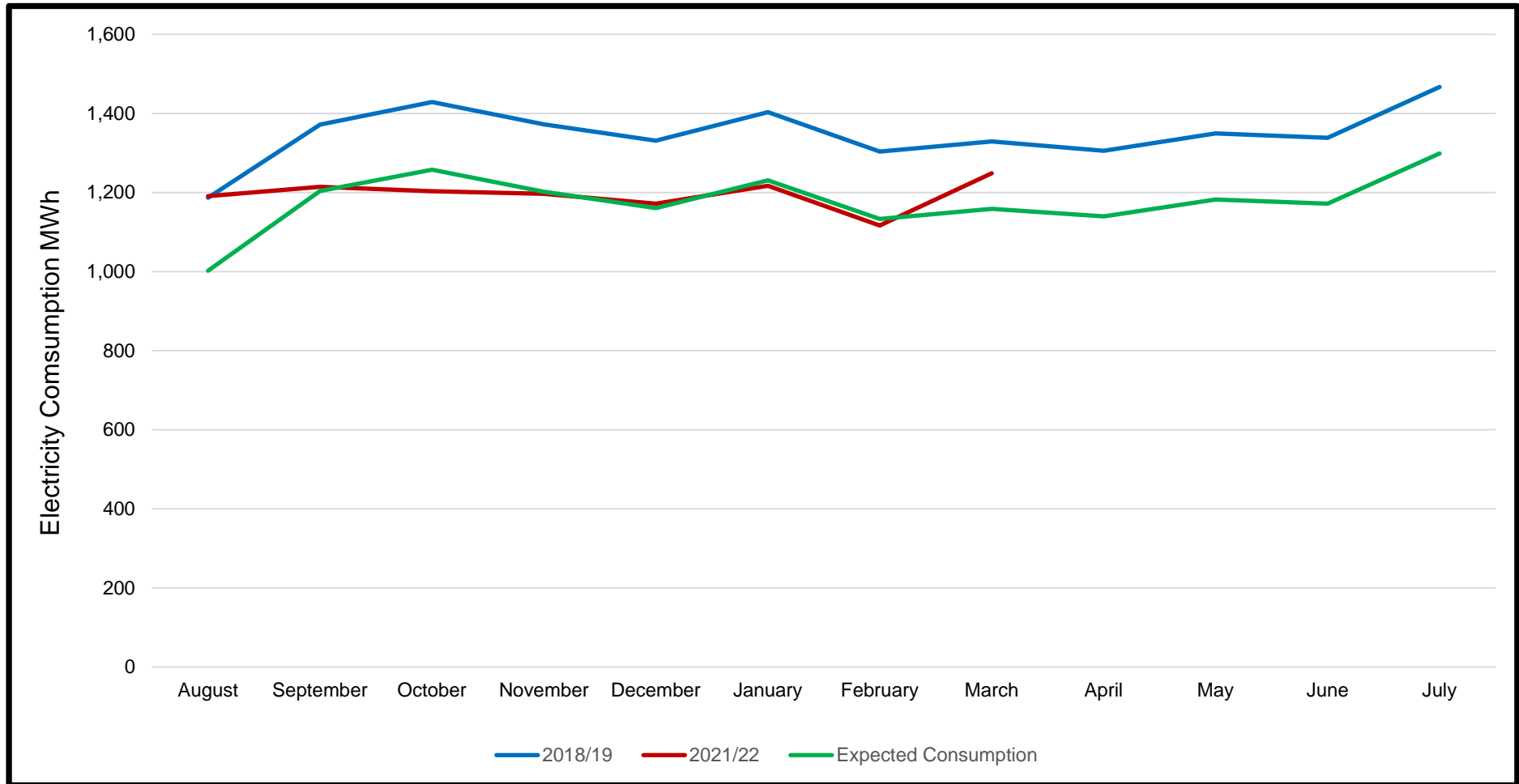
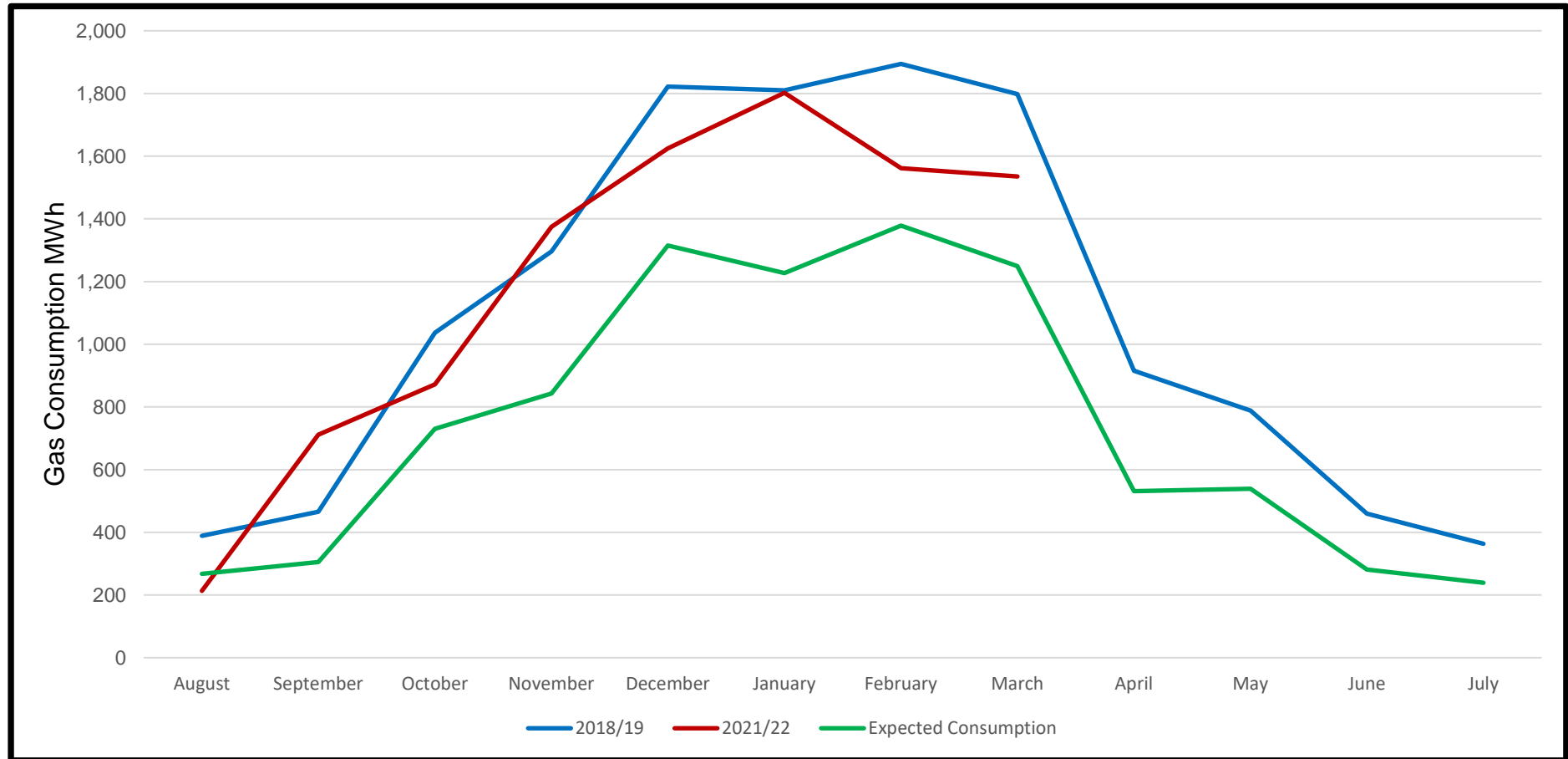


Figure 6: Salix Tranche 3 Performance: Trend in Gas Consumption



Conclusion and Recommendation

That the Sustainability Committee should:

- Consider this report
- Consider issues that should be escalated
- Take assurance of this report

Appendix 1: Electricity Consumption (kWh)

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Actual)
August	2,586,205	3,003,747	2,515,049	2,995,175	2,570,280
September	2,743,950	2,818,411	2,546,550	2,996,620	2,630,227
October	3,100,447	3,024,196	2,642,182	3,239,751	2,745,172
November	3,259,872	3,009,994	2,429,352	3,214,658	2,868,403
December	3,089,727	2,942,910	2,599,154	3,189,741	2,919,220
January	3,439,318	3,085,293	2,735,139	3,421,801	2,963,525
February	3,045,318	3,024,688	2,575,658	3,194,867	2,738,919
March	3,209,389	2,749,177	2,672,275	3,189,281	3,033,911
April	2,904,599	2,017,251	2,550,507	2,760,557	2,760,557 ¹
May	2,936,277	2,041,301	2,649,513	2,817,723	2,817,723 ¹
June	2,775,621	2,132,151	2,712,646	2,815,257	2,815,257 ¹
July	3,101,628	2,304,804	2,695,946	2,992,796	2,992,796 ¹

¹ Forecast consumption used

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Actual)
Total	36,192,351	32,153,922	31,323,971	36,828,227	33,855,990

Appendix 2: Gas Consumption (kWh)

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Actual)
August	911,372	1,114,925	834,221	933,006	767,127
September	1,037,385	1,542,730	1,174,363	1,224,587	1,514,646
October	2,671,705	2,684,675	2,074,746	2,353,579	2,251,799
November	3,712,736	4,178,501	2,963,170	3,470,141	3,120,399
December	4,574,507	4,316,648	3,235,702	3,885,172	3,714,962
January	4,691,627	4,748,592	4,268,633	4,471,375	4,137,928
February	4,486,371	4,372,730	3,264,071	3,937,615	4,060,722
March	4,561,438	3,999,056	4,337,390	4,206,864	3,196,312
April	2,155,433	2,449,772	4,418,353	2,943,187	2,943,187 ¹
May	2,274,192	1,423,301	2,178,931	1,916,695	1,916,695 ¹

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Actual)
June	1,619,533	1,147,414	1,431,237	1,302,573	1,302,573 ¹
July	1,325,105	829,267	776,999	956,116	956,116 ¹
Total	34,021,404	32,807,609	30,957,816	31,600,909	29,882,466

Appendix 3: Electricity Spend

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Spend)
August	£324,318	£416,208	£329,781	£417,827	£363,559
September	£307,634	£391,125	£339,118	£418,029	£373,605
October	£516,648	£533,607	£357,369	£541,362	£479,467
November	£535,215	£528,998	£335,522	£537,169	£497,094
December	£505,349	£515,308	£362,563	£533,006	£519,623
January	£562,224	£546,233	£380,352	£571,783	£497,238
February	£498,675	£540,343	£356,175	£533,862	£479,781
March	£538,229	£485,024	£372,510	£532,929	£529,958

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Spend)
April	£406,557	£274,832	£354,062	£461,289	£461,289 ²
May	£405,228	£271,849	£367,829	£470,841	£470,841 ²
June	£384,977	£282,616	£374,644	£470,429	£470,429 ²
July	£428,398	£303,627	£378,621	£500,096	£500,096 ²
Total	£5,354,262	£4,702,844	£4,308,546	£5,988,623	£5,642,980

Appendix 4: Gas Spend

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Spend)
August	£38,607	£43,013	£27,781	£76,377	£28,306
September	£33,373	£50,713	£31,933	£76,414	£38,122
October	£84,444	£80,649	£49,015	£137,689	£88,342
November	£105,591	£114,480	£58,254	£136,623	£115,118
December	£126,575	£118,248	£55,871	£135,564	£132,388

² Forecast spend

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Spend)
January	£126,761	£126,818	£77,989	£145,427	£144,741
February	£124,502	£117,801	£64,343	£135,782	£145,475
March	£127,804	£111,239	£79,813	£135,544	£117,469
April	£71,915	£52,576	£79,558	£117,324	£117,324 ²
May	£66,359	£36,050	£47,959	£119,753	£119,753 ²
June	£53,514	£32,473	£35,938	£119,648	£119,648 ²
July	£45,486	£27,809	£27,347	£127,194	£127,194 ²
Total	£990,355	£824,095	£635,800	£1,463,339	£1,047,816

Appendix 5: Unit Rates Electricity (p/kWh)

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Actual)
August	12.54	13.86	13.11	13.95	14.14
September	11.21	13.88	13.32	13.95	14.20
October	16.66	17.64	13.53	16.71	17.47

Month	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Actual)
November	16.42	17.57	13.81	16.71	17.33
December	16.36	17.51	13.95	16.71	17.80
January	16.35	17.70	13.91	16.71	16.78
February	16.38	17.86	13.83	16.71	17.52
March	16.77	17.64	13.94	16.71	17.47
April	14.00	13.62	13.88	16.71	
May	13.80	13.32	13.88	16.71	
June	13.87	13.25	13.81	16.71	
July	13.81	13.17	14.04	16.71	
Average	14.85	15.59	13.75	16.25	16.59

Appendix 6: Gas Unit Rates (p/kWh)

	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Actual)
August	4.24	3.86	3.33	2.55	3.69

	2018/19	2019/20	2020/21	2021/22 (Forecast)	2021/22 (Actual)
September	3.22	3.29	2.72	2.55	2.52
October	3.16	3.00	2.36	4.25	3.92
November	2.84	2.74	1.97	4.25	3.69
December	2.77	2.74	1.73	4.25	3.56
January	2.70	2.67	1.83	4.25	3.50
February	2.78	2.69	1.97	4.25	3.58
March	2.80	2.78	1.84	4.25	3.68
April	3.34	2.15	1.80	4.25	
May	2.92	2.53	2.20	4.25	
June	3.30	2.83	2.51	4.25	
July	3.43	3.35	3.52	4.25	
Average	3.12	2.89	2.31	3.97	3.52

Appendix 7: Performances of the Salix Tranche 3 Projects

Site Name	Intervention(s)	Baseline (kWh)		Anticipated Savings (kWh)		Savings Achieved (kWh)		Variance (kWh)	
		Electricity	Gas	Electricity	Gas	Electricity	Gas	Electricity	Gas
Blizard Building	BMS and LED Upgrade	3,238,750	2,683,696	723,235	601,068	609,685	362,178	-113,550	-238,890
Garrod Building	BMS and LED Upgrade	476,888	497,790	143,588	151,248	52,941	81,473	-90,647	-69,775
Wingate Building	BMS and LED Upgrade	465,334	1,070,172	126,614	318,576	201,836	288,775	75,222	-29,801
Whitechapel Library	BMS Upgrade	171,383	233,677	20,880	59,604	33,572	-69,626	12,692	-129,230
Yvonne Carter Building	BMS and LED Upgrade	135,140	25,207	51,907	6,300	37,583	5,050	-14,324	-1,250
Abernethy Building	BMS and LED Upgrade	780,297	625,006	180,307	194,796	147,854	112,616	-32,453	-82,180
Joseph Priestley Building	Plate-heat Exchanger	3,265,568	2,606,670	105,780	1,763,880	365,552	24,775	259,772	-1,739,105
William Harvey	LED Upgrade	1,310,533	NA	304,211	NA	289,967	NA	-14,244	NA
G. E. Fogg & Computer Science Building	BMS Upgrade	3,051,421	1,109,002	220,932	138,104	140,969	-403,152	-79,963	-541,256
Engineering Building	BMS Upgrade	1,269,324	1,671,790	16,304	400,434	71,595	-218,363	55,291	-618,797
Peoples Palace Building	BMS Upgrade	687,015	1,593,564	85,970	435,906	233,956	188,519	147,986	-247,387

Site Name	Intervention(s)	Baseline (kWh)		Anticipated Savings (kWh)		Savings Achieved (kWh)		Variance (kWh)	
		Electricity	Gas	Electricity	Gas	Electricity	Gas	Electricity	Gas
G. O. Jones Building	BMS Upgrade	1,033,657	702,284	31,010	21,069	154,265	225,671	123,255	204,602
Arts 2 Building	BMS Upgrade	300,805	219,047	34,526	39,742	12,650	-101,480	-21,876	-141,222
Total		16,186,113	13,037,905	2,045,264	4,130,727	2,352,426	496,437	307,162	-3,634,290

Appendix 8: Performances of the Salix Tranche 3 Projects (Electricity)

Year	August	September	October	November	December	January	February	March	April	May	June	July	Total
2018/19	1,186,653	1,371,952	1,428,502	1,371,980	1,331,300	1,403,260	1,303,607	1,329,240	1,305,757	1,349,084	1,337,991	1,466,789	16,186,113
2019/20	1,359,687	1,237,745	1,316,335	1,271,213	1,221,986	1,260,970	1,204,345	1,103,679	863,388	852,226	924,672	993,726	13,609,972
2020/21	1,165,225	1,089,672	1,110,115	1,049,399	1,005,172	1,033,794	992,761	1,111,828	1,045,728	1,090,260	1,179,563	1,259,051	13,132,570
2021/22	1,190,696	1,214,232	1,203,321	1,196,574	1,171,982	1,217,226	1,116,458	1,248,590					13,833,688 ³
Expected Consumption	1,002,138	1,203,741	1,257,684	1,201,535	1,160,854	1,230,579	1,133,161	1,158,794	1,139,781	1,182,363	1,171,642	1,298,578	14,140,850

Appendix 9: Performances of the Salix Tranche 3 Projects (Gas)

Year	August	September	October	November	December	January	February	March	April	May	June	July	Total
2018/19	388,712	465,452	1,036,539	1,296,116	1,822,000	1,810,020	1,894,302	1,798,146	915,058	788,227	459,830	363,503	13,037,905
2019/20	384,983	562,661	943,513	1,196,621	1,710,417	1,702,167	1,821,158	1,671,803	804,230	751,320	528,403	381,292	12,458,567
2020/21	192,847	207,319	870,747	1,383,095	1,667,179	2,287,380	1,226,777	2,067,614	1,480,722	854,654	514,475	209,002	12,961,809
2021/22	213,317	711,475	871,528	1,374,558	1,625,043	1,802,129	1,561,560	1,534,945					12,541,468 ³
Expected Consumption	267,863	305,183	730,197	842,865	1,314,816	1,227,297	1,378,435	1,249,293	531,158	539,214	281,694	239,164	8,907,178

³ Projected Year End