



King's Schools
TAUNTON

Sustainability Strategy for Energy, Carbon, Waste and Cost Reduction

June 2023

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Introduction and Context

In 2015, the EU and 196 nations signed on to the first truly global commitment to address climate change, namely the Paris Agreement. The aim of this was to limit global warming well below 2°C and in pursuit of 1.5°C. On the 3rd December 2020 the UK government unveiled its target to reduce emissions by 68% by 2030, compared to 1990 levels and net zero by 2050. The Glasgow Climate Pact 2021 kept the goal at 1.5%. The UK Environment Bill states that it will “deliver the most ambitious environmental programme of any country and drive forward action to protect nature and improve biodiversity, including through a target for species abundance for 2030, aiming to halt the decline of nature”.

As of October 2020, around 75% of councils across the UK had declared a climate emergency¹, with the majority of these setting target dates to be carbon neutral either for their own operations or across their area as a whole. **Somerset Council is working towards a carbon neutral Somerset by 2030.** Numerous other public and private bodies have also made declarations or are putting plans in place to begin this transition. The ambition of declarations varies significantly and will also vary in scope as they begin to define exactly what they are committing to include in terms of operations and emissions sources.

For the education sector specifically: UNESCO’s ‘ESD for 2030’ (Education for Sustainable Development) set out the key role of education in the successful achievement of the United Nation’s 17 Sustainable Development Goals. HMG requires the education sector to play its role in positively responding to climate change and inspiring action on an international stage. Following COP26, sustainability in education has been put front and centre, meaning **schools need solutions now**. If the UK is to reach its legally binding target of net zero by 2050, the whole of the education sector must play its part in reducing operational emissions. The DfE² Vision is for the UK to have a world-leading education sector in sustainability and climate change by 2030, achieving this in England through the following strategic aims:

- Excellence in education and skills for a changing world: preparing all young people for a world impacted by climate change through learning and practical experience
- Net zero: reducing direct and indirect emissions from education and care buildings, driving innovation to meet legislative targets and providing opportunities for children and young people to engage practically with the net zero concept
- Resilient to climate change: adapting to mitigate against the worst impacts of climate change in our education and care buildings and infrastructure
- A better environment for future generations: enhancing biodiversity and increasing access to nature in and around education and care settings.

The rapid increase in energy costs and confirmed increase in electricity of 2.59 times from Sept 23, gas 3.75 times from April 23, and oil doubling in price in the last year³

¹ [Declare a Climate Emergency | Go Zero Carbon by 2030](#)

² <https://www.gov.uk/government/news/education-secretary-puts-climate-change-at-the-heart-of-education--2>

³ <https://www.which.co.uk/reviews/heating-oil/article/heating-oil/getting-the-best-heating-oil-prices-ai4JE3I6UmJ1>

have increased the impact from high energy use making this strategy an important aspect in reducing cost and **ensuring financial sustainability**.

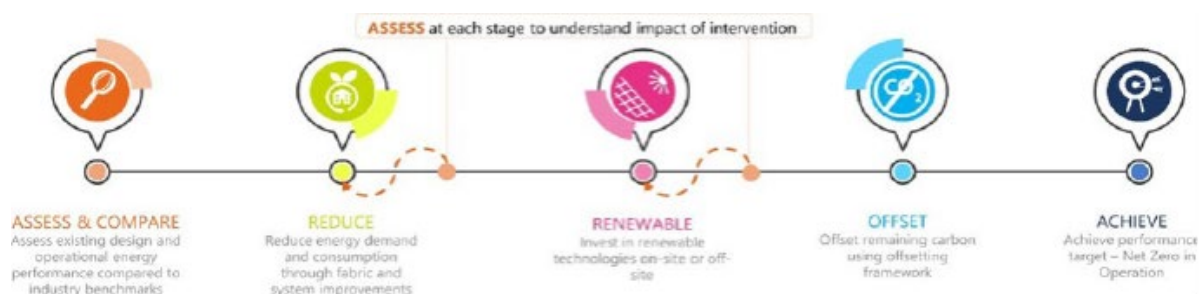
This paper is designed to help inform decision making and drive action. It is based on current known factors and knowledge of available technologies. Technologies and, as is now being shown to detrimental effect to future budgets, economics may change significantly over time and government funding and policy will also influence future actions. **Prudence and the climate emergency points to major cultural change and investment needing to take place now.** Regular review of this paper, actions taken, emissions and the impact on our educational and pastoral provision - as the educational, technology and economic landscape changes - will place King's in the best position to meet their net zero targets.

This plan is King's response to the climate emergency. It reflects our corporate strategic ambitions to provide a culture of excellence with a relentless focus on improvement whilst, at the same time, making a commitment and contribution to the environmental aspirations of the Somerset community. Our aim is for King's operations and services to be carbon neutral by 2040.

Executive Summary

This document provides an analysis and assessment of where we are now, where we want to be, and evolving plans of how we are going to get there.

Based on six Environmental Strategy Pillars of activity ([Annex A](#)), we will use net zero principles methodology (see diagram below) to ensure a consistent and thorough approach, ensuring that action plans developed will be able to deliver our objectives.



Initial work by the DFO has produced the following findings summarised below:

- Existing infrastructure (Pillar 1) - Scoping was carried out to define areas for assessment and set appropriate targets
- Carbon footprint was calculated, based on 2018/19 data, and shown to be dominated by heating and hot water use
- Business As Usual will have minimal further impact as King's has already moved to renewable electric provision (over 22% impact)
- A further 25% reduction by 2025 (in three years) does not represent a full fair share in line with the Paris Agreement but, together with the renewable electricity provision will be a major step forward and, with significant financial investment, is achievable
- A budget needs to be proposed and agreed including for additional staffing

- Modelling will need to be frequently conducted to assess scenarios, assessing their carbon and high-level financial implications. Options with biggest impact will include reducing the property portfolio, replacing oil boilers, and committing to enhanced levels of energy savings in buildings combined with investment in large scale renewable energy.

Key findings

- Substantial early action is needed and an effective, well thought out overarching (particularly educational) strategy would contribute to this
- King's requires a 'Cultural Shift' in behaviours. All staff must work to ensure energy use is minimised and take proactive actions to do so
- Direction on the King's estate particularly those high energy users (compared to use of the building) such as the Tennis Hub is extremely important. Without this the DFO and Ops Manager are unable to plan projects as they are uncertain which buildings will be retained and unable to plan an appropriate sustainability plan (without a potential waste of resources) or maximise energy procurement value as future energy volumes could potentially fluctuate significantly
- It is likely that King's will need to utilise some carbon offsetting to achieve net zero by 2040. There are risks and there would be no financial saving from doing so (unless carbon charging rules change significantly)
- Investment in large scale renewables is possible utilising current reserves, borrowing to do so, or utilising one of the many schemes that pay upfront costs (albeit with King's paying for it over the longer term).

Next steps are as follows:

- 1. Determine Schools and Estate Future**
- 2. Assess and compare**
- 3. Develop detailed action plans**
- 4. Develop appropriate reporting structure including yearly update of carbon footprint**
- 5. Commit resources**

Detail of work carried out and conclusions

1. Scoping

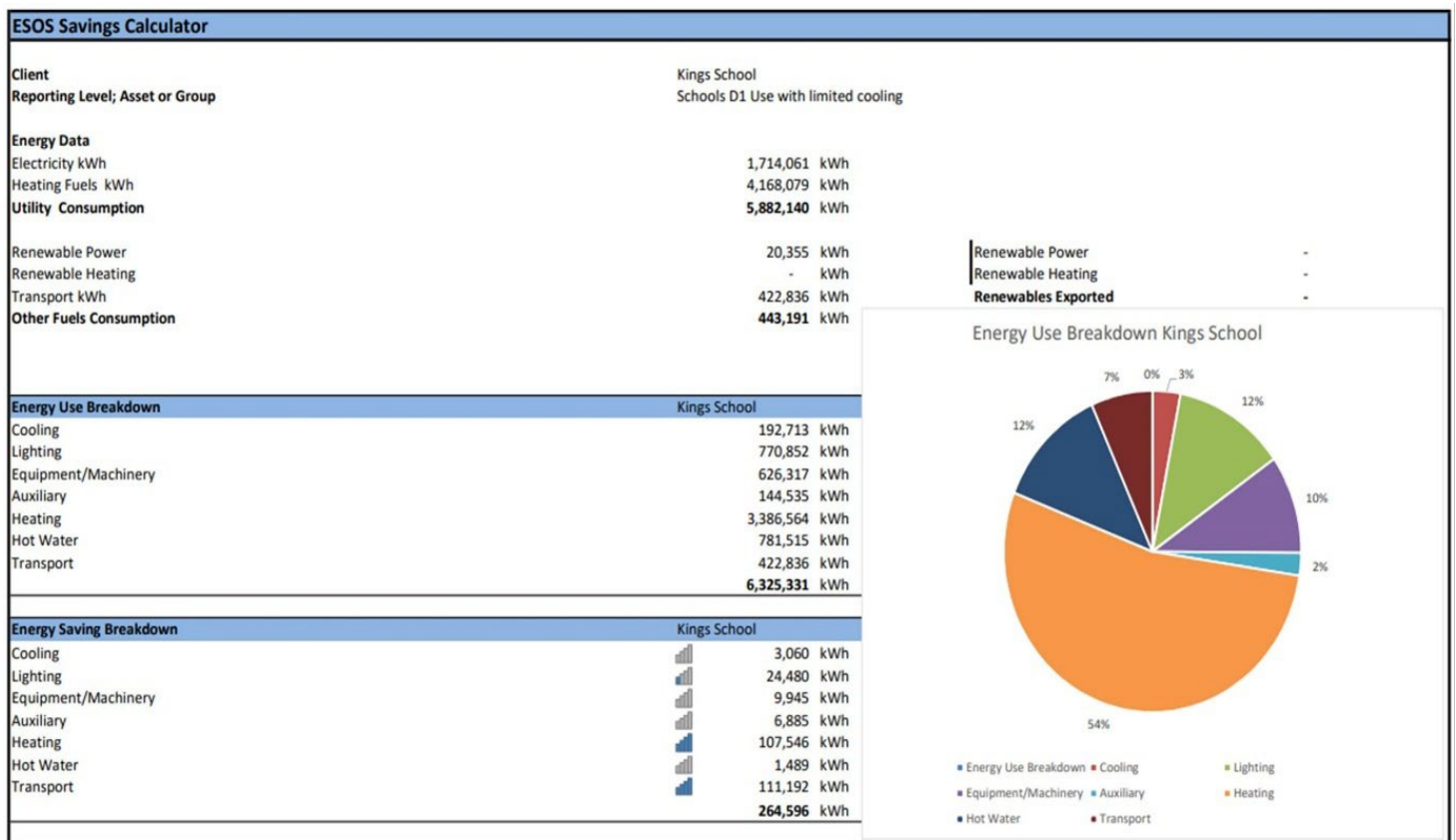
It is important to define the scope of the carbon emissions that are included within any net zero paper. The DFO conducted an initial kick off meeting with the 'Green Team' in September, 2021, briefed Council in February 2022, and has had numerous meetings to discuss strategy and, more crucially urgent operational actions to improve King's carbon footprint and reduce costs.

The organisational scoping exercise looked at the structure to determine which entities fall within the scope. King's College Taunton and King's Hall School were

identified as areas to be assessed; excluding the Equestrian Centre at this stage – i.e. focusing on property that King’s controls. Overseas schools within the King’s College brand were not considered in scope.

At the operational scoping stage, a number of areas were discussed and decisions made. The most notable of these were the decisions to include the catering contract and waste from both sites within scope. Although not operated by King’s directly it was felt that they were important due to their significance and the control that King’s has on these issues.

It was decided to use FY 18/19 as the base year as data is available immediately and it was not affected by Covid (21/22 still had latent impact). It should be noted that the baseline is not as vital when looking to achieve net zero due to the emphasis being on the absolute target. However, it gives context for the challenge faced and allows analysis of the contribution of each emissions source over time and efforts made to reduce them. The total baseline emissions (ie: excluding renewables) for King’s for 18/19 was 6,325,331 kWh with the breakdown in kWh in the table below. Although these are historical figures, with some estimation, they point to carbon use of 1,309 tCO₂e (1.7 tonnes of carbon per pupil).



2. Data Collection and Footprint

Data Collection

King's is required to report within its annual accounts the carbon impact and, through Woodard, has agreed a carbon ton per pupil KPI. Clearly this will be more for a boarding school on a heritage estate than for a day school in new buildings.

King's is, therefore, ahead of many schools (only two currently report within Woodard) with data collection. Emissions factors are provided via Woodard in accordance with annual carbon reporting requirements.

This, however, is only for energy and not complete for water, waste, or other emissions sources which will be addressed by phase two (from 2025). This is a lengthy procedure as substantial quantities of data are required to be gathered from numerous different sources in many different formats and the anomalies caused by the pandemic have hindered the ability to ascertain appropriate benchmarks.

Carbon Footprint

King's carbon footprint is calculated and broken down in a variety of ways which allows for insight into the emissions the significance of the different emissions sources. In essence a carbon footprint is divided into three different categories of emissions:

- Scope 1 – Direct GHG (Greenhouse Gas) Emissions, where the emission occurs directly from sources controlled or operated by King's, for example the gases emitted from a boiler flue as a result of burning natural gas or oil for heating
- Scope 2 – Electricity indirect GHG Emissions, where the consumption of a utility on site has a direct bearing on the emissions offsite. This predominantly relates to electrical consumption and is minimised by the procurement of renewable electricity. However, note this does not negate the 2.59 time increase in price and, therefore, the need to minimise consumption
- Scope 3 – is a wide category covering all emissions sources not included in the other two scopes: other indirect GHG Emissions, where emissions are a consequence of the activities of King's, but occur from sources not owned or controlled by them such as paper used and parents' car emissions from driving children to school. As part of the scoping exercise a decision has to be made as to which Scope 3 emissions sources to include within scope, if any. King's has decided to include emissions associated with disposal of waste generated by our own estate, water consumption, grey fleet (employees using their own vehicles on school business) and the outsourced catering contract. However, at this stage King's only has scope 3 emissions data for its grey fleet.

The figures for 21/22 can be found at [Annex B](#).

3. Measuring Success

Phase 1 2022-2025

- Net Zero Carbon Mapping and setting up analytics platform (assess and compare)

Pillar 1: Existing Infrastructure

We will, for immediate action (phase 1 2022 - 2025):

- Reduction of 25% of carbon emissions by August 2025. PV, LED, Insulation, controls, more energy efficient boilers, change in culture and practices and exploring potential of biomass will be part of the solution. Increasing use of air source heat pumps such as in a refurbished KCT dining room (including new floor and under floor heating).
- Work with Woodard, as “guinea pigs”, for Net Zero Carbon Mapping and setting up analytics platform
- Estate Rationalisation – including removal of KCT PortaKabin, review of other ‘temporary’ structures, and consideration of Tennis Hub removal
- PVs installed to provide maximum value by Sep 2025
- Full LED Lighting Roll Out including improved control/management measures (by Sept 2024) – both sites including floodlights, projectors/TVs, and path/street lighting
- Lighting and Heating Controls assessment, Improved metering

Pillar 2 - New Infrastructure

We will:

- Ensure all new builds to be at least net zero
- Rooftop Solar PV – 6th Form Centre incl. battery storage and PV exploration of both sites for implementation over the next three years (but as early as we can)

Pillar 3 & 5 - Our workforce and pupils

We will:

- Work towards a cultural Shift – change in behaviours. All staff to ensure minimum energy use and proactive actions to do so, room occupation survey, changed timetable to maximise usage of fewest buildings/classrooms/offices and also to maximise benefits of natural light in winter, rationalise (and confirm in advance as far as possible) events for minimum energy and other costs impact, fair use policy

for those resident on site, swimming pool use, tennis dome, heating not on until after MT half-term (not including pre-prep), etc.

- Ensure that the “Green Team” and sustainability leads in each school have support and mandate they require.
- Act on collated suggestions from staff, pupils and parents
- 50% reduction in printing (classroom and marketing materials, meeting papers, diaries, Aluredian, etc.).
- Governors and Executive direction and leadership for a change in culture by Sep 2023 supported by Green Team (See [Annex C](#))

Pillar 4 - Transport and machinery

We will:

- Reduce Own Fleet Mileage
- Reduce Grey Fleet Mileage
- Move to EVs – grey and own fleet. Salary Sacrifice from 22/23 and new EV 14+1 minibus

Pillar 6 - environmental engagement with stakeholders

We will:

- 25% reduction in food waste by 2025
- Catering Contract to include commitment and actions to be included as part of tender process 2024 - Catering Provider to be net zero by 2040

Sustainability for the 3rd party contracts with Sodexo has been discussed and some changes already made (including changing procurement of milk from Liverpool to the South West).

Phase 2 (2025 - 2030)

Reduction of a further 25% of baseline by August 2030. Continuation of above plus large-scale window updates and replacement of some old inefficient buildings (including Pre-Prep if not achieved in Stage 1) and greater move towards district heating.

- Continue to roll out Heat Pumps where appropriate
- Continue to Improve Building Fabric to reduce consumption
- Oil boilers to be replaced by Sep 2026 (one building per year) - to be replaced as far as possible by heat pumps, PV and, if appropriate, biomass
- Reduce own fleet/hired coach miles travelled by 50% by 2030
- 90% of own fleet miles to be via electric vehicle by 2030
- Reduce grey fleet miles travelled by 50% by 2030

- 70% of grey fleet miles to be via electric vehicle by 2030

Phase 3 (2030 - 2035)

Reduction of a further 25% of baseline by August 2035. Continuation of above and potential move from natural gas to hydrogen.

Phase 4 2035 - 2040

Reduction of a further 25% of baseline by August 2040. Continuation of above plus carbon offsetting.

Critical for success of above:

- ***Estate rationalisation*** - the carbon reduction options above are highly dependent on any potential KST estate rationalisation, it is critical that there is clear direction as soon as possible to allow for additional effective planning. If estate rationalisation is limited then greater activity will be needed in other areas
- ***Scale of investment*** perhaps the most important/limiting factor with consideration perhaps required of less preferential arrangements such as loans or other longer-term payback arrangements. Members acknowledged its significance and the limited resources and also noted the importance of potential partner/grant funding
- ***Speed/ease of implementation*** is critical with extremely limited resources unable to take on further burdensome projects without additional staffing. It is important King's focuses on the achievable quick wins to achieve the 2030 target whilst not missing the opportunity for larger scale and larger longer-term impact projects
- ***Financial returns*** – ideally there will be quick returns on investments including reducing the impact from large gas, electricity and oil price increases. However, with the charge for carbon likely to be ever increasing, longer-term payback (including from the environment) should not be discounted
- ***Scale of emissions reductions*** must be the priority with commitment from all staff, pupils and parents. However, it should be noted that the target may be able to be achieved by a wide portfolio of smaller scale measures
- ***PR/ Staff and Parent acceptability*** – work is required for all stakeholders to be aligned in their commitment to the target and so accept that sacrifices will need to be made
- ***Project certainty*** will be difficult to achieve without contributing huge sums to do so. Council may be required to commit support and funds based just upon higher level estimates to contribute towards action planning. However, an EPC Review of all buildings (first requiring a full set of scale drawings) will be a good start to tell us where we are and also allow us to look at opportunities and possible carbon reduction and achievable targets. A typical Decarbonisation Strategy Brief (from Buro Happold 19 May 22) for a school estate is at [Annex D](#)

- **Impact on operations** will need to be managed, accepting that there may need to be some impact on operations to achieve King's goals.
- **Reduce** (Net Zero principles) is critical in this pathway - Simple routes to this include encouraging "energy conscious behaviour", which includes simple moves such as switching off lights and PC's when not in use and can be integrated into King's school curriculum, and can have an extremely positive impact on the energy demand of the school, and thus the cost of energy bills. The next step in this is for the school to understand how and where energy is actually used, through effective metering, for instance on a building by building basis, with information on how the energy use varies through the day and between operational times and the school holidays.

4. Cash Flow

This 18-year plan is unlikely to produce significant net inflows during this period due, in some part, to the cost of offsetting (zero return on investment) and the likely additional costs for 3rd party contracts. The more work to reduce emissions the lower the cost of offsetting (also seen by some as 'greenwashing'). The budgetary work is still required (an ongoing process) but Council should be front loading, as far as possible, sustainability investment, with a **minimum of £1m over the next 12 months** (research/planning costs, LED/controls Investment, new more efficient gas boilers, and PV Panels). Government grants may become available during the period which will then be considered by the executive and Council.

5. Conclusion

- King's can achieve net zero carbon by the target date and the model sets out a general strategy to achieve this
- Substantial early action is needed
- Short term impact due to the pandemic has not yet been quantified but impact from increased energy costs on budget is clear
- The majority of King's carbon footprint is attributable to heating fuels
- Clear long-term policy on estate and other support to an excellent educational and pastoral provision is needed to allow planning of energy efficiency actions
- Investment in large scale renewables can be structured in a variety of ways and may not require vast up-front capital investment
- Without huge cultural change and investment, to achieve net zero in 2040 will require heavy reliance on offsetting emissions. This comes with significant risks⁴ and importantly no financial returns on any investment

Direction on estate rationalisation is extremely important, without this the DFO, Ops Manager and Heads are unable to guarantee efficient planning of projects - risk of investing in/prioritising areas/buildings where there they may not be retained. Long term volume commitments are also critical to future energy purchasing options.

⁴ The offsetting market is expected to change and develop hugely over the next decade.

Further work will need to be undertaken regarding the outsourced contracts, both internally and with contractors. Both the method by which these emissions will be abated and the costs associated with this are unclear at the moment. Companies like Sodexo are already looking into these issues and carbon emissions must be a critical consideration for any contract renewals.

As with estate rationalisation, it is important that a clear education and pastoral direction is decided upon to allow for carbon forecasts to be updated and action to commence.

The strategies for sustainability are expected to evolve and change as investigations into favoured options are taken forward and further information becomes available. This paper does not attempt to fully assess project options, cost and impact on emissions but to put a useful prompt for planning and decision making and for monitoring progress. It is likely that opportunities for further emissions reductions will come to light in the medium term that are not included in the paper. This may be through new technologies, reductions in costs of current technologies or government policies.

6. Next Steps

Next steps are as follows:

1. Complete estate and other enabling strategies, what will King's need in the future?

As mentioned, establishing a firm direction for the estate and education provision is vital to allow for planning to reduce emissions and it is recommended that this is made a priority following a room occupation survey.

2. Assess and compare detail to understand best solutions - when and where

Buildings /campus assessment to be completed: Review of existing energy consumption data, building condition survey, decarbonised heating review, costed appraisal of building fabric improvements and renewable energy generation assessment

3. Develop Detailed Action Plan based on 6 pillars of activity

It is recommended that King's should develop a detailed action plan which would cover policies, responsibilities, working groups, relevant estate and other surveys, and consultations with suppliers of EV vehicles, catering, and waste management and other providers. This plan should tie in all of the steps below and provide clear action points in each area. In order to create a meaningful action plan, it is crucial that Step 1 is carried out as soon as possible.

Initial focus can be brought on those buildings and areas where there is a strong likelihood that they will be retained plus external lighting. This investigation should continue to focus on established technologies like LED lighting, rooftop solar and

building fabric but should also look to assess low carbon heating solutions such as heat pumps and the applicability of other technologies and initiatives.

In addition to this the schools can pursue established initiatives in other areas such as moving to electric fleet (including grounds machinery), encouraging electric vehicles within the grey fleet and reducing mileage in all areas. Also reducing water use and waste generation should be considered and solutions for waste management to further promote reduction and recycling should to be investigated - these are relatively minor contributors to the overall footprint but all progress is important.

4. Develop appropriate reporting structure to include yearly update of carbon footprint

Concurrent with these investigations 2020-21 and then, shortly, 2021-22 data can be built into the model to demonstrate the changes to the carbon footprint to date and pertinently, the impact of COVID-19 on King's emissions.

5. Commit resources/ establish draft budget enabling prioritisation

Understanding of financial commitment required each year.

The six pillars of our Environmental strategy



Existing Infrastructure

We will target investment decisions in existing infrastructure to improve energy efficiency, reduce our carbon footprint and improve efficiency.



New Infrastructure

Where able, we will influence design and specifications to ensure that our new infrastructure is energy efficient with reduced energy demand and carbon emissions. We'll also ensure new infrastructure is resilient to change, running costs are reduced and green areas are utilised conscious of benefits for nature.



Our workplace and people

We will review and change our workplace practices to ensure that when possible our actions have minimal environmental impact. We will examine and implement policies in support of the environment – 'Sustainable Investment' for pensions (and investments), salary Sacrifice schemes for electric cars and bikes.



Transport and Machinery

We will change our transport and machinery working practices, work arrangements (such as reducing mowing of areas of grass areas) and our policies to reduce our carbon footprint.



Our pupils, parents, and community

We will work with our pupils, parents and community to ensure they have influence on the standards and priorities we're focussing on, to help improve the education provision, minimise costs, and support sustainable aspirations.



Environmental engagement

We will deliver an engagement strategy to ensure our design and commitment around environmental issues is strong, realistic and sustainable. We will work closely with our stakeholders and supply chain to influence change.

Annex B

Carbon Footprint

Percentages fluctuate but from 21/22 (with lingering impact from Covid) we had the following figures which, for benchmarking purposes, uses non-renewable electricity:

Scope 1 emissions in metric tonnes CO₂e

Gas Consumption	648.80
Owned Transport - mini buses	52.43
Delivery Vehs	3.81
Other Passenger Vehs	3.33
Garden Machinery	2.89
Burning Oil	0
Gas Oil	171.41



Total Scope 1

882.66

Scope 2 emissions in metric tonnes CO₂e

Purchased electricity	0
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Scope 3 emissions in metric tonnes CO₂e

Business travel in employee-owned vehicles	6.90
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Total gross emissions in metric tonnes CO₂e

889.56

Intensity ratio Tonnes CO₂e per pupil

1.14

In the previous years electricity would have accounted for 25% of carbon emissions. Scope 1 are 99% of emissions with gas being 52% of total metric tonnes CO₂e. With renewable electricity, gas consumption is 73% of our emissions and gas (heating) oil 19%. The emissions impact compared to the heating provided is the greatest for oil; this has to be a priority to address overall carbon emissions. Having renewable electricity has significantly reduced carbon emissions - KST's intensity ratio is now 1.14 tonnes per pupil.

It is difficult to break down usage into buildings as the metering system is not fit for this purpose. For example, few conclusions can be drawn from the extremely high use for Woodard/Tuckwell Boarding Houses gas meter point as it is also the meter for several other areas including the kitchen. This is clearly an area requiring further work with 'sub-metering'.

Annex C

The Green Team:

- DFO
- Ops Manager
- DS Manager
- KCT Sustainability Leads – Wendy Grant, Ross Friend, Tom Brimelow, David Snell
- KHS Sustainability Leads – Ali Halls, Karon Harvey
- IT Manager and Catering Contractor leads – as appropriate
- Higher level Academic and Pastoral leads – as appropriate

This grouping is not responsible for the formal education of pupils in this area. At KCT this lies with the HOD for PHSME and with the DHA at KHS.

The suggestions list for review by the Green Team can be found by clicking on following link: [Suggestions for Improvement](#)

Annex D

Typical Decarbonisation Strategy Brief – Lead: Ops Manager

The following chapter sets out a typical brief for a decarbonisation study to be carried out on a school. The outcomes of the commission would allow the school to:

- Understand the condition of their existing buildings
- Understand the existing operational carbon emissions of their buildings
- Have clarity as to the options available to decarbonise the school, including:
 - Recommended suite of decarbonisation measures
 - Capital cost of proposed measures
 - Carbon savings of proposed measures against carbon targets
 - Recommended programme for implementation of the measures
 - Impact of the proposed measures on energy costs
 - Any risks associated with the proposals
- Next steps towards implementation of the proposals
- This would allow the school to comprehensively plan a set of interventions, including setting of budgets and programmes, empowering them to achieve their decarbonisation targets.

1. First Phase – Building/Campus Assessment

The school is looking to assess the best possible solutions for the site and wishes to adopt a holistic approach to decarbonisation. The review should cover the following for each building:

- a. Review of existing energy consumption data; Gaining an understanding of where and when energy is used, including (where possible) hourly data on a building by building basis
- b. Building Condition Survey: A condition survey of the current buildings, considering the age of the heating systems, recommended dates for replacement (life expectancy), condition survey of the glazing, insulation and building fabric
- c. Decarbonised Heating Review: A costed appraisal for all the current/latest heating system options available and suitable for each building
- d. Renewable Energy Generation Assessment: A costed appraisal for on-site renewable energy generation (including but not limited to solar PV and wind generation) where appropriate, to provide electricity to the site and support the decarbonisation of heating systems
- e. Building Fabric Improvements: A costed appraisal for all the current/latest retrofit options suitable for all buildings, to improve the thermal efficiency and reduce wastage.

It is important that the school can understand the consequence of any necessary alterations and the potential for simple reductions as well as more intrusive measures such as the installation of new systems or upgrade of building fabric. The successful bidder will be expected to present the findings from the review for consideration by the school to agree on the final solutions for each site, before the final report is published.

The assessment criteria for each proposed “project” shall include the following:

- I. Assessment of planning requirements. A desk-based assessment of the likely planning issues that may be faced in implementing the project for reasons such as but not limited to those associated with local archology, ecology, geology and cultural/historical significance
- II. Disruption to service. The consultant should make clear for each option any impact and disruption to service relating to the installation of a new heating system and options to improve the thermal efficiency of the building – taking into consideration the school term times. Possible options to mitigate disruption should be suggested
- III. Register of main elements surveyed (e.g. systems / equipment / fabric etc). Provide a table which includes details of the item (e.g. description, location, manufacturer/model, serial number, approx. date of installation etc) and an appraisal of the present condition and remaining life expectancy

- IV. Detailed summary and rating for the reliability of the system. The reliable operation of the school is imperative and thus the chosen system must be reliable in terms of both consistency of the source to deliver the energy supply and in its ability to not break down and be resilient in operation
- V. Detailed summary and rating of the complexity of the system. The system should not be too conceptionally complex that regular maintenance and repair work cannot be carried out by the school facilities management. High complexity may also indicate the system has a lot of moving parts which could mean a lack of reliability which we are keen to avoid
- VI. Projected expectation for the availability of replacement parts. Consideration of factors which may lead to parts not being available in the future for reasons such as but not limited to: likelihood of company bankruptcy due to its economic state or size - custom parts would no longer be available, use of materials no longer being available or becoming too expensive
- VII. Time period required to complete the project
- VIII. The total net cost to complete the project outlining the expected ROI period. The consultant will need to quantify the costs involved in delivering the project and highlight what funding options, if any, exist to offset project costs. Detail cost savings/losses per year, over the lifetime of the equipment, compared to current equipment or modern equivalents, and provide estimates of the expected return on investment period
- IX. Impact on energy costs over 1 to 20 years. Low running cost would be advantageous to support future development and self-sufficiency of the sites
- X. Planned maintenance / Inspection requirements for the new technologies e.g. what are the frequency of inspections and who needs to undertake these?
- XI. The projected energy usage and tCO₂e over 1 to 20 years. Important headline figure for climate emergency. A key metric will be the ratio between energy / tCO₂e savings and project costs per CO₂e in short and long term
- XII. Forecasting of future energy demands and CO₂e savings with evidence supporting projections through to the zero carbon target of the school.

2. First Phase Deliverables

For each building surveyed, the consultant should produce a short note summarising the existing building condition and the suite of proposed intervention measures, with associated energy savings, carbon savings, and capital costs.

3. Second Phase – Shortlisting

Following the completion of the technical survey and submissions in the first phase, the consultant should arrange a joint meeting to discuss the findings and agree the final list of fully integrated solutions before the final report is published.

4. Second Phase Deliverables

The required deliverables are a draft and final Decarbonisation Plan (in word format) and should include:

- a. An executive summary, introductions, findings, main conclusions, and recommendations
- b. Where appropriate, maps, plans and illustrations should be included
- c. A fully costed plan and suggested timeline for delivering each site (in financial years). This should be largely based on details from the condition surveys and coincide with the suggested replacement dates for existing heating systems (gas boilers)
- d. CO₂ projections showing the decrease in the school's total carbon footprint with milestones for the introduction of each technology. This should also account for the anticipated changes to the carbon intensity of the UK electricity and gas grids. All values used to calculate final values must be provided and cited in appendices
- e. Persons/organisations consulted and documents
- f. A fully costed options appraisal in order to realistically get all included buildings as close to net zero as possible, providing a complete list of:
 - I. Energy efficient heating alternatives and comparisons to a conventional gas boiler system
 - II. Retrofitting options to improve the thermal efficiency of buildings to be considered
- g. The appraisals carried out in points 2 and 3 should provide details covering the following criteria:
 - I. Time period required to complete each project
 - II. Disruption to service assessments
 - III. Register of all installed items surveyed (e.g. systems / equipment / fabric etc). Provide a table which includes details of the item (e.g. description, location, manufacturer/model, serial number, approx.

- date of installation etc) and an appraisal of the present condition and remaining life expectancy
- IV. Appraisal of the current planned maintenance / inspection regime
 - V. Assessment of planning requirements
 - VI. Detailed summary and rating for the reliability of the system
 - VII. Detailed summary and rating of the complexity of the system
 - VIII. Projected tCO₂e LT, CAPEX cost and LT running Cost
 - IX. Life expectancy of the system
 - X. Projected expectation for the availability of replacement parts
 - XI. Time period required to complete the project,
 - XII. The total capex (including i.e. planning, project management etc) and running (including i.e. O&M, utility costs factoring in anticipated changes to the market) costs to complete the project outlining the expected ROI period
 - XIII. The projected energy and tCO₂e saved over 1 to 20 years
 - XIV. The projected monthly and Half Hourly energy usage / generation
 - XV. Planned maintenance / inspection requirements of the new technologies
 - XVI. Operation and Maintenance Costs over 1 to 20 years
 - XVII. Forecasting of future energy demands with evidence supporting projections
 - XVIII. All values and methods used to calculate final projections must be provided and cited in appendices
- h. Provide recommendations arising from the options appraisals based of the criteria set out in point 6, helping the school to understand how to prioritise their tasks, depending on available funding, appetite for significant change, planned maintenance interventions, ambition for the speed of decarbonisation.