



Appendix B: 3BM Limited Decarbonisation Plan July 2024

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3BM Limited (3BM) are committed to reducing our carbon footprint. In line with the UK Government’s Climate Change Act, 3BM are aiming to be a zero-carbon company by 2050. However, due to increased concern over the acceleration of Climate Change, 3BM aim to go above and beyond this, setting a more stringent target of being zero carbon for Scope 1 and 2 emissions by 2035 ahead of the 2050 deadline stated in the PPN06/21.

3BM have been undertaking projects to reduce their emissions for several years. This decarbonisation plan then, is the first step in collating information on tasks already undertaken, and formalising a strategy to reduce these further, to meet the Net Zero Carbon ambition.

This plan aims to identify sources of 3BM’s Green House Gases, set calculation methodologies to determine a baseline, and identify some initial reduction opportunities. The plan will then be updated with the results of the baseline calculation, and reduction opportunities which will be targeted going forward.

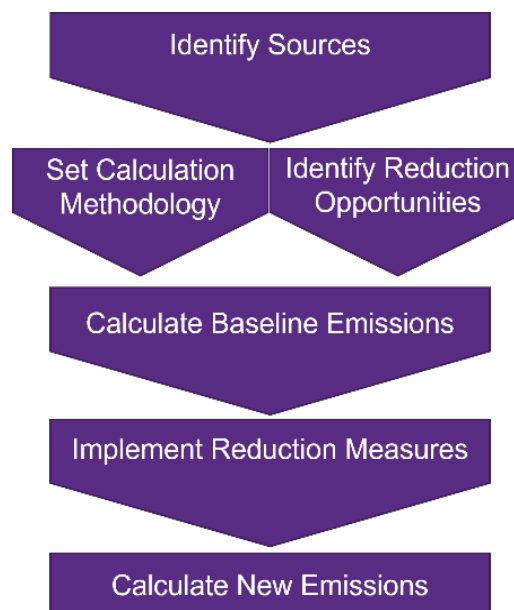


Figure 1 - Decarbonisation Strategy Steps

Scope 1-3 Emissions (under PPN 06/21)

Although carbon dioxide (CO₂) is the main driver behind climate change, there are several Green House Gases (GHGs) which contribute. The effect of each GHG is reported in terms of its effect as related to CO₂, for example, methane (CH₄) is over 25 times more potent than CO₂ at trapping heat in the atmosphere. A business' emissions then, are usually reported in tons of CO₂ equivalent (tCO_{2e}) meaning each gas has been calculated as relative to CO₂, before being summed to give a total carbon footprint.

The Green House Gas Protocol¹ breaks down a company's GHG emissions into 3 different categories (Figure 2):

Scope 1 – Direct emissions from an organisation's activities, which are completely under their control. e.g., fuel combustion from Gas Boilers on site, emissions from fleet vehicles owned by the organisation, and leaks from air-conditioning units.

Scope 2 – Indirect emissions from grid electricity purchased by the organisation.

Scope 3 – All other indirect emissions, which occur because of the organisation's activities, but which are somewhat outside of the organisation's control. For example, business travel and employee commuting in their own vehicles; waste disposal; and procurement of goods and services.

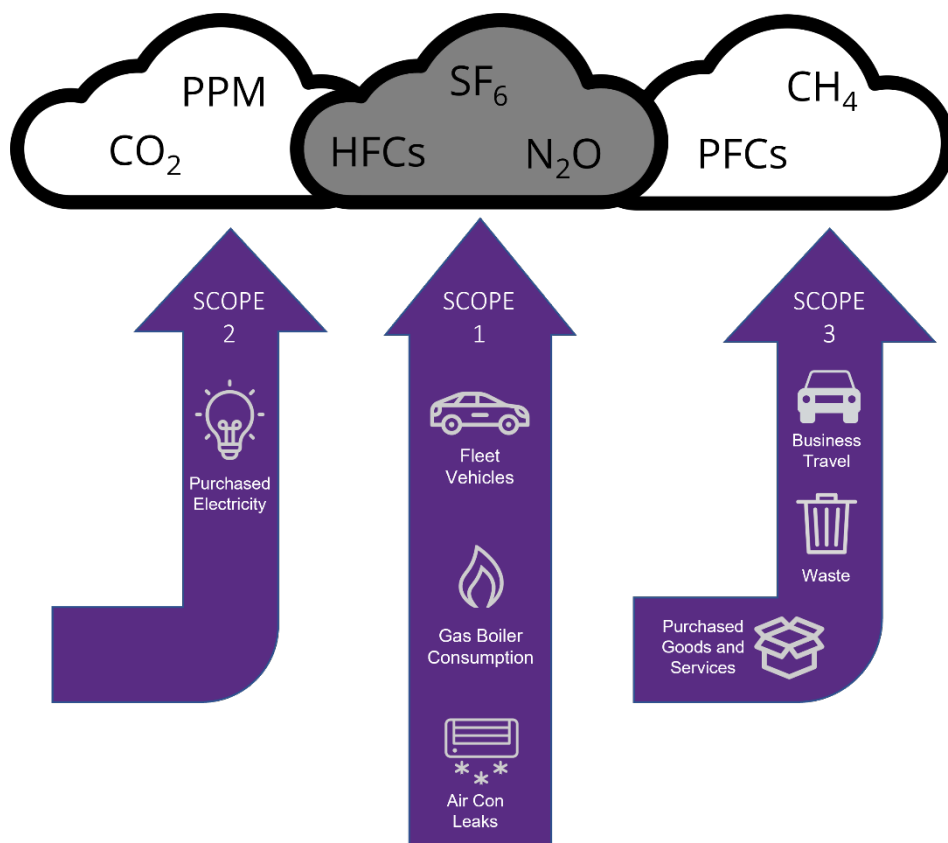


Figure 2 - Scope 1, 2 and 3 Emission Sources

¹Green House Gas Protocol is a global standardised framework for measuring, reporting, and managing GHG emissions from private and public sectors. <https://ghgprotocol.org/>

At present 3BM do not own any fleet vehicles, with staff using their own cars for business travel. Heating, cooling, and domestic hot water (DHW) in the office is provided via electric sources. Therefore, the only scope 1 emissions will be due to any refrigerant leaks within the cooling system.

Due to heating and hot water being provided via electricity, Scope 2 emissions are likely to be much higher than Scope 1.

As with most organisation, Scope 3 emissions are likely to be 3BM's largest. The Green House Gas Protocol identifies 15 'sources' of Scope 3 emissions called "categories". It recommends that organisations identify which scope 3 emissions activities are expected to:

- Have the most significant GHG emissions,
- Offer the most significant GHG reduction opportunities,
- Are most relevant to the organisation's goals.

For 3BM, the key Scope 3 emissions are likely to be Business Travel, Waste, and Procurement, but this will be investigated further to determine the impact of other emissions such as cloud storage.

Scope 1 Emissions – Fugitive Emissions

As heating and DHW in the offices are provided via electricity, the only Scope 1 emissions from 3BM are likely to be fugitive emissions. These are GHG leaks from refrigeration, in this case, cooling units. Refrigerant gases are particularly potent, often thousands of times more damaging than Carbon Dioxide.

Measurement

It can be difficult and expensive to determine the exact losses due to refrigerant leaks in small installations. Indeed, the DEFRA guidance on measuring GHG emissions² specifically excludes reporting fugitive emissions for offices, due to the cost and the likely small impact the emissions have:

"Emissions from air conditioning and refrigeration units in office buildings excluded due to cost of data collection. These account for less than 0.5% of total scope 1 emissions"

Reduction Opportunities

Although quantifying the emissions from refrigerants may be difficult, there are still opportunities to ensure these emissions are minimised. In the first instance, carrying out maintenance in line with manufacturer's specifications, will ensure the units are kept in good condition, and leaks will be reduced if not prevented entirely.

When the systems are coming to their end-of-life, replacement units which have low GHG refrigerants should be selected. Refrigerant R32 has a global warming potential one third of that of the most commonly used refrigerant R410a. It is also more efficient at conveying heat, meaning the electricity demand of the unit will be reduced.

² Department for Environment, Food, and Rural Affairs, 2009, "Guidance on how to measure and report your greenhouse gas emissions".

Scope 2 Emissions – Electricity Demand (under PPN 06/21)

Electricity demand is likely to be the largest emissions of the office. The demands can split into regulated energy – Heating, DHW, Cooling, and Lighting – and unregulated demands, which consist of plug in-loads such as computers, screens, kettles, fridges, vacuum cleaners etc.

Electricity consumption data taken from meter readings (Figure 3) show that currently, consumption is high during winter months, which is to be expected as heating systems will be running, and lighting will be on for longer. The data also shows consumption is high during summer months, likely due to cooling loads. This is shown in the peak loads in June 2021, and August 2022, when the UK suffered prolonged periods of high temperatures.

The increase in consumption in 2022, can be attributed to the fact more staff have been working from the office, due to the end of lock down restrictions.

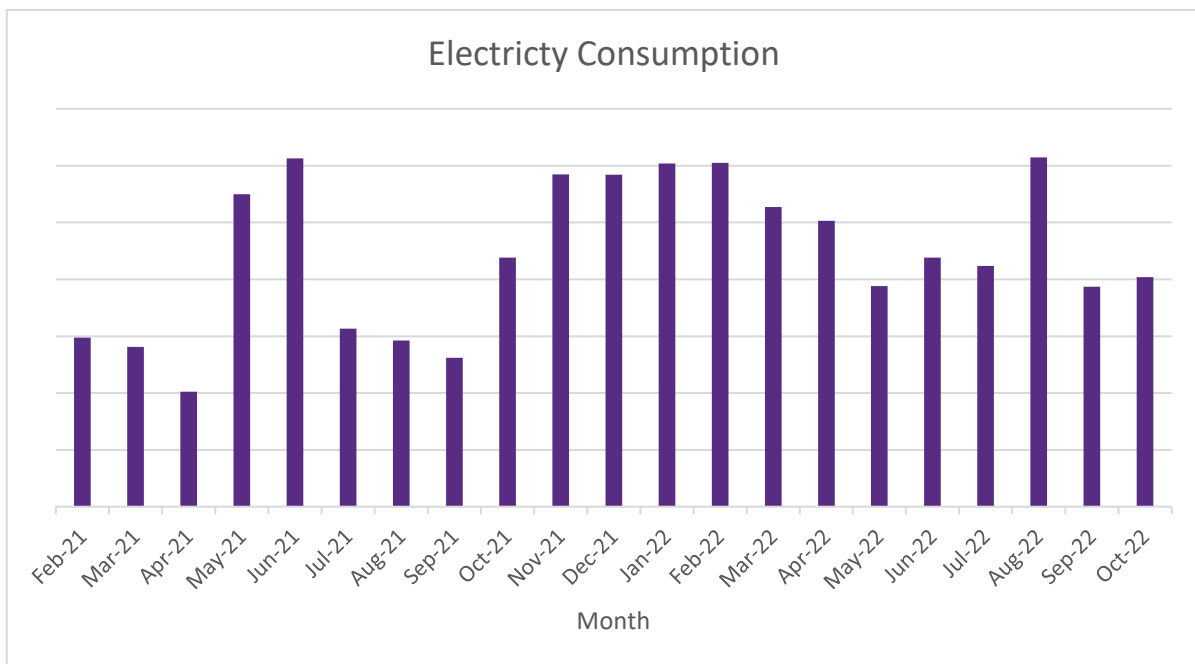


Figure 3 – Office Electricity Consumption February 2021 - October 2022

Reduction Projects to Date

A number of energy reduction measures have already been undertaken within the office as follows:

Lighting – All lighting within the office is now efficient LED type, reducing the wattage and subsequent demands

Unregulated Energy – The office has encouraged a paperless working system, meaning printing has been reduced. Schemes such as e-signing documents drastically reduces the need to print several copies of large documents, as these can now be sent electronically.

Measurement

The current meter readings give a good overall analysis of the building's energy consumption. However, this could be broken down further to determine exactly where the electricity is being used. If possible, additional meters could be installed to separate lighting, heating, cooling, DHW, and unregulated demands.

Once consumption data has been collected, kWh can be converted to kgCO₂ using the Government's Greenhouse Gas Reporting Factors³.

Reduction Opportunities

Over the past decade, there has been a significant shift in the way electricity is being generated in the UK with a large influx of embedded generation from renewable sources, and the managed decline in the use of coal-fired power stations.

Carbon dioxide emissions from the electricity grid therefore, reduced by almost 60% between 2012 and 2022⁴. In 2021, the UK committed to completely decarbonise the electricity system, such that emissions will be zero by 2035⁵. As such, all of 3BM's Scope 2 emissions should be zero by 2035. However, 3BM aim to reduce their energy demands in the first instance, to reduce their emissions ahead of the network going green.

Lighting – Although the lighting within the office is low energy LED, there are currently no sensors fitted. This means that lights could be on in areas when they are not required. Installing daylight sensors on the lights nearest windows, will ensure that the lights are only switched on when light levels dip below a pre-set value. If these fittings are also dimmable, the lights can automatically turn up incrementally as the daylight levels reduce, further reducing the lighting demands.

Presence and absence detection sensors could also be installed in rooms which are only partially occupied throughout the day, such as meeting rooms. This will ensure lights are not left on when these rooms are not in use.

Heating and Cooling –As the building is leased, it may not be possible to make changes such as installing brise soleil to reduce cooling loads or changing windows to reduce winter heat losses. However, this could be explored further, and discussed with the landlord.

The existing heating and cooling units should be examined to ensure they are in good working condition, and maintenance in line with manufacturer's specifications should be followed, to ensure the units are kept in good condition, and working at peak efficiency. When the systems are coming to their end-of-life, replacement units should be specified with high efficiencies, to ensure energy use within the system is minimised as far as possible.

The temperature settings within the office could also be explored. A report by the DECC showed that reducing the set temperature by 1°C can reduce energy demands by 13%⁶ and recommends buildings are heated to 18°C in winter.

³ Department for Business, Energy & Industrial Strategy , Updated Annually, "Government conversion factors for company reporting of greenhouse gas emissions", available at: <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

⁴ Data taken from UK Government GHG Conversion Factors for Company Reporting 2012 and 2022.

⁵ Department for Business, Energy & Industrial Strategy, 07/10/2021, "Plans unveiled to decarbonise UK power system by 2035".

⁶ Department of Energy and Climate Change, November 2012, "How much energy could be saved by making small changes to everyday household behaviours?", Pg 26.

Sensors could also be installed in a similar way to the lighting, to ensure the heating and cooling is only switched on in occupied areas, and when needed.

Unregulated Energy – It can be more difficult to quantify and reduce the demands of plug-in equipment, however, in the first instance a survey should be undertaken of what plug-in items are within the office, and any unnecessary or unused items should be identified and removed.

Whilst plug-in equipment may not be able to be metered, there are a number of “Smart Sockets” now available on the market. These can monitor the energy use of items which are plugged into them, in some cases reporting when items are in use or in standby mode. These can be controlled via timers or algorithms such that they turn off when the item is identified as not being in use. For example, computer screens and printers can be switched off over night when there are no staff in the building; and televisions can be switched off after a set amount of time in standby mode.

Green Energy – One easy way to instantly reduce the carbon emissions associated with electricity use, would be to switch to a Zero Carbon Energy Supplier. There are a number available on the market and this would require no intrusive works within the building. However, these will cost more per kWh than standard tariffs, and it would be prudent to reduce energy demands in the first instance to minimise the cost increase.

Low and Zero Carbon Technologies (LZCs) – The office has a large area of south facing roof, which may be suitable for a solar photovoltaic (PV) array. As the building is leased, it may not be possible to install an LZC such as this, however this should be investigated and discussed with the landlord, as this will help with reducing energy bills as well as carbon emissions.

Alternatively, there are a few companies offering shares in larger LZC installations around the country. One such company are currently offering shares in a new Wind Farm installation in Scotland. There is a one-off upfront cost based on typical electricity demands of the office. Once the wind farm is constructed (expected to be 12-18 months later), all savings generated by the share in the wind farm will be applied via the energy supplier bill. Whilst the energy bill won't be zero, due to grid costs, operational costs, and taxes, it can be significantly reduced – one calculation suggests by up to 25% over the 25 years of the wind farm's lifetime⁷.

Carbon Offsetting – There are a number of companies now offering carbon offsetting services. Once a calculation of the office's carbon footprint has been made, an annual payment can be made which goes to offsetting projects either in the UK or elsewhere in the world.

There are currently two main ways to offset carbon. One is via direct tree planting schemes where payment is made directly for planting. There are a number of schemes available in the UK which are verified against the Government's Woodland Carbon Guarantee. This ensures the carbon savings are not being double counted or sold to more than one company. This scheme has now been extended to include other carbon capture projects such as peatland restoration.

Another way is by buying carbon credits. This is where projects are undertaken, usually overseas, which reduce carbon and benefit the local communities, for example, setting up wind turbines for rural communities in India, or replacing stoves in homes in Rwanda with ones which are more efficient and less CO₂ emitting. Any carbon credit scheme should be investigated to ensure it is certified either by the “Gold Standard” or “Verified Carbon Standard” which are approved by the UN.

⁷ Ripple Energy, “Cooperative Share Offer Summary for the Kirk Hill Wind Farm”, Pg 5.

Scope 3 Emissions (under PPN 06/21)

Scope 3 emissions are far more wide reaching than Scope 1 and 2. These include emissions which result from the actions of the organisation but are not entirely controlled by them. For example, employees travel to clients as a result of their work for 3BM, however the organisation does not have direct control over how the employees travel, or for example, what sort of car they drive.

The Green House Gas Protocol identifies 15 “sources” of Scope 3 emissions split into Upstream and Downstream Categories (Figure 4).

Upstream or downstream	Scope 3 category
Upstream scope 3 emissions	<ol style="list-style-type: none"> 1. Purchased goods and services 2. Capital goods 3. Fuel- and energy-related activities (not included in scope 1 or scope 2) 4. Upstream transportation and distribution 5. Waste generated in operations 6. Business travel 7. Employee commuting 8. Upstream leased assets
Downstream scope 3 emissions	<ol style="list-style-type: none"> 9. Downstream transportation and distribution 10. Processing of sold products 11. Use of sold products 12. End-of-life treatment of sold products 13. Downstream leased assets 14. Franchises 15. Investments

Figure 4 - List of Scope 3 categories, Green House Gas Protocol⁸

As identified in Section 1, Scope 3 emissions are not currently recorded by 3BM, however it is estimated that the emissions over which the company has the most control, and/or are likely to account for the largest emissions are Business Travel, Waste, and Procurement.

⁸ Green House Gas Protocol, 2011, “Corporate Value Chain (Scope 3) Accounting and Reporting Standard”, Table 5.3

Reduction Projects to Date

A number of emission reduction measures have already been undertaken as follows:

Travel – Employees are encouraged to hold meetings via online platforms such as Microsoft Teams in the first instance. This reduces the need for travel to site, thereby making transport emissions zero. Where site visits are necessary, car sharing is encouraged where possible, to reduce the number of vehicles travelling.

Waste and Procurement - The office has encouraged a paperless working system, meaning printing has been reduced. Schemes such as e-signing documents, drastically reduces the need to print several copies of large documents, as these can now be sent electronically. This scheme not only reduces the amount of paper needed, but also reduces the amount going to waste.

Separate bins are provided within the building to separate cardboard, paper, and plastics from the general waste. These items are then recycled via the council's collection service.

Measurement

Travel – At present, staff use their own vehicles for business travel, and claim fuel costs through expenses. To measure related emissions then, the distance travelled plus type of vehicle used (train, bus, bicycle, car - petrol, diesel, electric) can be recorded as part of the expenses claim and converted using the Government's Greenhouse Gas Reporting Factors³.

Where staff have scheduled a Teams meeting, thereby negating the need for travel, or have shared a single car to a meeting, this could also be recorded to quantify how well these schemes are working.

Waste – Quantities (kg) of each waste stream could be recorded and multiplied by the Government's Greenhouse Gas Reporting Factors³. The council should be able to provide information on how each stream is disposed of.

Procurement – The carbon emissions of products and services is much more difficult to calculate if it is not stated by the manufacturer or service provider. There is also a counter argument to including emissions associated with materials and products, in that these emissions have already been included as part of the provider's carbon footprint. The risk is that these emissions are effectively 'double counted'.

Rather than measuring set figures then, data on how many products or services are sourced within 5, 10, 50 miles etc, could be recorded. Equally the number of products or supply companies which have environmental certifications could be recorded and compared each year.

Reduction Opportunities

Travel – A travel hierarchy should be set that minimises travel and encourages zero and low carbon methods. Where meetings are set up by other companies, if possible, a request should be made that attendance could be via online meeting methods such as Microsoft Teams, to reduce carbon footprints.

1. Virtual meeting via Microsoft Teams
2. Travel via Bicycle, E-Scooter, or Public Transport
3. Car-Share

Figure 5 - Example 3BM Travel Hierarchy for Client Meetings

An investigation could be made into whether an investment into Pool Cars would be viable. These could be electric vehicles owned by 3BM, which staff can use in the first instance, rather than their own vehicles, which may have higher emissions.

Alternatively, an agreement with a hire car company could be investigated, whereby staff can hire an electric or low emissions vehicle for a few hours for visiting site.

A salary sacrifice scheme could be made available to staff, for the purchase of electric vehicles. This would allow staff to purchase an electric vehicle over time, with the money coming out of their pay before tax is calculated. This essentially makes the car much cheaper to purchase than via traditional methods. This will have the added advantage of reducing employees' emissions outside of work trips as well as during business use.

Waste – Whilst the largest waste streams are already separated, an assessment could be made to determine if any other waste items could be extracted for recycling.

Additionally, recycling points for other items not collected by the council, such as crisps packets, could be set up within the office for staff to use. Schemes such as Terracycle, provide support to set up a collection point, and free shipping for packaging waste that is then sent to them. This could be expanded to a public collection point located at the edge of the site, with the landlord's permission. This would not only reduce 3BM's waste, but also that of the local residents and businesses.

Procurement - Encouraging procurement from local companies will reduce the transport emissions of the products to the business. A list of local suppliers could be compiled, and the procurement team encouraged to use these companies in the first instance, before sourcing from elsewhere.

Equally, suppliers which use recycled materials, or have environmental certifications such as ISO 5001, ISO 14001, or PFC/FSC should be sourced before other companies.

Accountability

Accountability for implementing and installing this Decarbonisation Plan sits with 3BM's directors. Reporting on the Plan will be made at Director meetings on a 6-month basis, and progress or set-backs highlighted. The plan will be updated annually, to show which reduction measures have been implemented, associated carbon savings, and further reduction opportunities.

A working group of employees focussing on the decarbonisation is rolled out throughout the company, and further ideas and opportunities can be incorporated. This group is be made up of volunteers and open to all staff of any position or department.

Summary and Next Steps

This Decarbonisation Plan is the first step in enabling 3BM to become a zero-carbon company by 2050. The plan identifies the sources of 3BM’s GHG emissions, gives methods for measuring these, and identifies opportunities for decreasing emissions at each source.

By following the methodologies, 3BM will calculate their baseline Carbon Footprint, and then determine the best opportunities for reducing each of these.

The table below gives a summary of the items recorded herein.

Source	Scope	Measurement	Reduction Potential
Fugitive Emissions	GHG emissions from refrigerant leaks within cooling systems	n/a	<ul style="list-style-type: none"> - Ensure systems are maintained properly in line with manufacturer guidance - Replacement systems should have low GWP refrigerants such as R32
Grid Electricity	Emissions relating to the generation and transportation of Grid Electricity	<p>Take meter readings or electricity.</p> <p>Split readings into separate demands (Heating, Cooling, Lighting, Unregulated) where possible.</p> <p>Multiply by Government GHG conversion figures.</p>	<ul style="list-style-type: none"> - Install sensors on lighting to reduce use when not required - Investigate changes to windows to reduce heat losses and gains - Ensure systems are maintained properly in line with manufacturer guidance - Replacement systems should have high efficiencies - Reduce temperature settings to 18oC in Winter - Install sensors on heating and cooling to reduce use when not required - Survey plug-in equipment and remove unnecessary appliances - Install “Smart Sockets” to reduce use when not required - Move to a Green Energy tariff - Investigate PV installation on building - Buy shares in an LCZ installation elsewhere - Offset carbon through a verified scheme

Travel	Includes travel by staff for all business-related actions. E.g., Client meetings, site visits, conferences, etc.	Collate data on distance travelled and methods used. Multiply by Government GHG conversion figures.	<ul style="list-style-type: none"> - Set a travel hierarchy that makes online meetings the "norm". - Investigate options such as electric pool cars, or an agreement with a hire car company - Implement a salary sacrifice scheme for employees so purchase electric vehicles
Waste	Transport of waste from site to disposal facility. If going to landfill, also includes emissions to decomposition.	Record quantities of each material in kg and where this goes to. Multiply by Government GHG conversion figures.	<ul style="list-style-type: none"> - Investigate opportunities for further recycling inc. Food waste, and/or crisps packets
Procurement - Supply Chain	Emissions from everything procured by 3BM for operational purposes. Includes emissions related to business services, catering, ICT, etc.	Collate	<ul style="list-style-type: none"> - Encourage locally sourced products. - Encourage sustainably made/sourced products