

JIGSAW24

Energy management review

July 2021



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1. Introduction

1.1 Energy planning

As a company, we are committed to improving our energy efficiency. To make continuous steps towards achieving an ISO 50001:2018 certification - the international energy management system standard, Jigsaw Systems LTD appointed Roland Boyer-Blanchard to undertake an energy review. We chose the ISO 50001 route to ensure compliance with Energy Savings Opportunity Regulations 2019. The previous report was undertaken in September 2019 by an external consultant, Paul Briggs of Integer Data Limited.

This program of activities includes undertaking an energy review, reviewing an energy baseline, and reviewing energy performance indicators. It aims to identify significant energy usage and areas for continual improvement while maintaining compliance with relevant legislation. This document helps to demonstrate Jigsaw24's conformance to the clauses of ISO 50001:2018.

Please note that ISO 50001 is only concerned with energy efficiency, not the financial or environmental implications of energy use. To this end, emissions of CO2 are not directly relevant to ISO 50001, nor is the type of energy purchased. For example, ISO 50001 makes no distinction between energy supplied by nuclear, renewable, or fossil fuel sources.

1.2 Energy review

The Energy Review comprises of a detailed review of the energy performance of Jigsaw24. The review process is planned and conducted as part of the identification and prioritisation of opportunities to improve energy performance. The methodology developed for the initial energy review will be used to form future reviews, to enable accurate monitoring against Energy Performance Indicators.

The Energy Review is updated every two years and in response to major changes in the organisation and its structure. The Energy Review update will include:

- A review of the effectiveness of chosen EnPI.
- Assessment of any changes in the area of significant energy consumption.
- Assessment of the composition and order of priority for opportunities for improving energy performance.
- Assessment of the performance under the energy management system over the preceding period.

2. Energy planning process

Figure 1 depicts the energy planning process concept diagram as shown in Annex A2 of ISO 50001, to which the energy review relates. The following sections of this report set out the findings of the energy planning process specific to Jigsaw24.

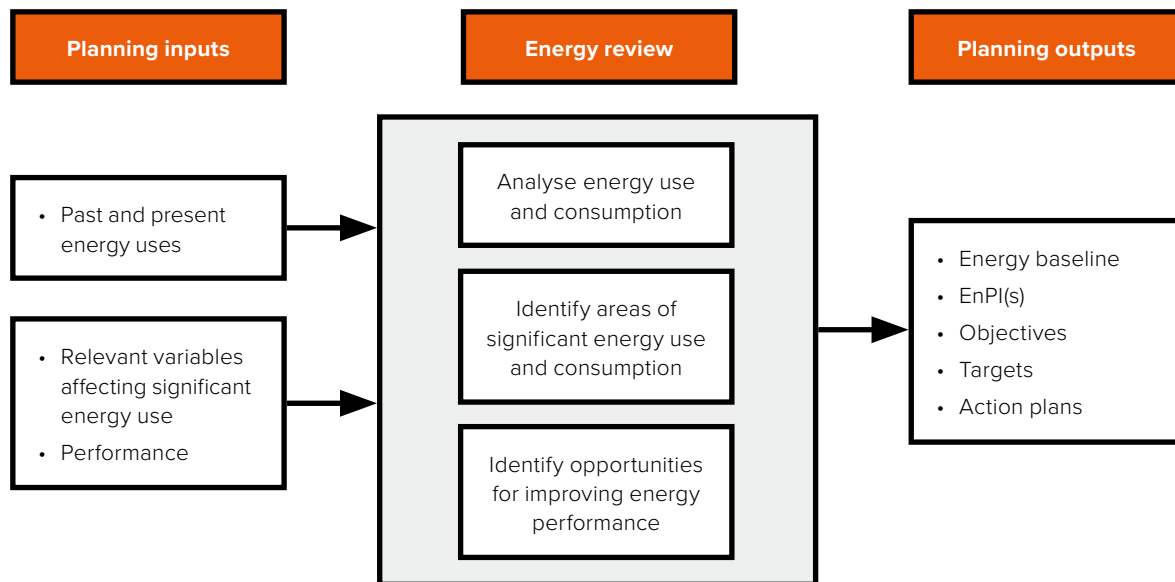


Figure 1. The basic concepts of energy planning

2.1 Energy Sources

Jigsaw24 does not generate its own energy. Energy sources directly consumed by Jigsaw24 are:

- Electricity supplied from the National Grid for use in offices.
- Electricity for servers, managed by a third party at an offsite location, Node4.
- Diesel and petrol for fleet business millage.
- Jigsaw24 did use gas at its Wardour Mews Office, however, this facility was closed in July 2020 and will therefore not be included in future planning.
- In Autumn 2021 Jigsaw24 opened a new location in Nottingham for office use that will be referred to as Resource House in this document. That location current also uses a gas boiler for hot water and a small number of radiators. The impact of this building will be detailed in this document however at the time of writing (July 2021), there are no energy records available to Jigsaw24 for this building.

No other energy sources are applicable to Jigsaw24. For clarity, this includes but is not limited to:

- Other modes of transport where Jigsaw24 does not purchase the fuel directly, i.e., flights, trains, taxis, and public transport. These transport modes are excluded from ESOS and are therefore excluded from this exercise. However, the carbon emissions of our business travel are recorded in a document that is out of the scope of this project.
- Renewable energy sources. Jigsaw24 does not own or operate any renewable sources of energy.

We explored the prospect of installing solar panels at our Nottingham HQ in partnership with Nottingham City Council in April 2021. After much consideration, it was ultimately concluded that the investment would be too long term (25 years). As Jigsaw24 are already purchasing 100% renewable energy, the impact on our overall carbon emissions would be limited, and this money would be better invested in other initiatives such as carbon offsetting and more efficient facilities and technology. This decision will be reviewed prior to the next energy review in 2023 should more efficient schemes be introduced.

2.2 Personnel with responsibility for energy usage

All Jigsaw24 staff must be deemed competent to undertake their role based on appropriate training, education, skills, and experience. Table 1 below details those roles where energy efficiency is a core competency. Section 7.2 of the EnMS details Jigsaw24's procedure regarding competence, training, and awareness.

Role	Responsibility	Competence
Top Management	Lead and support the energy efficiency objectives of the business. Lead the energy management and environmental teams.	
Environmental and Energy Manager	Monitoring of the system as required day to day operation and control Responsibility.	External training, BSI Internal auditor course May 2021.
Energy Team	Installation and maintenance of buildings and building services and provides Jigsaw24 with energy consumption data via meters.	Internal training.
Internal EnMS Auditor	Internal Auditing of EnMS.	Internal Auditor Training BSI.
Landlords	Maintenance of 8 Golden Square, London.	No direct responsibility.

Role	Representatives	SEU area
Managing Director	Roger Whittle	Lead energy and environmental initiatives and provide clear leadership and vision for energy and efficiency matters.
Chief Operating Officer	John Hughes	Support and sponsor environmental and energy initiatives.
Head of Operations	Roland Boyer-Blanchard	Auditing, building management and equipment purchase.
Finance Team	Abigail Gavigan	Fleet management and grey fleet usage.
IT Infrastructure Manager	Rory Coleman	IT Infrastructure.
Facilities Manager	Karolina Le Tu	Energy data collection.
Office Manager, Golden Square	Amran Ali	Office Manager, Golden Square.

Table 1. Energy management roles.

2.3 Past and present energy usage – sources of data

Jigsaw24 is not an intensive energy business, nevertheless, we have tracked our energy usage at our Nottingham and London offices since 2017. Other than ESOS 2014, the previous 2019 energy review carried out by Paul Briggs was the first exercise to identify and analyse our complete energy consumption in order to achieve ISO 50001 certification via BSI. While that review forms the format of this 2021 review, the data sources and collation of our energy consumption has been reviewed and is now collated in-house on a monthly basis. The data will also be used for our carbon footprint reporting. The data provided for this report is collated from several sources as detailed in table 2 below.

Data Source	Notes
High Church Street electricity meter	Smart meter half-hourly readings are provided on request from our energy supplier. Usage data is also acquired from invoices.
Golden Square electricity meter(s)	Manually checked and confirmed with invoices. At the time of writing the building has four separate electricity meters and these are all old-style manual meters. The landlord has committed to moving to smart meters later in 2021.
Wardour Mews gas & electricity meter(s)	Confirmed with Invoices. Note that this property closed in July 2020.
Company car mileage and fuel usage	Provided by the accounts team, data is recorded in our SID ERP system.
External server provider, Node4Data centre	Provided by Sub Contractor inclusive of Rack Cost on request.

Table 2. Energy Data and Source.

The information from the data sources in table 2 is collated into the EnMS review spreadsheet which records energy consumption across the whole organisation. This spreadsheet will be the primary source of data for the purposes of this energy review and is a controlled document stored in Jigsaw24’s SharePoint documentation library.

From July 2021, Jigsaw24 will be using Carbonfootprint.com’s Sustrax system for monitoring carbon emissions. Jigsaw24 will be looking at the feasibility of using Sustrax to store energy usage data for the purposes of ISO 50001 however, this is still under review at the time of writing as it is not known if Sustrax can record energy usage in kWh.

2.4 Past and present energy usage – baseline data

The previous 2019 report used a baseline based on 2017 energy usage. This report will also use 2017 as the baseline data and also compare the data to the 2019 figures. This report will be reporting on the 2020 calendar year. However, in order to align our energy usage to our carbon emissions reporting which is based on Jigsaw24’s financial year, we are considering changing the reporting period from June to May from the 2021/22 financial year for the next review.

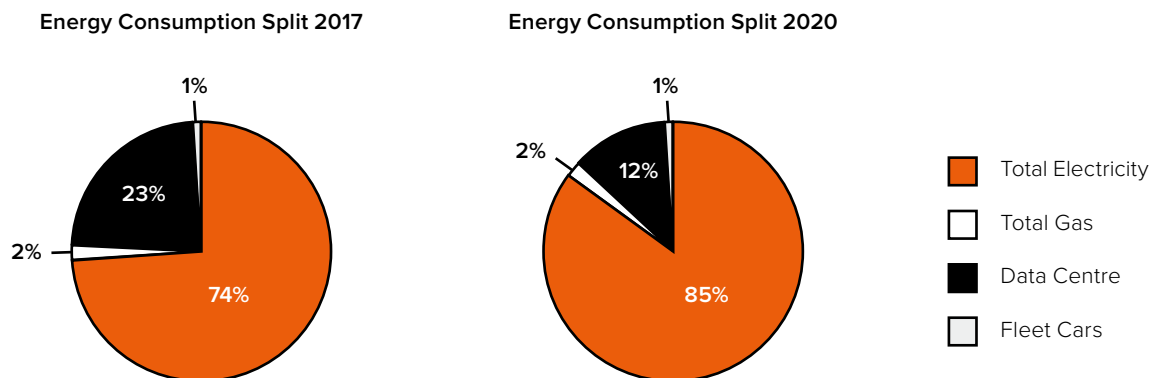


Figure 2. Breakdown of total vehicle, data centre, overall gas and electricity consumption (kWh) for baseline period calendar year 2017 & 2020.

The table below shows the energy usage by location and the significant locations of Nottingham HQ, Wardour Mews and Golden Square as well as data centre and fleet usage in 2017.

Energy Source	kWh
Total electricity (including remote server)	415789
Total gas	10283
Total fleet transport	134098
Total energy	549887

Table 3. Baseline energy consumption by energy source: financial year 2017.

2.5 Relevant variables

The following variables have been considered with regards to their impact on Jigsaw24's energy use, these variables were evaluated by the EMR. Where it is considered that Jigsaw24 has the ability to control or influence these variables to improve energy efficiency, an action has been added, which form the basis of the identified objectives.

Variable	Example impacts	Ability for Jigsaw24 to control or influence	Additional action	Owner	Comments & targets
Legal requirement	ESOS obligates Jigsaw24 to assess its energy efficiency, with the aim of identifying efficiency savings. The Energy Performance of Buildings Directive requires Jigsaw24 to assess the energy efficiency of its cooling systems and requires energy performance certificates for its buildings. Jigsaw24's HQ current EPC rating is C-72.	Significant	Ensure compliance with energy-related legislation through ISO 50001 accreditation. Understand wider legal obligations concerning energy and the environment.	RBB	We aim to get the Jigsaw24 HQ site to B EPC rating by the end of 2022. TM44 inspection carried out May 2022 for HQ. The company's solicitor reviewed all legal requirements regarding the environment in April 2021. Declaration made to the environmental agency with regards to ESOS, ISO 50001 on 26th April 2021
Ambient temperature	Narrowing the band of acceptable temperatures can reduce energy consumption. <ul style="list-style-type: none"> Control and lockdown of control units. Effects of insulation. 	None	Undertake degree day analysis to determine the impact of temperature on energy consumption. Continue Testing insulation.	RBB RBB	Degree day analysis relevance is currently under investigation as of July 2021. We aim to have improved insulation installed in the main HQ office by March 2021. We are currently evaluating quotes for insulating the rear warehouse roof (X2) and installing HVAC in this area which has considerable temperature fluctuation issues.

<p>New and improved technology</p>	<p>New technologies may improve energy efficiency. These include:</p> <ol style="list-style-type: none"> 1. Replacement of old telephony system in exchange for a more efficient. 2. Video conferencing. 3. Safe driver mobile apps. 4. Efficient AC units. 	<p>Significant</p>	<p>The cloud-based solution resulted in decommission of the whole telephony rack.</p> <p>Zoom video conferencing installed in 2018, estimated to have saved over 60,000 miles of train journeys per year.</p> <p>Rolling replacement of air conditioning unit continues.</p>	<p>IT</p> <p>IT</p> <p>RBB</p>	<p>A 3CX IP phone system was installed in December 2019.</p> <p>Several Zoom rooms were installed in HQ and Golden Square. We are considering moving to Microsoft Teams rooms in 2021/22 due to the performance of Teams during the pandemic.</p> <p>The main HQ office, server room, engineering areas and meeting rooms have been upgraded to more efficient R32 units since December 2019. There are five old R32 units remaining. Quotes have been sourced to upgrade these remaining units.</p>
<p>Efficiency of energy-consuming equipment</p>	<p>Energy consumption - using the most efficient equipment can reduce energy consumption significantly over the lifetime of the equipment. This includes:</p> <ol style="list-style-type: none"> 1. IT and office equipment. 2. Lighting that specifies the energy efficiency rating and/ or energy consumption. 3. Air conditioning units. 4. Kitchen equipment. 	<p>Significant</p>	<p>Jigsaw24 already use Apple equipment for 99% of its estate and this has a proven track record of energy efficiency. All users use laptops that typically have 85kW PSU's and over 10-hour battery life so their devices can run without being plugged into mains power.</p> <p>An initiative to replace appliances, fridges and TVs with the highest energy rated units possible equipment continues.</p>	<p>RW</p> <p>RBB</p>	<p>We are continuing the rollout of Mac and iOS refresh to newer more efficient models.</p> <p>TVs are set to go into standby mode after one hour. Staff are encouraged to turn lights and TV's off.</p> <p>The domestic appliance energy rating scheme changed in March 2021, so the old A-rating is now equivalent to the lowest G-rating. While energy rating is of primary importance, there are virtually no A-rated appliances available at the moment, so an F-rating is likely to be as high as we can aim initially.</p>

Building services	<p>The type, age controls for building services such as AC, lighting, and impact on energy efficiency such as the ability to:</p> <ol style="list-style-type: none"> 1. Open windows. 2. Switch on/off lighting and AC units. 3. Automated controls on lighting such as PIR. 4. Impact efficiency through the type of bulb used. 	Significant in Nottingham HQ	<p>An ongoing program to replace AC Units with more efficient ones.</p> <p>Windows were replaced in 2016 and are the highest thermal rating. We will review this by 2023 to determine whether there is newer technology available.</p> <p>In September 2019, LED lighting in all areas with PIR sensors was implemented in our X2 Warehouse.</p>	<p>RBB</p> <p>RW</p> <p>RBB</p>	<p>(Please see above.)</p> <p>This is not available in London as this building is rented.</p> <p>Our Nottingham HQ had further LED lighting installed for emergency lighting in 2020. This is now complete.</p> <p>Resource House has already been refurbished with LED lighting and modern HVAC. Jigsaw24 will be influencing the final design and build out, with energy reduction a core priority.</p>
Maintenance	<p>Well maintained equipment functions effectively, prolongs the lifespan of equipment and consumes less energy. This includes:</p> <ol style="list-style-type: none"> 1. Maintenance lifts at Golden Square & Nottingham HQ. 2. Maintenance AC. 3. Maintenance company vehicles. 	Moderate	<p>Implement a maintenance procedure for all significant energy consumption equipment.</p>	<p>RBB/LS</p> <p>RBB</p> <p>ACC.</p>	<ol style="list-style-type: none"> 1. The new lifts in London and GSW offices are not yet serviced. 2. See separate document. 3. Company car maintenance is the responsibility of the individual, but accounts send out reminders based on their records.
Offices	<p>The energy efficiency of an office building depends upon several factors including:</p> <ul style="list-style-type: none"> • The building fabric, particularly its insulating properties. • The design e.g. the proportion of windows in exterior walls. • The type of building. • The most recent refurbishment. • The floor area. 	Significant	<p>Ensure building works or refurbishments consider energy and carbon reduction in their materials, equipment and strategies.</p> <p>All buildings will use 100% renewable energy by July 2022 when our current contract with British Gas ends.</p>		<p>(See previous notes re: insulation and HVAC upgrades and windows.)</p> <p>Jigsaw24 acquired the first floor of our Golden Square building and refurbished this in 2019/20 to accommodate Wardour Mews staff. The windows and insulation were deemed adequate.</p> <p>(See section on Resource house below.)</p>

Company car fleet	<p>A few factors influence the energy efficiency of fleet usage. This includes:</p> <ul style="list-style-type: none"> • Millage travelled. • Age of vehicles. • Engine size. • Fuel type. • Driving style. 	Moderate	<p>Policy to remove all company-owned fleet cars by January 2022 by offering car allowances.</p> <p>Fuel and carbon data capture includes company-owned fleet, car allowance users and all other grey fleets (all staff fuel expense claims).</p> <p>The current Jigsaw24 HQ delivery van is currently 2018 EU6 diesel. We will be moving to full EV, however, due to extremely low mileage for this vehicle, this is likely to be delayed until 2022.</p> <p>We encourage all drivers with car allowances to move to electrified vehicles when replaced (this will also be extended to all staff, see EV section below).</p>	<p>DD</p> <p>RBB</p> <p>RBB</p> <p>RW</p>	<p>A company policy has been put in place to longer issue company fleet cars, with current fleet users encouraged to move to car allowances.</p> <p>Five company cars have been sold since March 2020. Our current fleet includes two diesel vans and three plug-in hybrid cars - two of which will be sold by the end of 2021.</p> <p>One vehicle purchased in March 2020 was a diesel van. Hybrid or EV options were limited and ruled out due to cost or range.</p>
Number of employees	<p>An increase in employee headcount requires further offices and IT equipment which results in increased energy consumption.</p> <p>We plan to grow our sales team.</p> <p>We expect our services team to grow.</p>	Moderate	<p>Our staff levels have increased by over 10% per year, however, energy consumption has not increased in line with this growth.</p> <p>The impact of the Covid-19 pandemic and the increase in home working is a key factor in 2020/21.</p> <p>Services team expansion has driven the requirement for further office space at Resource House (see section below).</p>		<p>Our current staff headcount is 310 as of June 2021.</p> <p>Acquiring Resource House could give capacity for up to 100 further heads.</p> <p>(See section on Covid-19.)</p> <p>(See section on Resource House below.)</p>
Lighting	<p>Additional savings through PIR technology will enable lights to be switched off.</p> <p>Training to encourage switching off lights.</p>	Moderate	<p>Our Nottingham and London offices are 100% LED including emergency lighting in Nottingham.</p> <p>PIR in use where relevant.</p> <p>'Lights off' policy in place.</p>	RBB	<p>Emergency lighting in our Nottingham HQ changed to LED.</p> <p>Resource House is already fully refurbished with LED and PIR throughout 2020.</p>
Wardour Mews closure & integration at Golden Square	<p>Wardour Mews staff relocated to our Golden Square offices in early 2020, the building was repurposed as an engineer and office space.</p>	Significant	<p>The new floor has been acquired as office and event space. The old Wonderland room was repurposed as office space. An additional office has also been installed.</p>	JH	<p>Golden Square energy consumption will increase, however, Wardour mews will not be a consideration after July 2020.</p>

Covid-19 pandemic	Home working was encouraged for all staff so they could follow government guidelines.	Moderate	<p>Between March and June 2020, the number of staff allowed on-site at the Nottingham HQ was limited to approximately 45 key warehouse and technical workers. Between June and April 2021, office workers were limited to 56. From April 2021 to date there are 86 staff on-site (plus initial key worker teams).</p> <p>Our Golden Square offices have been closed for a significant part of the pandemic, opened for 2 days per week for roughly 12 weeks but with very little uptake from home workers.</p>	JH	HVAC remained operational but very little IT usage, very little company car or general business travel.
Electric vehicles (EV) and charging points	Installation of EV charging points at our HQ.	Significant	<p>To encourage uptake of EVs by staff, Jigsaw24 are committing to EV charge points at our HQ. They will also be able to be used by visitors.</p> <p>We will introduce a salary sacrifice scheme to assist staff with purchasing or leasing an EV.</p> <p>We are currently at the advanced quotation phase as of July 2021.</p> <p>This will obviously increase our electricity consumption but would hopefully be offset by the reduction in fossil fuel-based expenses.</p>	RBB	<p>Staff survey to identify potential use.</p> <p>Introduce staff incentives such as salary sacrifice for EV leasing.</p> <p>Installation of charging points.</p> <p>Purchase of electric delivery van in 2022 (or lease at an earlier date).</p>

Resource House	Ensure energy, environmental and carbon emissions are the highest priority in any new building	Significant	<p>Current staff were 'heat mapped' for their home location in order to choose a suitable site.</p> <p>The site was chosen based on proximity to the Nottingham NET tram network (park and ride is a five-minute walk).</p> <p>The building has already been refurbished with LED lighting and HVAC (although not all R32 based units).</p> <p>All procurement of facilities and building materials will be the highest energy rating possible.</p> <p>Focus on sustainable materials and culture in the design.</p> <p>The current EPC rating is C-68</p> <p>The building does have a gas boiler for hot water and a few communal radiators in corridors.</p> <p>Planning permission to increase on-site parking spaces is in place, this will require EV points to be installed.</p>		<p>Encourage the use of public transport (the tram Park and Ride also has EV charging points).</p> <p>The designer was advised to focus on sustainability and energy efficiency wherever possible.</p> <p>All appliances are the highest possible energy rating.</p> <p>Identify opportunities to remove the gas boiler and replace it with inline water boilers and non-gas heating in communal areas.</p> <p>EV points will be installed if the car park proceeds.</p>
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Table 4. Relevant variables that impact energy consumption at Jigsaw24.

3. Energy review

3.1 Analyse energy use and consumption

Jigsaw24 analyses the monthly electricity consumption of each building using verifiable data (energy supplier invoices). This includes trend analysis, year on year variations and forecasting. Note that the Cardiff and Glasgow offices are small fully managed sites, and the electricity cost forms part of the rent, so Jigsaw24 has no visibility on the electricity usage for these sites.

Jigsaw24 also monitor business fuel consumption for company-owned fleet vehicles, vehicles driven by employees who have a car allowance as part of their salary and 'grey fleet' business mileage claimed back as expenses by all staff using their personal transport. The business owns one company van used for local deliveries in the Nottingham area.

To calculate energy usage (kWh/driver) for our company fleet, we have used data from our annual mileage allowance reports.

All driver mileage is accumulated to give the total mileage data.

The monthly total (£) has then been divided by £0.12 (the amount Jigsaw24 pays in expenses for each mile travelled) to give us total mileage for the particular month. The 12p rate applies to company car and car allowance staff. Grey fleet is paid at 45p per mile, but this is out of the scope of this report.

Example: An employee claimed £100 this month for fuel. As Jigsaw24 pays £0.12 for each mile travelled: £100/£0.12 = 83.33 (miles).

Litres of fuel used is calculated by dividing total mileage by the vehicle's MPG (miles per gallon – the average from our company cars is 44.7 MPG), and then multiplied by 4.5 to convert gallons to litres.

Each litre of fuel (petrol/diesel) is equivalent on average to 10.3 kWh (based on published data).

Total litres of fuel are multiplied by 10.3 kWh to give us the total energy used.

Total kWh is then divided by the number of drivers, giving us the average kWh/driver per month.

Individual driver data is also available in the data worksheet.

3.2 Identify area of Significant Energy Use and Consumption

ISO 50001 does not define the term significant regarding energy consumption. ESOS requires organisations to account for at least 90% of their energy consumption. For Jigsaw24, our offices are the most significant energy-consuming aspect of the business. However, to focus solely on our offices neglects other potential energy-saving measures. Therefore, Jigsaw24 defines significant energy consumption as:

- An individual process, plant, or operation where there is the potential to realistically improve its energy efficiency by at least 10%, considering available technology and resources.
- An energy source that accounts for at least 5% of total energy use. Therefore, significant energy uses are fleet and electricity consumption.
- Energy consumption via external servers is less than 1% of total energy and consumption is excluded from further analysis.

Jigsaw24 has identified its significant energy uses (SEUs) as:

Nottingham	Golden Square	Field	Resource House
Heating/cooling.	Heating/cooling.	Company cars.	Heating/cooling.
Lighting.	Lighting.	Node4 data centre.	Lighting.
Desktop/portable computing.	Desktop/portable computing.		Desktop/portable computing.
IT infrastructure.	IT infrastructure.		IT infrastructure.
Goods lifts.	Lift.		Lift.
Warehouse stacker truck.			
EV charge points.			

Table5. SEU's by location.

At the time of writing this report, it is not possible to track the electricity usage of individual SEUs, with the exception of company cars and the data centre. Jigsaw24 will look into the feasibility of further breaking down its electricity usage by the implementation of suitable technology in the next financial year. However, we will still, where feasible, implement opportunities for improvement for these SEUs. We will track our overall electricity in order to understand where we can improve.

Jigsaw24 can estimate the maximum consumption of our HQ lighting, air conditioning and all staff computers by detailing the maximum power consumption of individual lights, AC units, computers and monitors. However as the systems do not run at maximum power consumption at all times, this would result in an overestimation.

With regards to desktop computing, the major consumers will be staff computers and the servers in the computer room. All staff are issued with Apple MacBook computers which typically have 61w AC adaptors, monitors are mixed brands and sizes, but an average 24' monitor will have an 11w AC adaptor.

As can be seen from the table below, the maximum power consumption of lighting, AC and computers would be far higher than our overall electricity usage.

Jigsaw24 propose to carry out some degree of day analysis in order to identify the approximate boundaries where AC heating and cooling are required in the Nottingham building.

SEU	Item description	Quantity of items	Item energy consumption	Total maximum KwH consumption
HQ lighting	LED ceiling lights	274	40w	10.96 KwH
	LED spotlights	50	5w	250 w
	LED batons in warehouse	44	85w	3.74 KwH
HQ lighting total				15.43 KwH
HQ Air Conditioning	AC units between 3.5Kw & 25Kw	19		218 KwH
Staff MacBook's	Various MacBook Airs & MacBook Pros	306	Typically 61w	18.66 KwH
Staff monitors	Various models and sizes	306	Typically 11w	671 w
Staff computing Total				19.34 KwH
Total lighting, AC & computing				287.051 KwH

Table6. Key SEU's estimated maximum consumption.

With regards to the data centre, Jigsaw24 do not have access to the exact energy consumption, so the figures given are the maximum rating based on the specification of the base lease (currently drawing up to a maximum of 16 amps but we are aware that there is significant spare bandwidth within that, and the usage will be reduced in 2021/22.

The goods lift and electric stacker truck in Nottingham and shared elevator in Golden Square are deemed to be relatively low consumers. The Golden Square lift is shared with other users of the building.

3.3 Exclusions

Jigsaw24 will include at least 90% of its future energy consumption in this review. From figure 2b, it is clear that the majority of electricity consumption is from two offices: High Church Street and Golden Square and to a lesser extent Wardour Mews - which was unmanned from January 2020, with the lease expiring in July 2020, and therefore will be excluded from objectives. Two other small 2-man offices in Scotland and Wales are managed offices and they are both difficult to track but also likely to be less than 2% of energy consumption. Therefore, in accordance with its definition of significant energy consumption, Jigsaw24 proposes to exclude these other offices from further assessments.

For the estimations for our energy usage for 2021/22, we will add in estimations for Resource House that will be occupied from September 2021.

The ability to exclude certain energy-consuming processes is useful where a minor and insignificant energy consuming process is identified. This is because such processes would require more managerial effort to include within the EnMS than there is potential for efficiency savings being gained. Jigsaw24 will review and update the list of excluded processes as part of the periodic Energy review update.

3.4 Impact of the Covid-19 pandemic in 2020/21.

Comparing 2020 (and 2021 to date) to previous years and the 2017 benchmark is a difficult task due to the impact of the Covid-19 pandemic. The pandemic significantly reduced the number of staff that were allowed on-site from March 2020. Our Nottingham HQ continued to operate with most office staff working from home, with only the warehouse, repair centre and a few members of support staff on-site throughout the pandemic. This was approximately 46 people

on average, from June 2020 Jigsaw24 allowed up to 56 additional staff on-site, increasing to 112 from April 2021. While this will have had a minor impact on IT and kitchen appliance usage, the lighting and air conditioning continued to operate as normal throughout the building. There was also a significant amount of extended working hours later in the year from November 2020 to May 2021 to accommodate some large projects.

At the peak of the pandemic (Q2 and Q3 2020 plus Q1 2021), Nottingham HQ consumption reduced by an average of 16% per quarter against the previous respective quarters.

Golden Square effectively shut down for a large part of 2021, opening two days a week later in the year and closing again in the January 2021 lockdown. However, the increase in office-based staff negated any reduction in energy consumption.

Despite the pandemic, the overall headcount is increasing at around 10% per year, currently 306 as of July 2021.

3.5 Future energy use and consumption objectives

The targets for 2021 have therefore been set as follows:

Source	Target
High Church Street HQ	5% increase in overall kW/h per square meter. While the opening of Resource House will reduce on-site head count by 50-70 staff initially in Q4, this is expected to be offset by the return of staff to the office post-Covid-19 lockdown in Q3. Energy consumption is expected to be lower for Q1 & Q2 and rise to pre-Covid-19 levels in Q3 and Q4.
8 Golden Square	10% increase in kWh per square meter, mainly based on more staff returning to work full-time in the latter half of the year, as pre-Covid-19 there were fewer staff based here and the floor layout was different.
Resource House	Begin to monitor consumption by September 2021. The building uses electricity and gas which will be renewably sourced.
Car Fleet	It is intended to reduce company car ownership to two vans if possible by the end of 2022, at the time of writing four company cars have been sold by the business since October 2020.

Table 7. 2021 targets

Planned energy usage across its two main sites based on current usage and predicted headcount growth is as below:

Period	Nottingham Kw	% Gain, reduction	GSG Kw	% Gain, reduction	Wardour Mews Electric Kw	Wardour Mews Gas Kw	% Gain, reduction	Data Centre	Total building kWh	kWh per head	Diff to previous year qtr	% Gain, reduction
Q1-2020	53807	11.5	14699	8.9	9774	3936	-22.7	8541	90757	313.0	-13733	-13.14
Q2-2020	31675	-15.1	16488	21.3	11033	1891	-27.6	8541	69628	240.1	-24105	-25.72
Q3-2020	32554	-22.8	15930	23.0	0	0	-100.0	8541	57025	196.6	-27571	-32.59
Q4-2020	46048	-6.4	18410	36.4	0	0	-100.0	8541	72999	251.7	-18913	-20.58
Total 2020	164084	-7.3	65527	22.4	20807	5827	-65.5	34164	290409	1001.4	-84322	-22.50
Q1-2021	48365	-10.1	17168	16.8	0	0	-100.0	8541	74074	238.9	-16683	-18.38
Q2-2021	34843	10.0	18136	10.0	0	0	0	8541	61520	198.5	-8108	-11.64
Q3-2021	37437	15.0	17523	10.0	0	0	0	8541	63501	204.8	6476	11.36
Q4-2021	48350	5.0	20251	10.0	0	0	0	8541	77142	248.8	4143	5.68
Total 2021	168995		73078.47		0	0		34164	276237	891.1	-14171	-4.88

Table 8. Estimated targets for 2021.

Upper and lower control limits will be put in to trigger non-conformances if energy usage increases in real terms or drops by more than 10%.

3.6 Identify opportunities for improving energy performance

As part of EnMS, Jigsaw24 will continually review its overall energy efficiency performance. This will be undertaken by the Environmental and Energy Manager and Managing Director. Dependent on resources, employees with site-level responsibility will review energy performance at their sites.

Further analysis shall be undertaken to assess the impact of the different variables on energy efficiency.

Historical performance, future planned performance, objectives, and opportunities for improvement will be discussed by the energy team at least twice a year.

4. Planning outputs

4.1 Baseline

Jigsaw24 has set the 2017 calendar year as its baseline year. This corresponds to the start of Jigsaw24's implementation of energy-saving practices and the introduction of ESOS.

The baseline may be amended where it is no longer considered relevant, such as due to significant changes in energy consumption or business operations.

4.2 Benchmarking

Benchmarking allows companies to compare predicted and best practice performance to actual performance and to analyse any variance from predicted performance. External benchmarking is the process of comparing an organisation's performance to other organisations. Due to the nature of Jigsaw24's Nottingham office, Jigsaw24 shall not undertake an external benchmarking and will only review the results of internal benchmarking. Internal benchmarking is the process of comparing energy consumption across Jigsaw24's office portfolio. This has been undertaken and is recorded in the EnMS analysis and forecasting spreadsheet. Where significant deviation from the benchmarks is identified, Jigsaw24 shall investigate the root cause and implement corrective action where appropriate.

4.3 Energy Performance Indicators (EnPI)

Energy in kWh is reported to the board as a key performance indicator (KPI). The energy KPI's are calculated against square meters of floor and headcount to account for growth and are shown below.

Year	Nottingham	GSQ	Wardour Mews	Data Centre	Company Fleet	Total Energy Usage	Annual Diff %
2017	209797	44825	81449	100000	134099	570169.8	Baseline
2018	185366	51761	95020	100000	125000	557147.0	-2.8
2019	176978	53537	78271	67082	84348	460216.0	17.40
2020	164084	65527	28702	34164	41753	334229.7	-27.38

Table 9. Overall energy usage for all sites plus fleet, annually since 2017

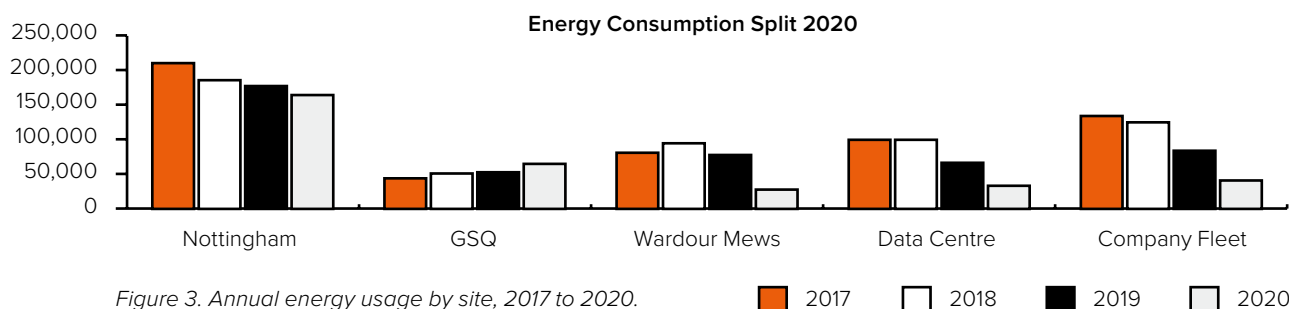


Figure 3. Annual energy usage by site, 2017 to 2020.

Legend: 2017 (orange), 2018 (white), 2019 (black), 2020 (grey)

Period	Nottingham	GSQ	Wardour Mews	Data Centre	Company Fleet	Total Energy Usage	Qtr Diff %
Q1-2019	48262	13498	18476	25000	1632.1	106868.1	
Q2-2019	37302	13589	19207	25000	1467.7	96565.7	
Q3-2019	42195	12952	20939	8541	1600.1	86227.1	
Q4-2019	49219	13498	19649	8541	2329.1	93236.1	
Q1-2020	53807	14699	14326	8541	2107.8	93480.8	-12.53
Q2-2020	31675	16488	14376	8541	599.5	71679.5	-25.77
Q3-2020	32554	15930	0	8541	1029.1	58054.1	-32.67
Q4-2020	46048	18410	0	8541	902.8	73901.8	-20.74
Q1-2021	48365	17168	0	8541	1831.1	75905.1	-18.80

Table 10. Overall energy usage for all sites plus fleet, quarterly 2019 to Q1 2021.

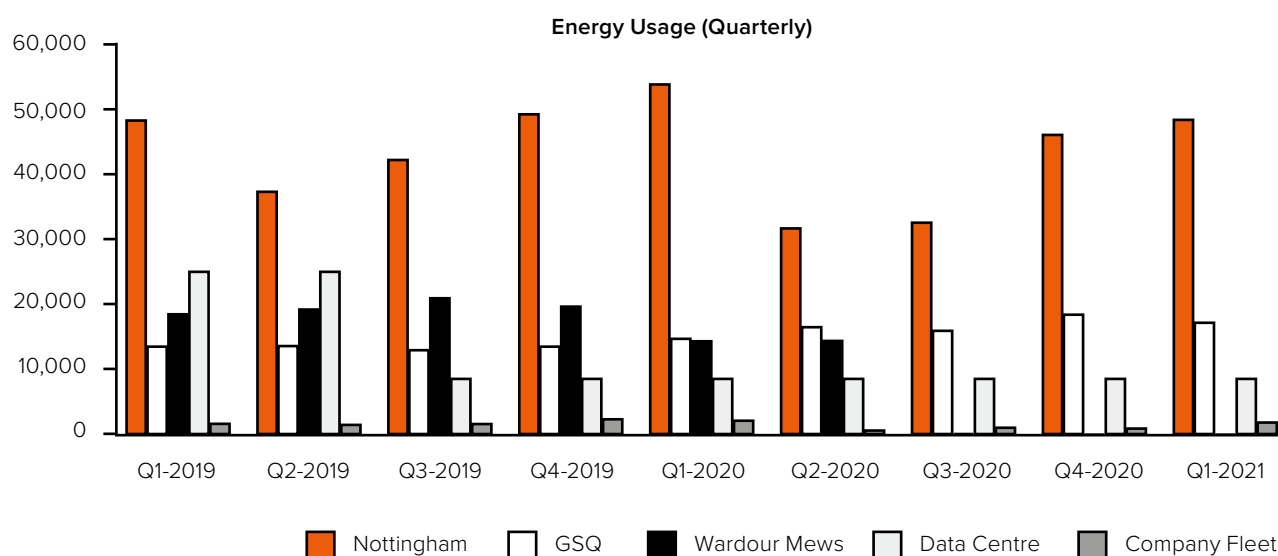


Figure 4. Performance by Site, 2020 v 2019.

Site	2020	2019	Annual Diff%
Nottingham HQ	164084	176978	-7.29
Golden Square (GSQ)	65527	53537	22.40
Wardour Mews	28702	78271	-63.33
Data Centre	34164	67082	-49.07
Company Fleet	41753	84348	-50.50
Overall Total	334230	460216	-27.38

Table 11. Total combined 2020 v 2019 comparison by site.

2020 Energy Consumption

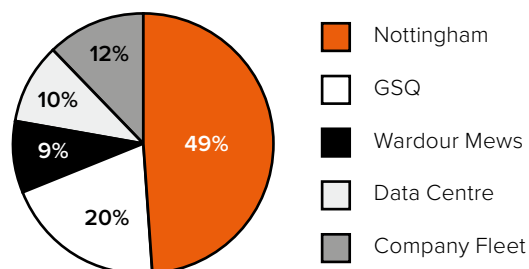


Figure 5. Energy consumption split by site / SEU 2020.

Energy Consumption Split 2020

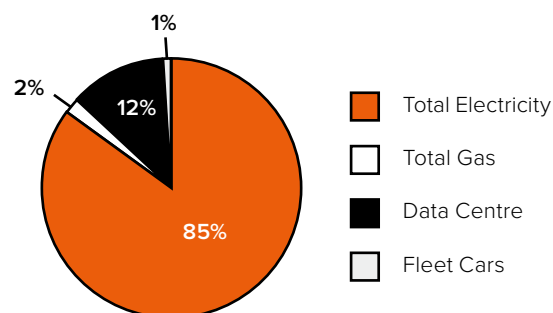


Figure 6. Energy split by source for 2020.

Headcount based

Jigsaw24's headcount has increased by approximately 10% year on year (it sits at 306 as of July 2021 compared to 208 in 2017). As the headcount has increased it is clear that energy consumption has not increased significantly as a result of the energy-saving initiatives and investments that have been made, particularly HVAC & lighting. Historic data is not available on the number of staff employed specifically at each site for previous years, so the figures below divide the consumption by the total number of Jigsaw24 employees at the beginning of each year. The 2020 numbers also do not take into account reduced on-site headcount during the pandemic lockdown.

	KwH per head
Q1-2017	437.5
Q2-2017	375.5
Q3-2017	353.5
Q4-2017	433.9
Q1-2018	333.8
Q2-2018	365
Q3-2018	312.9
Q4-2018	420
Q1-2019	340
Q2-2019	266.5
Q3-2019	289.3
Q4-2019	313.2
Q1-2020	285.6
Q2-2020	215.7
Q3-2020	167.2
Q4-2020	222.3
Q1-2021	211.4

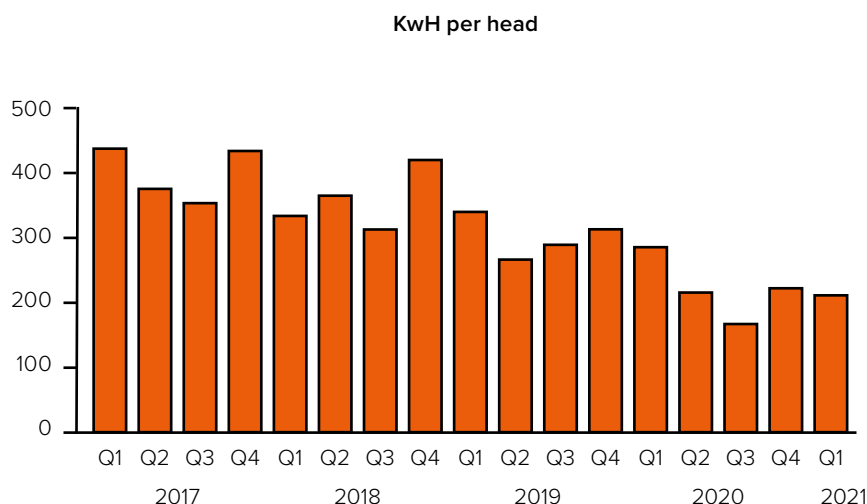


Table 12. Energy consumption v annual headcount.

Energy consumption by building Sq m

The closure of Wardour Mews reduced Jigsaw24's overall sq m significantly, but the transfer of staff and equipment to Golden Square has not had a significant impact on the Kw /sq m calculation, which has remained stable for Golden Square and the business as a whole. However, these figures will be significantly impacted by the Covid-19 pandemic in 2020.

Period	Nottingham Kw	Sq m	kWh per m ²	GSQ Kw	Sq m	kWh per m ²	Wardour Mews Electric Kw	Wardour Mews Gas Kw	Sq m	kWh per m ²	Total Building Sq m	Total Building kWh per m ²
Q1-2019	48262	2741	17.6	13498	290	46.6	13936	3794	882	20.1	3913	20.3
Q2-2019	37302	2741	13.6	13589	290	46.9	14636	3206	882	20.2	3913	17.6
Q3-2019	42195	2741	15.4	12952	290	44.7	20622	286	882	23.7	3913	19.4
Q4-2019	49219	2741	18.0	13498	290	46.6	18012	2642	882	23.4	3913	21.3
Q1-2020	53807	2741	19.6	14699	290	50.7	9774	3936	882	15.5	3913	21.0
Q2-2020	31675	2741	11.6	16488	290	39.8	11033	1891	882	14.7	3913	15.6
Q3-2020	32554	2741	11.9	15930	290	38.4	0	0	0	0	3031	16.0
Q4-2020	46048	2741	16.8	18410	290	44.4	0	0	0	0	3031	21.3
Q1-2021	48365	2741	17.6	17168	290	41.4	0	0	0	0	3031	21.6

Table 13. Energy consumption by building sq m.

Energy consumption commentary by site

Jigsaw24 can demonstrate that energy consumption in its Nottingham HQ has fallen year on year since 2017. In 2020 we saw a 7.28% overall reduction but as mentioned previously, the Covid-19 pandemic will have been a factor in this. In addition to the core warehouse, engineering and technical support staff (approx. 46 heads) who have been working throughout the pandemic in the building, staff numbers allowed on site were reduced by around 65% from March 2020 and increased by up to 56 staff from June 2020. New air conditioning was installed in the main office area, plus the technical area which previously had no AC installed, as well as fresh air filters. The AC continued to operate as normal for most of this period. LED lighting was increased to include emergency lighting in the summer of 2020.

Golden Square electricity consumption has increased year on year, however, the site started accommodating the Wardour Mews staff from Q1 2020. This saw Jigsaw24 acquiring a new floor of the building and repurposing part of the building as engineer space, which included expanding the on-site server requirements and upgrading air conditioning. In 2020 Golden Square consumption increased by 22.4%.

Wardour Mews effectively closed in August 2020, however it was only lightly occupied from January 2020. Note that gas formed 5827Kw of energy compared to 20,807Kw of electricity.

Jigsaw24 use an external data centre known as Node 4. The capacity was greatly reduced in 2019 due to removing redundant servers which decreased potential electricity usage by over 50%. Note that the figures are maximum consumption based on leased ampage and may not be a true reflection of the exact amount of power consumed.

Company-owned vehicle fleet

For its car fleet, Jigsaw24 intends to use the following EnPI: kWh per driver. The actual average kWh per driver is shown. Note that Jigsaw24 has introduced a policy of no longer issuing company-owned fleet vehicles, instead offering car allowances as part of salary. The energy of non-company owned fleet vehicles is out of the scope of this report however, Jigsaw24 are monitoring and recording all company car, vehicle allowance and 'grey fleet' (all other staff expenses from personal vehicles) as part of their carbon monitoring and carbon reduction plan. Covid-19 reduced company car travel enormously. Q1 2020 saw an increase in business travel due to several high-profile contracts that were in the negotiation stage at the time, plus a requirement for more engineers to attend customer sites. It is accepted that after Q1 2020, travel data generally is an anomaly caused by the pandemic

	EnPI = kWh/driver					
	2017	2018	2019	2020	2021	2020 v 2019 % Diff
January	352.6	452.9	550.6	729.1	567.1	32.4
February	427.2	444.5	657.3	827.7	643.8	25.9
March	427.7	492.4	424.2	551.0	428.5	29.9
April	559.1	508.1	482.4	355.4	276.4	-26.3
May	560.5	515.5	467.7	137.3	106.8	-70.6
June	592	472.8	517.6	106.8		-79.4
July	396.1	621.4	505.6	133.5		-73.6
August	519.4	504.3	532.2	338.0		-36.5
September	537.9	625.6	562.3	557.6		-0.8
October	429.4	654.6	988.5	503.3		-49.1
November	540.8	556	644.0	177.8		-72.4
December	405.6	427.9	696.6	221.7		-68.2
Total:	5748.3	6276	7029	4639.2	2022.6	-32.4

Table 14. Company-owned vehicle fleet kWh per driver.

4.4 Opportunities

The energy review has identified opportunities for improving energy performance that Jigsaw24 are considering. These potential opportunities are outlined in the table below.

Opportunity	Impact	Progress as of September 2021	Time frame
Implement a maintenance procedure for all significant energy consumption equipment.	High	In progress, records are available for AC & emergency lighting.	2018
Review of increased use of PIR technology.	Medium	This is in place in all areas at all sites where relevant to do so (including Resource House).	2018
Printing – look into further options to reduce printing.	Medium	Accounts and most areas are now virtually paper-free (a byproduct of the pandemic home working). Our warehouse is looking into how paper dispatch notes could be removed. Most export paperwork is electronic, however we are finding that we still have to provide duplicate paper copies.	2020
Improve carbon reporting.	High	Partnered with Carbonfootprint.com for the 2020/21 report. Using their Sustrax software for 2021/22 reporting.	May-21
Undertake degree day analysis to determine the impact of temperature on energy high consumption.	Low	This is under review. 23 degrees has been identified as an ideal setting but HQ building is prone to changes in temperature based on the external temperature.	Jun-21

Ensure energy management is a key consideration in any proposed office space search.	High	Environmental considerations were at the forefront in the search for an additional building. Factors considered included: heat map of staff to identify the most suitable location for all staff to commute to. The energy efficiency of the building. Use of LED lighting, modern AC & electrics. All energy will be sourced from renewables. The building has infrastructure for EV points and is within walking distance from the tram Park and Ride.	Jun-21
Install electric vehicle (EV) charging points at our HQ.	High	Now in place as of August 2021 at our Nottingham HQ, with plans to install chargers at Resource House in 2022. Chargepoint is our partner. EV charging is not relevant to our London office due to it being located in Soho.	Aug-21
Encourage all staff to consider electric vehicles for their next car.	Medium	EV salary sacrifice leasing scheme that can assist staff in upgrading to an EV is at the pilot stage with a strong level of interest.	Aug-21
Continue to maintain ISO 50001 certification, originally gained in 2019.	High	Next annual audit November 2021 with NQA, UKAS accredited provider	Nov-21
Encourage Tram to work	Medium	The newest office, Resource House, has been selected due to its proximity to the tram Park and Ride. The Tram2Work scheme is under consideration, however interest from staff has been low so far.	2021
Make company car and van fleet fully electric.	Medium	The company car fleet will be sold by 2022, replaced with car allowances. Users will also be encouraged to move to electrified vehicles where possible. The company van will be replaced with an EV when ready. Mileage is extremely low.	2021
Review the process of recording company mileage to take electric vehicle charging into account for ongoing reviews.	Medium	As EV uptake rises and Jigsaw24 install charging points, the methodology of recording mileage will need to be reviewed to take into account electricity consumption, both on-site and as part of staff fuel expenses when charged externally.	2021
Discuss the possibility of developing safe driving apps with the apps team.	Low	Jigsaw24 always encourage safe and frugal driving techniques and we have decided that the use of apps should be a personal choice. Our new health insurance provider vitality can provide suitable apps to all members.	2021
Review insulation trial and make a decision.	High	The main office ceiling has been insulated. Quotes have been obtained to possibly insulate the rear warehouse roof that currently has no HVAC.	2022
Encourage couriers to look at what schemes and options are available to reduce emissions and drive more EV deliveries.	Medium	Mainly relevant to carbon emissions. DPD, UPS & DHL are key partners and are all increasing EV presence, however, reporting their carbon emissions is over-complicated and costly.	2022
Look into breaking down electricity usage further to track individual SEU.	Medium	Ongoing, SEU's are known, Jigsaw24 need to carry out work on fuse boards to identify routing and remove obsolete cabling first.	2022
Obtain improved energy performance certificate (EPC) ratings for all buildings.	High	This is currently in place. Nottingham HQ review is in 2022 and we are seeking to achieve a B rating rather than the current C-72. Resource House is rated C-68.	2022

Implement a purchasing/ procurement policy specifying that energy efficiency is considered in all purchasing decisions.	High	There are several ongoing projects on procurement policy and sustainability. Jigsaw24 requests that all suppliers are environmentally responsible.	2022
Move ISO 140001 certification to UKAS certified provider (NQA).	High	Jigsaw24 hold ISO14001 through QMS who are not UKAS accredited.	2022
Pursue ISO14064 carbon management certification.	High	Identify requirements of the standard. This will be through a UKAS accredited provider.	2022
Improve Ecovadis & CDP score and reporting available for customer tenders.	Medium	Ensure our environmental commitments are shared with our customers and that we are shown to be a leader in our industry.	2022
Move to 100% renewable purchased energy.	High	Our Nottingham HQ is 100% renewable, Good Energy will be the supplier for Resource House (100% renewable electricity and 100% offset gas). London has four separate supplies, one of which is currently renewable and will be 100% renewable from August 2022 when our current British Gas contract expires.	Aug-22
Continued investment into air conditioning upgrades from R410 to R32 refrigerant.	High	There are five older R410 units left at our HQ. It will cost approximately £17,000 to upgrade our current older units, plus £8,000 to install AC in our warehouse. However, all of the existing units are currently working well.	Final upgrades for our HQ in 2022. All units are on a 10-year renewal program. Resource House air conditioning was installed in 2020 and our London offices has this installed in 2018.
Pursue PAS 2060 certification for carbon neutrality.	High	To verify any claims to carbon neutrality, possibly in conjunction with ISO 14064.	2025
Implement a training program to ensure all personnel who can control or influence energy efficiency are competent in their role.	High	Our Managing Director is leading environmental training. World Environmental Week events and other incentives are considered by the environmental and energy team monthly.	Ongoing BAU
Obtain data to confirm how many internal meetings are being held over Zoom compared to face to face.	Medium	We estimate that one Zoom meeting hosted in Nottingham per working day that prevents one employee from visiting London or Nottingham saves 60,720 miles of train travel per annum.	Ongoing BAU
Increased facilitation of home working post-Covid pandemic lockdown.	Medium	Zoom and Microsoft Teams have been the primary meeting method over the pandemic and has become the new norm, facilitating more home working post-pandemic. It is recognised that some teams do perform better in an office environment, but more home-based workers will be the norm.	Ongoing BAU

Table 15. Energy efficiency opportunities

Declaration

This report has been prepared in good faith as a fair and truthful analysis of Jigsaw24's energy performance in line with ISO50001 by Roland Boyer-Blanchard (Head of Operations) with data reporting support from Karolina Le Tu (Facilities Manager) and Abigail Gavigan (Finance team).

Signed by Director

John Hughes

A handwritten signature in black ink, appearing to read 'John Hughes', written in a cursive style.

Date: July 2021