

A.E.S Engineering Ltd. GHG Inventory

Scope 1, 2 & 3 Emissions Inventories

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1 Responsible Undertaking

AES Engineering Ltd. is the parent company and the highest business entity and therefore will be responsible for undertaking the completion of all requirements for the group. This will cover all subsidiary companies worldwide including those within the UK.

- **Company Registration Number:** 00392743
- **Standard Industry Classification:** 28290
- **Registered Address:** Global Technology Centre
Bradmarsh Business Park
Mill Close
Rotherham
South Yorkshire
S60 1BZ
- **Primary Contacts:** Mr Simon Sheaf
Mr David Montero
Mr Elliott Michel
- **Responsible Director:** Mr Stephen Shaw

2 Introduction

The following document serves as an assessment of the greenhouse gas emissions of AES Engineering Ltd., a UK-based manufacturing company producing mechanical seals, sealing products and seal support products for a global market.

This greenhouse gas inventory is the second such assessment of the global emissions of the AES Engineering group, consisting of multiple subsidiary companies under the ownership of AES Engineering Ltd.. For many years now AES has worked to minimize the negative impact that the company has on our planet and maximize the positive impacts to the environment and others. The products manufactured and sold by the company nearly always carry a benefit to the environment in some form. This can be as simple as reduced energy loss from friction through the use of more efficient sealing methods, to vast energy savings from the prevention of unwanted fluid flow into industrial processes. In particular, AES is very proud of the huge water savings that have been made over many years through the use of its products, with it being calculated that the water saving systems sold save industries 19 billion gallons of water each year.

Although the positive impact of these products far outweighs the negative impacts associated with their production, every business should be committed to reducing its own environmental impact wherever possible. The company runs an integrated system that encompasses environmental and energy management amongst wider elements including quality and safety. Certification to ISO 14001 was first gained for its UK subsidiary in 2003, with many operational sites around the globe following. Further to this in 2012 the head office in Rotherham gained certification to ISO 50001.

Over the past two years, great efforts and significant investments have been made to further green the business in the UK, where primary manufacturing takes place. Solar panels have been installed at the head office in Rotherham, working in conjunction with battery storage to provide clean power to the site and even to the local grid during times of peak generation. Efforts are ongoing to eliminate Scope 1 & 2 emissions at other AES sites in the UK and abroad, with solar arrays being installed in both India and the USA towards the end of this reporting period.

Continual improvement is dependent upon measuring and monitoring, and carrying out a group-wide assessment of emissions is key to driving down emissions to zero. The act of carrying out this assessment requires the involvement of multiple people across the group who are not directly involved in matters of sustainability or environmental

protection. This involvement creates a measure of performance across the group on an emissions basis and also encourages these individuals to take greater responsibility for reducing emissions within their own power and authority. Further to this, despite the great efforts made by AES, there are always areas to be improved upon and only through conducting an assessment of all areas is it possible to identify where work still needs to be done. Finally, as the effects of global warming become more severe, it will only become more important for companies to be clear and transparent about their contribution towards climate change. This assessment is important to allow the company to be very open about any possible negative impacts resulting from its activities.

3 Scope

3.1 Organizational

AES Engineering Ltd. is the parent company and owner of various AES group companies operating across the globe, many of which (but not all) carry the AESSEAL brand name in their titles. AES Engineering Ltd. maintains operational control of these subsidiaries that are covered within the confines of this GHG inventory.

3.2 Reporting Period

This inventory covers a customized 12-month reporting period from the 1st of October 2021, through to the 30th of September 2022.

3.3 Base Year

This reporting period is the second full assessment of A.E.S Engineering Ltd., with a comparable inventory having been conducted for the period of 1st October 2020 to 30th September 2021. Improvements in data collection, scope, and calculation methods have been made between these two inventories, though such changes are not considered to have changed the reporting method significantly enough to alter the baseline year.

It is worth noting that there was significant growth within the business in comparison to the previous reporting period, with growth as measured by turnover of more than 15%.

3.4 Locational

There is significant variance in the size of sites covered by this GHG inventory, ranging from large energy-intensive manufacturing sites to very small regional sales offices. Please see appendix C for a list of the sites covered by this inventory.

3.5 Inclusions

This report covers all greenhouse gas emissions attributable to AES Engineering Ltd. under the defined scope above.

All Scope 1 & 2 emissions are covered within the inventory report including: direct combustion of fuels, fugitive emissions from the release of refrigerant of other global warming gases, and the purchase of energy (predominantly electricity) generated off-site.

For the purposes of data collection and this report, Scope 1 emissions are divided between fleet emissions, supplied natural gas, other fuel consumption, and fugitive emissions. Supplied natural gas consists of space heating, although do note that there are individual sites which do have space heating that is not covered by supplied natural gas. In these cases, the emissions as a result of this activity will be reported under either other fuel consumed (e.g. oil heating) or the relevant Scope 2 category (purchased heat for district heating systems).

Scope 2 emissions for AES Engineering Ltd. consist almost entirely of purchased electricity, although there are some instances of purchased heat which are also accounted for. Emissions arising from purchased electricity will be reported as both a location-based and a market-based total, with the market-based total reflecting the use of green tariffs where they are applicable, primarily within the UK and the USA.

All relevant Scope 3 value chains have been included within this inventory, although it is noted that not all categories are applicable to the business. The Scope 3 Category numbers 10, 13, 14, & 15 are not relevant to AES Engineering Ltd. and are thus not covered within this report.

3.6 Global Warming Potentials

This report considers carbon dioxide equivalent (CO₂e); values for methane (CH₄) and nitrous oxide (N₂O) are therefore reported in terms of CO₂e. Conversion to carbon dioxide equivalent has been carried out with factors from the Intergovernmental Panel on Climate Change fourth assessment report.

3.7 Offsets

Also covered within this report is the use of purchased offsets. Where Scope 1 & 2 emissions are present despite previous efforts at reducing emissions, offsets have been

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purchased to cover them. In such cases, a log of purchased offsets is recorded as a separate document and is available on request.

These are purchased from verified schemes under Gold Standard or Verra VCS programs. It is understood that carbon avoidance from sold products cannot be reported alongside GHG Scope 1 & 2 emissions. Where possible, offsets purchased will also have positive associations with other UN sustainable development goals.

Summary

Scope	Category	CO ₂ e (Tonnes)
1	Fleet Emissions	1,758.96
1	Natural Gas	515.14
1	Other Consumed Fuels	101.65
1	Fugitive Emissions	63.33
1	Scope 1 Total	2,439.08
2	Purchased Electricity (Location-based)	3,099.36
	Purchased Electricity (Market-based)	1,991.42
2	Purchased Heat	2.96
2	Scope 2 Total (Location-based)	3,102.32
2	Scope 2 Total (Market-based)	1,994.38
3	Category 1: Purchased Goods and Services	71,922.10
3	Category 2: Capital Goods	6,783.44
3	Category 3: Fuel and Energy-Related Activities Not Included in Scope 1 or Scope 2	2,317.08
3	Category 4: Upstream Transportation and Distribution	41,311.43
3	Category 5: Waste Generated in Operations	168.30
3	Category 6: Business Travel	1,778.84
3	Category 7: Employee Commuting	2,164.24

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3	Category 8: Upstream Leased Assets	225.32
3	Category 9: Downstream Transportation and Distribution	1,066.84
3	Category 10: Processing of Sold Products	0.00
3	Category 11: Use of Sold Products	846.78
3	Category 12: End-of-Life Treatment of Sold Products	70.79
3	Scope 3 Total	128,655.2

Scope	Category	CO ₂ e (Tonnes)
1 and 2	Scope 1 and 2 Total (Location-based)	5,541.40
	Scope 1 and 2 Total (Market-based)	4,433.45
3	Scope 3 Total	128,655.2
All	All Scopes Total (Location-based)	134,196.6
	All Scopes Total (Market-based)	133,088.63

The report below details each category in further detail.

4 Methods & Verification

4.1 Approach

The basis of the approach adopted for completing this inventory is that of the GHG protocol, which is linked to the Paris agreement. The content of this report has been verified by a third-party, British Standards Institution. Verification is against the principles of ISO 14064 Part 1 (2018) with inventory reports prepared in accordance with this standard. Please see appendix for certification received from BSI.

Verification would be to a reasonable level with anything below one Tonne considered de-minimums, anything between 1% & 4% of the overall inventory total being of low significance, and anything of 5% or more treated as significant.

4.2 Data Collection

For the purposes of data collection to carry out this inventory, a centralized approach to data collection was undertaken. This was done to ensure consistency of reporting across the group and to minimize the impact on branch staff involved in data collection.

Shortly after the end of the reporting period in question, activity data was sought from branch heads relating to the activities required to complete the GHG inventory. Necessary delegation was then conducted by local branch heads in order to obtain all the data required.

4.3 Changes to Methodology from Previous Years

The baseline year for this inventory remains the previously conducted inventory for the reporting period of the 1st of October 2020 to the 30th of September 2021. However, improvements to the method and approach have been made to better reflect the true emissions figure of AES Engineering Ltd.

For the purposes of transparency, improvements made to the methodology are as follows:

- Previously, spend-based emissions factors available from Quantis were used, which were worldwide averages based on the World Input Output Database (WIOD). This year, to better reflect the environmental impact of the company's value chain activities, in particular Scope 3 Category 1, nation-specific spend-based emissions factors have been used where available. These have been derived from the 2013 release of the WIOD. In cases where the item has been

procured from a nation where there is insufficient data to calculate an emissions factor, a rest-of-world emissions factor will be applied. Please see the relevant categories in later sections for further detail.

- Previously, AES sites were broken down into three levels of operation, these being significant operational sites (level 1), repair centres (level 2), and sales offices (level 3). An approach was taken where all level 2 and a representative sample of levels 2 and 3 were directly calculated, and the remaining smaller sites calculated from those with full datasets. This approach was taken for Scope 1, 2 and 3 emissions. This year, with the aim of being more complete (and also identifying further areas to improve), every site was contacted to provide a full Scope 1 and 2 datasets, thus greatly reducing the uncertainty and error on Scope 1 and 2 emissions. As discussed previously, this scaling approach will still be applied for the Scope 3 emissions of the less significant entities, albeit with no distinction made between sites in terms of levels. This change has been made as the differences between repair centres and sales offices that was included previously is only relevant to Scope 1 and 2 emissions and not to Scope 3 emissions.
- As part of data collection, information on the number and size of refrigerant units and fire suppression systems will be gathered. Previously, information was only gathered in the cases of a leak occurring that resulted in fugitive emissions. As per previous recommendations from BSI following the audit process in early 2022, it was decided that information should be collected regardless of a leak occurring in order to provide more confidence that fugitive emissions did not occur.
- Although not a change to the methodology in a way that could potentially alter results, it should be noted that effort has been made for automatic categorization of purchased goods and services for Scope 3 Category 1. This was a recommendation by BSI following the audit at the beginning of 2022. Where possible, primarily for companies using SAP, commonly purchased goods have been assigned a 'GHG Category' which corresponds to the emissions factors used by the WIOD & Quantis. Doing so substantially reduces the workload associated with Scope 3 Category 1 to allow focus of efforts on other problem areas.

- In such cases where there may be insufficient data to calculate fleet emissions, scaling will be conducted with the dependent variable being number of fleet vehicles and not staff headcount. This change has been made following a recommendation from BSI in the audit conducted in early 2022. However, with the expansion of Scope 1 inventory to all sites, this change is expected to be largely redundant.
- In cases where heating is provided by a geothermal district heating system, this being the ProPack site in Germany, an emissions factor specific to geothermal heating has been used in opposition to the previously used DEFRA emissions factor for on-site heating system which was based on a CHP unit.

4.4 Acknowledgement of Areas to Improve

AES acknowledges that despite best efforts, some uncertainty and error will remain within the figures reported as part of this inventory. AES intends to improve on this process year on year to ensure accuracy and transparency in reporting emissions. Wherever improvements are identified by ourselves or others, these will be implemented if possible in future inventories.

5 Scope 1

5.1 Fleet Emissions

Fleet emissions are calculated in a varying manner according to the best quality of data available. The reason for this being that each subsidiary manages its own vehicle fleet and the methods of monitoring and recording activity vary between them. Calculation methods may be split between fuel-based, and distance-based. Where the fuel consumed by owned vehicles for business use is recorded, the volume of fuel is multiplied by either the local (if available), or DEFRA emissions factor for that particular fuel. In cases where fuel consumption is not recorded, instead the distance covered by that vehicle is multiplied by the relevant local or DEFRA emissions factor for that vehicle type.

Fleet emissions across the group are a very significant source of Scope 1 & 2 emissions – contributing 31.74% to the Scope 1 & 2 total, and some of the largest single sources of Scope 1 & 2 emissions are the fleet emissions of the larger AES subsidiaries.

Category	CO ₂ (Tonnes)	CH ₄ (Tonnes)	N ₂ O (Tonnes)	CO ₂ e (Tonnes)
Petrol Vehicles	811.53	2.02	1.94	815.48
Diesel Vehicles	889.62	0.05	10.70	900.37
Hybrid Vehicles	42.65	0.04	0.43	43.11
Total Fleet Emissions	1,743.80	2.11	13.06	1,758.96

5.2 Natural Gas

Natural gas is calculated primarily from data sourced from utility invoices by the utility providers, supported by meter readings where available. The consumption of the fuel, usually in kilowatt hours, is multiplied by the local (if available) or DEFRA emissions factor to calculate carbon dioxide equivalent emissions. In certain cases, volume of gas is recorded as opposed to energy. Where a relevant conversion is not supplied by the utility provider themselves, the corresponding volumetric emissions factor is used, and a kWh equivalent also reported for internal comparative purposes.

Natural gas is used exclusively for the purposes of space heating for AES sites. Of those sites where information was gathered relating to natural gas use, 27 operated a gas heating system while 40 had no gas heating system.

Note that in particular, this category results in a likely overestimate of emissions for those sites which were not calculated but scaled. Amongst the scaled sites there have been no exclusions from this category despite the likelihood of several sites such as those in Africa not operating a space heating system. No attempt to exclude sites from this scaling was made, in order to ensure that any underestimates present in the estimates (for those in the coldest climates) were sufficiently covered by the over-reporting from the warmest sites.

Natural gas use is responsible for 9.3% of the group's Scope 1 & 2 emissions total, and in total AES Engineering Ltd. used 2,822,042 kWh of natural gas during the reporting period.

Category	CO ₂ (Tonnes)	CH ₄ (Tonnes)	N ₂ O (Tonnes)	CO ₂ e (Tonnes)
Natural Gas	514.19	0.66	0.28	515.14

5.3 Other Consumed Fuels

Other consumed fuels refers to all consumption of fuels outside of natural gas use for space heating. AES does not consume any fuel as part of its regular processes. However, fuel is consumed at certain sites, such as propane and LPG for forklifts or diesel for generators. Often for this category fuel is purchased to replenish stocks that are used on a regular basis. Information about when the fuel itself was consumed is not always available. As a result, the approach is taken that fuel purchased within the reporting period is assumed to be consumed and is therefore reported as part of this inventory.

Multiple sites operate diesel generators. In South Africa and India these are operated for the purposes of providing power to site during frequent blackouts. At the head office in Rotherham, UK, a significant quantity of diesel fuel was purchased during the reporting period for the on-site generator. This was for the purposes of powering the site during a planned outage during which the battery storage system was changed. Of the sites contacted for emissions data, 14 had emissions due to some form of fuel use outside of natural gas.

Data sources for this category are invoices and purchase orders for the respective fuels. Conversion to a carbon dioxide equivalent figure is then done through DEFRA emissions factors based on either the mass or volume of the purchased fuel. This category contributes 1.83% to the groups Scope 1 & 2 emissions.

Category	CO ₂ (Tonnes)	CH ₄ (Tonnes)	N ₂ O (Tonnes)	HFC (Tonnes)	CO ₂ e (Tonnes)
Propane	17.06	0.01	0.01	0.00	17.08
Gases w/CO ₂	0.17	0.00	0.00	0.00	0.17
Diesel	61.35	0.01	0.86	0.00	62.21
Oil	21.03	0.05	0.05	0.00	21.14
LPG	1.05	0.00	0.00	0.00	1.05
Total	100.66	0.07	0.92	0.00	101.65

5.4 Refrigerants

Across the group there were four instances of refrigerant or fugitive losses that have a carbon dioxide equivalent figure. These being Rockford, Tampico, Pune and Lisbon. Incidents in Tampico and Lisbon were single events where a leak or loss of fluid was identified during maintenance of units, whilst Rockford and Pune have seen multiple top-ups of fluid during the reporting period. The mass of fluid that was replaced as part of maintenance is multiplied by the global warming potential of the gas to provide a carbon dioxide equivalent figure.

In total, 4.96 kg of R-410A and 29.26 kg of R-22 were lost, resulting in the carbon dioxide equivalent of 10.36 and 52.97 Tonnes respectively. This contributes 1.14% to the group Scope 1 & 2 total.

Category	Mass (kg)	HFC Eq. (Tonnes)	CO ₂ e (Tonnes)
R-410A	4.96	10.36	10.36
R-22	29.26	52.97	52.97
All Refrigerants	34.23	63.33	63.33

5.5 Scope 1 Summary by Source & Greenhouse Gas

Category	CO ₂ (Tonnes)	CH ₄ (Tonnes)	N ₂ O (Tonnes)	HFC (Tonnes)	CO ₂ e (Tonnes)
Fleet – Petrol	811.53	2.018	1.935	0.00	815.48
Fleet – Diesel	889.62	0.049	10.695	0.00	900.37
Fleet – Hybrid	42.65	0.040	0.427	0.00	43.11
Propane	17.06	0.013	0.011	0.00	17.08
Gases w/ CO ₂	0.17	0.000	0.000	0.00	0.17
Diesel	61.35	0.006	0.857	0.00	62.21
Oil	21.03	0.051	0.052	0.00	21.14
LPG	1.05	0.001	0.001	0.00	1.05

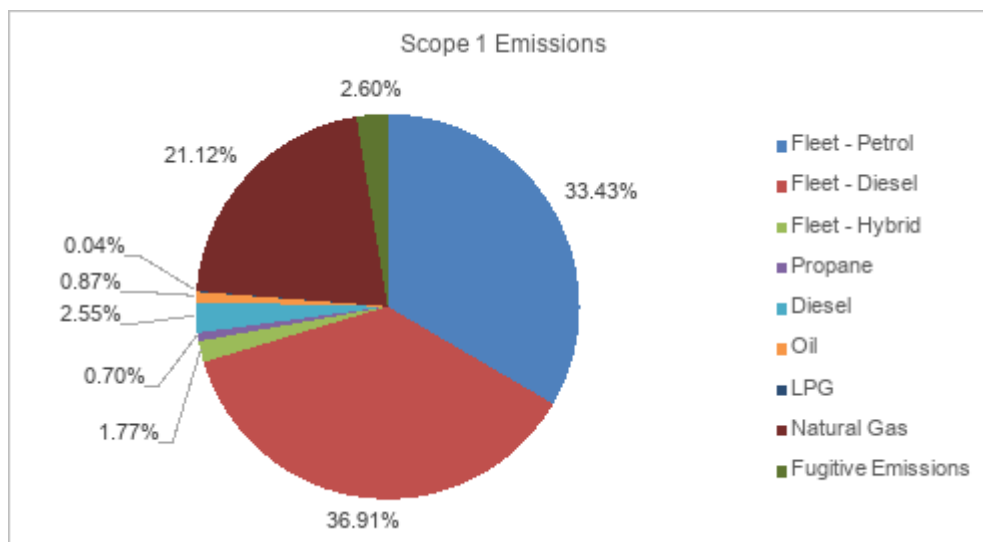
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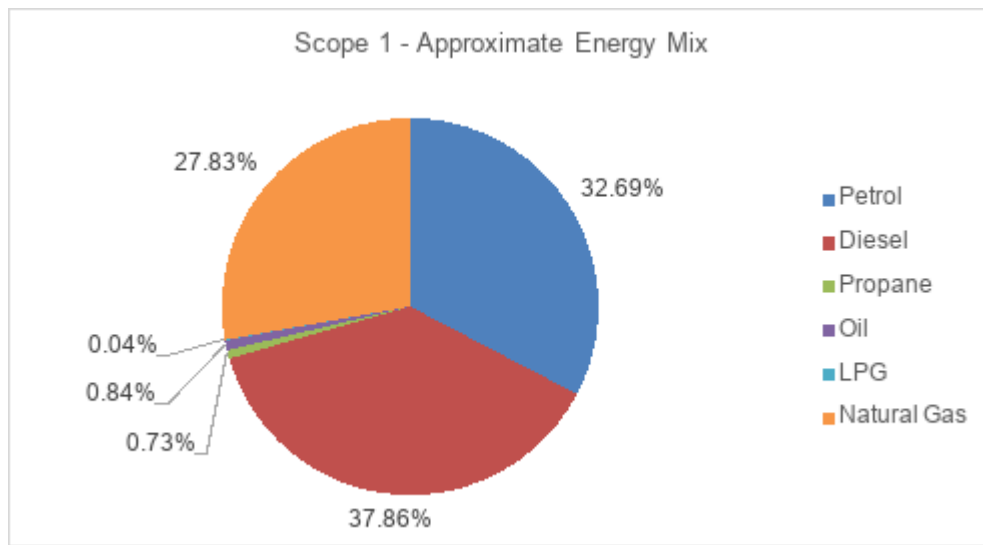
Natural Gas	514.19	0.663	0.283	0.00	515.14
R-410A	0.000	0.000	0.000	10.36	10.36
R-22	0.000	0.000	0.000	52.97	52.97
Total	2,358.64	2.840	14.261	63.33	2,439.08

Overall, Scope 1 emissions have changed by -7.41% from the previous total of 2,634.2 Tonnes. As with the previously conducted inventory, Scope 1 emissions are dominated by the emissions from fleet vehicles, with this sub-category accounting for 72.12% of Scope 1 emissions. Although it should be noted that this is actually a reduction of 10.03% on the previous reporting year. Note however that this is not believed to be indicative of actual reduced emissions from vehicle use by the group. Within the previously conducted inventory, certain smaller sites had fleet emissions scaled from the data collected by the larger entities. With the expansion of data collection to improve accuracy, it was found that a number of these smaller sites did in fact lease their vehicles or had no owned vehicle fleet. As such the fleet emissions reported in the previous inventory were an overestimate, and with greater data quality some of these emissions are now reported under Category 6 as per the GHG protocol.



After fleet emissions, the use of natural gas (primarily for space heating) is the second largest contributor of emissions to Scope 1 at 9.3% of the total. This sub-category is broadly unchanged from the previous inventory, having only altered by -3.64%. DEFRA also publishes distance factors for reporting energy use from vehicles. Utilizing these

allows for estimates of energy use across the vehicle fleet. Doing so allows for an estimation of the fuel source for the group Scope 1 emissions.



A further change from the previous inventory is that of emissions due to combustion of other fuels outside of natural gas use. In the previous inventory 36.5 Tonnes were the result of oil, 38.2 Tonnes the result of diesel, and 6.9 Tonnes the result of bottled gases. These sources are still present in the current inventory but are compounded by persistent power outages in South Africa, the use of oil heating in Cork, propane heating in Maine, and the use of a diesel generator at the head office at Mill Close to cover outages required for electrical infrastructure work.

6 Scope 2

6.1 Purchased Electricity

Emissions from purchased electricity form the vast majority of Scope 2 emissions for AES Engineering Ltd.

The primary source of evidence and data for this category is invoices from the utilities provider at the site. In certain cases, meter readings from the start and end of the reporting period were also provided. In a similar case to that of natural gas use, certain invoices do not provide a meter reading and only a monthly consumption figure, while in other cases a single invoice displays an annual consumption of electricity.

Consumption is recorded in kWh and a relevant local emissions factor is used to convert to a carbon dioxide equivalent figure. This category in particular is where a large amount of different emissions factors are used to reflect the localized grids and networks from which different sites source their electricity. Where available, emissions factors published

by a relevant national or regional government body are used. Should these not be available, emissions factors are primarily sourced from the most recent statistical profiles from the International Renewable Energy Agency.

As a result of the huge amount of variation in emissions factors, certain sites provide a disproportionately large amount of emissions to the overall figure within this category. Sites in South Africa and India, for example, have a very high emissions factor due to a very carbon-intensive local grid, and thus produce high emissions figures relative to their electricity use.

Note that both a location-based and a market-based total are provided. A number of sites purchase electricity on green tariffs, these sites being the UK sites of AESSEAL plc, Warrington, Gloucester, Kronau, and Sauerlach. In addition, the site of Rockford also purchases electricity, 90% of which is sourced from green sources. As these sites are some of the largest electricity users within the group, particularly the head office of Mill Close, approximately 57.9% of the group's electricity is sourced on a green tariff. Purchased electricity accounts for 55.93% of the total Scope 1 and 2 emissions on a location basis.

Note that both location-based and market-based figures are reported below.

Sub-Category	Energy (kWh)	Market- Based CO ₂ e (Tonnes)	Location- based CO ₂ e (Tonnes)
On Green Tariff	4,924,263	0.00	1,107.94
Standard	3,575,912	1,991.42	1,991.42
Total	8,500,175	1,991.42	3,099.36

6.2 Purchased Heat

There are two sites across the group which purchase heat through the use of a district heating system, these being Sauerlach in Germany and Benelux (Breda) in the Netherlands. Sauerlach utilizes heat from local geothermal sources; the usage in kWh has been multiplied by an emissions factor sourced from research into the life-cycle emissions of geothermal heating. Benelux is heated through waste heat from a local

power station. The provider in this case offers a customs emissions factor specific to this grid.

The entire group purchased 183,464 kWh of heat energy during the reporting period. In total these sources resulted in emissions of *2.96 Tonnes CO₂e* which corresponds to 0.05% of the Scope 1 and 2 total.

Category	Energy (kWh)	CO ₂ e (Tonnes)
Purchased Heat	183,464	2.96

6.3 Scope 2 Summary

Scope 2 emissions for AES Engineering Ltd. are comprised almost entirely of emissions due to purchased electricity, with the exception of 2.96 Tonnes due to energy sourced from district heating systems.

In comparison with the previously conducted inventory, Scope 2 emissions have changed by 6.43% on a location basis and by -2.08% on a market basis.

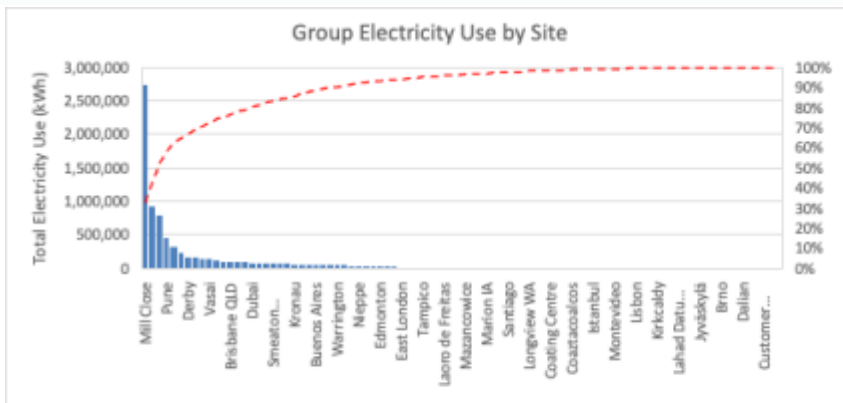
Total group electricity use (Scope 2) is up by 5.39% from an estimated 8,065,233 kWh during the previous inventory. It is expected that this is the result of increases to the size of the business, both through acquisitions and through a year of increased turnover and output.

The move of two sites, Rockford & Kronau, to a percentage-green and full-green tariff respectively has had a noticeable impact on the figures in comparison to previous year. Electricity purchased on a green tariff is up 21.1% from the figure of 4,066,212 kWh observed during the previous reporting period. As a result, the location-based equivalent of the group's green energy is 1,107.94 Tonnes, up 26.16% from 878.2 Tonnes in the previous inventory.

Electricity use (and thus Scope 2 emissions) are heavily skewed towards just a handful of the larger sites which handle manufacturing duties, with just three sites accounting for roughly half of group electricity use:

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In particular, the head office of Mill Close accounts for 32.41% of group electricity use. As is discussed later on within this report, this distribution does aid emissions reduction work as only a handful of projects can be considered to have a very significant impact on the overall group figures.

Category	Energy (kWh)	Market-Based CO ₂ e (Tonnes)	Location-based CO ₂ e (Tonnes)
Electricity On Green Tariff	4,924,263	0.00	1,107.94
Standard Electricity	3,575,912	1,991.42	1,991.42
Purchased Heat	183,464	2.96	2.96
Total	8,683,639	1,994.38	3,102.32

7 Scope 3

7.1 Category 1: Purchased Goods and Services

Category 1 is the single largest source of emissions for AES Engineering Ltd. Calculation of this category has been undertaken on a spend-based approach. There is insufficient data available from the many suppliers and products involved, so that a supplier-specific approach is not practical to undertake.

As a result, a spend-based approach is used, utilizing emissions factors from the World Input Output Database released in 2013.

Use of these emissions factors requires conversion both from the local currency to US dollars and from present prices to those of the emissions factors as per the GHG protocol. Conversion to US dollars is done on an average exchange rate representing the reporting period from *01-10-2021* to *30-09-2022*.

Values for major currency exchange rates are published by the IMF and are available at https://www.imf.org/external/np/fin/data/param_rms_mth.aspx. The average of all available data points falling during the reporting period will be taken for each respective currency.

Once converted to USD, inflation will be accounted for between September 2012 (the prices used in the release of the WIOD) and April 2022, the mid-point of the reporting year. Inflation data is sourced from the US Bureau of Labor Statistics, available at https://www.bls.gov/data/inflation_calculator.htm.

Data sources for this category are the ERP systems through which the various AESSEAL companies operate. Many companies across the group use SAP, although data has been sourced from other systems where they are in use.

Purchased goods and services are assigned to a relevant category within the WIOD database. A significant proportion of line items had already been assigned to categories following the previous inventory, although a large number of line items were manually assigned to a category for the purposes of this report.

This category is very significant for AESSEAL plc. Due to the business model of the company many of the smaller subsidiaries purchase items from AESSEAL plc and thus do not see as significant a Category 1 figure. Category 1 remains the most significant of all Scope 3 emissions and contributes 55.9% to the overall Scope 3 total.

Category	CO ₂ e (Tonnes)
Category 1	71,922.10

7.2 Category 2: Capital Goods

Calculation methods for Category 2 are identical to those of Category 1, as per the GHG protocol. However, a distinction is made for capital expenditure.

Category 2 is a significant source of emissions for the largest subsidiary, AESSEAL plc, which also includes the spend made by AES Engineering Ltd. itself. This is a result of large amounts of expenditure on the expansion of the head office in Rotherham, and of the expenditure through the [29 by 29 environmental projects](#) budget. Outside of the UK, Category 2 is not overly significant, as when required, assets are often purchased through AESSEAL plc.

This category in particular is much more significant than in the previous inventory. Due to the aforementioned construction project at the head office, Category 2 contributed 5.27% to the overall scope 3 total.

Category	CO ₂ e (Tonnes)
Category 2	6,783.44

7.3 Category 3: Fuel and Energy-Related Activities Not Included in Scope 1 or Scope 2

Category 3 consists of the additional fuel and energy related activities that are not directly calculated within Scopes 1 & 2. This refers to cases such as the emissions due to losses of transmission and distribution in electricity grids, or the well-to-tank emissions of combustible fuels.

The Category 3 emissions from Scope 1 are calculated using DEFRA emissions factors. DEFRA publishes well-to-tank emissions factors for combustible fuels, and well-to-tank distance-based emissions factors for vehicles.

This category is broadly proportional to the Scope 1 & 2 emissions of a site, with some variation due to the varying gross grid loss and carbon intensity of the different electrical grids. This category contributes 1.8% to the overall Scope 3 total.

Category	CO ₂ e (Tonnes)
Category 3	2,317.08

7.4 Category 4: Upstream Transportation and Distribution

Category 4 emissions are to be calculated using the purchase orders of group companies within the reporting period. At present, there is insufficient data available on fuel consumption during shipping, nor enough information to accurately assess the mass, and distance that items have travelled. Efforts are ongoing in future to record and tabulate weights of components and items within SAP which would allow a more accurate distance-based calculation to be carried out. However, at present this data is not available.

As per the GHG protocol, a spend-based method has been used instead. Available data consists of: supplying company, receiving company, item description and purchase order value. In order to make a spend-based calculation, a flat-rate proportion of the purchase order value is assumed to go towards the transport and distribution of that order. This value will then be used with Environmentally Extended Input-Output emissions factors for inland transport, air, and water transport from the WIOD 2009 database.

In the previously conducted GHG inventory, over half of purchased items by AESSEAL plc fall into the category of *Rubber and plastics* or *Basic metals and fabricated metal*.

AESSEAL plc (2020-2021 Data)	No. of orders	% Share
Rubber and plastics	15,003	35.76%
Basic metals and fabricated metal	11,761	28.03%
Remaining	15,190	36.21%
Total PO Orders	41,954	100%

The majority of purchased items for AESSEAL plc have a percentage share of transport costs below 10%. It is likely that in assigning a flat rate to all purchase orders, this figure would be less than 10% given the make-up of purchase orders. To be overly conservative as a result of the assumptions that have been made, a higher figure of 15% has been implemented. As this higher figure does not represent a benefit in any other

capacity, it is justifiable through representing an over-estimate of emissions from these categories.

Calculated separately from the above are the cases where AES companies have utilized the services of third-party couriers such as UPS or DHL for transport of components and products to other AES companies or customers.

AESSEAL plc manufactures and supplies products which are then sold and distributed to smaller AESSEAL subsidiaries for onward sale. As a result of this, a significant proportion of the deliveries that AESSEAL plc pays for are to other AES companies. For these smaller companies, however, the vast majority of deliveries are to end-users, with only some shipments to other AES locations.

For the most significant and some representative sites, data has been collected on the use of third-party logistics couriers to make a calculation of emissions. This calculation is ideally based upon weight, distance, and mode of transport, though some assumptions have been made where all the above data is not available.

Logistics of both inbound and outbound goods falls under the Scope 3 Categories 4 & 9, depending upon the subsidiary that is paying for this shipment to take place. Although ultimately all contributing to the same grand total for AES Engineering Ltd., due to the integrated supply chain of the business there is difficulty and lack of clarity in distributing these emissions between the various AES companies.

Categories 4 and 9 refer to upstream and downstream transportation and distribution logistics respectively. However, it should be noted that an important distinction is that when logistics services have been paid for by the company, these are considered upstream as they are a purchased service. Category 4 thus refers to logistics paid for by the company and emissions from the transport of products into the company regardless of who has paid this cost. Category 9 refers to downstream logistics, these being cases where a customer or third party has covered the cost of shipping from an AES site.

As such, where emissions are calculated using the flat-rate method from company purchases, these emissions will be assigned to Category 4. This will remain the case even when these purchases are from another AES company, due to the transport of these goods being covered (the majority of the time) by the receiving company. These datasets will be used to scale the entities where such a calculation was not carried out as per standard practice for this inventory.

Where emissions have been calculated from data provided by logistics companies, this will again fall under Category 4. This being deemed as upstream as it is a purchased service by the purchasing company.

Category 4 thus ends up being one of the most significant categories of emissions for the entire group at 32.11% of the Scope 3 total, behind only the emissions from purchased goods and services within Category 1.

Category	CO ₂ e (Tonnes)
Category 4	41,311.43

7.5 Category 5: Waste Generated in Operations

Category 5 concerns emissions from waste produced from AES Engineering sites. The business has run environmental management systems for many years with the majority of operational sites maintaining certification to ISO 14001. The largest entity within the group, AESSEAL plc, first gained ISO 14001 in 2003. This has driven down the amounts of waste generated. That which is generated is diverted away from landfill where possible using the hierarchy of reduce, reuse, recycle and recover. For non-operational sites the levels of waste generated are generally very low. As a result, this category is a relatively low contributor to the overall value chain emissions.

For this category it was not always possible to determine with a high level of confidence the means of disposal across the entire group. In cases where it could not be determined with a reasonable level of confidence that the waste was recycled or reused, it was assumed that landfill was the default method of disposal.

Data on waste disposal is primarily obtained from receipts and invoices documenting either the mass, or volume of waste collected and disposed of. The majority of invoices do not provide a mass of waste collected or disposed of. It is common for invoices to provide only the container volume or class of container that was collected from site. In such cases it is assumed that any container collected was full to its maximum capacity at the time of collection.

The mass of waste was then used in conjunction with DEFRA emissions factors to provide a carbon dioxide equivalent figure. Category 5 contributes only 0.13% to the overall Scope 3 figure.

Category	CO ₂ e (Tonnes)
Category 5	168.30

7.6 Category 6: Business Travel

Data for business travel for all group companies was collected from local accounts records. The data included business travel from flights, both long haul and short haul, trains, taxis, hire cars, grey fleet and hotel stays.

Business flight emissions are calculated on a passenger kilometer basis using either DEFRA or EPA emissions factors. Specific emissions factors are chosen on the basis of flight distance, as distinction is made between short, medium or long-haul flights.

Transport via train and taxi was calculated in a similar manner to that of flights, using the origin and destination (if available) to estimate distance. DEFRA emissions factors were applied for conversion to CO₂e.

Also included in this category are emissions from hired vehicles. Note that in certain cases a leased vehicle fleet was used in a similar manner to an owned vehicle fleet. Calculation methods in this case were the same as those for an owned vehicle fleet. However, emissions were allocated to Category 6 instead of Scope 1.

Hotel stays are also accounted for where appropriate. DEFRA emissions factors for hotel stays are the only source of emissions factors for this particular category and subset. Hotel stays are broken down by nights stay and country. Source of data for this category and subset are again expense records from accounting departments.

Category	CO ₂ e (Tonnes)
Grey Fleet	836.60
Air Travel	817.44
Taxis	13.85
Trains	2.36
Hotels	106.78

Other	1.81
Total	1,778.84

Air travel is one of the largest sub-categories within Category 6, and the emissions from air travel may be further broken down as shown.

Category	CO ₂ e (Tonnes)
Domestic, to/from UK	44.43
Short-haul, to/from UK	49.15
Long-haul, to/from UK	437.22
International, to/from non-UK	233.29
Air Travel - Short Haul (< 300 Miles)	0.28
Air Travel - Medium Haul (>= 300 miles, < 2300 Miles)	23.97
Air Travel - Long Haul (>= 2300 Miles)	29.09
Total	817.44

In total Category 6 contributes 1.38% to the overall scope 3 total.

Category	CO ₂ e (Tonnes)
Category 6	1,778.84

7.7 Category 7: Employee Commuting

Category 7 is an area where calculation method may vary in order to fit the form of data that is available for each particular site. In all cases, this category is a distance-based calculation using emissions factors from DEFRA. This category contributes 1.68% to the overall Scope 3 total.

Category	CO ₂ e (Tonnes)
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Category 7	2,164.24
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7.8 Category 8: Upstream Leased Assets

Across the group there are multiple instances of sites which are leased where consumption of utilities is not charged directly but forms part of the rent. In such cases, the scaling method is applied to the electricity and/or heating emissions for these sites and this figure is then assigned to Category 8 as per the GHG protocol.

Emissions within this category are the result of multiple sources, these being the utilities of rented sites. Some of the total is the result of emissions due to electricity use at rented sites, whilst others are the result of natural gas use or in the case of Finland, oil use. Category 8 contributes 0.18% to the scope 3 total.

Category	CO ₂ e (Tonnes)
Category 8	225.32

7.9 Category 9: Downstream Transportation and Distribution

For details on the calculation of this category, please see the previous section on Category 4 for details.

Category	CO ₂ e (Tonnes)
Category 9	1,066.84

7.10 Category 10: Processing of Sold Products

Category 10 does not hold any relevance to AES Engineering Ltd. All manufacturing and production work of AES products is carried out at AES manufacturing sites or repair centres.

7.11 Category 11: Use of Sold Products

The vast majority of products sold are passive in nature; there is no consumption of electricity or fuels in use. There are however three products sold that operate with an electrical input, these being the PumpPac, FDU, and FDSC systems sold by AESSEAL plc.

A worst-case scenario is assumed where the system is assumed to be operating continuously over the entire life cycle of the product. This total time in use is multiplied by the maximum power draw of the product to result in a total lifetime energy use for that system. This total energy use is multiplied by a custom emissions factor of *0.589 kg CO₂e/kWh*, which is an average of the UK, USA, China, India, South Africa, and Australia. This is used to represent a worldwide average emissions factor into which these products are sold.

In total these 28 systems sold are estimated to consume *1,437,516 kWh* throughout their entire lifespan. In total this results in *846.78 Tonnes CO₂e* and contributes 0.66% to the overall Scope 3 total.

Category	CO ₂ e (Tonnes)
Category 11	846.78

7.12 Category 12: End-of-Life Treatment of Sold Products

Category 12 refers to the end-of-life disposal of sold products during the reporting period.

Almost all the construction materials can be recycled or recovered due to metals making up the vast majority by mass of sold products, and it being cost-effective and logical to recycle metal. Subsequent emissions from this disposal are assessed using DEFRA emissions factors for landfill and metal recycling, alongside an estimate of the total mass of products sold during the reporting period. A conservative estimate of 90% being recycled and 10% going to landfill is made for the primary products sold by AESSEAL companies.

Conducted slightly differently is the Category 12 figure for ProPack AG, a subsidiary of AES Engineering Ltd. based in Germany. The primary product sold by ProPack is gland packing, which is subject to fouling and heating through its use and is therefore assumed not to be recyclable at end of life. The sales data of ProPack is consulted to arrive at a figure for the mass of packing sold during the reporting period. This is used with the DEFRA emissions factor for landfill to provide an emissions figure.

Manufacturing sites involved in mechanical seals and support systems produce emissions of *44.03 Tonnes CO₂e*, while ProPack is responsible for a further *26.77 Tonnes CO₂e*. Category 12 contributions to the overall Scope 3 total stands at 0.06%.

Category	CO ₂ e (Tonnes)
Category 12	70.79

7.13 Scope 3 Summary

Scope 3 emissions have increased notably from the previously conducted inventory, having risen by 44.48% from the 89,048 Tonnes observed previously. This is driven by substantial increases in Categories 1, 2, 6, and 4 & 9.

Category 2 has increased by 155.13% from the previous reporting period. The primary reason for this is substantial capital expenditure increases from the previous reporting period, arising from the expansion of the head office and expenditure on [environmental projects](#). Of the Category 2 total of 6,783.44 Tonnes, 3160.77 is attributed to capital expenditure from the head office of AESSEAL plc. Category 6 has seen substantial increase due to a vast increase in the number of flights and travel in general being undertaken for business purposes.

The majority of the change is due to Categories 1, 4 & 9. These are categories directly related to the value chain of the company and are strongly tied to output and overall activity. This year, 2023, has been a particularly successful year for AES Engineering Ltd., with multiple months of record turnover. In addition, there have been acquisitions of other companies made since the previous reporting period that have increased the size and scope of the group's value chain. It was expected that Scope 3 emissions would have increased significantly from the previous inventory, and this has been observed.

The value chain emissions of AES Engineering Ltd. are dominated by Category 1, purchased goods and services. This was to be expected due to the purchase of relatively carbon-intensive materials, such as metals and minerals, in significant quantities, and follows a similar breakdown to that seen in the previously conducted GHG inventory.

A significant change that should be noted is that of Category 8. This has seen an increase relative to the previously reported figure of 15.3 Tonnes. This change is not believed to be indicative of any real increase in emitted CO₂e, but a consequence of improved data collection.

A.E.S Engineering Ltd. GHG Inventory

Scope 1, 2 & 3 Emissions Inventories



Category	CO ₂ e (Tonnes)
1	71,922.10
2	6,783.44
3	2,317.08
4	41,311.43
5	168.30
6	1,778.84
7	2,164.24
8	225.32
9	1,066.84
10	0.00
11	846.78
12	70.79
Total	128,655.2

8 Uncertainty & Estimates

AES acknowledges that although every care has been taken to be as diligent as possible, for an undertaking of this size across the group there is always a degree of uncertainty. This section aims to quantify this uncertainty for the purposes of transparency and further improvement.

Throughout this inventory, efforts have been undertaken, as per the ISO 14064 standard, to be conservative in cases of incomplete or unclear data. This means taking a worst-case scenario to overestimate emissions should sufficient data be unavailable to prove otherwise. Quantified uncertainty is the result of activity error, emissions factor error, and the scaling error. The activity error is the estimated uncertainty on the activity data figures with which emissions are calculated. The emissions factor error is the uncertainty on the accuracy of the emissions factors themselves. These are not published and are thus estimated at one percentage point per year since the factors were published. The scaling error is any uncertainty within the scaled figures as a result of the scaling approach.

8.1 Scaling

As mentioned previously, an approach was taken where certain data points are calculated and others are scaled. This varies between scope, with the vast majority of Scope 1 & 2 emissions sources being directly calculated while those it was not possible or reasonably practical to obtain were scaled. As focus was aimed at the largest and most significant sites, those sites which are scaled are the smaller subsidiary or satellite sites of regional head offices. For Scope 3, the most significant, and also a sample of representative entities, have had full datasets calculated whilst the smaller entities have their Scope 3 emissions scaled. Due to the business model of AES Engineering Ltd, this introduces an inherent overestimation as the entities which are most emissions-intensive are used as data points to scale the least emissions-intensive data points.

For a full breakdown of categories and uncertainty, a request can be made to view the report at www.aesseal.com.

8.2 Summary of Uncertainty

Scope	Total CO ₂ e (Tonnes)	± (Tonnes)	% Error
Scope 1	2,439.1	225.7	9.25%
Scope 2	3,102.3	167.3	5.39%

Scope 3	128,655.2	26,941.3	20.94%
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9 Carbon Reduction Plan

The ultimate aim of any inventory is to drive emissions reductions. Conducting an assessment in itself allows us to be more aware as a company of the environmental aspects of our activities that may otherwise be overlooked or not duly considered. By involving multiple AES companies and through the participation of many individuals, the act of assessing our emissions promotes and encourages more environmentally conscious behaviour.

Furthermore, conducting an inventory yields the obvious benefit of identifying where it is that the company needs to improve the most. As a result of the previously conducted inventory, AES has been able to identify where investment in environmental projects yields the most benefit for the planet in cutting emissions.

From April of 2022, solar panels have been generating clean energy to help power the head office at Mill Close, Rotherham, and by the end of the reporting period had generated 188,340 kWh. As the site is powered by green energy through the use of a green tariff, this array will benefit other users across the United Kingdom by contributing to improve the fuel mix of the national grid. Complementing the solar array is an upgrade of the on-site battery storage system to 1.2 MWh of storage. This battery storage system allows for storage of excess solar generation in summer months, serves to protect the site from power outages, and allows electricity to be taken in at night (when renewables provide a greater share of generation) to reduce carbon emissions. It is expected that this combined PV and battery system will generate approximately 748,800 kWh of energy a year and prevent the emissions of approximately 144 Tonnes CO₂e over a 12-month period. This system has been installed at a cost of £648,065 for the solar array and a further £1,051,545 for the improved battery storage.

Taking into account market-based accounting of emissions, two of the largest single sources of Scope 1 & 2 emissions from the previous inventory were emissions due to purchased electricity at the Rockford and Pune sites. Following on from this inventory, \$747,897 has been invested in a 552.2 kWp solar array and a further £693,797.69 for battery storage at the Rockford site. Solar panels are now installed on the roof of the site and are generating clean energy for use, and excess energy is stored within the battery storage system if not needed. This project unfortunately did not have a significant impact on this particular reporting timeframe, but is expected to offer savings of 296.2 Tonnes CO₂e on an annual basis through the generation of 778,100 kWh of clean energy. As the

Rockford site switched to a mostly green tariff towards the end of December 2021, these reductions will not be counted by AES on a market basis but will instead be seen as a wider benefit to users of the Tennessee grid.

At the Pune site, a similar battery system has been installed at a cost of £543,483, with solar panels providing clean energy to the grid, and the battery also offering the additional benefit of protecting the site during the frequent power outages suffered by the local grid. With the Indian grid being particularly carbon-intensive, it is expected that this system will prevent the emissions of almost 300 Tonnes over a 12-month period.

Elsewhere, at a cost of 38,519€, the Spanish site of Tarragona has been fitted with a 33.75 kWp array, which is expected to save 9.4 Tonnes carbon dioxide equivalent annually. Installation of a 99.6 kWp array is also under way at the German site of Kronau, at a cost of 133,672.60 €, and is expected to save 15.1 Tonnes carbon dioxide equivalent on an annual basis.

AES Engineering Ltd. also aims to reduce Scope 3 emissions, but it is noted that these are areas over which the business exercises little direct control with which to incorporate reduction plans. The most significant categories within Scope 3 are broadly proportional to the activity of the business and are thus hard to impact with any specific policy. Long-term, A.E.S hopes to engage with suppliers of goods and to improve data quality to allow for a greener supply chain.

Certain categories such as Categories 5 & 6 can be influenced by the business, however. These categories may be improved by diverting the percentage of waste that goes to landfill and reducing unnecessary business travel. A strong focus on diverting waste to landfill has been maintained across the UK sites where some of the largest quantities of waste are generated.

10 Offsets

While emissions reduction efforts are ongoing, AES Engineering Ltd. is still responsible for the production of Scope 1 & 2 emissions. Although the focus is reduction of emissions, while this is taking place AES will continue to offset its emissions through verified Gold Standard or VERRA Projects. Projects are purchased with the assistance of Carbon Footprint Ltd:

Carbon Footprint Ltd

Belvedere House

Basing View

Basingstoke

Hampshire

RG21 4HG

Company Number 04532520 / SIC 74901

The details of the selected projects where offsetting credits were purchased are shown in the table below.

In the unfortunate event that any errors or missing data is identified following the production of this report, AES will purchase further offsets to cover these emissions to ensure an overall balance of zero is maintained.

Aligning to the reporting period of 1st October 2021 to 30th of September 2022, a total of 5,500 Tonnes of offset credits were purchased, with an additional 40 Tonnes also purchased by AES as part of a local bio-diversity project in Rotherham.

Credits	Projects	Project Reference	Verification
2750	Offset via efficient household cookstoves in India	VCS 2336	VERRA
2750	Offset via reduced deforestation in Cambodia	VCS 1650	VERRA
40	Pacajai REDD+ Project	VCS 981	VERRA



This certificate acknowledges that

A.E.S Engineering Ltd

offset

5,500 Tonnes of Carbon Dioxide

by supporting:

- Efficient cookstoves in India (2,750 tCO₂e)
- Reduced deforestation in Cambodia (2,750 tCO₂e)

This helps to combat climate change
and sustain our environment for future generations.



John Buckley, Managing Director,
Carbon Footprint Ltd.

www.carbonfootprint.com

13 October 2022

Calculating the carbon footprint
offsetting carbon emissions
helping to combat climate change



This certificate acknowledges that

AES Engineering Ltd

offset

40 Tonnes of Carbon Dioxide

by supporting reduced deforestation and forest degradation
in Brazil as well as planting 40 trees in the UK

This helps to combat climate change
and sustain our environment for future generations.



John Buckley, Managing Director,
Carbon Footprint Ltd.

www.carbonfootprint.com

24 November 2022

Calculating the carbon footprint
offsetting carbon emissions
helping to combat climate change

Appendix – A: Statement of Verification



Verification Opinion

CFV 756927 15032023

**Responsible Party:**

A.E.S. Engineering Ltd (Group of Companies)
Global Technology Centre
Bradmarsh Business Park
Mill Close
Rotherham
South Yorkshire
S60 1BZ

Type of GHG Statement:

Organisational

Identification of GHG Statement:

A.E.S Engineering Ltd. GHG Inventory – Scope 1, 2 & 3 Emissions Inventories (GHGINV2122 – V7 - Public – 02-Mar-2023)

Scope of activities:

Manufacturing, sales and technical service for mechanical seals and support systems.

Organisational Boundary:

Operational Control

Sites Included in Organisational Boundary:

(See Appendix 1)

Reporting Boundary:

Scope 1 - Direct GHG emissions
Scope 2 - Indirect GHG emissions from purchased energy
Scope 3 - Indirect GHG emissions (corporate value chain)

Exclusions from reporting Boundary:

Scope 3: Processing of sold products, downstream leased assets, franchises and investments.

Criteria for developing the organisational GHG Inventory:

ISO 14064-1:2018 (BS EN ISO 14064-1:2019) & The Greenhouse Gas Protocol

Level of Assurance:

Reasonable

Materiality level:

5%

...making excellence a habit.™

A.E.S Engineering Ltd. GHG Inventory

Scope 1, 2 & 3 Emissions Inventories



Period:

1-Oct-2021 to 30-Sep-2022

GHG Emissions:

tCO ₂ (e)	Location Based	Market Based
Scope 1	2,439.08	2,439.08
Scope 2	3,102.32	1,994.38
Scope 3	128,655.2	128,655.2
Total	134,196.6	133,088.63

Note: A.E.S Engineering Ltd. purchases and retirement of 5,540t of CO₂e was verified:

Projects	t CO ₂ e	Verified by
Offset via efficient household cookstoves in India (VCS 2336)	2750	Verra
Offset via reduced deforestation in Cambodia (VCS 1650)	2750	Verra
Pacajai REDD+ Project (VC 981)	40	Verra
Total	5540	

Verification Opinion: Verified with Comments

Based on the processes and procedures conducted, the GHG statement is materially correct and is a fair representation of the GHG data and information and is prepared in accordance with ISO14064-1:2018.

The following improvements were raised in relation to future reporting:

Natural gas	Sites to consider gas meter readings to confirm billing data.
Refrigeration gases	Sites to consider having an inventory of refrigeration gases storage (type & amount) within refrigeration equipment. Sites to report confirmation of non leakage / refilling of refrigeration gases.
Purchased electricity	Sites to consider electricity meter readings to confirm billing data.
Purchased goods.	To consider automatic categorization of purchased goods at purchasing IT tools (SAP, MS Dynamics, etc., ...). Currently categorization of purchases is done manually from original data.

In the organisation carbon footprint both location and market-based scope 2 emissions are reported.

The organization has calculated GHG emissions associated to some sites (repair centres, sales offices) on the basis of scaling emissions from other similar sites using averages and linear regression approaches, instead of using sites activity data.

Scale model was reviewed during the verification process, has been improved from previous reporting period and seems to provide consistent results.

Verification Activities:

The following were the verification activities undertaken:

- Review of GHG calculation methodologies, including uncertainty
- Review of activity data and monitoring / controls systems through visiting sites (remote connection), interview of employees, review of supporting records.
- Verification of the data through sampling recalculation, retracing, cross checking, reconciliation
- Review of offset credits supporting records (purchasing, projects information, credits retirement)

The quantification and reporting of the GHG emissions has been independently verified by BSI against the specifications defined in ISO 14064-1:2018 (BS EN ISO 14064-1:2019). The verification activity has been carried out in accordance with ISO 14064-3:2019 and the principles of ISO 14065:2013.

Responsibilities:

The data on which the GHG emissions are based has been provided by A.E.S. Engineering Ltd in the document. This document "A.E.S Engineering Ltd. GHG Inventory – Scope 1, 2 & 3 Emissions Inventories (GHGINV2122 - V7 – Public- 2-Mar-2023) is the responsibility of A.E.S. Engineering Ltd and is historical in nature.

The responsible party is responsible for the preparation and fair presentation of the GHG statement in accordance with the criteria.

BSI is responsible for expressing an opinion on the GHG statement based on the verification.

Lead Verifier: Jose L Miguel

Signed on behalf of BSI: Matt Page, Managing Director UK & Ireland, Assurance

Issue Date: 15th March 2023

NOTE: BSI Assurance UK Ltd is independent to and has no financial interest in A.E.S. Engineering Ltd.. This verification Opinion has been prepared for A.E.S. Engineering Ltd. only for the purposes of verifying its statement relating to its GHG emissions more particularly described in the scope above. It was not prepared for any other purpose. In making this Statement, BSI Assurance UK Ltd has assumed that all information provided to it by A.E.S. Engineering Ltd. is true, accurate and complete. BSI Assurance UK Ltd accepts no liability to any third party who places reliance on this Statement.



Appendix – B: Site Locations

Entity	Site (Shorthand)	Address
AESSEAL plc (02101607)	Mill Close	Rotherham - Mill Close, Bradmarsh Business Park, Rotherham, S60 1BZ
AESSEAL plc (02101607)	Derby	Derby - Wetherby Road, Osmaston Park Ind Est, Derby, DE24 8HL
AESSEAL plc (02101607)	Bradford	Bradford - Unit 1 and Unit 2 Venlo Ind Est, Knowles Street, Bradford, BD4 6HE
AESSEAL plc (02101607)	Mangham Road	Mangham Road, Barbot Hall Ind Est, Rotherham, S61 4RJ
AESSEAL plc (02101607)	NE	Middlesborough - Trident House, 1st Floor RHS Falcon Court, Preston Farm Business Park, Stockton-on-Tees, TS18 3TX
AESSEAL plc (02101607)	SE	Essex - 11 Saxon House, Upminster Trading Park, Warley Street, Upminster, Essex RM14 3PJ
AESSEAL plc (02101607)	Pontypridd	Abercynon - CF45 4SN Abercynon , Rhondda Cynon Taff
AESSEAL (MCK) LTD. (NI017307)	Lisburn	Lisburn - 139A Hillsborough Old Rd, Lisburn, County Antrim BT27 5QE
AESSEAL IRELAND LTD (NI065308)	Cork	Cork - Unit 14, Knockgriffin Ind. Park, Midleton, County Cork, P25 AR23
AVT RELIABILITY LTD (01829338)	Warrington	Warrington - Unit 2 Easter Court, Europa Boulevard, Warrington, WA5 7ZB
AVT RELIABILITY LTD (01829338)	Kirkcaldy	Evans John Smith Business Park, Kirkcaldy, KY2 6HD
AVT RELIABILITY LTD (01829338)	JaTech	JaTech Services - 801 Upper Canada Dr, Sarnia, ON N7W 1A3, Canada
AVTPUMP LIMITED (03336919)	Gloucester	Gloucester - Unit 5, Centurion Industrial Estate, Empire Way, Gloucester , GL2 5HY
AVTPUMP LIMITED (03336919)	Grangemouth	Grangemouth - Central England Workshop, North Site, Earls Road, Grangemouth, FK3 8XG
VULCAN ENGINEERING LIMITED (02422728)	Vulcan Sheffield	Southwest Centre, The South West Centre, Unit 3 Troutbeck Rd, Sheffield S8 0JR
VULCAN ENGINEERING LIMITED (02422728)	Vulcan Minnesota	Vulcan Seals Inc., 11401-11481 Rupp Drive, Burnsville, Minnesota, MN 55337
VULCAN ENGINEERING LIMITED (02422728)	Eastern Seals	Unit 3, Sovereign Business Park, Jubilee Industrial Estate, Ashington NE63 8UG
VULCAN ENGINEERING LIMITED (02422728)	Coating Centre	Unit 10 Eastover Farm, Abbots Ann, Andover, UK, SP11 7BT
AESSEAL Inc.	Rockford	Rockford TN - 355 Dunavant Drive, Rockford Tennessee 37853
AESSEAL Inc.	Kingsport TN	Kingsport TN - Building 226 Dr 6, Eastman Road, Kingsport, Tennessee 37662 (AES employees on Eastman Site)
AESSEAL Inc.	Marion IA	Marion IA - 5055 8th Avenue Marion, Iowa 52302
AESSEAL Inc.	Fairfield ME	Fairfield ME - 11 Evergreen Drive, Fairfield, Maine, 04937
AESSEAL Inc.	Longview WA	Longview WA - Suite #8, 960 Industrial Way, Longview, WA 98632
Mechanical Seal & Service Inc.	Odessa TX	Odessa - 3500 N County Road W, Odessa, TX, 79764
AVT Sealing Solutions Inc.	Addison IL	Addison - 1070 N Garfield Street Lombard, IL 60418

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AESSEAL Sealing Products of Corpus Christie, LLP	Corpus Christi TX	Corpus Christi - 433 Sunbelt Drive, Suite A, Corpus Christi, TX 78408
AESSEAL Canada Inc	Mississauga ON	Mississauga - Unit 2, 445 Admiral Boulevard, Mississauga, Ontario, L5T 2N1
AESSEAL Canada Inc	Vancouver BC	British Columbia - #304 19292- 60th Avenue, Surrey, B.C Canada, V3S 3M2
AESSEAL (SEALTEC PLC SA)	Buenos Aires	Vicente Lopez, Buenos Aires - Sebastian Gaboto 4950, B1605BH- Munro, Buenos Aires, Argentina.
AESSEAL (SEALTEC PLC SA)	Montevideo	Montevideo - Asuncion 1476 Aguada , Montevideo
AESSEAL Brazil Ltda	Sao Paulo	Sau Paulo (Main Office) - Av. Guido Caloi No 1985, Galpao 3, Santo Amaro, CEP No. 0582-140, Sao Paulo SP
AESSEAL Brazil Ltda	Belo Oriente	Belo Oriente (Branch) - Rodovia BR 381, KM 172, Perpetuo Socorro, CEP No. 35196-000, Belo Oriente, MG
AESSEAL Brazil Ltda	Laoro de Freitas	Lauro de Freitas (Branch) - Av Luiz Tarquino, 2580, Ed Villa Empresarial I, sala 311 - Pitangueiras, CEP No 42700-000, Lauro de Freitas, BA
AESSEAL Colombia SA	Bogota	Bogota - Calle 25g No. 85B-65: Barrio Santa Cecilia de Modelia Providencia, Santiago. - Avenida El Retiro 1275. Bodega A05
AESSEAL Chile SA	Santiago	RENCA- Santiago, Chile
AESSEAL MEXICO S. DE R.L. DE C.V.	Tampico	Tampico Tamaulipas - Carretera Tampico, Mante #2005 Local D Planta Alta y Baja , Colonia del Bosque, Tampico Tamaulipas CP 89318
AESSEAL MEXICO S. DE R.L. DE C.V.	Tlalnepantla	Tlalnepantla - El Encanto #8, Col. Electra, Tlalnepantla de Baz, 54060, Edo. Mexico.
AESSEAL MEXICO S. DE R.L. DE C.V.	Coatzacoalcos	Coatzacoalcos - Nuevo Leon No. 713 Colonia Petrolera, Coatzacoalcos, Veracruz, 96400
AESSEAL Coldweld Pvt. Ltd,	Coldweld	Vasai East Mumbai - Gala No A Cold Weld Estate, 22-23 Gokhivare Village, Sativali Road, Vasai East, Dist Palghar, Maharashtra, India, Pin Code 401208
AESSEAL India Pvt. Ltd	Vasai	Bldg. no. 4A, KT Laser, S. No. 15 H. No. 1, KT Industrial Park, Vasai East - 401208.
AESSEAL India Pvt. Ltd	Customer operated	Customer operated site
AESSEAL India Pvt. Ltd	Pune	Pune - Gat No. 85, At Post Varve, Khed Shivapur, Taluka Bhore, Dist. Pune, 412 205.
AESSEAL China Ltd	Ningbo	Ningbo - No. 65 1-2, Lane 777, Qingfeng Road, Ci Cheng Town, Jiang bei District, Ningbo, Zhejiang Province, China
AESSEAL China Ltd	Wuxi	Wuxi - 21F Coast Center, No. 41 Guanshundao Coast City, Taihu New Town, Binhu District, Wuxi City
AESSEAL China Ltd	Dalian	18th floor, Dalian Ping An Building, 24 Renmin Road, Zhongshan District, Dalian
AESSEAL China Ltd	Zhanjiang City	Room 806, No 9, Zone 4, Lucun Road, Xiashan district, Zhanjiang City
AESSEAL Pty Ltd	Johannesburg	Johannesburg - 67 Loper Avenue, Spartan Extension 2, Johannesburg, Gauteng
AESSEAL Pty Ltd	Durban	Durban Durban Belzona - 454 Kingsway Road, Amanzimtoti, KZN, South Africa
AESSEAL Pty Ltd	Cape Town	Cape Town - 10 Killamey Avenue, Killamey Gardens, Milnerton, Cape Town, 7441.
AESSEAL Pty Ltd	Richards Bay	Richards Bay - Unit 4, Dolphin Park, 72 Ceramic Curve, Alton, Richards Bay
AESSEAL Pty Ltd	Sasolburg	Sasolburg - 3 Oxygen Street, Sasolburg Eco Industrial Park, Vaalpark, 1947
AESSEAL Pty Ltd	Kuruman	10 Schoeman Street, Kuruman, Northern Cape, 8460

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AESSEAL Pty Ltd	Secunda	Secunda - 14 Kingfisher Street, Secunda, Mpumalanga
AESSEAL Benelux BV	Breda (Benelux)	Breda - Nikkelstraat 27, 4823 AE, Breda.
AESSEAL Czech s.r.o.	Brno	Brno - Turanka 115, 627 00 Brno
AESSEAL Denmark A-S	Køge	Koege - Koebenhavnsvej 222, DK-4600 Koege
AESSEAL Austria GmbH	Oberösterreich	Obere Dorfstraße - Obere Dorfstraße 39, 4616 Weißkirchen an der Traun , Oberösterreich
AESSEAL Deutschland GmbH	Kronau	Kronau - Heidigstrasse 9, Kronau, D - 76709
AESSEAL Finland OY	Jyväskylä	Jyväskylä - Sorastajantie 1a lt. 2, 40340 Jyväskylä, Lansi-Suomen laani
AESSEAL France SARL	Nieppe	Nieppe - ZA De L'EpINETTE, 161 rue de Bruxelles, 59850 Nieppe France
AESSEAL Ibérica SL	Tarragona	Tarragona (Delivery Address) - Pol Ind Riu Clar, Plata 7, Tarragona, 43006
AESSEAL Italia SRL	Gallarate	Gallarate - Via Varese 17/B - 21013 Gallarate (Va)
AESSEAL Italia SRL	Latina	Latina - Via Gioberti, 11 - 04100 Latina (Lt)
AESSEAL Polska Sp. z o.o.	Mazancowice	Mazańcowice - Mazańcowice 999, 43-391 Mazańcowice
AESSEAL Russia	Moscow	Moscow - Boldyreva Street, 1 Koroliov City, Moscow Area, 141073
AESSEAL Nordic AB	Stockholm	Jordbro, Stockholm - Jordbro Park, Rörvägen 57, 136 50 Jordbro
AESSEAL Sızdırmazlık Tic.Ltd.	Istanbul	Istanbul - Tekstilcent Is Merkezi, A15 Blok, No.13 Esenler - Istanbul 34235
AESSEAL Univeda Unipessoal LDA	Lisbon	QUELUZ de BAIXO - Barcarena - Estrada Consiglieri Pedroso, 71 Edificio E - Fracção Q4 - 2730-055 Queluz de Baixo
AESSEAL Univeda Unipessoal LDA	Porto	Stª Maria da Feira - Porto - Rua Centro Empresarial do Cavaco, Pav. 04 - Escritório 06, 4520-061 S. João De Ver
Propack Dichtungen und Packungen AG	Sauerlach	Rudolf-Diesel-Ring 28, D 82054 Sauerlach
AESSEAL (M) Sdn Bhd	Selangor (Puchong)	Selangor (Puchong) - No.9, Jalan MJ 13, Taman Industri Meranti Jaya, 47120 Puchong, Selangor Darul Ehsan
AESSEAL (M) Sdn Bhd	Pahang (Kuantan - Gebeng Area)	Pahang (Kuantan - Gebeng Area) - A-25. Ground Floor, Jalan Gebeng 2/6, Kawasan Industri Gebeng, 26080 Kuantan, Pahang Darul Makmur, Pahang.
AESSEAL (M) Sdn Bhd	Johor (Masai)	Johor (Masai) - No. 31 Jalan Bukit 9 , Bandar Seri Alam , 81750 Masai, Johor.
AESSEAL (M) Sdn Bhd	Lahad Datu (East Malaysia)	Lahad Datu (East Malaysia) - MDLD 7635, Lot 3, Block B, Layung Industries, Jalan Tengah Nipah, 91100 Lahad Datu,
AESSEAL (M) Sdn Bhd	Pulau Pinang (Butterworth)	Pulau Pinang (Butterworth) - No. 52, Lengkok Kapal, Jalan Chain Ferry, 12100 Butterworth, Pulau Pinang
AESSEAL Saudi Arabia Co. Ltd.	Dammam	DAMMAM - DAMMAM 2ND INDUSTRIAL CITY - SAUDI INDUSTRIAL PROPERTY AUTHORIYT - MODON - Building No 6770 Unit No. 3 - PO BOX 6770 - 3341 Dammam 34334 KSA
AESSEAL Middle East FZE	Dubai	Dubai - Showroom No. S3B5SR08, Jebel Ali Free Zone, Jebel Ali, Dubai, UAE
AESSEAL Australia Pty Ltd	Brisbane QLD	QLD - 12 Counihan Road, Seventeen Mile Rocks, Queensland, 4073
AESSEAL Australia Pty Ltd	Rockingham WA	WA - Unit 6, 5 Nasmyth Road, Rockingham WA 6168
AESSEAL Australia Pty Ltd	Edwardstown SA	SA - 25 Weaver Street, Edwardstown SA 5039
AESSEAL Australia Pty Ltd	Sydney NSW	NSW - Sydney - Unit 11/1 Adept Lane, Bankstown, NSW 2200
AESSEAL COJ	Algiers	Algiers - Lot No 5 Zone d'activite Ain Benian-Alger, Algeria

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AESSEAL Taiwan Co., Ltd	Kaohsiung	Kaohsiung City - No.124 Zhumen Ln., RenWu Dist., Kaohsiung City 81448, Taiwan (R.O.C.)
AESSEAL Namibia (Pty) Ltd	Swakopmund	Swakopmund - Unit 9, Einstein Business Park, Einstein Street, Swakopmund (moving Aug 19 to Winghoek)
AESSEAL Botswana (Pty) Ltd	Orapa	Orapa - Office Unit 3, Plot 1056, Industrial Site Orapa, Botswana
AESSEAL NSW Pty Ltd	Smeaton Grange (Stevco)	Stevco Seals & Pumps Pty Ltd - 11 Samantha Place Smeaton Grange, NSW, 2567
AESSEAL NSW Pty Ltd	Smeaton Grange (AES&S)	Australian Engineering Sale & Service Pty Ltd - 11 Samantha Place Smeaton Grange, NSW, 2567
AES Edmonton	Edmonton	3104/3108 - 121 Avenue N.E, Edmonton, Alberta
Van Geffen AMS	Van Geffen	Uilenwaard 7, 5236 WB 's-Hertogenbosch, Netherlands
AESSEAL Pty Ltd	East London	Mercedes Benz SA (PTY) LTD, 7 Settlers Way, Gately Industrial Township, Building B-Plant, Machine Shop, East London, 5200
AESSEAL MEXICO S. DE R.L. DE C.V.	Atizapan	Gardenia 14, Tulipan y Azucena, HDA De La Luz, C.P. 52929, Atizapan De Zaragoza, Mex.

For further information or questions regarding the methodology or emission factors used by AES Engineering Ltd please contact enquiries@aes seal.info.