

# Avon Pension Fund:

Carbon Footprint of Listed Equity Portfolios

2018



S&P Dow Jones Indices  
ESG Analysis



September 2018

## CREDITS

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## EXECUTIVE SUMMARY

This is Trucost's second annual assessment of the carbon footprint of Avon Pension Fund's listed equity portfolios, with holdings as at 31<sup>st</sup> March 2018. The date of analysis is 25<sup>th</sup> September 2018.

Trucost was asked to analyse Avon Pension Fund's seven listed equity portfolios, as well as the Aggregate Active Portfolio and overall Aggregate Portfolio, against their respective benchmarks.

## KEY RESULTS

- This year's carbon footprint results show an overall year-on-year improvement in the carbon footprint performance of Avon Pension Fund's Aggregate Portfolio between 2017 and 2018, driven mainly by underlying improvements in the underlying passive portfolios (viz. the addition of the Blackrock Low Carbon portfolio this year).
- All portfolios, with the exception of the TT portfolio, were more carbon efficient than their respective benchmarks this year. However, on aggregate, the active portfolios, though still more efficient than their respective benchmarks, saw a decline in their carbon performance, both in terms of year-on-year performance and performance relative to benchmark.
- The Aggregate Portfolio is more carbon efficient than its benchmark, outperforming by 28.48% in terms of carbon to revenue (up from 20.49% in 2017). This is due to positive sector allocation and stock selection effects. Sector allocation resulted in the portfolio being 19.07% more carbon efficient than the benchmark. Stock selection resulted in the portfolio being 9.41% more carbon efficient than the benchmark.
- The two sectors that have the greatest positive effect on carbon efficiency of the portfolio are Utilities (14.02%) and Energy (6.98%). The two sectors that have the greatest overall negative effect on carbon efficiency of the portfolio are Consumer Staples (-0.93%) and Information Technology (-0.72%).
- The largest contributors to the portfolio's carbon footprint are Alcoa Corp, Mondi PLC and Intl Paper Co, which together account for 12.03% of the portfolio's apportioned carbon emissions.
- In terms of disclosure, the Aggregate Portfolio has a high overall level of disclosure. 83% of the companies included in this year's analysis (by value of holdings) disclose GHG data (either fully or partially).
- In terms of fossil fuel exposure, the Aggregate Portfolio has a lower level exposure to extractives than its benchmark (1.5% vs. 2.2% in terms of revenue, and 5.8% vs. 10.7% in terms of VOH). It also has a lower level of exposure to companies with fossil fuel reserves, in terms of value of holdings (4.5% vs. 9.7%).

- In terms of the overall proportion of coal power in the energy generation mix, the Aggregate Portfolio generates less energy from coal than the benchmark (21.84% versus 31.80%) and more energy from renewable sources (22.37% versus 19.46%).
- However, there is still the opportunity to better align the Aggregate Portfolio with low carbon energy transition scenarios (such as the 2 Degree Scenarios developed by the International Energy Agency), by increasing the proportion of renewable energy in the portfolio's energy generation mix, and reducing the proportion of coal-fired power generation.
- At an underlying portfolio level, the best performing individual portfolio based on this year's carbon footprint results is the Blackrock Low Carbon portfolio, with a carbon to revenue figure of 183.30 tCO<sub>2</sub>e/mGBP. The Genesis portfolio is a close second with a carbon to revenue figure of 229.90 tCO<sub>2</sub>e/mGBP. However, the Genesis portfolio has the best overall efficiency relative to benchmark (70.61%). The Blackrock Low Carbon portfolio is next, with a relative efficiency to benchmark of 54.31%.

## RECOMMENDATIONS

- A number of individual portfolios have seen their carbon efficiency decline over the last year vis-à-vis their respective benchmarks and/or the prior year's carbon footprint. In order to drive improvements in performance, Avon Pension Fund should consider engaging with those fund managers whose portfolios have seen a decline in year-on-year carbon performance, and those whose holdings include companies listed among the top 10 contributors to the Aggregate Portfolio's carbon footprint and embedded emissions from fossil fuel reserves.
- Avon should consider setting carbon footprint performance targets for the overall equities portfolio to encourage those fund managers that performed less well to improve, and better performers to maintain their performance going forward.
- In order to improve low carbon energy transition alignment across its portfolio, Avon Pension Fund should consider also setting targets to minimise coal mining and coal power exposure and maximise renewable energy exposure across the individual funds.

## INTRODUCTION

This is Trucost's second annual assessment of the carbon footprint of Avon Pension Fund's listed equity portfolios, with holdings as at 31<sup>st</sup> March 2018.

In recent years, asset owners have become more pro-active in understanding their exposures to risk deriving from holdings of carbon-intensive equities. Such carbon risk can emanate from country-specific carbon legislation – particularly where investments extend beyond national boundaries to imply differing regulation risks – or via reputational impacts on a company's earnings potential.

International commitments to transition to a low carbon economy, such as the UNFCCC's 2015 Paris Climate Accord, have caused more and more investors to take notice. The UN PRI's Montréal Carbon Pledge, a spin off initiative to the Paris agreement, together with a number of regulations such as Article 173 in France, have accelerated the process. More recently, the EU has set out its *Action Plan: Financing Sustainable Growth* that is expected to move a whole region towards implementing its own regulations and will be adopted by the member states in order to enhance transparency and standardisation of ESG and sustainability metrics, integrate them in risk management, and steer capital flows towards sustainable investments. Much of the momentum on disclosures and ESG integration for financial institutions and regulators is also driven by non-binding guidelines created by high level initiatives such as the Task Force for Climate-related Financial Disclosures (TCFD), emphasising the importance of using forward looking metrics and tools for reporting and risk assessment.

Carbon footprints and analysis of carbon "hot spots" in portfolios can be used to identify carbon-related strengths, weaknesses, opportunities and threats from the shift to a low-carbon economy.

This carbon footprint analysis underpins Avon's climate change policy to carry out analysis of the investment portfolios at a top level, identifying what the key climate change impacts are, and to focus on the related risks and opportunities through further discussion with external managers and stakeholders.

Trucost's assessment of carbon risk in the Avon's equity funds includes:

- Measurements of the carbon efficiency of portfolios relative to benchmarks
- Analysis of sector allocation effects and stock selection effects
- Assessment of the transparency of carbon disclosure at portfolio and constituent level
- Identification of key contributors to the carbon footprints of the funds
- Highlighting of key (active) investees for engagement on carbon risk
- Determination of the funds' exposures to fossil fuel and renewable energy

The carbon footprint analysis is done by apportioning each holding's emissions to their respective portfolios based on the level of "ownership" of the company (value of holding/market cap). We then compare the carbon intensity of each portfolio to the benchmark, where applicable, to determine sector allocation and stock selection effects. A glossary of terms can be found in the Appendices. Values expressed in percentage terms have been constructed such that a positive (negative) number is "good" ("bad") news for the fund's carbon risk exposure.

The Total Carbon Emissions, Carbon to Value Invested (C/V), Carbon to Revenue (C/R), and Weighted Average Carbon Intensity (WACI) are presented below. If not explicitly stated, all references to portfolio or benchmark performance are made on a C/R basis.

For more information on methodological approaches please refer to Appendices.

## SCOPE OF THE ANALYSIS

Trucost was asked to analyse the carbon footprints of Avon Pension Fund’s seven listed equity portfolios, as well as the Aggregate Active Portfolio and overall Aggregate Portfolio, against their respective benchmarks.

Table 1 provides an overview of the holdings analysed in each portfolio.

TABLE 1: PORTFOLIO COMPANY COVERAGE SUMMARY

Portfolio	Analysis Company Coverage (% by Holdings Value)	Holdings Value Covered (mGBP)	No. of Constituents <sup>1</sup> Covered
<b>BlackRock Low Carbon</b>	99.97	458.03	1237
<b>BlackRock Passive Global Equity</b>	99.29	388.29	1623
<b>Genesis Emerging Markets Investment Company SICAV</b>	95.7	107.08	113
<b>Jupiter</b>	95.97	175.52	53
<b>Schroders Global Equity</b>	100	352.21	76
<b>TT INTL</b>	97.74	175.52	39
<b>Unigestion</b>	99.27	105.73	98
<b>Aggregate Active Portfolio</b>	98.18	916.06	353
<b>Aggregate Portfolio</b>	98.88	1762.38	1860

An equivalent overview of the coverage of all benchmarks is shown in Table 2:

TABLE 2: BENCHMARK COMPANY COVERAGE SUMMARY

Benchmark	Analysis Company Coverage (% by Weight)	No. of Constituents Covered
<b>FTSE All-Share Total Return Index</b>	95.46	443
<b>MSCI ACWI</b>	99.9	2454
<b>MSCI Emerging Markets Index</b>	99.71	826
<b>MSCI World</b>	99.93	1628
<b>MSCI World Ex UK</b>	99.92	1526
<b>Aggregate Active Benchmark</b>	98.67	2792
<b>Strategic Benchmark</b>	98.50	2792

<sup>1</sup> The number of constituents consolidates multiple holdings of the same company and is exclusive of non-listed equity lines.

## AVON AGGREGATE PORTFOLIO

The following sections of this report will cover the Avon Aggregate Portfolio’s carbon footprint, and include attribution analysis as well as analysis of key contributors, disclosure, fossil fuel exposure, and power generation mix alignment with two degree scenarios. The scope of this analysis covers only direct and first tier indirect emissions.

### HEADLINE RESULTS

- The Avon Aggregate Portfolio – an aggregation of all equity portfolios – is outperforming the Strategic Benchmark by 29% (20% in 2017).
- The Strategic Benchmark is comprised of three individual benchmarks, namely FTSE All Share (30%), MSCI World ex UK (50%) and MSCI Emerging Market (20%).
- At present, every time the portfolio generates £ 1m of revenue, 335.30 tonnes of carbon dioxide are emitted.
- Stated in absolute terms using holdings data as of the date of analysis, the equities portfolio “finances” 361,683 tCO<sub>2</sub>e per year (199,362 tCO<sub>2</sub>e per year direct and 162,321 tCO<sub>2</sub>e per year first tier indirect).
- The date of analysis is 25<sup>th</sup> September 2018.

FIGURE 1: CARBON PERFORMANCE BY METHOD

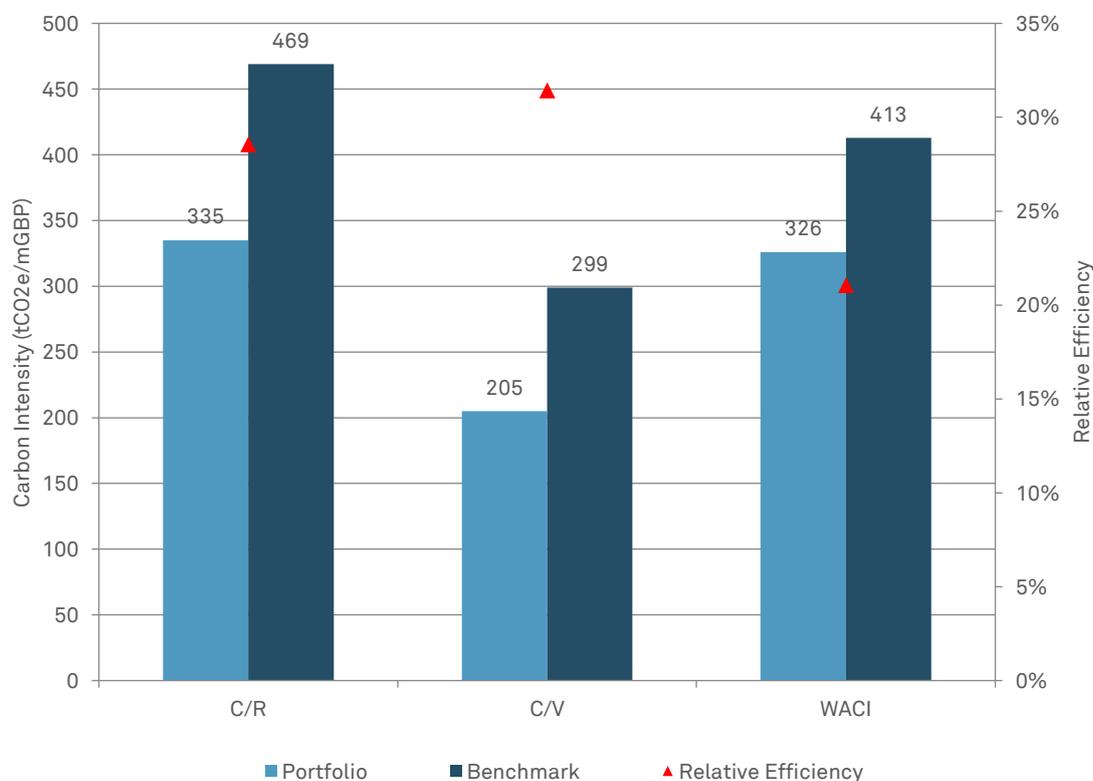


FIGURE 2: CARBON APPORTIONED BY SCOPE

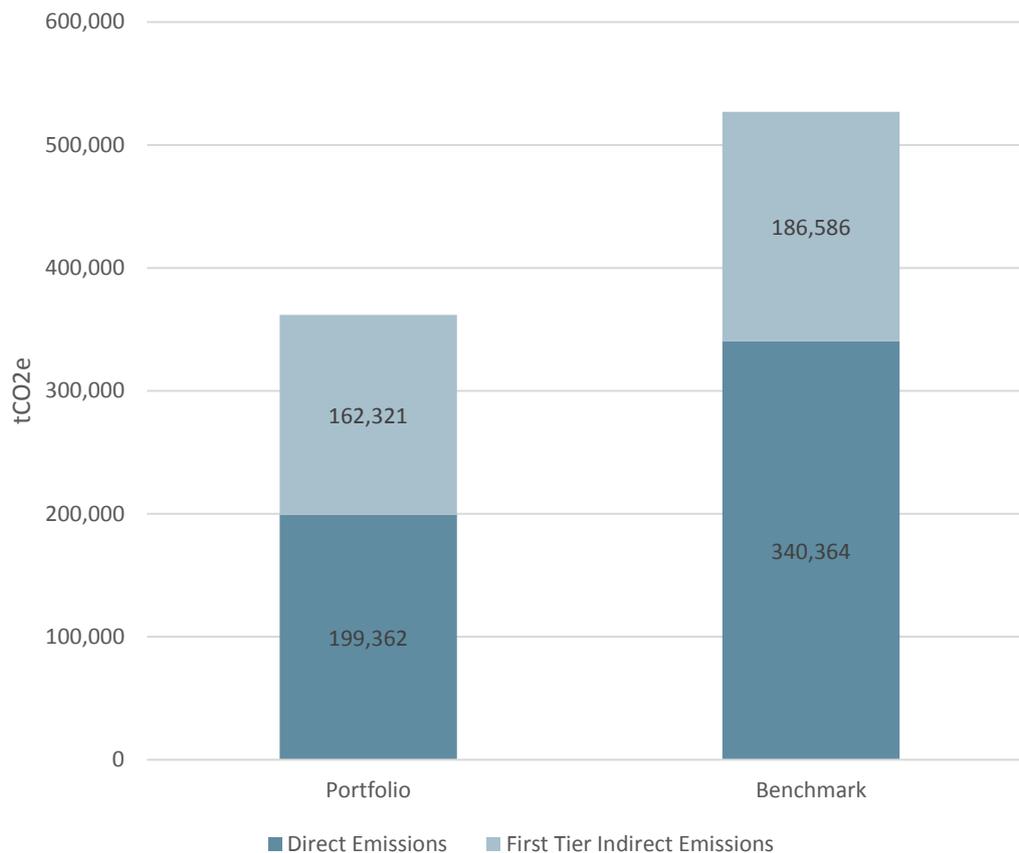


TABLE 3: SUMMARY OF THE CARBON FOOTPRINT: AGGREGATE PORTFOLIO

Avon Aggregate Portfolio	2017	2018
Portfolio Carbon to Revenue (tCO <sub>2</sub> e/mGBP)	386.36	335.30
Benchmark Carbon to Revenue (tCO <sub>2</sub> e/mGBP)	485.94	468.81
<i>Sector allocation effect</i>	11.90%	19.07%
<i>Company selection effect</i>	8.59%	9.41%
<b>Relative Efficiency</b>	<b>20.49%</b>	<b>28.48%</b>

TABLE 4: PORTFOLIO CARBON FOOTPRINT AND RELATIVE EFFICIENCY

Portfolio vs Benchmark	2017 Portfolio Carbon to Revenue (tCO <sub>2</sub> e/mGBP)	2018 Portfolio Carbon to Revenue (tCO <sub>2</sub> e/mGBP)	2017 Relative Efficiency to Benchmark	2018 Relative Efficiency to Benchmark
Aggregate Portfolio vs Strategic Benchmark	386.36	335.30	20.49%	28.48%
Agg. Active vs Agg. Active Benchmark	374.58	377.05	28.15%	25.09%
BlackRock Low Carbon vs MSCI World	N/A	183.30	N/A	54.31%
BlackRock Passive Global Equity vs MSCI World	428.92	400.58	-1.75%	0.15%
Genesis Emerging Markets Investment Company SICAV vs MSCI Emerging	384.17	229.90	51.16%	70.61%
Jupiter vs FTSE All-Share Total Return Index	249.07	331.10	33.54%	15.23%
Schroders Global Equity vs MSCI ACWI	382.84	409.20	18.28%	9.40%
TT vs FTSE All-Share Total Return Index	434.01	401.01	-15.80%	-2.66%
Unigestion vs MSCI Emerging Markets Index	359.54	483.48	54.29%	38.14%

## PERFORMANCE ATTRIBUTION

The two principal reasons why the carbon exposure of the portfolio may differ from the benchmark are due to sector allocation decisions and company allocation decisions. Sector allocation decisions will cause the carbon intensity of the portfolio to diverge markedly from the benchmark where the sector/s are either carbon intensive or low carbon.

If the portfolio is overweight in carbon intensive sectors, the portfolio is likely to be more carbon intensive than the benchmark. However, if the companies within a carbon intensive sector are the most carbon efficient companies, it is possible that the portfolio may still have a lower carbon footprint than the benchmark.

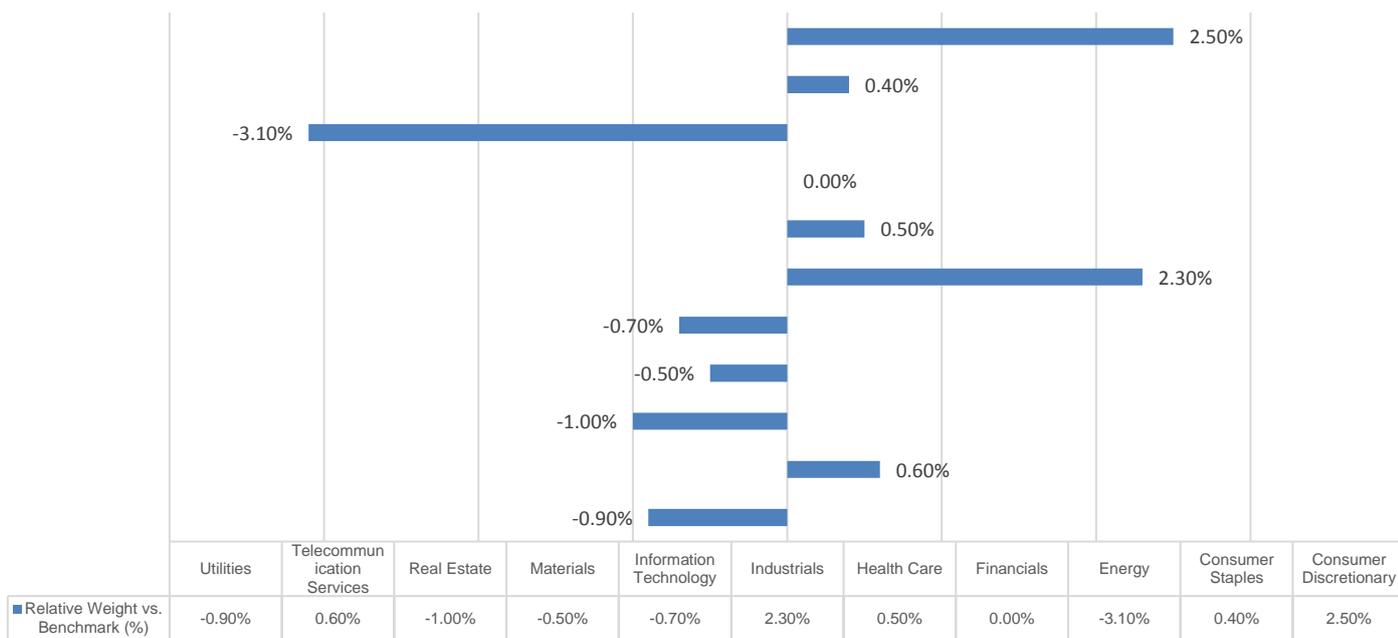
Sector allocation resulted in the portfolio being 19.07% more carbon efficient than the benchmark. Stock selection resulted in the portfolio being 9.41% more carbon efficient than the benchmark.

The two sectors that have the greatest positive effect on carbon efficiency of the portfolio are Utilities (14.02%) and Energy (6.98%). The two sectors that have the greatest overall negative effect on carbon efficiency of the portfolio are Consumer Staples (-0.93%) and Information Technology (-0.72%).

TABLE 5: COMPANY AND SECTOR PERFORMANCE EFFECTS IN THE AGGREGATE PORTFOLIO

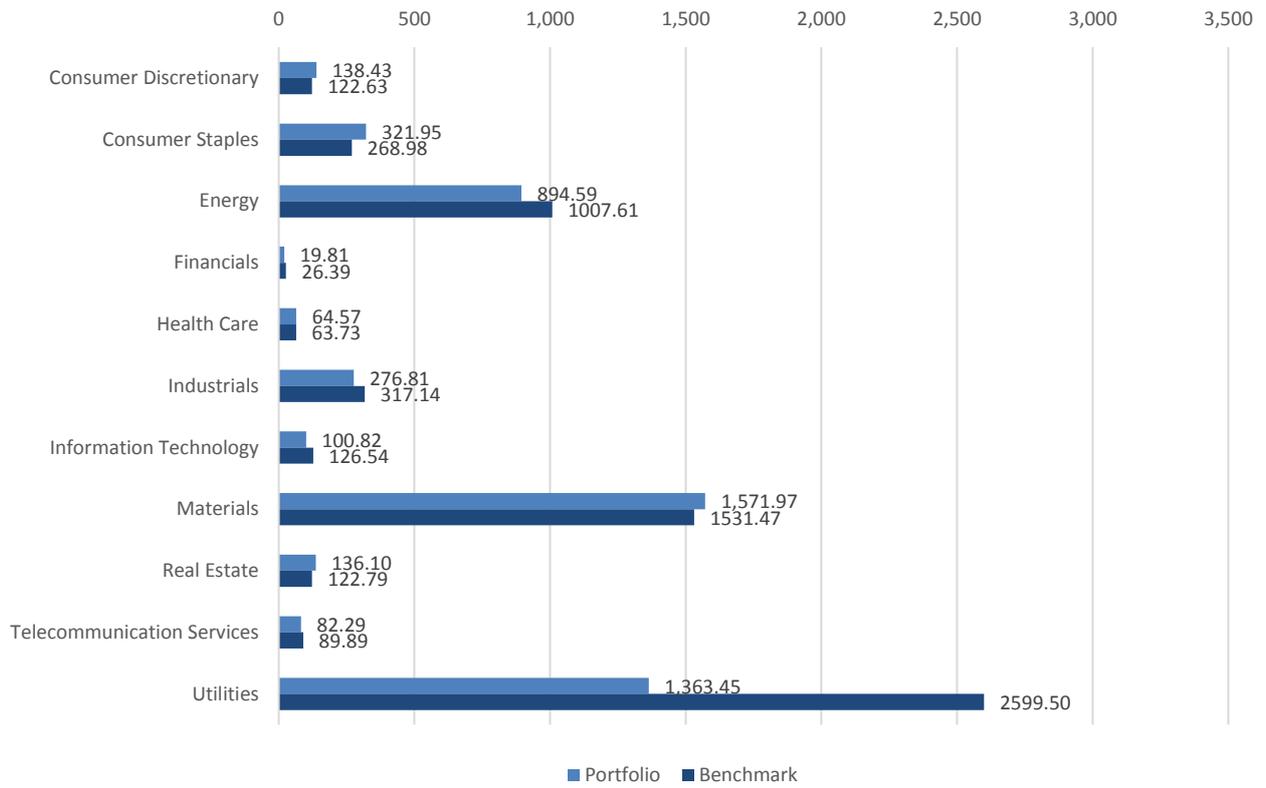
Sector	Carbon to Revenue (tCO <sub>2</sub> e/mGBP)		Attribution Analysis		
	Portfolio	Benchmark	Sector Allocation	Stock Selection	Total Effect
Consumer Discretionary	138.43	122.63	0.59%	-0.52%	0.07%
Consumer Staples	321.95	268.98	0.33%	-1.27%	-0.93%
Energy	894.59	1,007.61	5.05%	1.92%	6.98%
Financials	19.81	26.39	1.85%	0.28%	2.13%
Health Care	64.57	63.73	0.85%	-0.01%	0.84%
Industrials	276.81	317.14	1.28%	1.45%	2.73%
Information Technology	100.82	126.54	-1.09%	0.37%	-0.72%
Materials	1,571.97	1,531.47	3.54%	-0.55%	2.99%
Real Estate	136.1	122.79	-0.39%	-0.02%	-0.41%
Telecommunication Services	82.29	89.89	0.72%	0.07%	0.80%
Utilities	1,363.45	2,599.50	6.33%	7.69%	14.02%
	335.3	468.81	19.07%	9.41%	28.48%

FIGURE 3: RELATIVE SECTOR WEIGHT



■ Relative Weight vs. Benchmark (%)

FIGURE 4: SECTOR CARBON INTENSITY (tCO2e/mGBP)



**TOP 10 PORTFOLIO FOOTPRINT CONTRIBUTORS**

The table below displays the top 10 companies that contribute most negatively to the Aggregate Portfolio's carbon footprint.

Companies can appear in the "Top 10 Contributors" list for a number of reasons. A company might have a carbon intensity value that is significantly higher than the average for its sector or for the portfolio overall, or the size of the holding in the company may be relatively large (reflected in its portfolio weight), or the holding might represent a large percentage of capital ownership of the company, leading to a higher amount of the carbon emissions from the company's operations being apportioned to the holding.

The largest contributors to the portfolio's carbon footprint are Alcoa Corp, Mondi PLC and Intl Paper Co, which together account for 12.03% of the portfolio's apportioned carbon emissions.

TABLE 6: TOP 10 AGGREGATE PORTFOLIO FOOTPRINT CONTRIBUTORS

Company	Holding (mGBP)	Sector	Company Carbon Intensity (tCO <sub>2</sub> e / mGBP)	Rank In Benchmark Sector	C/R Intensity Contribution (%)	Data Source (Scope 1)	Constituent Portfolio
<b>Alcoa Corp</b>	3.397	Materials	4,094.07	N/A	-4.10	Full Disclosure	Schroders Global Equity
<b>Mondi PLC</b>	7.306	Materials	3,619.08	202/240	-3.93	Full Disclosure	BlackRock Passive Global Equity; Jupiter; TT INTL
<b>Intl Paper Co</b>	4.362	Materials	2,726.52	189/240	-2.88	Full Disclosure	BlackRock Passive Global Equity; Schroders Global Equity
<b>Royal Dutch Shell PLC</b>	19.915	Energy	884.40	70/141	-2.82	Full Disclosure	BlackRock Low Carbon; BlackRock Passive Global Equity; TT INTL
<b>CRH Plc</b>	7.133	Materials	1,585.44	158/240	-2.71	Full Disclosure	BlackRock Passive Global Equity; Jupiter; TT INTL
<b>Cranswick</b>	8.093	Consumer Staples	1,322.61	199/212	-1.91	Partial Disclosure	Jupiter
<b>HeidelbergCement AG</b>	1.244	Materials	6,254.83	222/240	-1.83	Full Disclosure	BlackRock Passive Global Equity; Schroders Global Equity
<b>Indian Oil Corp Ltd</b>	2.789	Energy	982.08	81/141	-1.17	Full Disclosure	Unigestion
<b>Polski Koncern Naftowy SA</b>	2.595	Energy	1,146.12	94/141	-1.16	Partial Disclosure	Unigestion
<b>Bharat Petroleum Corp Ltd</b>	2.154	Energy	988.42	82/141	-1.07	Modelled	Unigestion

### TRANSPARENCY & DISCLOSURE

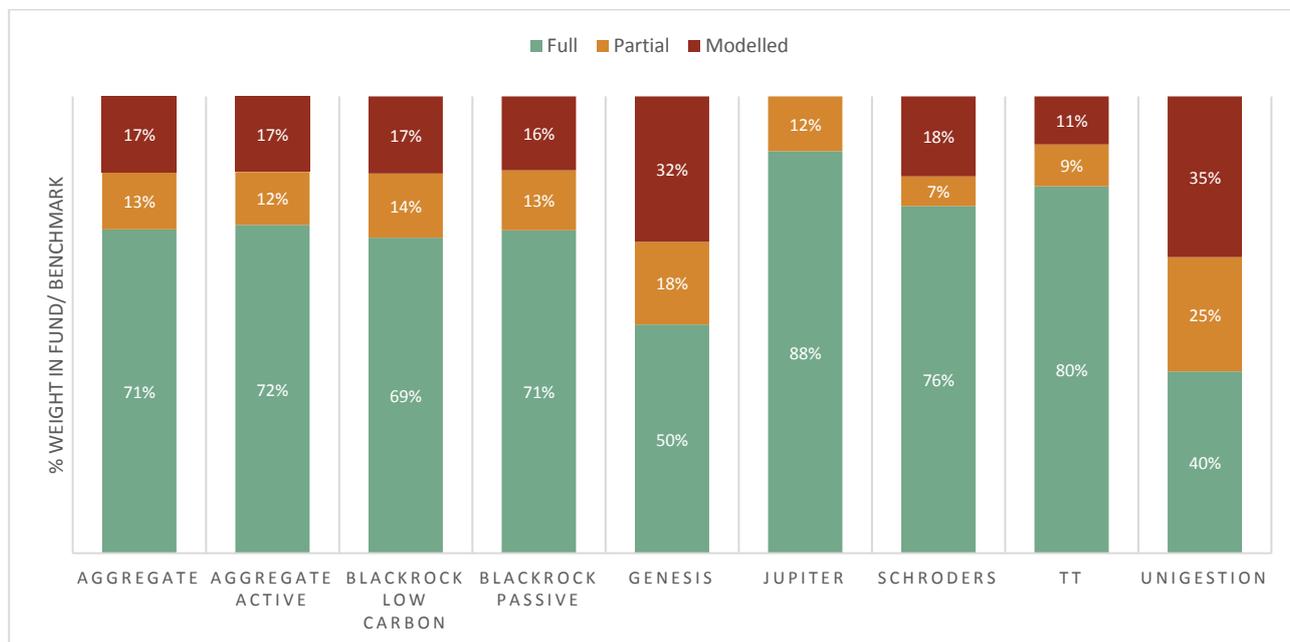
The disclosure analysis shows how much of the carbon data is sourced from actual company disclosures and how much is modelled by Trucost.

The disclosure rate is measured against the value of holdings (VOH). The VoH method shows for how much VoH, either carbon data is disclosed or modelled. The results for the GHG method can be interpreted as how much of the GHG data is sourced either from actual company disclosures or from the Trucost model. The disclosure rates by Companies method shows how many holdings out of analysed holdings provide disclosure.

The disclosure rates are defined for three categories: namely full disclosure, partial disclosure and modelled. Full disclosure is considered when carbon data is available from company reporting. Partial disclosure is considered when a company lacks full disclosure data and the Trucost model is used in order to fill the gaps. Modelled data is considered when there is a complete lack of disclosure from companies and Trucost has entirely modelled its carbon data.

71% of the aggregate portfolio’s companies by value of holdings disclose carbon data at all, or of a sufficient quality and scope for use in analysis (Figure 5).

FIGURE 5: PORTFOLIO CARBON DATA DISCLOSURE RATES



## FOSSIL FUELS & STRANDED ASSETS

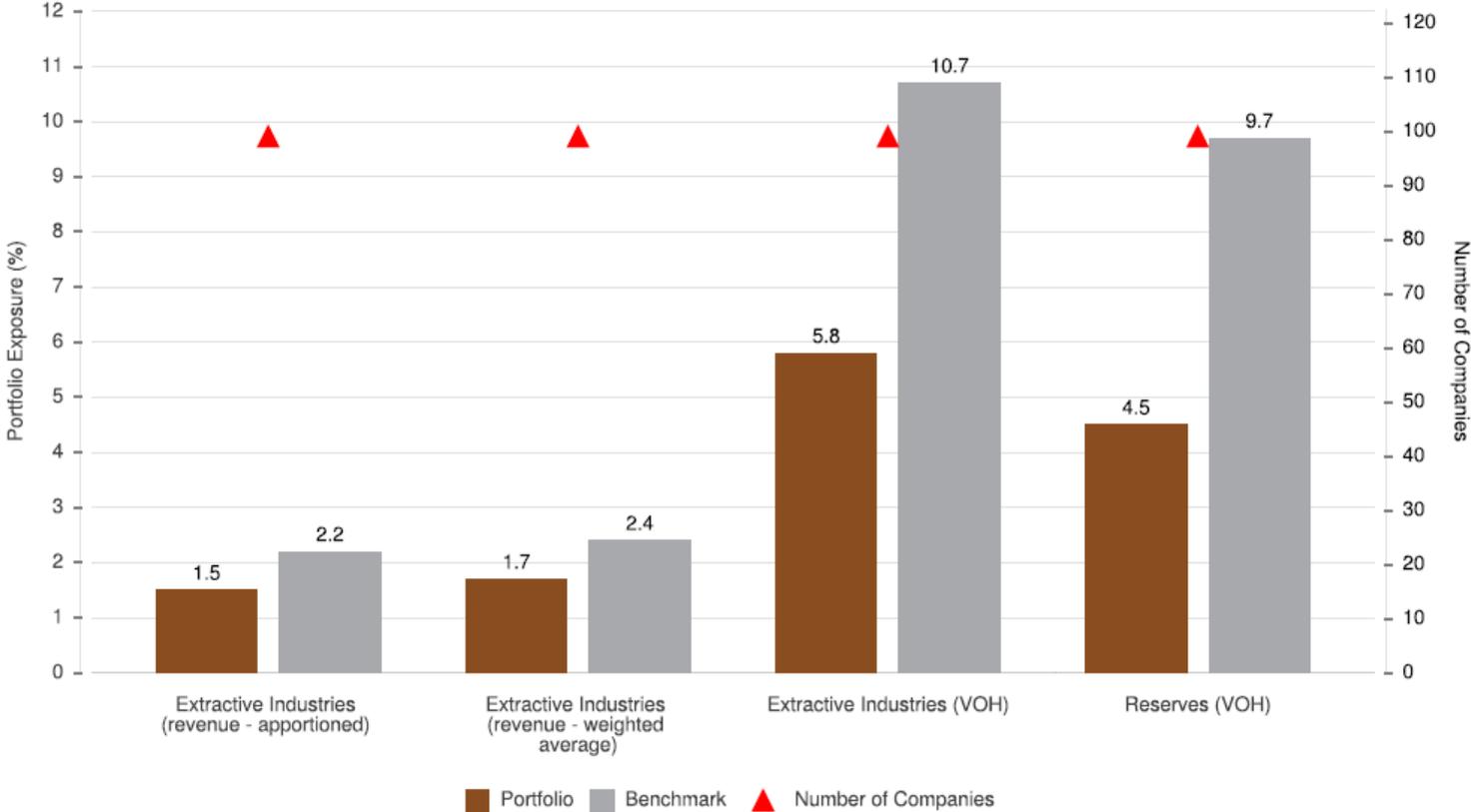
Future emissions from fossil fuel reserves far outweigh the allowable carbon budget that will limit global warming to 2 degrees Celsius above pre-industrial levels. Industry experts refer to assets that may suffer from unanticipated or premature write-downs, devaluations or conversion to liabilities as 'stranded assets'. Trucost assesses exposure to such assets by highlighting holdings with business activities in extractive industries, as well as holdings in companies that have disclosed proven and probable fossil fuel reserves in the portfolio. This helps to identify potentially stranded assets that would become apparent as economies move towards a 2<sup>o</sup> alignment.

### HEADLINE RESULTS

Avon Pension Fund's Aggregated Equities portfolio's exposure to potentially stranded assets has been assessed on both a value of holdings (VOH) basis and a revenue basis. For the revenue exposure metric, both the apportioning and weighted average approach are presented. For the VOH exposure metric, the revenue threshold for inclusion was 0%.

The Aggregate Portfolio has a lower level exposure to extractives than its benchmark (1.5% vs. 2.2% in terms of revenue, and 5.8% vs. 10.7% in terms of VOH). It also has a lower level of exposure to companies with fossil fuel reserves, in terms of value of holdings (4.5% vs. 9.7%).

FIGURE 6: EXPOSURE TO EXTRACTIVE INDUSTRIES AND RESERVES - AGGREGATE PORTFOLIO



## EXTRACTIVES REVENUE EXPOSURE BY SECTOR

Below is a breakdown of the portfolio's extractive industries revenue exposure by sector, as a share of total revenue. Both the apportioning and the weighted average methods are displayed.

From the breakdown in Table 7, we can see that the Aggregate Portfolio has a lower exposure to bituminous coal mining revenue and revenue from other types of fossil fuel extraction activities, than its benchmark, but is more exposed to revenue from drilling of oil and gas wells and other support activities for oil and gas operations.

TABLE 7: SUMMARY OF EXTRACTIVE INDUSTRIES REVENUE EXPOSURE BY SECTOR

Company Name	Bituminous Coal And Lignite Surface Mining	Bituminous Coal Underground Mining	Crude Petroleum And Natural Gas Extraction	Natural Gas Liquid Extraction	Drilling Oil And Gas Wells	Tar Sands Extraction	Support Activities For Oil And Gas Operations	Total Extractives Exposure
<b>Portfolio apportioned</b>	0.12%	0.02%	0.79%	0.20%	0.02%	0.02%	0.29%	<b>1.46%</b>
<b>Benchmark apportioned</b>	0.23%	0.08%	1.23%	0.42%	0.01%	0.05%	0.22%	<b>2.24%</b>
<b>Portfolio weighted</b>	0.11%	0.01%	0.95%	0.17%	0.03%	0.03%	0.44%	<b>1.74%</b>
<b>Benchmark weighted</b>	0.23%	0.06%	1.37%	0.33%	0.02%	0.08%	0.29%	<b>2.38%</b>

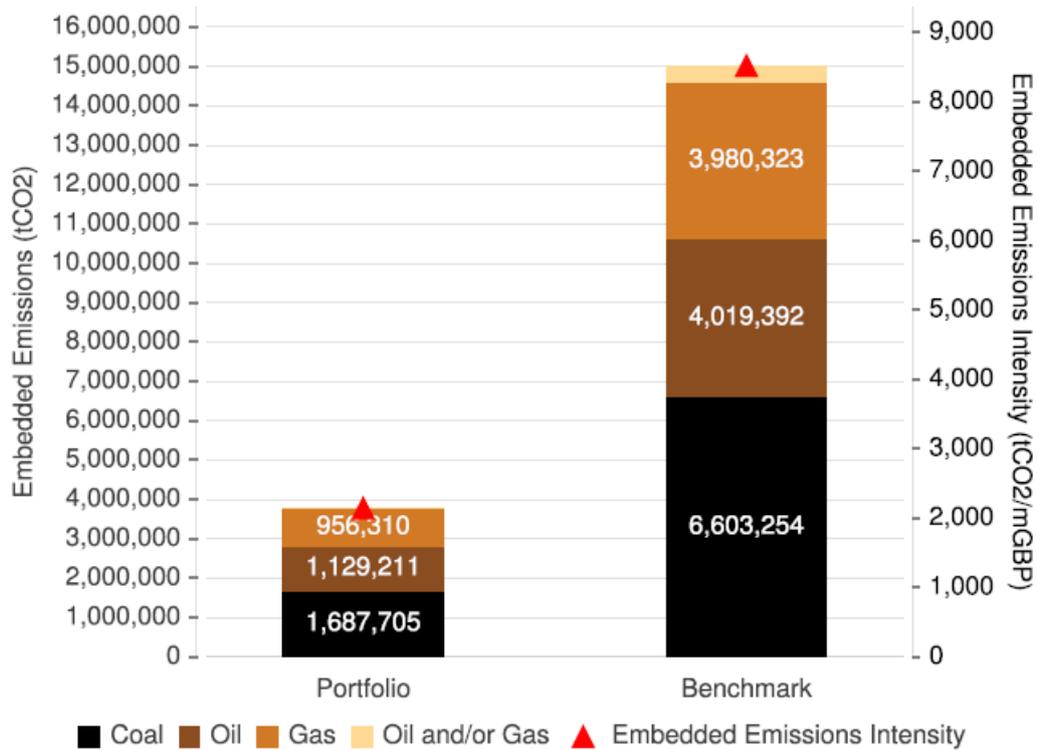
## EMBEDDED EMISSIONS

Trucost is able to analyse the carbon emissions embedded within the fossil fuel reserves which have been disclosed by companies in the portfolio or benchmark. Companies may disclose both 1P and 2P reserves (1P refers to those held with 90% confidence, 2P are those held with 50% confidence). Both 1P and 2P are used when assigning embedded emissions to a company.

The figure below shows the total tonnes of apportioned CO<sub>2</sub> from reserves, broken down by reserve type. It also shows the reserves 'intensity' by normalizing the apportioned embedded emissions by the VOH.

The total embedded CO<sub>2</sub> emissions from reserves in Avon Pension Fund's Aggregated Equities portfolio is 3.777 m tonnes (15.019 m tonnes for the benchmark).

FIGURE 7: APPORTIONED FUTURE EMISSIONS BY RESERVE TYPE

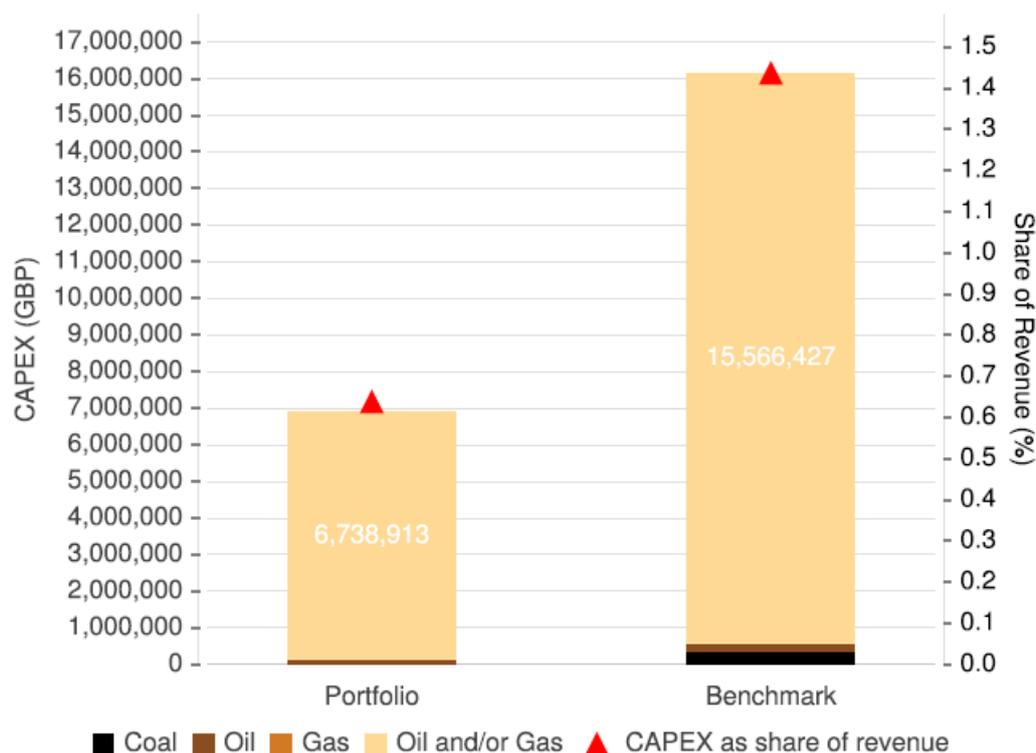


**FOSSIL FUEL CAPEX**

In addition to reserves, Trucost collects data on the capital expenditure set aside for fossil fuel related activities such as further exploration and extraction in order to provide additional quantitative insights on stranded asset risk. The figure below shows the total apportioned capital expenditure on fossil fuel related activities by reserve type. It also normalizes the CAPEX by showing it as a share of apportioned revenue.

The total apportioned fossil fuel CAPEX in Avon Pension Fund’s Aggregated Equities portfolio is 6.878 mGBP (16.135 mGBP for the benchmark).

FIGURE 8: APPORTIONED CAPEX BY RESERVE TYPE



### LARGEST CONTRIBUTORS - EXTRACTIVES REVENUE & EMBEDDED EMISSIONS

The table below shows the largest contributors towards the portfolio's apportioned extractives revenue. It is displayed as a percentage of the portfolio's total apportioned revenue. The degree to which the company's own revenues are derived from extractive activities is also shown in the table below.

TABLE 8: LARGEST CONTRIBUTORS - EXTRACTIVES REVENUE

Company Name	Holding (mGBP)	Sector	Portfolio Level Extractives Revenue Exposure (% of Total)	Company Level Extractives Revenue Exposure (% of Total)	Portfolio Level Future Emissions From Reserves (MtCO <sub>2</sub> )	Company Level Future Emissions From Reserves (MtCO <sub>2</sub> )
Royal Dutch Shell PLC	19.915	Energy	0.23%	13.56%	0.517	4,896.37
Schlumberger Ltd	5.436	Energy	0.16%	100.00%		
Marubeni Corp	1.398	Industrials	0.16%	22.48%		
Total S.A.	8.56	Energy	0.08%	9.81%	0.333	4,122.35
Mitsui & Co	2.343	Industrials	0.06%	23.38%	0.018	164.62
Halliburton Co	1.535	Energy	0.06%	100.00%		
Polskie Gornictwo Naftowe	0.765	Energy	0.06%	85.75%	0.028	250.93
Occidental Petroleum	4.215	Energy	0.05%	65.28%	0.115	969.42
Glencore Plc	4.873	Materials	0.05%	4.60%	0.883	9,162.58
TechnipFMC Ltd	0.749	Energy	0.04%	52.50%		

The table below shows the largest contributors towards the portfolio's apportioned embedded emissions. The absolute contributions are shown in the second to last column, while final column shows the company's total level of emissions from reserves.

Royal Dutch Shell PLC has the largest contribution to the portfolio's extractives revenue, and the second largest contribution to the portfolio's future emissions from reserves. Glencore Plc has the largest contribution to the portfolio's future emissions from reserves overall.

TABLE 9: LARGEST CONTRIBUTORS - EMBEDDED EMISSIONS

Company Name	Holding (mGBP)	Sector	Portfolio Level Extractives Revenue Exposure (% of Total)	Company Level Extractives Revenue Exposure (% of Total)	Portfolio Level Future Emissions From Reserves (MtCO <sub>2</sub> )	Company Level Future Emissions From Reserves (MtCO <sub>2</sub> )
<b>Glencore Plc</b>	4.873	Materials	0.05%	0.05%	<b>0.883</b>	9,162.58
<b>Royal Dutch Shell PLC</b>	19.915	Energy	0.23%	13.56%	<b>0.517</b>	4,896.37
<b>BHP Billiton Ltd</b>	3.133	Materials	0.03%	37.57%	<b>0.374</b>	9,818.00
<b>Total S.A.</b>	8.56	Energy	0.08%	9.81%	<b>0.333</b>	4,122.35
<b>Rio Tinto PLC</b>	4.82	Materials	0.01%	6.98%	<b>0.253</b>	3,303.00
<b>Cabot Oil &amp; Gas A</b>	2.133	Energy	0.03%	100.00%	<b>0.145</b>	535.57
<b>Occidental Petroleum</b>	4.215	Energy	0.05%	65.28%	<b>0.115</b>	969.42
<b>Novatek PJSC</b>	0.847	Energy	0.02%	100.00%	<b>0.113</b>	3,929.79
<b>Exxon Mobil Corp</b>	3.103	Energy	0.02%	9.23%	<b>0.105</b>	7,613.27
<b>BP</b>	1.266	Energy	0.01%	8.53%	<b>0.090</b>	6,776.60

## COAL EXPOSURE

Coal related activities are widely understood to be among the largest contributors to anthropogenic carbon emissions. As such, an increasing number of investors are strategizing around coal exposure and positioning for a transition to a low carbon economy. This may include strategies such as implementing reduction targets for exposure to the embedded emissions, or adopting an assess-engage-monitor-divest approach to individual holdings involved in coal mining or coal power activities.

Trucost has assessed both the VOH and revenue exposure at the portfolio level to the following activities:

- Bituminous coal underground mining
- Bituminous coal and lignite surface mining
- Coal power generation

For the VOH exposure metric, the revenue threshold for inclusion was 10%.

FIGURE 9: COAL REVENUE EXPOSURE BY SECTOR

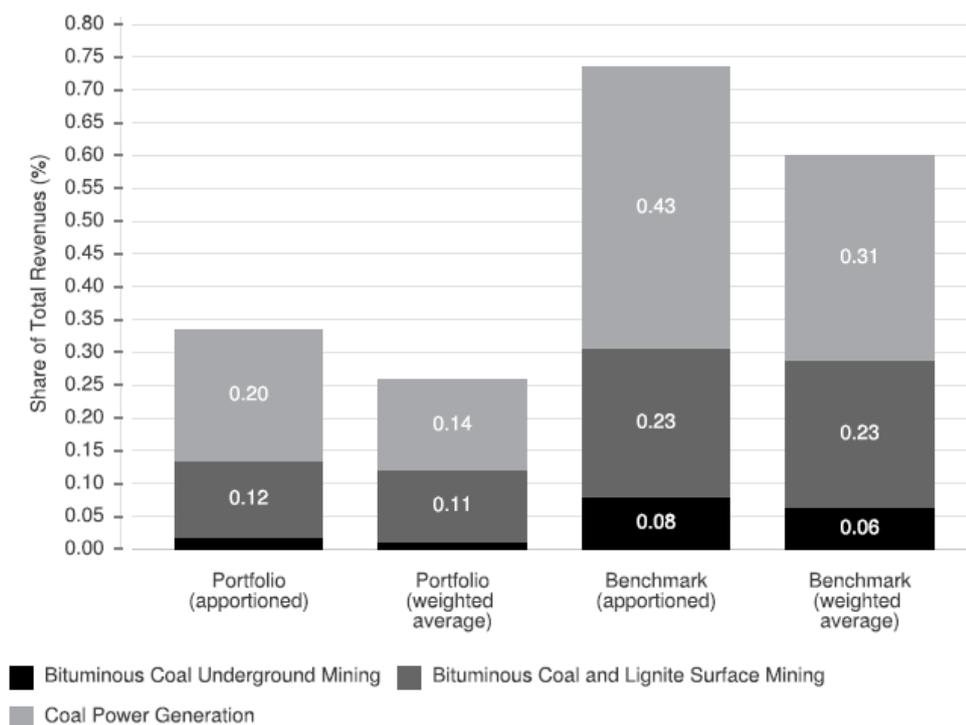
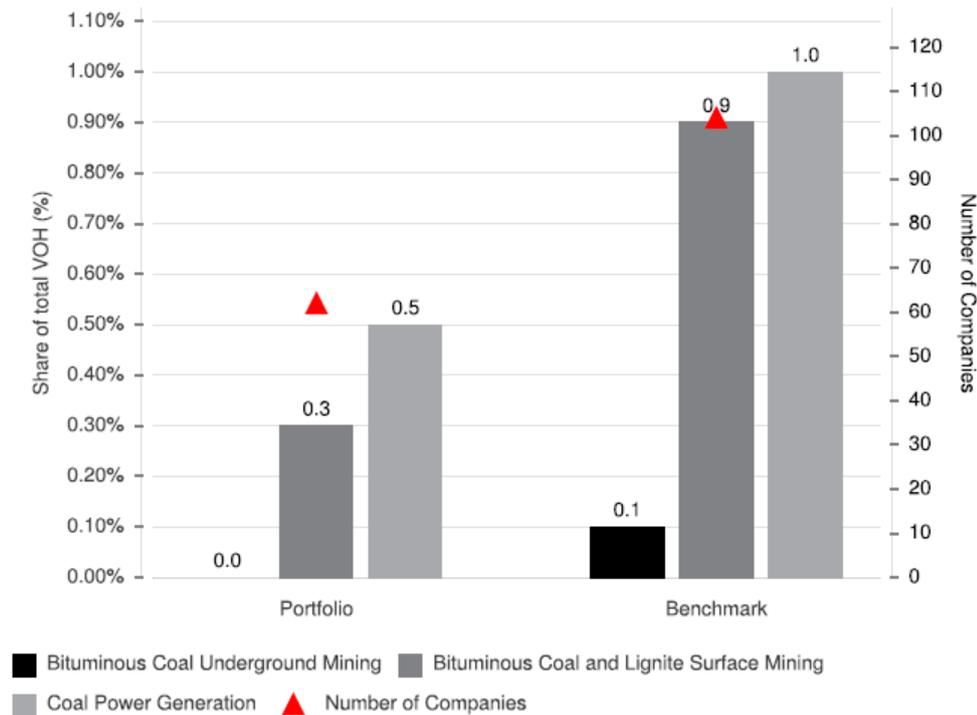


FIGURE 10: COAL VOH EXPOSURE BY SECTOR



The table below shows the largest contributors towards the portfolio's apportioned coal revenue. The absolute contributions are shown in the final column, while the second to last column shows the degree to which the company's own revenues are derived from coal mining and/or power generation.

While Scottish & Southern Energy is the portfolio's largest contributor in terms of revenue from coal, that revenue is exclusively from coal power generation. Glencore Plc has the second largest revenue contribution from coal overall, all of which is from coal mining.

TABLE 10: LARGEST CONTRIBUTORS – COAL REVENUE

Company Name	Holding (mGBP)	Company Level Coal Extracted (M Tonnes)	Company Level Coal Surface Mining Exposure (% of Revenues)	Company Level Coal Underground Mining (% of Revenues)	Company Level Coal Power Generation Exposure (% of Revenues)	Company Level Total Coal Exposure (% of Revenues)	Portfolio Level Apportioned Revenues From Coal (mGBP)
<b>Scottish &amp; Southern Energy</b>	2.539				15.00%	15.00%	<b>0.849</b>
<b>Glencore Plc</b>	4.873	124.90	3.67%	0.75%		4.42%	<b>0.483</b>
<b>Coal India Ltd</b>	0.662	538.75	93.73%	6.27%		100.00%	<b>0.377</b>
<b>Tenaga Nasional Bhd</b>	1.695				26.54%	26.54%	<b>0.198</b>
<b>Mitsui &amp; Co</b>	2.343	13.50	4.94%	0.97%		5.91%	<b>0.172</b>
<b>Rio Tinto PLC</b>	4.820	50.57	6.05%	0.93%		6.98%	<b>0.134</b>
<b>BHP Billiton Ltd</b>	3.133	77.09	14.44%	0.60%		15.03%	<b>0.119</b>
<b>Alcoa Corp</b>	3.397				2.22%	2.22%	<b>0.087</b>
<b>Polskie Gornictwo Naftowe</b>	0.765				9.37%	9.37%	<b>0.066</b>
<b>American Electric Power</b>	0.324				39.57%	39.57%	<b>0.065</b>

## ENERGY TRANSITION

### HEADLINE RESULTS

While carbon footprints can help to identify the most carbon efficient companies within a portfolio, they do not recognize those companies that are contributing positively to the low carbon economy by offering climate-mitigation or adaptation solutions. As the energy generating sectors are critical to this transition, Trucost has analyzed physical units of power production embedded within the portfolio to highlight aggravators (fossil fuels) vs. mitigators (renewables). The generation types within each category are as follows:

- **Renewable Energy Generation:** solar, wind, wave & tidal, geothermal, hydroelectric, biomass
- **Fossil Fuel Energy Generation:** coal, petroleum, natural gas
- **Other Energy Generation:** nuclear, landfill gas, any other unclassified power generation

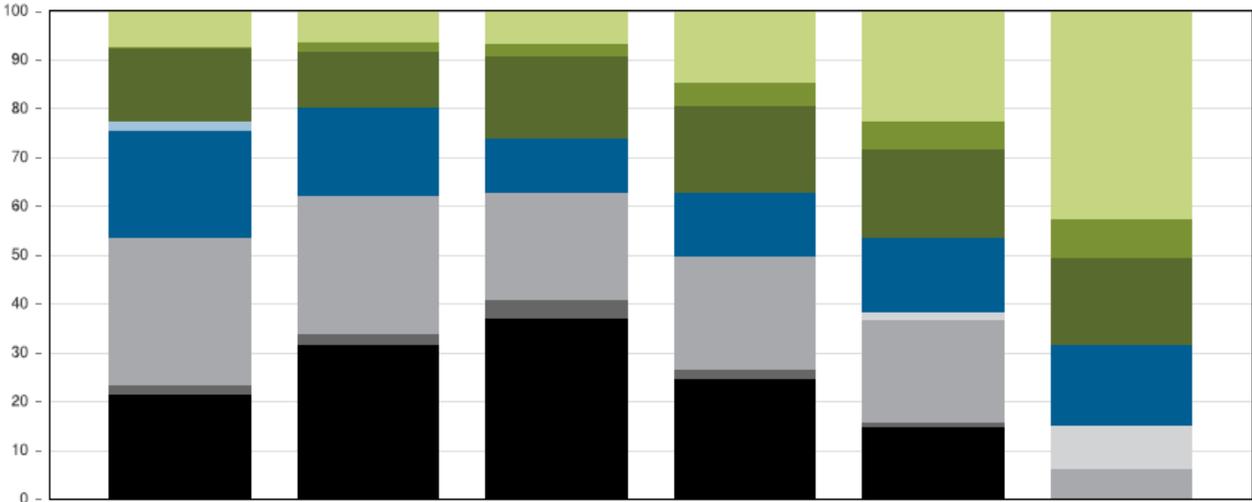
TABLE 11: GENERATION MIX

	FOSSIL FUELS			RENEWABLE		OTHER		
	Coal (GWh)	Petroleum (GWh)	Natural Gas (GWh)	Hydroelectric (GWh)	BioMass (GWh)	Other Renewables (GWh)	Nuclear (GWh)	Other Sources (GWh)
Portfolio	17.74	1.57	24.39	12.11	0.38	5.68	17.79	-
Benchmark	71.62	4.81	63.66	25.40	3.96	14.48	41.12	-

### 2 DEGREE ALIGNMENT

Investors are increasingly asking how they can align their portfolio with globally agreed forward-looking targets to mitigate climate change - so called two degree targets. Historically, portfolios have been measured against traditional financial benchmarks, which generally reflect the economy today rather than the low carbon economy - as suggested by the International Energy Agency (IEA) - we need for tomorrow. This over-represents traditional fossil fuel energy sectors and under-represents greener energy providers. To overcome this issue, Trucost compares the current energy mix of a portfolio to the IEA's two degree scenarios, showing investors how to work toward an energy transition goal. This allows them to redirect capital to have the highest "transition" impact and help to finance the low carbon economy.

FIGURE 11: 2 DEGREE ALIGNMENT<sup>2</sup>



	Portfolio	Benchmark	IEA (World) 2016 2 Degree Scenario	IEA (World) 2025 2 Degree Scenario *	IEA (World) 2030 2 Degree Scenario *	IEA (World) 2050 2 Degree Scenario *
Other renewables	6.99%	6.43%	6.39%	14.60%	22.31%	42.52%
Biomass	0.47%	1.76%	2.63%	4.65%	5.92%	7.91%
Hydroelectric	14.91%	11.28%	16.67%	17.84%	18.16%	17.91%
Other sources (incl. landfill gas)	1.93%	0.07%	0.05%			
Nuclear	21.91%	18.26%	11.14%	12.97%	15.06%	16.29%
Fossil energy with CCS			0.04%	0.19%	1.62%	8.98%
Natural Gas	30.03%	28.27%	21.94%	23.07%	21.04%	6.04%
Petroleum	1.93%	2.13%	3.84%	2.00%	0.96%	0.27%
Coal	21.84%	31.80%	37.31%	24.68%	14.94%	0.08%

<sup>2</sup> \*The content within table above was prepared by S&P Trucost Limited, with data derived from the 2 Degree Scenarios developed by the International Energy Agency. ©OECD/IEA 2017. The content within the table above does not necessarily reflect the views of the International Energy Agency.

### ENERGY GENERATION REVENUE EXPOSURE

The analysis above has focused on the physical units of power generated by companies within the portfolio. As not all energy companies disclose this information, it is also useful to determine exposure to 'aggravators' and 'mitigators' based on sources of revenue. Trucost has assessed both the value of holding (VOH) and revenue exposure to fossil fuel, renewable, other power generation for the portfolio and benchmark.

For the VOH exposure metric, the revenue threshold for inclusion was 0%.

FIGURE 12: REVENUE EXPOSURE TO ENERGY GENERATION

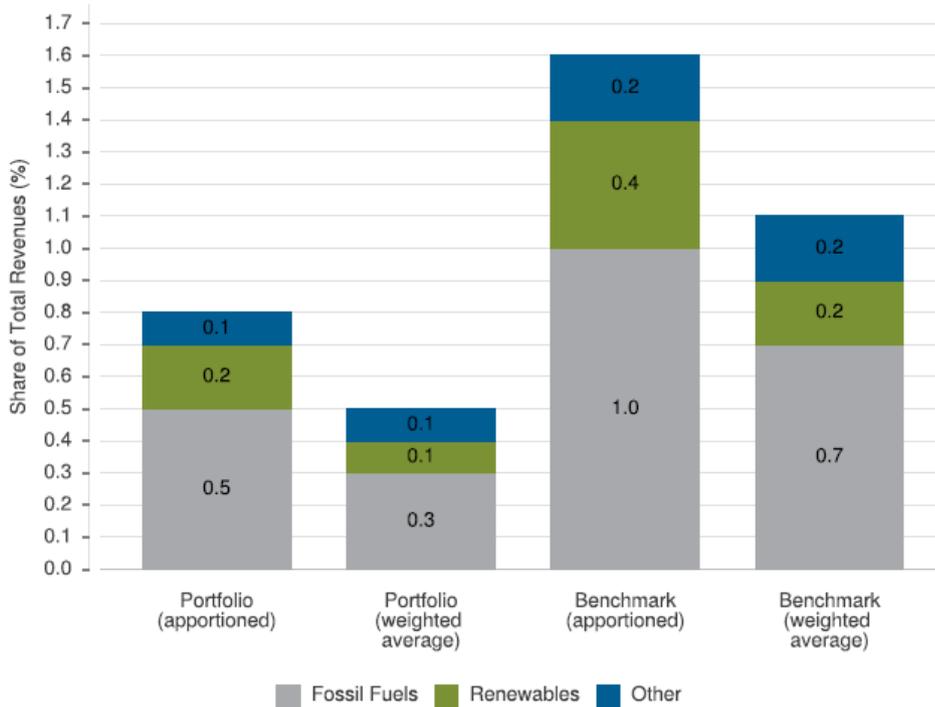
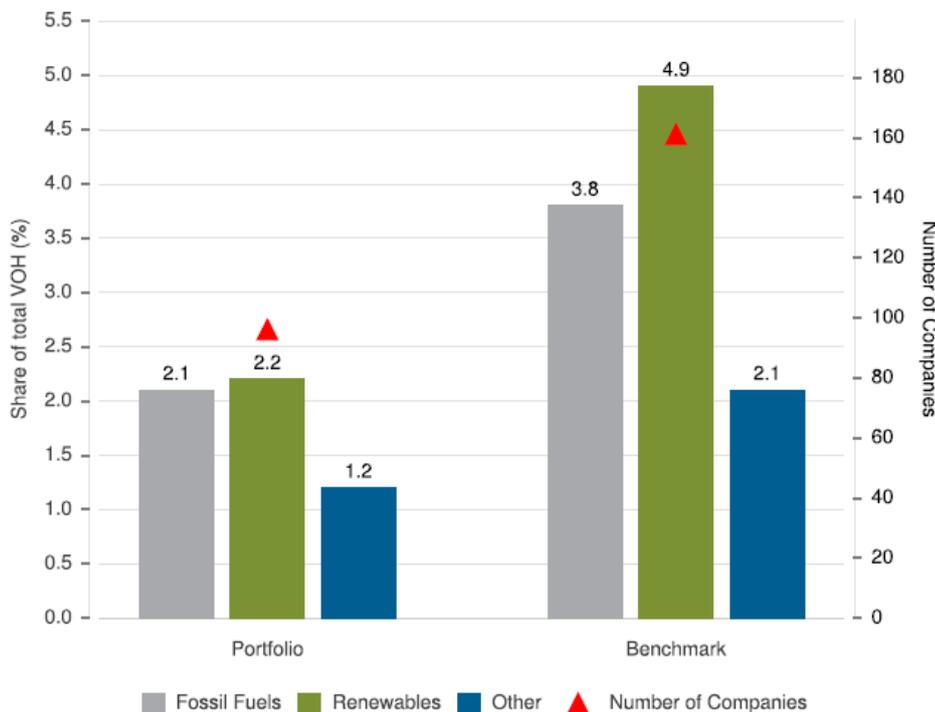


FIGURE 13: VOH EXPOSURE TO ENERGY GENERATION



Avon Pension Fund's Aggregate Portfolio has a lower level of revenue exposure to fossil fuel power generation than its benchmark (0.5% vs. 1.0%) and a lower share of total VOH in companies involved in fossil fuel power generations (2.1% vs. 3.8%). The benchmark, however, has a higher share of companies with revenues from renewables, both in terms of percentage revenue and VOH.

The table below shows the largest contributors towards the portfolio's apportioned renewable energy revenue. The absolute contributions are shown in the final column, while the second to last column shows the degree to which the company's own energy revenues are derived from renewable generation.

TABLE 12: LARGEST CONTRIBUTORS – RENEWABLE ENERGY REVENUE

Company Name	Holding (mGBP)	Company Level Renewables Revenue (% of Total)	Company Level Fossil Fuels Revenue (% of Total)	Company Level Other Revenue (% of Total)	Company Level Total Energy Revenue (% of Total)	Renewables Share (% Of Total Energy Revenue)	Portfolio Level Total Apportioned Renewables Revenue (mGBP)
<b>Scottish &amp; Southern Energy</b>	2.539	23.68%	44.16%		67.84%	34.91%	<b>1.340</b>
<b>PG&amp;E Corporation</b>	0.704	25.78%	5.31%	0.01%	31.09%	82.90%	<b>0.147</b>
<b>Enel SpA</b>	0.494	13.84%	23.32%	5.72%	42.88%	32.28%	<b>0.087</b>
<b>Consolidated Edison Inc</b>	1.465	9.03%	9.71%		18.75%	48.19%	<b>0.069</b>
<b>Meridian Energy Ltd</b>	0.27	68.40%			68.40%	100.00%	<b>0.063</b>
<b>Edison Intl</b>	1.068	7.03%	7.27%	3.34%	17.64%	39.85%	<b>0.045</b>
<b>Brookfield Asset</b>	0.816	10.03%	0.10%		10.13%	98.97%	<b>0.042</b>
<b>Iberdrola SA</b>	0.397	14.37%	36.49%	15.10%	65.96%	21.78%	<b>0.042</b>
<b>Berkshire Hathaway</b>	4.679	1.88%	4.08%	0.09%	6.05%	30.99%	<b>0.041</b>
<b>ENGIE Brasil Energia S.A.</b>	0.182	90.86%	9.14%		100.00%	90.86%	<b>0.041</b>

The table below shows the largest contributors towards the portfolio's apportioned fossil fuel energy revenue. The absolute contributions are shown in the final column, while the second to last column shows the degree to which the company's own energy revenues are derived from fossil fuel generation.

Scottish & Southern Energy, Tenaga Nasional Bhd and Tokyo Electric Power Co are the three largest contributors of fossil fuel revenue to Avon Pension Fund's Aggregate Portfolio. However, Scottish & Southern Energy is also the portfolio's largest contributor in terms of renewable energy revenue.

TABLE 13: LARGEST CONTRIBUTORS – FOSSIL FUEL ENERGY REVENUE

Company Name	Holding (mGBP)	Company Level Renewables Revenue (% of Total)	Company Level Fossil Fuels Revenue (% of Total)	Company Level Other Revenue (% of Total)	Company Level Total Energy Revenue (% of Total)	Fossil Fuel Share (% Of Total Energy Revenue)	Portfolio Level Total Apportioned Fossil Fuel Revenue (mGBP)
<b>Scottish &amp; Southern Energy</b>	2.539	23.68%	44.16%		67.84%	65.09%	<b>2.499</b>
<b>Tenaga Nasional Bhd</b>	1.695	1.88%	50.45%		52.34%	96.40%	<b>0.376</b>
<b>Tokyo Electric Power Co.</b>	0.058	3.90%	70.70%		74.60%	94.77%	<b>0.314</b>
<b>Chubu Electric Power Co</b>	0.08	6.02%	77.05%		83.07%	92.75%	<b>0.148</b>
<b>Chubu Electric Power Co</b>	0.494	13.84%	23.32%	5.72%	42.88%	54.39%	<b>0.146</b>
<b>Southern Co</b>	0.44	3.97%	62.79%	12.72%	79.48%	79.00%	<b>0.127</b>
<b>Kansai Electric Power Co</b>	0.091	9.23%	53.60%	0.50%	63.33%	84.64%	<b>0.107</b>
<b>Iberdrola SA</b>	0.397	14.37%	36.49%	15.10%	65.96%	55.33%	<b>0.106</b>
<b>Tohoku Electric Power Co</b>	0.062	7.95%	57.31%		65.26%	87.82%	<b>0.103</b>
<b>Duke Energy Corp</b>	0.518	1.96%	44.91%	24.61%	71.47%	62.83%	<b>0.098</b>

## ENVIRONMENTAL FOOTPRINT

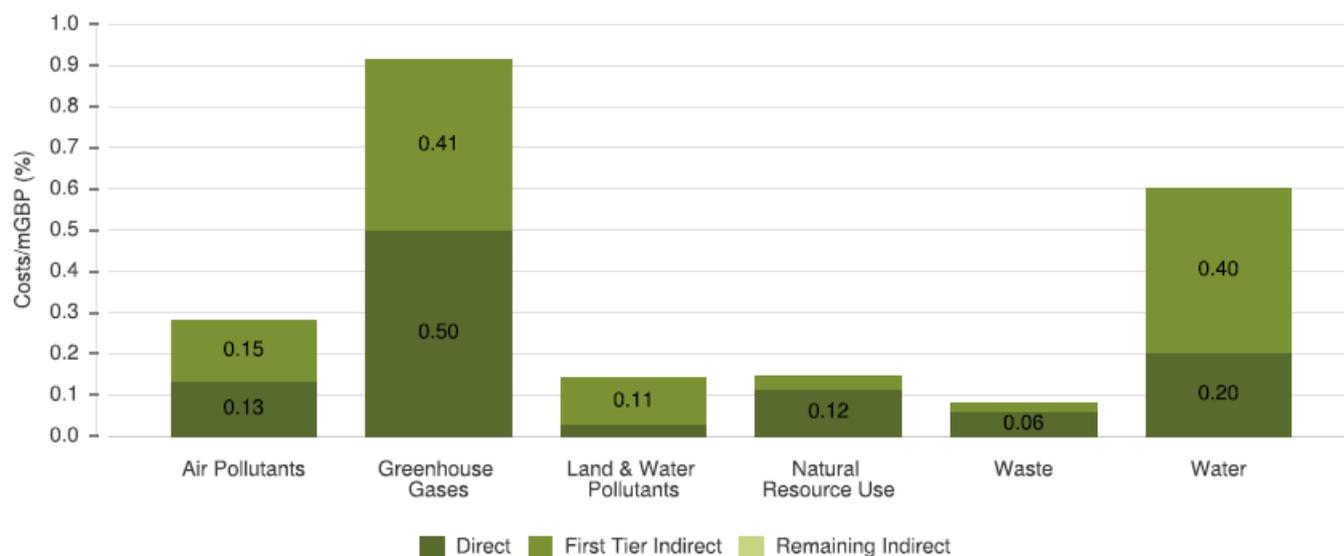
### HEADLINE RESULTS

Environmental footprints quantify the greenhouse gas (GHG) emissions, water, waste, land & water pollutants, air pollutants, and natural resource use associated within a portfolio.

The total environment footprint of the Aggregate Portfolio outperforms its benchmark by 30.31%. A combination of positive sector allocation (14.80%) and company selection (15.51%) effects drive the overall relative environmental performance of the portfolio.

The Figure 1.2.7 shows the relative contribution of each of these six impact areas to the environmental footprint of the portfolio. The portfolio is most exposed to greenhouse gases and water impacts.

FIGURE 14: ENVIRONMENTAL INTENSITY BROKEN DOWN BY ISSUE



## CONCLUSION

This year's carbon footprint results (Tables 3 and 4) have shown an overall year-on-year improvement in the carbon footprint performance of Avon Pension Fund's Aggregate Portfolio between 2017 and 2018, driven mainly by underlying improvements in the underlying passive portfolios (viz. the addition of the Blackrock Low Carbon portfolio this year).

All portfolios, with the exception of the TT portfolio, were more carbon efficient than their respective benchmarks (Table 4). However, on aggregate, the active portfolios, though still more efficient than their respective benchmarks, saw a decline in their carbon performance, both in terms of year-on-year performance and performance relative to benchmark.

In terms of overall fossil fuel exposure, the Aggregate Portfolio is less exposed to fossil fuel related activities than the Strategic Benchmark overall. However, there is still the opportunity to better align the Aggregate Portfolio with low carbon energy transition scenarios (such as the 2 Degree Scenarios developed by the International Energy Agency), by increasing the proportion of renewable energy in the portfolio's energy generation mix, and reducing the proportion of coal-fired power generation.

At an underlying portfolio level, the best performing individual portfolio based on this year's carbon footprint results is the Blackrock Low Carbon portfolio, with a carbon to revenue figure of 183.30 tCO<sub>2</sub>e/mGBP. The Genesis portfolio is a close second with a carbon to revenue figure of 229.90 tCO<sub>2</sub>e/mGBP. However, the Genesis portfolio has the best overall efficiency relative to benchmark (70.61%). The Blackrock Low Carbon portfolio is next, with a relative efficiency to benchmark of 54.31%.

## RECOMMENDATIONS

- A number of individual portfolios have seen their carbon efficiency decline over the last year vis-à-vis their respective benchmarks and/or the prior year's carbon footprint. In order to drive improvements in performance, Avon Pension Fund should consider engaging with those fund managers whose portfolios have seen a decline in year-on-year carbon performance, and those whose holdings include companies listed among the top 10 contributors to the Aggregate Portfolio's carbon footprint and embedded emissions from fossil fuel reserves.
- Avon should consider setting carbon footprint performance targets for the overall equities portfolio to encourage those fund managers that performed less well to improve, and better performers to maintain their performance going forward.
- In order to improve low carbon energy transition alignment across its portfolio, Avon Pension Fund should consider also setting targets to minimise coal mining and coal power exposure and maximise renewable energy exposure across the individual funds.

## APPENDICES

### APPENDIX A: TRUCOST'S APPROACH TO CALCULATING CARBON FOOTPRINTS OF PORTFOLIOS

The carbon footprint is a measure of the greenhouse gas emissions (GHGs) associated with each portfolio. This is calculated by allocating GHGs from each constituent company held in the portfolio in proportion to the equity ownership of that company. The GHGs measured are converted into their carbon dioxide equivalents (CO<sub>2</sub>e). The carbon footprint is expressed as metric tons of GHGs emitted by the companies within the portfolio, per million GBP (£m) of revenue from holdings. This normalized measure of carbon performance enables comparison of portfolios and benchmarks, irrespective of the type and size of the portfolios. The GHGs and revenue allocated to each holding are summed to calculate the overall carbon footprint of listed equity holdings.

GHG emissions data for companies analysed are the latest available in Trucost's database (the Trucost Environmental Register) – the world's largest and most comprehensive database of corporate natural capital impact data covering 93% of global markets by market capitalization. Where companies do not provide usable data on GHG emissions, Trucost uses its environmentally extended input-output (EEIO) model to calculate likely emissions based on business activities in 464 sectors.

#### Carbon footprint equation:

$$\frac{\sum_{c=1}^n \frac{VOH_{c,t}}{MC_{c,t}} GHGS_{c,FY}}{\sum_{c=1}^n \frac{VOH_{c,t}}{MC_{c,t}} R_{c,FY}}$$

c = company, t = date of analysis, VOH = value of holding in GBP MC = market capitalization in GBP, GHGs = sum of direct GHG emissions + first tier indirect GHG emissions in the FY, FY = most recent financial year with relevant data, R= total annual revenue in GBP.

### APPENDIX B: COMPANY ANALYSIS

Trucost maintains the world's largest database of standardised corporate natural capital impact data. Trucost's comprehensive coverage of more than 5,000 companies since 2000 ensures that virtually all companies in a portfolio or Index are included, not just those that disclose environmental information.

To calculate the carbon emissions of companies included in the study, Trucost reviewed company annual reports and accounts, environmental/sustainability reports, public disclosures and corporate websites. However Trucost might standardise or normalise disclosed data where necessary. Where a company only discloses data for part of its overall activities, analysts may standardise or normalise quantities in order to calculate the carbon impacts of the business's entire operations in line with the Greenhouse Gas Protocol.

Where companies only disclose resource use, such as fuel consumption, this information is used to derive emissions data where possible.

Trucost uses its environmental profiling model to calculate the environmental impacts of companies that do not disclose adequate data, as well as the upstream impacts from supply chains. These include GHG emissions from the production of purchased goods and services, under Scope 3 of the Greenhouse Gas Protocol. The input-output model examines interactions between 464 sectors to calculate each company's likely direct and supply chain environmental impacts. These calculations combine quantitative government census and survey data on natural resource use through economic interactions between sectors with information on pollutant releases from national emissions registries. Information on company revenues in different industries is used to map environmental impacts from business activities.

Environmental profiling using an input-output model, overseen by an academic advisory panel, is a "best efforts" attempt to understand environmental impacts in the current absence of sufficient and comparable company disclosures on the environmental impacts of operations and supply chains.

Calculations incorporate disclosed quantitative data on industrial facilities' actual pollutant releases where available. Trucost engages with companies so that they have the opportunity to verify their environmental profiles and provide more information. Analysts quality check any further disclosures made, which are exclusive to Trucost and further augment the database.

GHG emissions for each company analysed are measured in tonnes of carbon dioxide equivalents (CO<sub>2</sub>e). The analysis includes the six GHGs covered by the UN Kyoto Protocol. Each GHG has a different capacity to cause global warming. Trucost's conversion of GHGs to CO<sub>2</sub>e is based on the Global Warming Potential (GWP) index published by the Intergovernmental Panel on Climate Change, which assesses the effect of the emissions of different gases over a 100-year time period relative to the emission of an equal mass of CO<sub>2</sub>.

Where reported, data on GHG emissions from operations and purchased electricity, under Scopes 1 and 2 of the Greenhouse Gas Protocol corporate accounting standard, are included in Trucost's database.

To limit any issues associated with double counting greenhouse gas emissions, Trucost analysed only the direct and first-tier indirect emissions for each company. First-tier emissions are emissions purchased upstream from the company's direct suppliers. These included purchased electricity and business air travel. Most companies are not major emitters of direct greenhouse gases and adopting this method ensures that the study assesses the carbon impacts of business activities – such as extraction, production, transport and logistics – outsourced to companies excluded from this analysis. In many sectors, indirect greenhouse gas emissions are greater than their direct emissions. It is important to take into account indirect exposure to carbon costs as suppliers may pass these on down the value chain.

Company carbon intensity is calculated throughout this report as total direct and first-tier indirect greenhouse gas emissions per GBP million of revenue, unless stated otherwise. This quantitative approach enables businesses of different sizes within different industries to be compared.

### APPENDIX C: INTERPRETATION OF SECTOR ALLOCATION & STOCK SELECTION EFFECTS

Attribution analysis identifies drivers of carbon performance relative to a benchmark. Trucost conducts attribution analysis to identify the effects of sector allocation (based on the ICB Super Sector breakdown) and stock selection decisions on portfolio carbon footprints relative to the relevant indices selected as their benchmarks. The sum of these stock and sector allocation effects results in either a positive or negative overall portfolio carbon efficiency relative to a benchmark.

Where the percentage difference in the carbon efficiency of the portfolio against its benchmark is positive (indicated by a “+” sign), the portfolio is more carbon efficient than its benchmark. This indicates that the portfolio has a smaller carbon footprint than this benchmark. Conversely, where the percentage difference in the carbon efficiency of the portfolio against its benchmark is negative (indicated by a “-” symbol), the portfolio is more carbon intensive than its benchmark. The portfolio therefore has a larger carbon footprint than the benchmark index.

Sector allocation effects are based on a combination of the amount of the portfolio’s assets allocated to a sector relative to the benchmark allocation to that sector in apportioned revenue terms, and the average carbon intensity of the sector compared to the benchmark’s total footprint. For example, a portfolio derives 1.92% of its total apportioned turnover from the Oil & Gas sector, whereas the benchmark derives 24.64% of its total apportioned revenue from the oil & gas sector. The benchmark’s total footprint is 664.66 metric tons of CO<sub>2</sub>e/£m, whereas the benchmark’s Oil & Gas sector carbon footprint is 1,382.5 metric tons of CO<sub>2</sub>e/£m. The Oil & Gas sector allocation effect would therefore be +24.54%:

$$\text{Portfolio is underweight the Oil \& Gas sector in revenue terms} \rightarrow (1.92\% - 24.64\%) * (664.66 - 1,382.5) \leftarrow \text{The sector is less carbon efficient than the benchmark}$$

664.66

Stock selection effects are based on the average carbon intensity of the companies held in the portfolio, combined with the holdings per company, compared with the companies present in their sector and their allocation in the benchmark. Stock selection effects indicate the potential to reduce carbon risk in the holdings without adjusting sector weightings. The carbon performance of companies directly contributes to the carbon embedded within portfolio holdings. For example, a portfolio derives 1.92% of its total turnover

from the Oil & Gas sector. The portfolio’s sector carbon footprint is 4,443.62CO<sub>2</sub>e/£m. The benchmark’s total footprint is 664.66 metric tons of CO<sub>2</sub>e/£m and the benchmark’s Oil & Gas sector carbon footprint is 1,382.5 metric tonnes of CO<sub>2</sub>e/£m. The Oil & Gas stock allocation effect would be -8.84%

Portfolio derives 1.92% of total turnover from the Oil & Gas sector

$$1.92\% * \frac{1,382.51 - 4,443.62}{664.66}$$

The portfolio invests in *less* carbon efficient Oil & Gas companies than the benchmark

## GLOSSARY

### % Improvement/ % Difference:

The presentation of percentage figures in this report has been constructed such that a positive (negative) number is “good” (“bad”) news for the fund’s carbon risk exposure.

### Carbon Footprint (tonnes CO<sub>2</sub>e/£m):

The direct and first tier indirect GHG emissions apportioned to the portfolio per million GBP revenue generated by the portfolio. Each holding's contribution to the carbon footprint of the portfolio is calculated on an equity ownership basis. The carbon footprint of the fund is the sum of these contributions, normalised by revenue owned.

### CO<sub>2</sub> Equivalent (CO<sub>2</sub>e):

Each greenhouse gas differs in its ability to absorb heat in the atmosphere. HFCs and PFCs are the most heat-absorbent. Calculations of greenhouse gas emissions are presented in units of millions of metric tons of carbon equivalents (MMTCE), which weights each gas by its GWP value, or Global Warming Potential. The Global Warming Potentials used in this analysis are:

GREENHOUSE GAS	CO <sub>2</sub> EQUIVALENT
Carbon Dioxide	1
Methane	21
Nitrous Oxide	310
Sulphur Hexafluoride	23,900
Per Fluoro Carbons	7,850
Hydro Fluoro Carbons	5,920

See [www.unfccc.org](http://www.unfccc.org) for more information about global warming.

**Exposure (Coal Exposure and Renewable Energy Exposure):**

An investor's "Coal Exposure" (or "Renewable Energy Exposure") is a measurement of the value of the fund facing the risk of a "stranded asset" – such as an inefficient coal power plant becoming uneconomic to run owing to stringent carbon regulation – considering both the value of holding in that company and the revenue-dependence of the company on coal. For example, a £1m investment in a company deriving 50% of its revenue from coal power generation and 50% from mortgage finance would contribute £0.5 to the Coal Exposure metric.

**GHG:**

Abbreviation for Greenhouse Gases. Emissions to air that contribute to the greenhouse effect and global warming. Each greenhouse gas differs in its ability to absorb heat in the atmosphere. HFCs and PFCs are the most heat-absorbent. Methane traps over 21 times more heat per molecule than carbon dioxide, and nitrous oxide absorbs 270 times more heat per molecule than carbon dioxide. Often, estimates of greenhouse gas emissions are presented in units of millions of metric tons of carbon equivalents (MMTCE), which weights each gas by its GWP value, or Global Warming Potential.

**Sector allocation effects, Stock selection effects:**

Please refer to Appendix C.

## NOTICE

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