



# SPECIAL PENSIONS COMMITTEE

Monday, 17th February, 2020  
at 6.30 pm

The Council Chamber  
Hackney Town Hall  
Mare Street E8 1EA

## Membership

### Members:

Councillor Robert Chapman (Chair)  
Councillor Michael Desmond (Vice-Chair)  
Councillor Kam Adams  
Councillor Ben Hayhurst  
Councillor Polly Billington  
Councillor Rebecca Rennison

### Co-optees:

Jonathan Malins-Smith and Henry Colthurst

**Tim Shields**  
Chief Executive

Contact:  
Rabiya Khatun Governance Services  
Tel: 020 8356 6279 [Rabiya.khatun@hackney.gov.uk](mailto:Rabiya.khatun@hackney.gov.uk)

**Future Meetings**  
31 March 2019 (TBC)

Quorum: 2 Elected Members

The press and public are welcome to attend this meeting

# **AGENDA**

## **Monday, 17th February, 2020**

### **ORDER OF BUSINESS**

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<b>1</b>	<b>Apologies For Absence</b>	
<b>2</b>	<b>Declarations of Interest - Members to declare as appropriate</b>	
<b>3</b>	<b>Any Other Business Which in The Opinion Of The Chair Is Urgent</b>	
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## ACCESS AND INFORMATION

### Location

Hackney Town Hall is on Mare Street, bordered by Wilton Way and Reading Lane, almost directly opposite Hackney Picturehouse.

**Trains** – Hackney Central Station (London Overground) – Turn right on leaving the station, turn right again at the traffic lights into Mare Street, walk 200 metres and look for the Hackney Town Hall, almost next to The Empire immediately after Wilton Way.

**Buses** 30, 48, 55, 106, 236, 254, 277, 394, D6 and W15.

### Facilities

There are public toilets available, with wheelchair access, on the ground floor of the Town Hall.

Induction loop facilities are available in Committee Rooms and the Council Chamber

Access for people with mobility difficulties can be obtained through the ramp on the side to the main Town Hall entrance.

### Copies of the Agenda

The Hackney website contains a full database of meeting agendas, reports and minutes. Log on at: [www.hackney.gov.uk](http://www.hackney.gov.uk)

Paper copies are also available from Governance Services whose contact details are shown on the front of the agenda.

### Council & Democracy- [www.hackney.gov.uk](http://www.hackney.gov.uk)

The Council & Democracy section of the Hackney Council website contains details about the democratic process at Hackney, including:

- Mayor of Hackney
- Your Councillors
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## RIGHTS OF PRESS AND PUBLIC TO REPORT ON MEETINGS

Where a meeting of the Council and its committees are open to the public, the press and public are welcome to report on meetings of the Council and its committees, through any audio, visual or written methods and may use digital and social media providing they do not disturb the conduct of the meeting and providing that the person reporting or providing the commentary is present at the meeting.

Those wishing to film, photograph or audio record a meeting are asked to notify the Council's Monitoring Officer by noon on the day of the meeting, if possible, or any time prior to the start of the meeting or notify the Chair at the start of the meeting.

The Monitoring Officer, or the Chair of the meeting, may designate a set area from which all recording must take place at a meeting.

The Council will endeavour to provide reasonable space and seating to view, hear and record the meeting. If those intending to record a meeting require any other reasonable facilities, notice should be given to the Monitoring Officer in advance of the meeting and will only be provided if practicable to do so.

The Chair shall have discretion to regulate the behaviour of all those present recording a meeting in the interests of the efficient conduct of the meeting. Anyone acting in a disruptive manner may be required by the Chair to cease recording or may be excluded from the meeting. Disruptive behaviour may include: moving from any designated recording area; causing excessive noise; intrusive lighting; interrupting the meeting; or filming members of the public who have asked not to be filmed.

All those visually recording a meeting are requested to only focus on recording councillors, officers and the public who are directly involved in the conduct of the meeting. The Chair of the meeting will ask any members of the public present if they have objections to being visually recorded. Those visually recording a meeting are asked to respect the wishes of those who do not wish to be filmed or photographed. Failure by someone recording a meeting to respect the wishes of those who do not wish to be filmed and photographed may result in the Chair instructing them to cease recording or in their exclusion from the meeting.

If a meeting passes a motion to exclude the press and public then in order to consider confidential or exempt information, all recording must cease and all recording equipment must be removed from the meeting room. The press and public are not permitted to use any means which might enable them to see or hear the proceedings whilst they are excluded from a meeting and confidential or exempt information is under consideration.

Providing oral commentary during a meeting is not permitted.

# ADVICE TO MEMBERS ON DECLARING INTERESTS

Hackney Council's Code of Conduct applies to **all** Members of the Council, the Mayor and co-opted Members.

This note is intended to provide general guidance for Members on declaring interests. However, you may need to obtain specific advice on whether you have an interest in a particular matter. If you need advice, you can contact:

- The Director of Legal and Governance Services;
- The Legal Adviser to the committee; or
- Governance Services.

If at all possible, you should try to identify any potential interest you may have before the meeting so that you and the person you ask for advice can fully consider all the circumstances before reaching a conclusion on what action you should take.

## 1. Do you have a disclosable pecuniary interest in any matter on the agenda or which is being considered at the meeting?

You will have a disclosable pecuniary interest in a matter if it:

- relates to an interest that you have already registered in Parts A and C of the Register of Pecuniary Interests of you or your spouse/civil partner, or anyone living with you as if they were your spouse/civil partner;
- relates to an interest that should be registered in Parts A and C of the Register of Pecuniary Interests of your spouse/civil partner, or anyone living with you as if they were your spouse/civil partner, but you have not yet done so; or
- affects your well-being or financial position or that of your spouse/civil partner, or anyone living with you as if they were your spouse/civil partner.

## 2. If you have a disclosable pecuniary interest in an item on the agenda you must:

- Declare the existence and nature of the interest (in relation to the relevant agenda item) as soon as it becomes apparent to you (subject to the rules regarding sensitive interests).
- You must leave the room when the item in which you have an interest is being discussed. You cannot stay in the meeting room or public gallery whilst discussion of the item takes place and you cannot vote on the matter. In addition, you must not seek to improperly influence the decision.
- If you have, however, obtained dispensation from the Monitoring Officer or Standards Committee you may remain in the room and participate in the meeting. If dispensation has been granted it will stipulate the extent of your involvement, such as whether you can only be present to make representations, provide evidence or whether you are able to fully participate and vote on the matter in which you have a pecuniary interest.

### 3. Do you have any other non-pecuniary interest on any matter on the agenda which is being considered at the meeting?

You will have 'other non-pecuniary interest' in a matter if:

- i. It relates to an external body that you have been appointed to as a Member or in another capacity; or
- ii. It relates to an organisation or individual which you have actively engaged in supporting.

### 4. If you have other non-pecuniary interest in an item on the agenda you must:

- i. Declare the existence and nature of the interest (in relation to the relevant agenda item) as soon as it becomes apparent to you.
- ii. You may remain in the room, participate in any discussion or vote provided that contractual, financial, consent, permission or licence matters are not under consideration relating to the item in which you have an interest.
- iii. If you have an interest in a contractual, financial, consent, permission or licence matter under consideration, you must leave the room unless you have obtained a dispensation from the Monitoring Officer or Standards Committee. You cannot stay in the room or public gallery whilst discussion of the item takes place and you cannot vote on the matter. In addition, you must not seek to improperly influence the decision. Where members of the public are allowed to make representations, or to give evidence or answer questions about the matter you may, with the permission of the meeting, speak on a matter then leave the room. Once you have finished making your representation, you must leave the room whilst the matter is being discussed.
- iv. If you have been granted dispensation, in accordance with the Council's dispensation procedure you may remain in the room. If dispensation has been granted it will stipulate the extent of your involvement, such as whether you can only be present to make representations, provide evidence or whether you are able to fully participate and vote on the matter in which you have a non pecuniary interest.

### Further Information

Advice can be obtained from Suki Binjal, Director of Legal and Governance Services on 020 8356 6234 or email [suki.binjal@hackney.gov.uk](mailto:suki.binjal@hackney.gov.uk)



FS 566728



## REPORT OF THE GROUP DIRECTOR, FINANCE & CORPORATE RESOURCES

### Carbon Risk Audit – 2019 Interim Results

Special Pensions Committee  
17<sup>th</sup> February 2020

Classification  
**PUBLIC**

Ward(s) affected

**ALL**

Enclosures

One

**AGENDA ITEM  
NO. 4**

## 1. INTRODUCTION ¶

- 1.1 This report presents the results of a carbon risk audit carried out on the Fund's equity and segregated bond portfolios. The audit has been carried out by TruCost to measure the Fund's carbon footprint and exposure to future CO<sub>2</sub> emissions, and to assess progress made against the Fund's target to reduce exposure to future CO<sub>2</sub> emissions by 50% by 2022.
- 1.2 The results show that the Fund has reduced its exposure to carbon reserves by 31.4% between July 2016 and June 2019. This places the Fund well over halfway to its target of 50% over 6 years, with 60% of the target reduction already achieved. The Fund is therefore on track to achieve its target ahead of time and could even outperform it.
- 1.3 We are proud to have responded to this issue early and to have been one of the first LGPS funds to set and transparently monitor performance against a carbon reduction target. The results from this interim assessment of the Fund's carbon exposure will be used to help meet our overall target of at least a 50% reduction in exposure to future CO<sub>2</sub> emissions and to help set our investment strategy for the next 3 years.

## 2. → RECOMMENDATIONS¶

- 2.1 The Pensions Committee is recommended to:
  - Note the reduction in exposure to future CO<sub>2</sub> emissions by 31% over 3 years, which places the Fund well over halfway to its target of 50% over 6 years.
  - Note that officers are engaging with the relevant fund manager with regards to the Fund's holding in Indonesian coal miner PT Bukit Asam, with a view to looking at options available to remove this holding from the Fund's investment portfolio
  - Agree that consideration of performance against the Fund's carbon reduction target will form a formal part of setting the 2020 investment strategy.
  - Agree that consideration of approaches to improving alignment with the 1.5°C warming scenarios will form a formal part of setting the 2020 investment strategy.
  - Agree that the strategy setting process will consider how the Fund can make a positive contribution to the transition to a low carbon economy, through investment in renewable infrastructure and other suitable asset classes.

### 3. → **RELATED DECISIONS¶**

- 3.1 Pensions Committee - 29th March 2017 - investment Strategy Statement
- 3.2 Pensions Committee - 24th January 2017 - Investment Strategy Statement
- 3.3 Pensions Committee - 19th September 2016 - Update on climate change recommendations and presentation of carbon footprinting results.
- 3.4 Pensions Committee - 28th January 2016 - Future Workstreams - Climate Change

### 4. → **COMMENTS OF THE GROUP DIRECTOR OF FINANCE & CORPORATE RESOURCES¶**

- 4.1 The Pensions Committee acts as Scheme Manager for the Pension Fund and is therefore responsible for the management of £1.7 billion worth of assets and for ensuring the effective and efficient running of the Pension Fund. The investment returns that the Fund is able to deliver have significant financial implications, not just for the Fund itself but also on the Fund's employers in terms of the level of contributions they are required to make to meet the Fund's pension promises, which are underwritten by statute.
- 4.2 The Fund recognises that investment in fossil fuels and the associated exposure to potential stranded assets scenarios pose material financial risks. These risks apply not only to the Fund's investment portfolio but also, when considered on a wider scale, to long term global economic growth.
- 4.3 In recognising the risks that climate change and stranded assets scenarios could pose to the Fund, the Committee needs to understand where these risks might apply and how they can best be mitigated within the investment management framework within which LGPS funds operate. This report provides the Committee with a greater understanding of where climate risks are concentrated within its investment portfolio, which can then be used to help mitigate those risks within its investment strategy.
- 4.4 The Group Director is very pleased to report the reduction in exposure to future CO<sub>2</sub> emissions by 31% over 3 years, which places the Fund well over halfway to its target of 50% over 6 years, with 60% of the target reduction already achieved. The Fund is therefore on track to achieve its target ahead of time and might even outperform it. The reduction is fully compatible with the Fund's wider investment strategy and has been achieved with no negative impact on performance; the Fund's performance has improved relative to its peer group (other local authority pension funds) over the 3 year period since the introduction of the target.

### 5. → **COMMENTS OF THE DIRECTOR OF LEGAL AND GOVERNANCE SERVICES¶**

- 5.1 The Pensions Committee has delegated authority for managing all aspects of the Pension Fund including the following from the Committee's Terms of Reference:



- To formulate and publish an Investment Strategy Statement
- To set the overall strategic objectives for the Pension Fund, having taken appropriate expert advice, and develop a medium term plan to deliver the objectives.
- To determine the strategic asset allocation policy

5.2 Regulation 7 of the Local Government Pension Scheme (Management and Investment of Funds) Regulations 2016 requires the Administering Authority to formulate an Investment Strategy Statement (ISS) in line with guidance published by the Secretary of State. The guidance requires the Fund to include a section on its approach to Environmental, Social and Governance (ESG) factors within its ISS.

5.3 In 2014, the Law Commission produced guidance on the fiduciary duties of investment intermediaries, which indicated that investors should have regard to ESG factors where they are financially material. In its guidance to occupational schemes, the Pensions Regulator has given a clear indicator that it believes this to be the case for climate change.

5.4 This report helps to demonstrate that the Committee is factoring climate risk into its investment strategy setting process as a material financial risk and will make clear disclosures with regards to its approach in the ISS as required by the LGPS (Management and Investment of Funds) Regulations 2016.

## 6. → **BACKGROUND TO THE REPORT**

6.1 In January 2016, the Fund held its initial strategy meeting to consider in detail the Fund's approach to investment in fossil fuels and management of the financial risks posed by climate change. At that meeting, the Committee considered and approved a set of recommendations reflecting both its recognition of these risks and a strengthened commitment to factor them into its investment approach. The recommendations were as follows:

- Develop a policy statement regarding the London Borough of Hackney's approach to fossil fuel investment with a view to inclusion as a section within the new Investment Strategy Statement (ISS)
- Agree to monitor carbon risk within the London Borough of Hackney Pension Fund and to appoint a specialist contractor to conduct a carbon footprint of the Fund
- Review options for the Pension Fund's passive UK equity mandate
- Continue engagement activities with the Fund's investment managers on their approach to fossil fuel and to promote consideration of climate change issues with managers when making investment decisions.
- Maintain an active approach to climate change issues with investee companies and look for further opportunities to work with others on issues of ESG importance
- Consider options for an initial active investment of approximately 5% of the Fund in a sustainability/low carbon or clean energy fund(s)
- Review options for switching some of the existing property mandate into a low carbon property fund
- In recognition of the financial risks posed by climate change, resolve to amend the Fund's risk register to reflect this as a risk

6.2 The Fund has now completed or commenced work on all of the above recommendations. Since 2016, the Fund has:

- Included a carbon reduction policy statement within the ISS, clearly setting out the carbon reduction target
- Commissioned 2 carbon footprint reports (2016 and 2019) - these have been used to set and monitor the Fund's carbon reduction target
- Reviewed exposure to UK passive equities (one of the Fund's most significant sources of exposure to reserves) and reduced the Fund's allocation from 25% to 10% of assets under management
- Changed the Fund's active equity managers, ensuring that the new manager considers carbon risk as an integral part of its decision making. The Fund continues to engage with both its active and passive equity managers
- Stepped up involvement with the work of the Local Authority Pension Fund Forum (LAPFF), which engages collectively on behalf of local authority pension funds. Cllr Chapman, Chair of the Pensions Committee, is now a member of the LAPFF executive and attends engagement meetings on behalf of the group
- Invested 23% of the Fund in sustainable/low carbon equity funds, far above the initial commitment of 5%
- Switched £25m of the Fund's property mandate into Threadneedle's Low Carbon Workplace Fund, which is a partnership between Columbia Threadneedle Investments, the Carbon Trust and property developer Stanhope. Through the fund, the partnership acquires commercial office buildings and refurbishes them, turning them into energy efficient workplaces. Once occupied, the buildings' energy and carbon performance are monitored against standards set by the Carbon Trust, who also provide support to occupiers to help reduce their energy usage
- Amended the Fund's risk register to include carbon risk/stranded assets within the Fund's Environmental, Social and Governance risks

6.3 We are very pleased by the progress made on implementing these recommendations. The Fund has gone significantly beyond the original recommendation in many cases, perhaps most notably in the case of the carbon footprinting recommendation. The Fund used this initial assessment as the start of a significant 6-year work programme, which is set out in more detail in sections 7-13.

## 7. → **CARBON REDUCTION TARGET**

7.1 The Fund undertook its first carbon risk audit in summer 2016, following the recommendation made at the January 2016 meeting to commission a carbon footprint report for the Fund. Carried out by Trucost, the audit assessed not only the carbon footprint of the Fund's equity portfolio, but also its exposure to future emissions through fossil fuel reserves.

7.2 The Fund's view is that exposure to future emissions most accurately represents the risk to the Fund from investing in fossil fuel companies. Assessing exposure to emissions from reserves in this way helps the Fund to take a view on its exposure to

potentially stranded assets that may provide unusable as a result of the transition to a low carbon economy.

7.3 After careful consideration of how carbon risk could best be reduced within the investment management framework in which LGPS funds operate, and after taking proper advice, the Committee considered it appropriate to propose a quantifiable, time-bound target for a reduction in the Fund's exposure to future fossil fuel emissions. The Committee agreed that the Fund should:

- Reduce its relative exposure to future emissions from fossil fuel reserves (measured in MtCO<sub>2e</sub> – million tonnes of CO<sub>2</sub> emissions) by 50% over 2 valuation cycles (6 years)
- Measure the reduction relative to the Fund's position as at July 2016 and adjusted for Assets Under Management (£AUM)

7.4 The proposal represented an initial step in ensuring that the Fund is prepared for transition to a low carbon economy. It clearly set out the timeframe for decarbonisation and defined how it should be measured, making it the most ambitious carbon reduction target amongst the London LGPS funds.

7.5 As the target was to be assessed over 2 valuation cycles, the Committee agreed to have an interim audit carried out at the 3 year point to review progress against the target and assist with decision making for the 2020 investment strategy. The audit was once again carried out by Trucost to ensure that comparable metrics were used. The audit covered the Fund's listed equity portfolio as per the 2016 audit; however, for 2019 the Fund's segregated bond mandate has also been assessed.

7.6 This report presents the results of that interim audit, reviewing progress made against the target to date and setting out some initial recommendations for the next three year cycle. The report sets out the excellent progress made to date against the 50% reduction target and provides a summary of the various metrics calculated. It then provides a more detailed breakdown of 2 key metrics; exposure to future emissions and alignment with the International Energy Agency (IEA)'s 2°C warming scenario. It also considers how the Fund will take this analysis into account in setting its 2020 investment strategy and consider the position against the enhanced 1.5°C warming scenario in the future

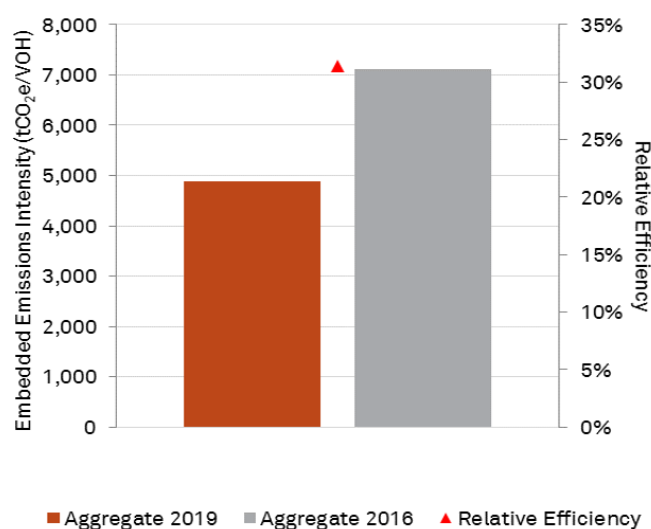
## 8. → **SUMMARY OF PERFORMANCE AGAINST TARGET**

8.1 The audit shows that the Fund has reduced its exposure to carbon reserves by 31.4% between July 2016 and June 2019, as set out in the chart below:

# Hackney 2019 Portfolio Audit

## Embedded Emissions Intensity Comparison

Portfolio	Aggregate 2019	Aggregate 2016	Relative Efficiency
Embedded Emissions Intensity (tCO <sub>2</sub> e/VOH)	4882.75	7113.27	31.4%



- 8.2 Trucost has analysed the carbon emissions embedded within the fossil fuel reserves that are disclosed by the underlying companies within the Fund’s equity portfolio. The emissions measured are the potential future amounts of CO<sub>2</sub> that could be released if the fuel reserves disclosed were to be burnt. The Committee has used this metric to set its target as it gives an indication of the extent to which the Fund is exposed to assets (i.e. coal, oil and gas reserves) that may be at risk of stranding.
- 8.3 The results shown here are normalised by asset value; the future emissions measured for each portfolio (2016 and 2019) have been divided by the value of holdings for that portfolio. This gives a figure for emissions intensity. This has been done as Trucost have used the most recent data available to assess both portfolios (to ensure comparability of data); this means an adjustment to allow for asset growth over time is required to compare the 2 portfolios.
- 8.4 The Fund’s equity portfolio as at 31st August 2016 (as used in the initial assessment) had an emissions intensity of 7,113.27 tCO<sub>2</sub>e/VOH (tonnes of carbon dioxide divided by value of holdings), whilst the equity portfolio as at 31st June 2019 has an emissions intensity of 4,882.75 tCO<sub>2</sub>e/VOH. This represents a reduction of 31.4% over the 3 year cycle.
- 8.5 We are extremely pleased with this overall result, as it indicates that the Fund is on track to achieve its overall target of a 50% reduction in exposure to reserves over 6 years. The plans to reduce exposure put in place for the 2017 investment strategy have had the desired effect, and we are already starting to develop our approach for the 2020 strategy.

- 8.6 We do, however, recognise that there is more work to do, both in terms of achieving our overall target and in ensuring that the Fund's approach remains in line with the requirements of the IEA's 2°C warming scenario and takes into account the recent recommendation by the Intergovernmental Panel on Climate Change (IPCC) to achieve no more than 1.5°C warming.
- 8.7 It should be remembered that carbon risk data is complex and has certain inherent limitations. The Fund has tried to avoid some of these; for example, the Committee has chosen to set its reduction target using fossil fuel exposure/stranded assets metrics rather than carbon footprinting metrics, to help avoid issues over disclosure of Scope 3 data. Scope 3 measures the indirect emissions through a company's value chain, including both upstream (supply chain) and downstream (use of product) emissions. Measurement of downstream emissions is extremely challenging and therefore rarely disclosed; it is not included in Trucost's analysis for this reason. Looking solely at the carbon emissions from a fossil fuel company therefore does not include the impact of the use of the products.
- 8.8 We recognise both that limitations remain around disclosure and that data can be used and interpreted in different ways - this is discussed further in Section 8. The Fund's approach is to use this carbon risk audit as a guide to where the most significant risks are concentrated and to use this to inform decision-making around strategy setting and risk management. The metrics disclosed can also be used to inform the Fund's engagement with its managers and investee companies, as well as potentially assisting us in improving climate-related disclosures.

## 9. REDUCTION IN EXPOSURE TO RESERVES - WHOLE FUND

- 9.1 As set out above, the Fund has achieved an overall reduction of 31.4% in its exposure to future CO<sub>2</sub> emissions over the past 3 years. This represents excellent progress towards the overall target of 50% over 6 years.
- 9.2 The Fund's equity portfolio as at 31st August 2016 (as used in the initial assessment) had an emissions intensity of 7,113.27 t CO<sub>2</sub>e/VOH (tonnes of carbon dioxide divided by value of holdings), whilst the equity portfolio as at 31st June 2019 had an emissions intensity of 4,882.75 t CO<sub>2</sub>e/VOH. As set out above, these figures have been normalised by asset value to allow direct comparison of the 2016 and 2019 portfolios using up to date carbon disclosure data.
- 9.3 Whilst we measure performance against our target using emissions intensity, Trucost have also measured the absolute exposure to future CO<sub>2</sub> emissions. The total exposure within the Fund's equity portfolio as at 30th June 2019 was 4.319m tonnes CO<sub>2</sub>e.
- 9.4 To compare this absolute emissions measurement to the 2016 portfolio, we need to look back to our original carbon risk audit to make sure we are taking account of the growth in asset values over the 3 years. At the 2016 audit, the July 2016 portfolio had an absolute exposure of 7.11m tonnes CO<sub>2</sub>e. Measuring this way suggests a reduction of 39%.
- 9.5 Both approaches to measurement have advantages and disadvantages; measuring

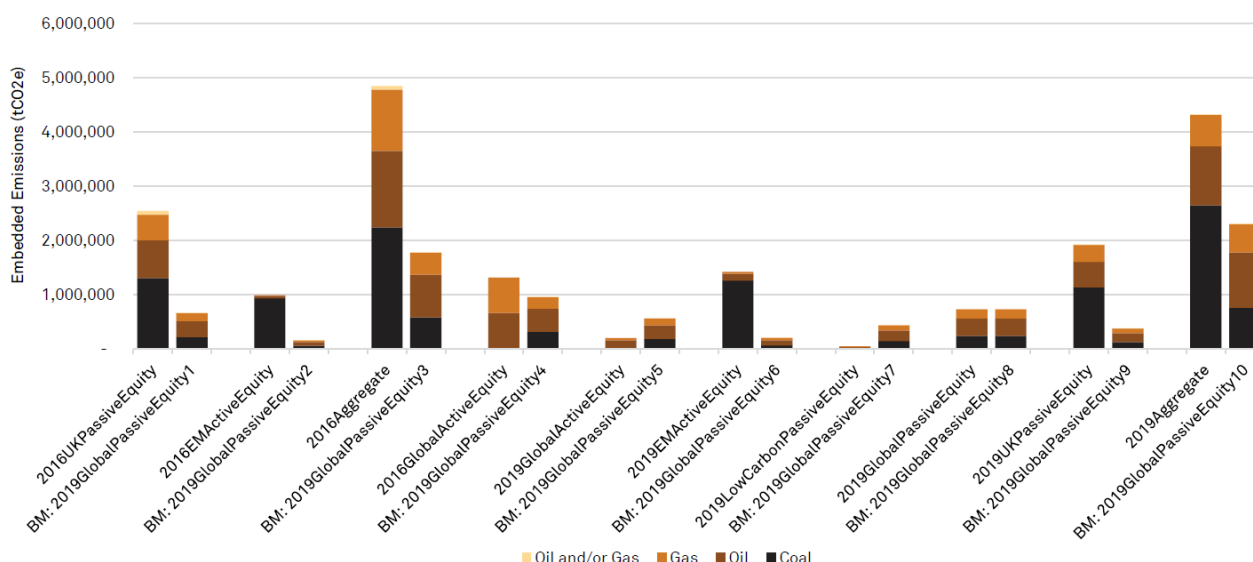
using the same dataset adjusts for improvements in disclosure over the 3 years, whilst comparing the dataset from 2016 to that from 2019 captures the effect of decarbonisation by individual companies over the period. Both approaches are valid; however, measurement using the same dataset and adjusted for asset values is perhaps a clearer indicator of the effect of the Committee’s strategic decisions (i.e. it strips out the effect of changes in exposure within individual companies over the 3 year period) and clearly reflects the commitment made in the original target.

## 10. → REDUCTION IN EXPOSURE TO RESERVES - BREAKDOWN BY MANDATE

10.1 As well as measuring the exposure across the aggregate equity portfolios for both 2016 and 2019, the audit assessed exposure to future emissions for each of the Fund’s underlying equity mandates. The exposure to reserves from coal, oil and gas was measured for each mandate for both 2016 and 2019, and compared to the exposure for a portfolio of the same value tracking the MSCI World. The benchmark should not be considered as representing the Fund’s overall equity investment strategy; rather it provides a useful way of comparing exposure across portfolios of different sizes.

10.2 The chart below sets out the absolute exposure for each of the Fund’s equity mandates for both 2016 and 2019, measured using current data. As set out above, each mandate is benchmarked against the MSCI World to indicate the intensity of its exposure. For each mandate, the benchmark exposure represents the level of exposure that would be expected for a portfolio of the same size tracking the MSCI World. A larger version of the chart can be found in Appendix 1 to this report.

Future Emissions from Reserves



10.3 Looking at the 2 aggregate portfolios and their benchmarks helps demonstrate how the 31.4% reduction in exposure has been achieved. The key drivers have been reducing the size of UK passive equity mandate (the Fund’s most significant exposure to fossil fuel reserves) from 25% to 10% of total assets, moving to an active global equity mandate with very low exposure to fossil fuel reserves, and investing in MSCI’s low carbon target passive index. Both the Fund’s current active global equity mandate and the MSCI low carbon target passive mandate have exposures well below that of

the MSCI World benchmark.

- 10.4 Three of the Fund's current equity mandates (2019 Global Active Equity, 2019 Low Carbon Passive Equity, 2019 Global Passive equity) therefore have exposures at or below the benchmark. Taken together, the 3 mandates contribute 0.977m tonnes in future CO<sub>2</sub> emissions - 22.6% of the total. All 3 are new mandates since 2016, indicating that the changes made by the Fund following the 2016 carbon risk audit have achieved the desired effect.
- 10.5 The other 2 mandates (2019 UK Passive Equity, 2019 EM active Equity) have inception dates prior to 2016. These are the only current equity mandates that were held prior to the 2016 carbon risk audit and between them contribute 3.341m tonnes in future CO<sub>2</sub> emissions - 77.4% of the total.
- 10.6 The Fund's UK Passive Equity mandate, which tracks the FTSE Allshare, has been reduced substantially as a proportion of total assets since 2016 (from 25% to 10% of total assets). This has materially reduced its absolute exposure to future emissions; however, the mandate remains a significant contributor to the Fund's overall exposure.
- 10.7 As shown in the chart, a significant proportion (59%) of the UK Passive mandate's exposure comes from coal. Coal has a greater emissions intensity than either oil or gas; for a certain monetary value, investment in coal will result in a greater exposure to future emissions. The exposure to coal in this mandate comes primarily from the presence in the FTSE Allshare index of large, diversified mining companies.
- 10.8 The other current mandate with significant future emissions exposure is the Emerging Markets Active equity mandate. The majority of this mandate's exposure (89%) also comes from coal; however, unlike the UK Passive mandate, almost all of this exposure is associated with a single company (Indonesian coal miner PT Bukit Asam). This holding therefore represents a significant contribution towards exposure at a whole fund level (approx. 25%). It should be noted that the company is a pure-play coal miner, deriving 97.98% of its revenue from coal.
- 10.9 Given the concentration of exposure to future emissions in the UK Passive and Emerging Markets Active mandates, the Committee's focus will be on these 2 mandates in terms of ensuring that the 50% reduction target is achieved over the next 3 year cycle. This will form a significant part of the process of setting the Fund's 2020 investment strategy.
- 10.10 Additionally, given the significance of the exposure through PT Bukit Asam and the fact that the company lacks exposure to other revenue streams, the Committee is recommended to continue a targeted engagement with the relevant fund manager in relation to this holding. As set out in 10.8, this holding represents a significant proportion of the Fund's remaining exposure to reserves and will be a key focus as the Fund moves into the next 3 year cycle.

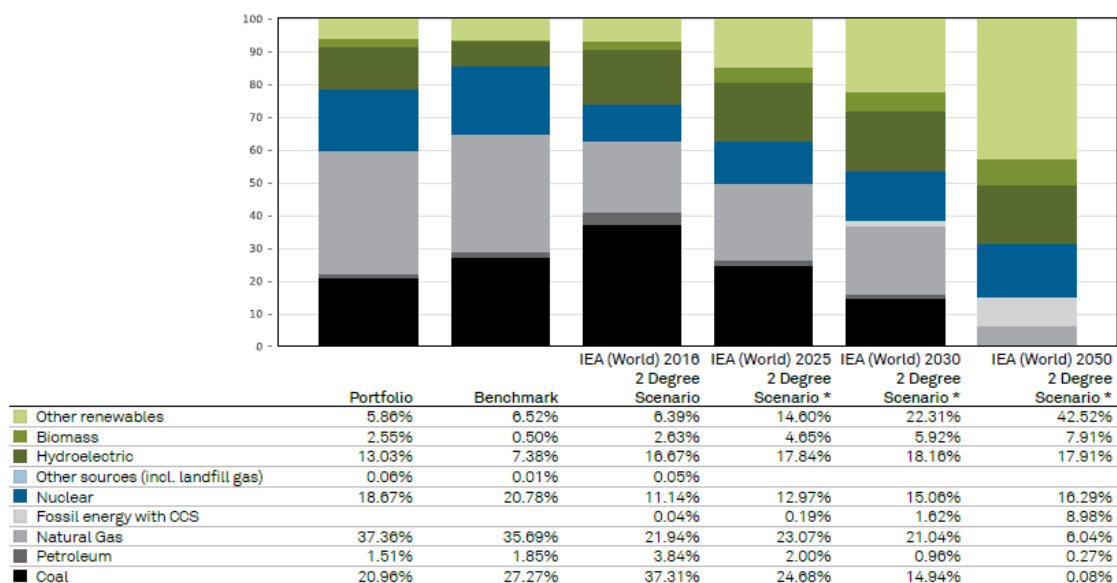
#### 11. → **ALIGNMENT WITH 2°C WARMING SCENARIO**

- 11.1 Another key metric for the Committee to consider is alignment with the IEA's 2°C

targets; a set of globally agreed, forward-looking targets to mitigate climate change. Historically, portfolios have been measured against traditional financial benchmarks which reflect the economy today rather than the low carbon economy needed for the future. This over-represents traditional fossil fuel energy sectors and under-represents greener energy providers.

- 11.2 To help overcome this issue, Trucost has compared the current energy mix of the Fund's portfolio to the IEA's two degree scenarios to illustrate how to work toward an energy transition goal. This will allow the Fund to assess its transition impact and help to finance the low carbon economy.
- 11.3 One of the key issues in the debate around fossil fuel divestment is that whilst reduction in exposure to fossil fuels can be a helpful risk management tool for investors, it cannot in isolation reduce CO<sub>2</sub> emissions or support the transition to a low carbon economy. Recognising this, the Fund is aiming to broaden its focus by also considering how it can make a positive contribution towards a lower carbon economy.
- 11.4 The chart below shows the percentage share in the overall energy mix of each unit of energy apportioned to the Fund's 2019 portfolio and MSCI World benchmark, by type. These are then compared to the IEA's '2 degree aligned' energy mix scenarios for the world in 2016, 2025, 2030 and 2050 respectively.

### 2 Degree Alignment - 2019 Portfolio



- 11.5 It is worth noting that the portfolio and benchmark generation mixes are based only on disclosed energy production data. Companies operating in the energy sector but not disclosing units of energy produced are not included in the grid mix presented here. For example, the Fund's Global Active Equity portfolio does not have exposure to any companies disclosing figures for energy generation and therefore has no results included within this analysis.
- 11.6 The Fund is reasonably well aligned with the IEA's 2°C scenario for 2016 in terms of fossil fuel exposure within its energy mix (59.83%) vs 63.13%). However, to align with



the 2025 scenario, it would need to increase its exposure to renewable energy generation from 21.44% to 37.09%. This cannot be done through reduction to fossil fuels alone; as this analysis focuses on the percentage energy mix, the Fund would need to make positive decisions around renewable energy generation and green revenues to improve its alignment.

- 11.7 This analysis focuses on a 2°C warming scenario, as Trucost uses data derived from the IEA to assess alignment for its clients. The 2 degree warming scenario has been fully modelled by the IEA in its annual World Energy Outlook (WEO), which is used by businesses, investors and governments as the global benchmark for modelling the energy industry. The WEO currently models 2 degree warming as its Sustainable Development Scenario (SDS) intended to meet the targets of the Paris Agreement.
- 11.8 We are very conscious of the IPCCs Special Report on Global Warming of 1.5°C, and that the IEA has come under pressure to bring its Sustainable Development Scenario in line with 1.5°C given the conclusions of the IPCC report. This could provide the basis for modelling alignment with a 1.5°C warming scenario in the future and will be considered further when looking to update our investment strategy over the coming months.
- 11.9 Although for this exercise the Fund's alignment has been assessed using a 2°C warming scenario, we are mindful of the conclusions of the IPCC special report, and recognise that alignment with a 1.5°C scenario may be preferable from a transition impact perspective. Making a positive contribution to the transition to a low carbon economy will be a key area of consideration for the Committee in terms of setting the 2020 investment strategy; careful consideration will be given as to how this can best be reflected in the Fund's approach.

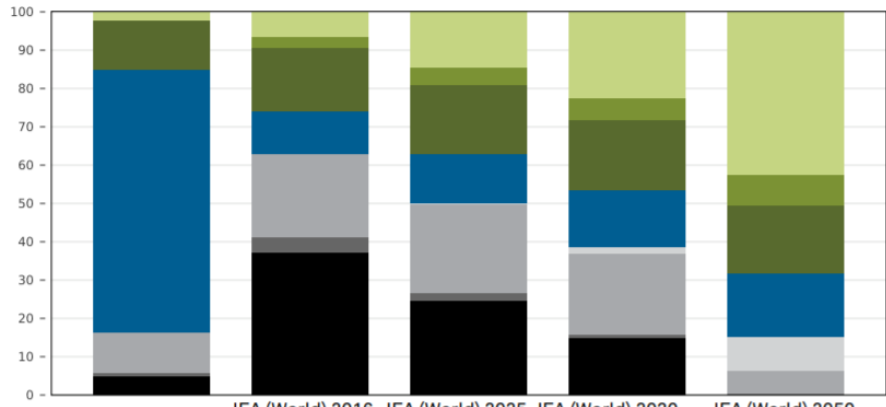
## 12. → OTHER METRICS

- 12.1 Sections 8-10 set out the key metrics for the Fund in terms of carbon risk exposure and alignment with 2°C /1.5°C warming scenarios. However, Trucost's audit also assessed a number of other metrics, which are set out in more detail in the Key Findings Report at Appendix 1. These metrics include:
- Carbon footprinting metrics
    - Carbon footprint by scope
    - Carbon intensity
    - Sector carbon intensities
    - Top contributors
    - Attribution analysis
  - Carbon disclosure metrics
    - Disclosure analysis
    - Top modelled contributors
  - Fossil fuel and stranded assets exposure metrics
    - Financial Exposure to Fossil Fuel Activities
    - Fossil Fuel Activities Revenue Breakdown
    - Emissions from Reserves - **See Sections 9 & 10**
    - Emissions from CAPEX
    - Watch Lists
  - 2 Degree Alignment metrics
    - Financial exposure to energy generation and energy revenue

- breakdown - **See Section 11**
- Energy generation mix - **See Section 11**

### 13.→ **BOND PORTFOLIO**

- 13.1 For the first time, the Fund has also had its exposure to carbon risk through its bond portfolio assessed. The assessment covers the Fund's segregated bond mandate as at 30th June 2019, and has been split into 2 parts covering corporate and sovereign bonds respectively.
- 13.2 The assessment of exposure through corporate bonds covers many of the same metrics as the equity portfolio, including carbon footprint metrics, exposure to future emissions and 2 degree alignment metrics.
- 13.3 The metrics relating to exposure to embedded future emissions and 2 degree alignment metrics are of particular interest to the Committee. As with the equity portfolio, Trucost have assessed the portfolio's total tonnes of apportioned CO<sub>2</sub> from reserves, broken down by reserve type. They have also assessed reserves 'intensity' by normalizing the apportioned embedded emissions by the value of holdings (VOH).
- 13.4 The portfolio's total exposure to future emissions is 0.280m tonnes CO<sub>2</sub>e, with the emissions intensity being 4049 t CO<sub>2</sub>e/VOH. The emissions intensity of this section of the portfolio is therefore slightly lower than the emissions intensity for the equity portfolio (4882.75 t CO<sub>2</sub>e/VOH). 100% of the exposure comes from embedded coal reserves.
- 13.5 The exposure comes entirely from bonds held with 2 companies; Glencore and Anglo American. Both are large, diversified miners with significant revenue streams outside of coal mining; extractive activities contribute 4.82% of total revenue for Glencore and 25.17% for Anglo American. It should also be noted that the absolute exposure to reserves for the 2 companies (0.280m t CO<sub>2</sub>e) is far lower than that for PT Bukit Asam within the Emerging Markets Active Equity portfolio, which is in excess of 1.2m t CO<sub>2</sub>e.
- 13.6 The portfolio's alignment with a 2°C warming scenario is shown below; the most notable feature here is the portfolio's exposure to nuclear power generation (68.56% share) relative to the forecast scenarios. To achieve alignment with a 2 degree scenario by 2025, the portfolio's exposure to renewables would need to increase; however, exposure to fossil fuel power generation is well below the 2 degree scenario at 16.54% compared to 49.75% for the 2025 scenario.

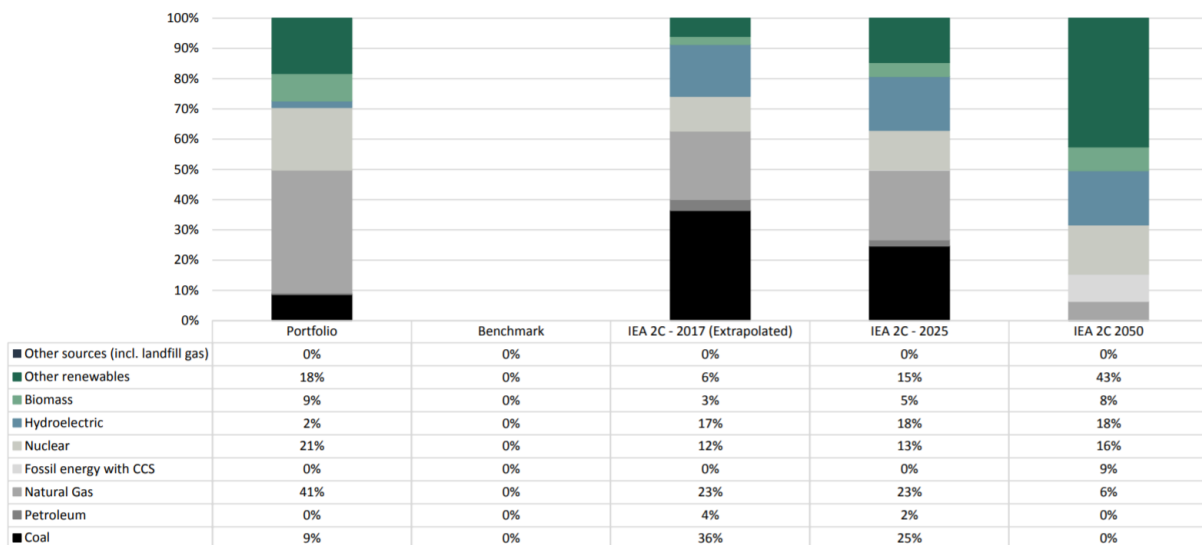


	Portfolio	IEA (World) 2016 2 Degree Scenario	IEA (World) 2025 2 Degree Scenario *	IEA (World) 2030 2 Degree Scenario *	IEA (World) 2050 2 Degree Scenario *
Other renewables	2.22%	6.39%	14.60%	22.31%	42.52%
Biomass	0.03%	2.63%	4.65%	5.92%	7.91%
Hydroelectric	12.65%	16.67%	17.84%	18.16%	17.91%
Other sources (incl. landfill gas)		0.05%			
Nuclear	68.56%	11.14%	12.97%	15.06%	16.29%
Fossil energy with CCS		0.04%	0.19%	1.62%	8.98%
Natural Gas	10.74%	21.94%	23.07%	21.04%	6.04%
Petroleum	0.99%	3.84%	2.00%	0.96%	0.27%
Coal	4.81%	37.31%	24.68%	14.94%	0.08%

13.7 A separate analysis has been carried out on the sovereign bond element of the bond portfolio. The metrics used for this analysis differ considerably from the equity and corporate bond analyses, given that the underlying holdings are in government rather than corporate entities. The analysis focuses primarily on the carbon footprint of the portfolio, breaking the exposure down by region and considering which regions have the greatest intensity of exposure.

13.8 The analysis also considers energy mix and alignment with the IEA's 2 degrees scenario, which is set out in the chart below. The full analysis uses 2 different methods (apportioned and weighted average) which produce similar results - the apportioned method is shown here.

PORTFOLIO GENERATION MIX - APPORTIONED OUTPUT METHOD



13.9 As shown in the chart, the portfolio is well aligned with the 2016 scenario, but would require a greater exposure to renewables within its energy mix to achieve alignment with the 2025 scenario (29% exposure vs 38% exposure).

## 14. → NEXT STEPS

- 14.1 Climate aware investing is evolving rapidly, both as climate science advances and as investment markets' understanding of the subject deepens. Even since the Fund set its target 3 years ago, the backdrop has changed considerably.
- 14.2 Climate change and its implications are increasingly high on the agenda for policy makers and the general public, with the IPCC suggesting that avoided climate change impacts on sustainable development, eradication of poverty and reducing inequalities would be greater if global warming were limited to 1.5°C rather than 2°C. This would require rapid and far-reaching transitions in energy, land, infrastructure (including transport and buildings), and industrial systems.
- 14.3 Against this backdrop, we are looking to broaden our approach to climate aware investing. Our 50% reduction target helps to reduce transition risk for the Fund, by reducing the risk that it will be exposed to potentially stranded assets. However, we now also wish to make a positive contribution to reducing real-world emissions and assisting in the transition to a low carbon economy.
- 14.4 As part of developing our new investment strategy, we will consider how best to achieve this impact whilst achieving a competitive financial return. This is likely to involve investment in new asset classes, such as renewable infrastructure. As part of these changes, we expect our exposure to unlisted assets to increase, and this will also mean finding new ways to assess both our carbon exposure and impact on real-world emissions.

Ian Williams ¶

**Group Director of Finance & Resources ¶**

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Financial considerations: Ian Williams (020 8356 3003) ¶

Legal comments: Sean Eratt (020-8356 6012) ¶

## **Appendices¶**

Appendix 1 - Hackney Portfolio Footprint 2019 - Equities - Key Findings Report

# Key Findings Report

## Hackney Portfolio Footprint

27 September 2019

Trucost  
ESG Analysis

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**S&P Global**



# ABOUT TRUCOST

Trucost is part of S&P Global.

A leader in carbon and environmental data and risk analysis, Trucost assesses risks relating to climate change, natural resource constraints, and broader environmental, social, and governance factors. Companies and financial institutions use Trucost intelligence to understand their ESG exposure to these factors, inform resilience and identify transformative solutions for a more sustainable global economy. S&P Global's commitment to environmental analysis and product innovation allows us to deliver essential ESG investment-related information to the global marketplace.

For more information, visit [www.trucost.com](http://www.trucost.com).

# ABOUT S&P GLOBAL

S&P Global (NYSE: SPGI) is a leading provider of transparent and independent ratings, benchmarks, analytics and data to the capital and commodity markets worldwide.

For more information, visit [www.spglobal.com](http://www.spglobal.com).

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# INTRODUCTION TO CLIMATE-RELATED REPORTING

The effects of climate change pose considerable and far-reaching risks to the global economy. Among those most directly affecting businesses include physical risks posed by increased climate variability and more frequent extreme weather events, which may result in property damage, challenges linked to business continuity, and the disruption to global supply chains. Businesses also face risks associated with the transition to a low-carbon economy, including policy changes designed to discourage carbon-intensive energy use or favour more resource-efficient industries and operations.

At the request of the G20, the Financial Stability Board (FSB) reviewed how the reporting on climate-related issues in financial reporting could be improved in order to better reflect the risks and opportunities facing financial institutions and non-financial businesses alike. In June 2017, the FSB Taskforce for Climate-Related Financial Disclosure (TCFD) published recommendations on the disclosure of "information needed by investors, lenders, and insurance underwriters to appropriately assess and price climate-related risks and opportunities."

The TCFD provides a voluntary disclosure framework organized around four themes, designed to facilitate better disclosure. These are **governance, strategy, risk management, and metrics and targets**. In order for organizations to disclose in line with TCFD recommendations, they must be able to quantify or qualify the risks and opportunities facing them, linked to climate-related issues, and be able to describe policies, procedures and systems in place to monitor and address climate-related issues on an on-going basis.

This report by Trucost provides both forward-looking and historical metrics that may be used by asset owners and/or asset managers to support their climate-related disclosures in line with TCFD recommendations, and inform internal processes for risk management and strategy development within an organization.

The report is comprised of two parts:

## Historical Performance

- Carbon Footprint Metrics
- Carbon Disclosure Metrics
- Fossil Fuel & Stranded Assets Exposure Metrics





















## Forward-Looking Metrics and Scenario Analysis

- 2 Degree Alignment: Energy Generation Mix

See appendix 1 for more information on the TCFD recommended disclosures for asset owners and asset managers, as well as the grey 'call-out' boxes throughout the report which link the recommendations to specific metrics.



# COVERAGE RATE

	Original Value of Holdings (mGBP)	Standard Portfolio Analysis	
		No. Companies Analysed	Value Analysed Coverage Rate (mGBP) (%)
2016UKPassiveEquity	288	402	253 88 
BM: 2019GlobalPassiveEquity1	-	1,613	- 99.56 
2016EMActiveEquity	62	176	61 97.68 
BM: 2019GlobalPassiveEquity2	-	1,613	- 99.56 
2016Aggregate	741	708	681 91.92 
BM: 2019GlobalPassiveEquity3	-	1,613	- 99.56 
2016GlobalActiveEquity	391	150	367 93.88 
BM: 2019GlobalPassiveEquity4	-	1,613	- 99.56 
2019GlobalActiveEquity	222	32	214 96.65 
BM: 2019GlobalPassiveEquity5	-	1,613	- 99.56 
2019EMActiveEquity	80	171	78 96.96 
BM: 2019GlobalPassiveEquity6	-	1,613	- 99.56 
2019LowCarbonPassiveEquity	168	1,278	167 99.74 
BM: 2019GlobalPassiveEquity7	-	1,613	- 99.56 
2019GlobalPassiveEquity	282	1,613	280 99.56 
BM: 2019GlobalPassiveEquity8	-	1,613	- 99.56 
2019UKPassiveEquity	153	449	145 95.06 
BM: 2019GlobalPassiveEquity9	-	1,613	- 99.56 
2019Aggregate	904	2,114	885 97.89 
BM: 2019GlobalPassiveEquity10	-	1,613	- 99.56 

## A NOTE ON MAPPING:

- STANDARD PORTFOLIO ANALYSIS: Equity instruments are mapped to the issuing entity. Debt instruments are mapped to the first publically listed entity in the instrument's parent chain (starting with a bond's issuer, followed by its immediate parent, and finally it's ultimate parent). Bonds with no public parent are excluded. This approach to mapping is also applicable to Transition Pathway and Unpriced Carbon Cost analysis.

# CARBON SCORECARD

The Carbon Scorecard is an annual Trucost publication that evaluates a range of S&P indices across some of our key climate performance metrics. The table below ranks each portfolio across the same metrics, allowing for a quick comparison of performance between funds. For more information on each individual metric please refer to the associated section within this report.

For access to previous Carbon Scorecards, visit [www.trucost.com/news-insights](http://www.trucost.com/news-insights).

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	Carbon Intensity (tCO2e/mGBP)*		Reserve Emissions Intensity (tCO2e/mGBP)**		Exposure to Coal Revenues (% of VOH)		Renewables Share in Energy Mix (% of GWh)	
2016UKPassiveEquity	319	3	10,038	7	5.3%	9	24.5%	4
2016EMActiveEquity	713	10	16,242	9	2.8%	4	12.4%	9
2016Aggregate	353	6	7,113	6	3.9%	7	17.1%	6
2016GlobalActiveEquity	324	5	3,577	4	3.1%	6	14.8%	7
2019GlobalActiveEquity	164	1	936	2	0.0%	1	0.0%	10
2019EMActiveEquity	528	9	18,306	10	0.9%	2	40.2%	1
2019LowCarbonPassiveEquity	172	2	274	1	1.7%	3	34.0%	2
2019GlobalPassiveEquity	372	8	2,609	3	4.3%	8	14.4%	8
2019UKPassiveEquity	366	7	13,234	8	7.5%	10	28.8%	3
2019Aggregate	320	4	4,883	5	3.0%	5	21.4%	5

\* Per million revenues

\*\* Per million invested

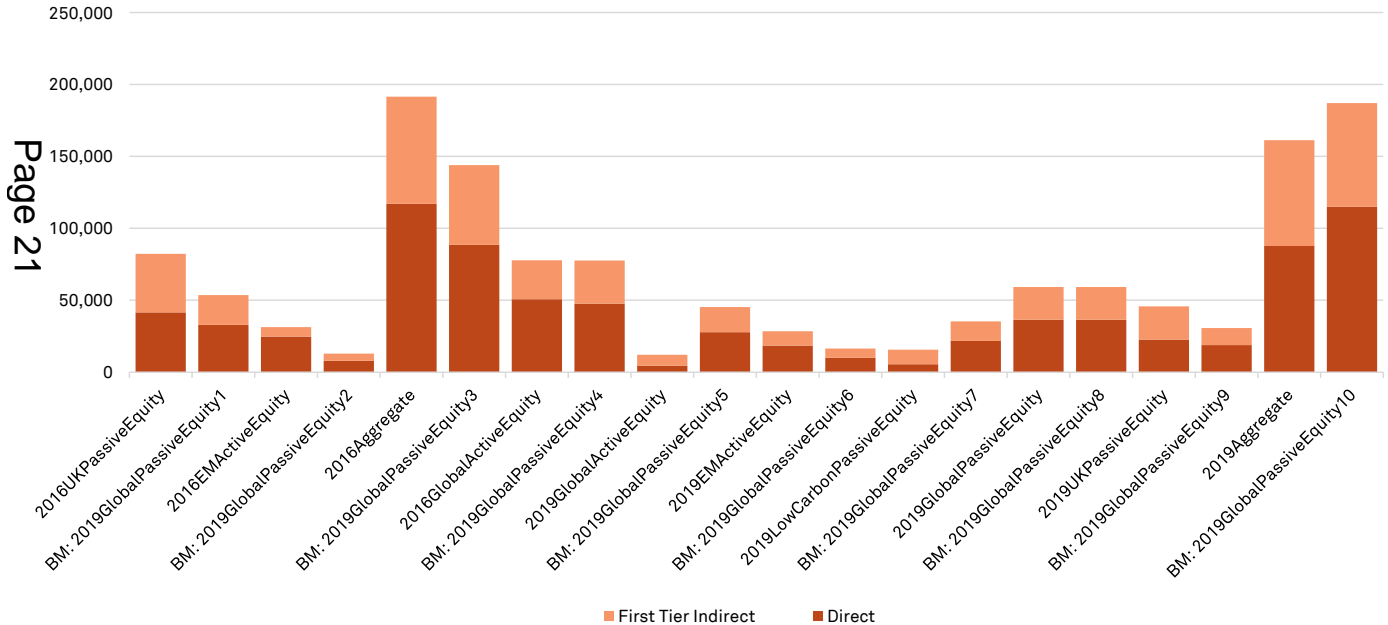
# CARBON FOOTPRINT METRICS

## Carbon Apportioned by Scope

Carbon audits offer a systematic assessment of the carbon related impacts within a portfolio or index at a given point in time. Emissions associated with investee companies may range from those generated by direct operations, to those generated throughout the entire value chain. The charts below show the total carbon that has been apportioned to each of the portfolios analysed, broken out by scope. It represents each portfolio's absolute contribution towards climate change.

For more information on apportioning please see appendix 2, or for more information on the different scopes refer to appendix 3.

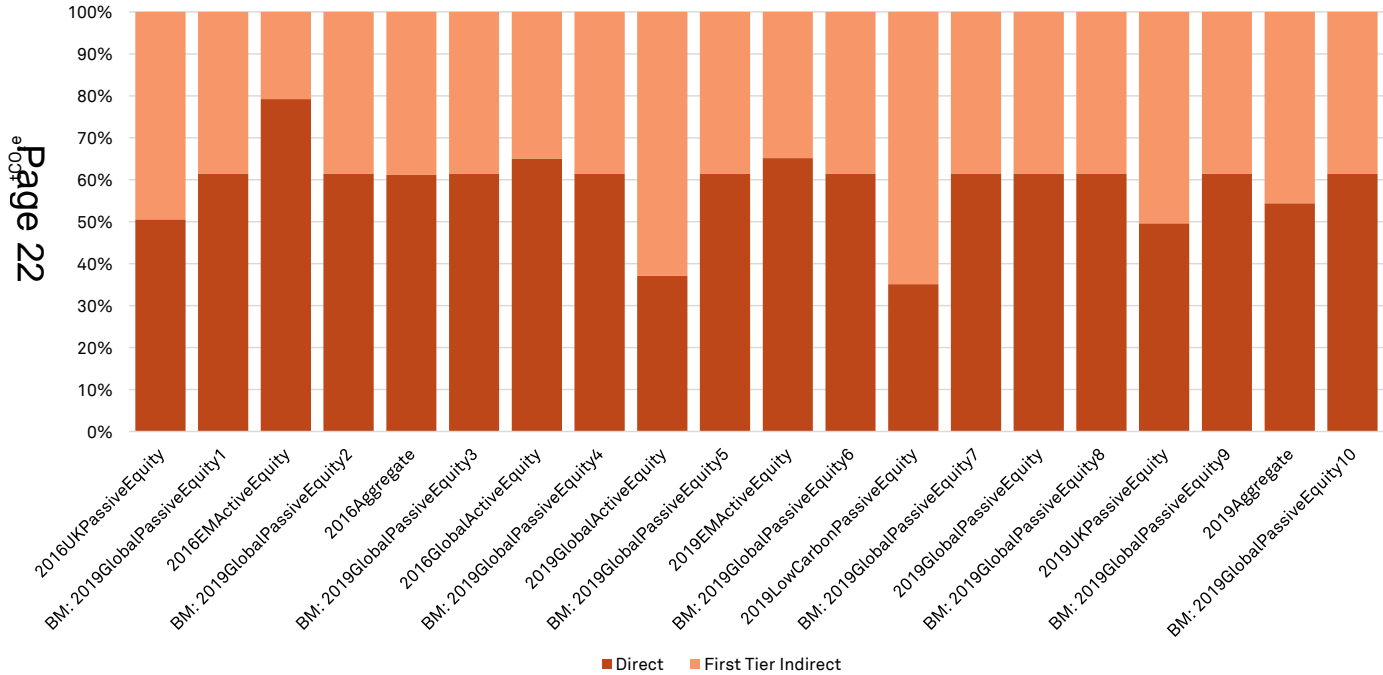
Total Apportioned Carbon by Scope (tonnes)



# CARBON FOOTPRINT METRICS

## Carbon Apportioned by Scope

Total Apportioned Carbon by Scope (%)



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# CARBON FOOTPRINT METRICS

## Carbon Apportioned by Scope

Below are the tabulated results from the charts above. These figures may be used to support internal and/or external reporting, as well as for the setting and tracking of climate-related targets. See the box at the bottom for how these relate to the TCFD guidance documents.

	Direct emissions tCO <sub>2</sub> e	First Tier Indirect emissions tCO <sub>2</sub> e
2016UKPassiveEquity	41,585	40,691
<b>BM: 2019GlobalPassiveEquity1</b>	32,917	20,611
2016EMActiveEquity	24,830	6,519
<b>BM: 2019GlobalPassiveEquity2</b>	7,937	4,970
2016Aggregate	117,066	74,423
<b>BM: 2019GlobalPassiveEquity3</b>	88,568	55,456
2016GlobalActiveEquity	50,651	27,212
<b>BM: 2019GlobalPassiveEquity4</b>	47,713	29,875
2019GlobalActiveEquity	4,517	7,636
<b>BM: 2019GlobalPassiveEquity5</b>	27,852	17,439
2019EMActiveEquity	18,580	9,945
<b>BM: 2019GlobalPassiveEquity6</b>	10,079	6,311
2019LowCarbonPassiveEquity	5,496	10,162
<b>BM: 2019GlobalPassiveEquity7</b>	21,742	13,614
2019GlobalPassiveEquity	36,459	22,828
<b>BM: 2019GlobalPassiveEquity8</b>	36,459	22,828
2019UKPassiveEquity	22,676	23,015
<b>BM: 2019GlobalPassiveEquity9</b>	18,889	11,827
2019Aggregate	87,728	73,586
<b>BM: 2019GlobalPassiveEquity10</b>	115,021	72,019

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**TCFD GUIDANCE FOR ASSET OWNERS / MANAGERS: METRICS & TARGETS RECOMMENDED DISCLOSURE (A)**

Asset owners / managers should describe metrics used to assess climate-related risks and opportunities in each fund / product or investment strategy. Where relevant, asset owners / managers should also describe how these metrics have changed over time. Where appropriate, asset owners / managers should provide metrics considered in investment decisions and monitoring.

**TCFD GUIDANCE FOR ASSET OWNERS / MANAGERS: METRICS & TARGETS RECOMMENDED DISCLOSURE (B)**

Asset owners / managers should provide the weighted average carbon intensity, where data are available or can be reasonably estimated, for each fund / product or investment strategy. In addition, asset owners / managers should provide other metrics they believe are useful for decision making along with a description of the methodology used.

Source: FSB TCFD (2017) Implementing the Recommendations of the TCFD

# CARBON FOOTPRINT METRICS

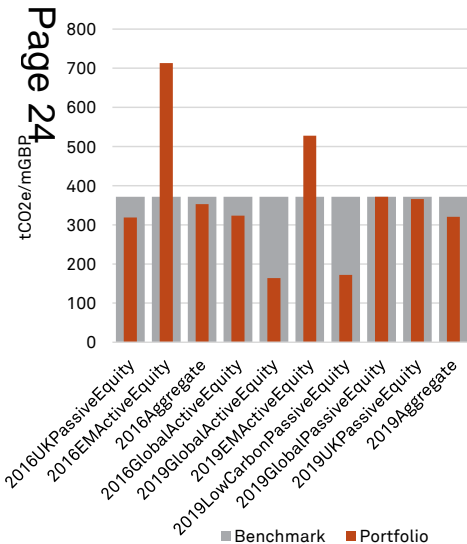
## Carbon Intensity by Method

Portfolios with larger assets under management will typically also have larger absolute carbon footprints than smaller portfolios due to their size. In order to facilitate fair comparison between portfolios, benchmarks and across years, it is therefore important to normalize the totals, either by revenues or by value invested. The three most common approaches to normalization are:

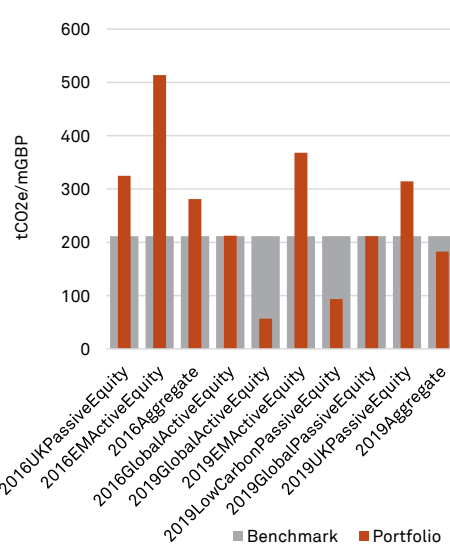
1. **Carbon to Revenue (C/R):** Dividing the apportioned CO<sub>2</sub>e by the apportioned annual revenues.
2. **Carbon to Value Invested (C/V):** Dividing the apportioned CO<sub>2</sub>e by the value invested.
3. **Weighted Average Carbon Intensity (WACI):** Summing the product of each holding's weight in the portfolio with the company level C/R intensity (no apportioning).

The charts below show the intensity for all portfolios using all three calculation methods. The scopes used for the intensity were **Direct** and **First Tier Indirect Emissions**.

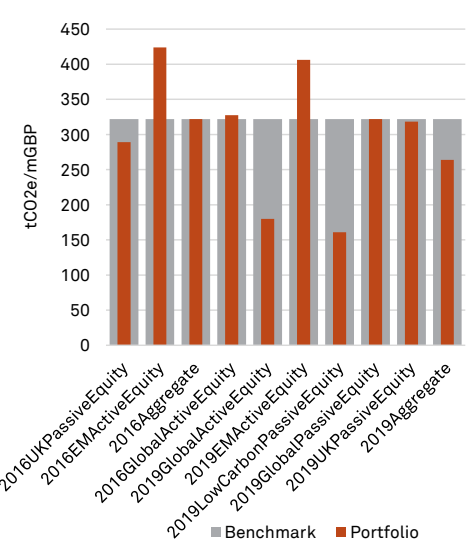
C/R Intensity



C/V Intensity



WACI Intensity



# CARBON FOOTPRINT METRICS

## Carbon Intensity by Method

Below are the tabulated results from the charts above. These figures may be used to support internal and/or external reporting, as well as for the setting and tracking of climate-related targets.

	C/R	Relative		C/V	Relative		WACI	Relative
	tCO2e/mGBP	Efficiency		tCO2e/mGBP	Efficiency		tCO2e/mGBP	Efficiency
2016UKPassiveEquity	319	14%		325	-54%		289	10%
BM: 2019GlobalPassiveEquity1	372	-		211	-		322	-
2016EMActiveEquity	713	-92%		514	-143%		424	-32%
BM: 2019GlobalPassiveEquity2	372	-		211	-		322	-
2016Aggregate	353	5%		281	-33%		322	0%
BM: 2019GlobalPassiveEquity3	372	-		211	-		322	-
2016GlobalActiveEquity	324	13%		212	0%		328	-2%
BM: 2019GlobalPassiveEquity4	372	-		211	-		322	-
2019GlobalActiveEquity	164	56%		57	73%		180	44%
BM: 2019GlobalPassiveEquity5	372	-		211	-		322	-
2019EMActiveEquity	528	-42%		368	-74%		406	-26%
BM: 2019GlobalPassiveEquity6	372	-		211	-		322	-
2019LowCarbonPassiveEquity	172	54%		94	56%		161	50%
BM: 2019GlobalPassiveEquity7	372	-		211	-		322	-
2019GlobalPassiveEquity	372	0%		211	0%		322	0%
BM: 2019GlobalPassiveEquity8	372	-		211	-		322	-
2019UKPassiveEquity	366	2%		315	-49%		318	1%
BM: 2019GlobalPassiveEquity9	372	-		211	-		322	-
2019Aggregate	320	14%		182	14%		264	18%
BM: 2019GlobalPassiveEquity10	372	-		211	-		322	-

Both C/R and WACI measure company intensities on a revenue basis. In the WACI method, the tilt toward or away from high (or low) intensity companies is determined by their value of holdings (VOH) weight in the portfolio, whereas in the C/R method it is determined by their relative contribution to the total apportioned revenues.

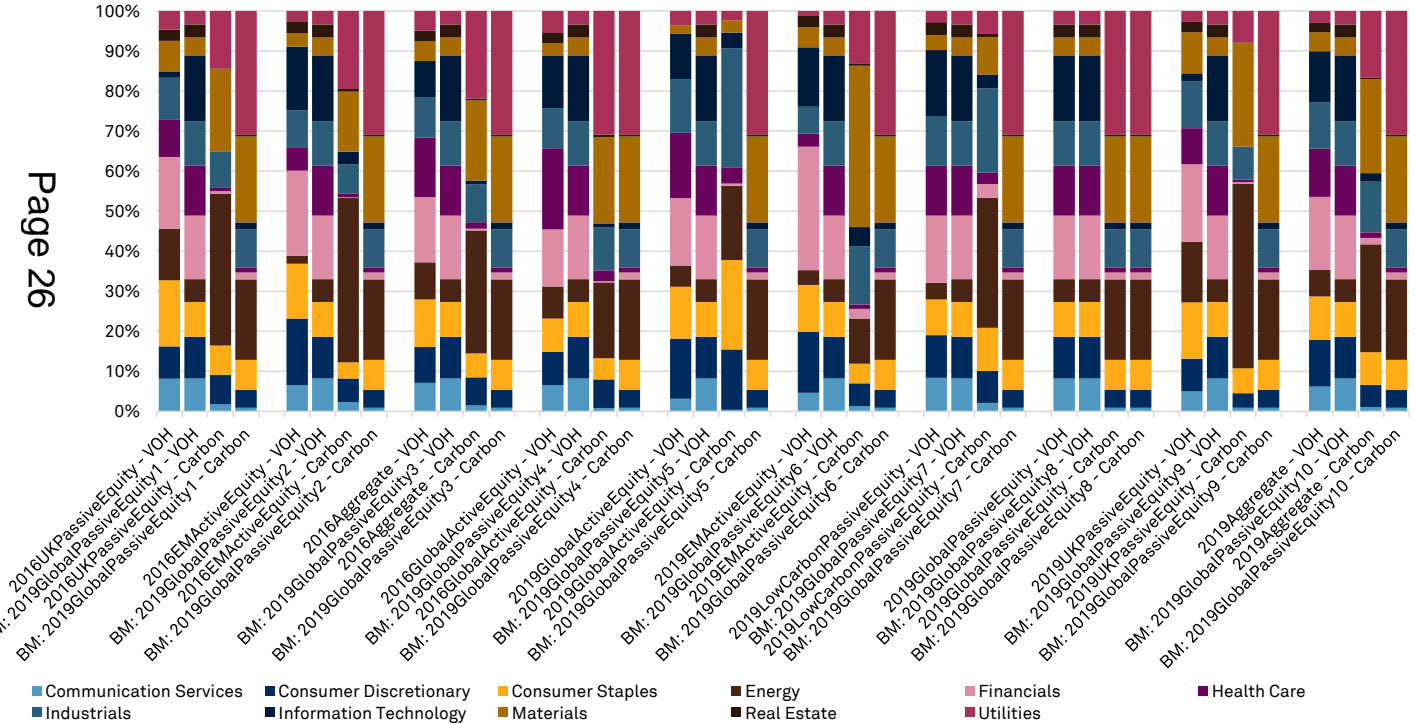
In contrast to C/R and WACI, C/V measures company intensities on a valuation basis. However as with WACI, the tilt towards or away from high (or low) intensity companies is determined by their VOH weight in the portfolio. WACI will be higher than C/V if - on average - the tilt is towards companies whose annual revenues are lower than their

# CARBON FOOTPRINT METRICS

## Sector VOH Share vs. Carbon Share

The chart below compares each sector's value-based weight in a portfolio or benchmark to its share of the total apportioned carbon emissions.

VOH vs. Carbon Share by Sector



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# CARBON FOOTPRINT METRICS

## Sector Carbon Intensities

The table below shows the carbon intensities of the portfolio and benchmarks at the GICS sector level.

	Communication Services	Consumer Discretionary	Consumer Staples	Energy	Financials	Health Care	Industrials	Information Technology	Materials	Real Estate	Utilities
2016UKPassiveEquity	68	179	199	721	14	76	214	47	688	59	579
BM: 2019GlobalPassiveEquity1	55	114	250	837	37	52	257	86	1,283	159	2,607
2016EMActiveEquity	312	185	243	5,181	10	146	510	126	2,814	343	4,475
BM: 2019GlobalPassiveEquity2	55	114	250	837	37	52	257	86	1,283	159	2,607
2016Aggregate	79	161	184	954	12	57	292	95	1,143	90	870
BM: 2019GlobalPassiveEquity3	55	114	250	837	37	52	257	86	1,283	159	2,607
2016GlobalActiveEquity	54	140	156	927	9	49	372	76	2,294	75	909
BM: 2019GlobalPassiveEquity4	55	114	250	837	37	52	257	86	1,283	159	2,607
2019GlobalActiveEquity	52	208	279	634	7	35	169	130	400		240
BM: 2019GlobalPassiveEquity5	55	114	250	837	37	52	257	86	1,283	159	2,607
2019EMActiveEquity	85	256	260	842	52	378	845	140	3,536	137	3,943
BM: 2019GlobalPassiveEquity6	55	114	250	837	37	52	257	86	1,283	159	2,607
2019LowCarbonPassiveEquity	55	91	177	700	30	52	210	77	550	110	593
BM: 2019GlobalPassiveEquity7	55	114	250	837	37	52	257	86	1,283	159	2,607
2019GlobalPassiveEquity	55	114	250	837	37	52	257	86	1,283	159	2,607
BM: 2019GlobalPassiveEquity8	55	114	250	837	37	52	257	86	1,283	159	2,607
2019UKPassiveEquity	68	141	200	728	10	77	241	43	720	75	642
BM: 2019GlobalPassiveEquity9	55	114	250	837	37	52	257	86	1,283	159	2,607
2019Aggregate	63	141	231	753	28	55	257	104	1,142	132	1,646
BM: 2019GlobalPassiveEquity10	55	114	250	837	37	52	257	86	1,283	159	2,607

# CARBON FOOTPRINT METRICS

## Top Contributors

The table below shows the top contributors to the carbon intensity of the portfolios analysed. Note that if the method used is C/R or C/V, then a company may appear due to the proportion owned/financed, rather than because it is the most carbon intensive held. The 'Contribution' is the percentage change in the portfolio's intensity that would be caused by excluding the holding referenced. In other words, it is a measurement of how much a specific holding affects the carbon performance of the portfolio.

	Name	Sector	VOH Weight	Carbon Weight	Company C/R (tCO2e/mGBP)	Company C/R Contribution	Climate 100+*
2016UKPassiveEquity	1 Royal Dutch Shell PLC	Energy	8.23%	22.77%	792	-14.98%	Yes
	2 BP	Energy	4.14%	14.39%	679	-8.19%	No
	3 CRH Plc	Materials	1.01%	5.45%	1,512	-4.35%	Yes
	4 Drax Group	Utilities	0.08%	4.05%	4,316	-3.76%	No
	5 International Consolidated Airlines G	Industrials	0.38%	3.92%	1,515	-3.12%	No
2016EMActiveEquity	1 Bangchak Corporation PCL	Energy	0.17%	36.17%	29,517	-35.60%	No
	2 Korea Elec Power Corp	Utilities	0.34%	15.90%	6,761	-14.47%	Yes
	3 Lucky Cement Ltd	Materials	0.32%	4.96%	5,948	-4.39%	No
	4 Enka Insaat ve Sanayi AS	Industrials	0.92%	5.00%	4,373	-4.22%	No
	5 Ternium SA ADR	Materials	0.21%	4.21%	4,499	-3.57%	No
2016Aggregate	1 Royal Dutch Shell PLC	Energy	3.81%	12.18%	792	-7.14%	Yes
	2 Intl Paper Co	Materials	0.47%	6.90%	3,270	-6.20%	Yes
	3 Bangchak Corporation PCL	Energy	0.02%	5.92%	29,517	-5.85%	No
	4 AES Corp	Utilities	0.19%	5.16%	8,163	-4.95%	Yes
	5 BP	Energy	1.54%	6.18%	679	-3.07%	No
2016GlobalActive Equity	1 Intl Paper Co	Materials	0.86%	16.97%	3,270	-15.56%	Yes
	2 AES Corp	Utilities	0.35%	12.69%	8,163	-12.25%	Yes
	3 AirAsia Group	Industrials	0.79%	5.97%	1,588	-4.81%	No
	4 Royal Dutch Shell PLC	Energy	1.39%	5.89%	792	-3.57%	Yes
	5 Southwestern Energy Co	Energy	0.18%	3.69%	2,379	-3.20%	No
2019GlobalActive Equity	1 InterContinental Hotels Group Plc	Consumer Discretionary	2.22%	10.27%	1,792	-9.43%	No
	2 EOG Resources	Energy	3.82%	9.29%	651	-7.12%	No
	3 Neste Oyj	Energy	1.46%	9.28%	618	-7.00%	No
	4 Essity AB	Consumer Staples	2.18%	8.68%	397	-5.29%	No
	5 Anheuser Busch Inbev NV	Consumer Staples	3.37%	7.23%	387	-4.31%	No

\*Climate Action 100+ is an investor initiative to ensure the world's largest corporate greenhouse gas emitters take necessary action on climate change. The companies include 100 'systemically important emitters', accounting for two-thirds of annual global industrial emissions, alongside more than 60 others with significant opportunity to drive the clean energy transition. For more information see <http://www.climateaction100.org>.

# CARBON FOOTPRINT METRICS

## Top Contributors

The table below shows the top contributors to the carbon intensity of the portfolios analysed. Note that if the method used is C/R or C/V, then a company may appear due to the proportion owned/financed, rather than because it is the most carbon intensive held. The 'Contribution' is the percentage change in the portfolio's intensity that would be caused by excluding the holding referenced. In other words, it is a measurement of how much a specific holding affects the carbon performance of the portfolio.

	Name	Sector	VOH Weight	Carbon Weight	Company C/R (tCO2e/mGBP)	Company C/R Contribution	Climate 100+*
<b>2019EMActiveEquity</b>	1 Inter RAO OJSC	Utilities	0.21%	10.60%	7,048	-9.88%	No
	2 China Resources Cement Holdings I	Materials	0.26%	8.26%	19,800	-8.06%	No
	3 Ternium SA ADR	Materials	0.29%	8.04%	4,499	-7.16%	No
	4 China BlueChemical Ltd. - H Shares	Materials	0.17%	5.36%	9,251	-5.07%	No
	5 Enka Insaat ve Sanayi AS	Industrials	0.75%	5.70%	4,373	-5.05%	No
<b>2019LowCarbon PassiveEquity</b>	1 Phillips 66	Energy	0.35%	7.59%	936	-6.28%	Yes
	2 Valero Energy Corp	Energy	0.23%	6.28%	785	-4.97%	Yes
	3 Marathon Petroleum Corp.	Energy	0.23%	4.50%	872	-3.64%	Yes
	4 Marubeni Corp	Industrials	0.19%	5.15%	473	-3.34%	No
	5 Royal Dutch Shell PLC	Energy	0.30%	2.89%	792	-2.27%	Yes
<b>2019GlobalPassive Equity</b>	1 Exxon Mobil Corp	Energy	0.79%	3.03%	1,133	-2.06%	Yes
	2 LafargeHolcim Ltd	Materials	0.06%	1.93%	8,184	-1.84%	Yes
	3 RWE AG	Utilities	0.04%	1.96%	3,604	-1.76%	Yes
	4 ArcelorMittal Inc	Materials	0.02%	1.83%	4,182	-1.67%	Yes
	5 Royal Dutch Shell PLC	Energy	0.66%	2.79%	792	-1.50%	Yes
<b>2019UKPassiveEquity</b>	1 Royal Dutch Shell PLC	Energy	9.57%	27.37%	792	-16.87%	Yes
	2 BP	Energy	5.00%	17.94%	679	-9.17%	No
	3 CRH Plc	Materials	0.95%	5.29%	1,512	-4.07%	Yes
	4 International Consolidated Airlines G	Industrials	0.34%	3.68%	1,515	-2.82%	No
	5 Rio Tinto PLC	Materials	2.46%	3.64%	1,207	-2.56%	No
<b>2019Aggregate</b>	1 Royal Dutch Shell PLC	Energy	1.84%	9.06%	792	-5.60%	Yes
	2 BP	Energy	0.93%	5.78%	679	-3.14%	No
	3 Inter RAO OJSC	Utilities	0.02%	1.87%	7,048	-1.79%	No
	4 China Resources Cement Holdings I	Materials	0.02%	1.46%	19,800	-1.44%	No
	5 CRH Plc	Materials	0.18%	1.70%	1,512	-1.35%	Yes

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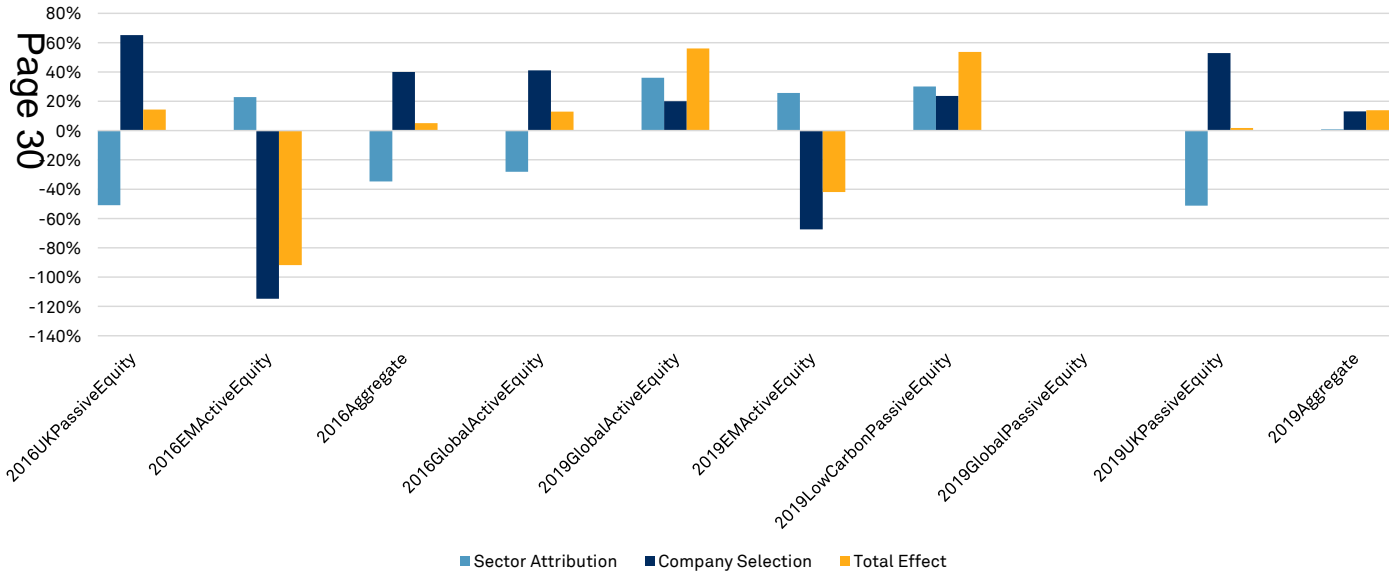
# CARBON FOOTPRINT METRICS

## Attribution Analysis

The principal reasons for the carbon intensity of a portfolio to differ from the benchmark are a) **sector allocation** decisions and b) **company selection** decisions. Sector allocation decisions can cause the carbon intensity of a portfolio to diverge from its benchmark when it is over or underweight markedly high or markedly low carbon sectors. For example, if a portfolio is overweight a high carbon sector, then it is more likely to have a higher overall intensity than the benchmark. However, if the companies selected within a high carbon sector are the most carbon efficient, then it is still possible that the portfolio may have a lower overall intensity.

The chart on the right shows the relative contribution of **sector allocation** and **company selection** effects towards the 'Total Effect' of each portfolio versus their respective benchmark. Sector allocation effects are determined using the 11 GICS Sector classifications, and the analysis uses the Carbon-to-Revenue intensity metric.

Performance Attribution



# CARBON FOOTPRINT METRICS

## Key Takeaways

### Total Carbon

- Overall, the 2019 portfolios have a lower total apportioned carbon than the portfolios of 2016.
- The highest total apportioned carbon values are observed in the two aggregate portfolios (2016 Aggregate and 2019 Aggregate) which are largely driven by the size of their holdings. However, the 2019 Aggregate portfolio has a lower apportioned carbon than the 2016 Aggregate portfolio even though the VOH are higher. This suggests that the 2019 Aggregate portfolio is more carbon efficient than the 2016 Aggregate.

### Carbon Intensity

- The EM Active Equity portfolios are the most carbon intensive. Nevertheless, when comparing the portfolio carbon intensity between the two analysis years, there is a reduction of 25% from 2016 to 2019.
- Changes in carbon intensities over time can be caused by a multitude of factors, for example by changes in the percentage owned/financed of investees, or by fluctuations in exchange rates. However, broadly speaking there are three key drivers:
  1. **Valuation Changes:** If, all else being equal, valuations rise for all companies held – for example in a bull market – then this may contribute towards a year-on-year fall in C/V intensities, but no change to C/R or WACI intensities. If valuations fall only for the carbon intensive companies held, then this may contribute towards a year-on-year rise in C/V intensities (as their carbon-to-value ratio worsens), but a fall in WACI intensities (as their relative weight in the portfolio decreases). The opposite would be true of a rise in valuations for carbon intensive companies.
  2. **Revenue Changes:** If, all else being equal, revenues rise for all companies held – for example in a booming economy – then this may contribute towards a year-on-year fall in both the C/R and WACI intensities, but cause no change to the C/V intensity.
  3. **Constituent Weight Changes:** If, all else being equal, the VOH weight in the portfolio of carbon intensive companies is increased (by increasing the share of their equity or debt held), then this may contribute to towards year-on-year increases across all three methodologies. The opposite would be true for decreasing their weight in the portfolio (by decreasing the share of their equity or debt held), or for increasing the weight of carbon efficient companies.

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### TCFD Relevance

- The TCFD identifies GHG emissions intensity, as well as absolute emissions levels, as types of transition risk metrics.
- WACI is the primary intensity metric recommended by the TCFD for portfolio footprinting. Portfolios exposed to more carbon intensive companies and sectors by percentage of overall value of holdings will tend to have a higher WACI. The TCFD recommends this approach because it can be applied across asset classes and avoids calculating 'ownership' of emissions.
- The TCFD also encourages asset owners and asset managers to provide other metrics useful for decision making, including the absolute carbon emissions, C/R intensity and C/V intensity metrics provided in this report.

# CARBON DISCLOSURE METRICS

## Disclosure Analysis

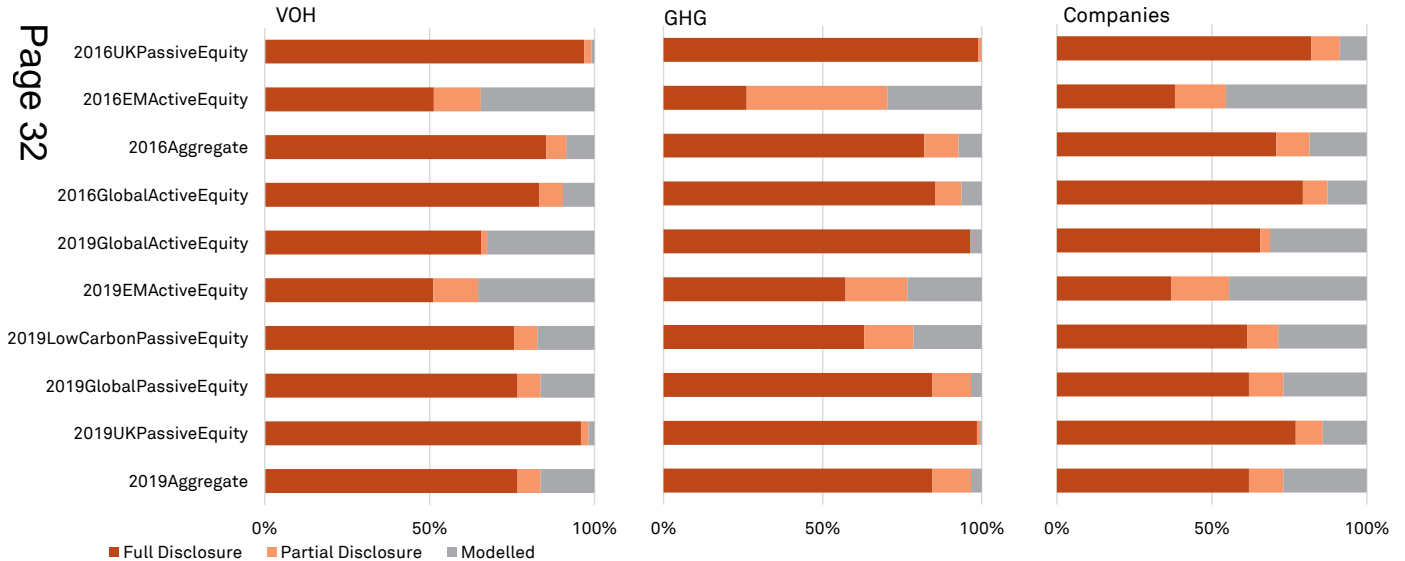
In the charts below, the overall level of disclosure in each portfolio is assessed using the following three methods:

- VOH:** The sum of the weights of each holding within each of the three disclosure categories.
- GHG:** The sum of each holding's share of the total apportioned Scope 1 CO<sub>2</sub>e within each of the three disclosure categories.
- Companies:** The number of companies, shown as a percent of all companies analysed, within each of the three disclosure categories.

For more information on the three disclosure categories, please refer to appendix 4.

TCFD GUIDANCE FOR ASSET OWNERS / MANAGERS: RISK MANAGEMENT RECOMMENDED DISCLOSURE (A)  
*Asset owners / managers should describe, where appropriate, engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks to improve data availability and asset owners' / managers' ability to assess climate-related risks.*

Source: FSB TCFD (2017) *Implementing the Recommendations of the TCFD*



# CARBON DISCLOSURE METRICS

## Top Modelled Contributors

The level of carbon disclosure is based on each company's Scope 1 emissions, which can be classified as **fully disclosed**, **partially disclosed**, or **modelled**. The table below shows the top contributors to each portfolio's C/R intensity whose Scope 1 CO<sub>2</sub>e is classified as **modelled**. These may be prime candidates for company engagement.

	Name	Sector	VOH Weight	Carbon Weight	Company C/R (tCO <sub>2</sub> e/mGBP)	Company C/R Contribution	Climate 100+*
<b>2016UKPassiveEquity</b>	1 Wizz Air Holdings Plc	Industrials	0.03%	0.07%	955	-0.05%	No
	2 Ibstock Plc	Materials	0.01%	0.01%	787	-0.01%	No
	3 Macau Property Opportunities Fund	Real Estate	0.00%	0.00%	109	0.00%	No
	4 Real Estate Credit Investments Limit	Financials	0.01%	0.00%	17	0.00%	No
	5 Phoenix Spree Deutschland Ltd.	Real Estate	0.01%	0.00%	110	0.00%	No
<b>2016EMActiveEquity</b>	1 Bangchak Corporation PCL	Energy	0.17%	36.17%	29,517	-35.60%	No
	2 Lucky Cement Ltd	Materials	0.32%	4.96%	5,948	-4.39%	No
	3 Ternium SA ADR	Materials	0.21%	4.21%	4,499	-3.57%	No
	4 Eregli Demir Celik	Materials	0.18%	1.77%	4,589	-1.50%	No
	5 Lee & Man Paper Manufacturing Ltd	Materials	0.34%	0.78%	1,091	-0.27%	No
<b>2016Aggregate</b>	1 Bangchak Corporation PCL	Energy	0.02%	5.92%	29,517	-5.85%	No
	2 Norwegian Cruise Line Holdings Ltd	Consumer Discretionary	0.30%	0.97%	1,699	-0.77%	No
	3 Lucky Cement Ltd	Materials	0.03%	0.81%	5,948	-0.76%	No
	4 Ternium SA ADR	Materials	0.02%	0.69%	4,499	-0.64%	No
	5 Eregli Demir Celik	Materials	0.02%	0.29%	4,589	-0.27%	No
<b>2016GlobalActive Equity</b>	1 Norwegian Cruise Line Holdings Ltd	Consumer Discretionary	0.56%	2.38%	1,699	-1.94%	No
	2 Concho Resources Inc	Energy	0.28%	0.17%	669	-0.09%	No
	3 Cabot Oil & Gas A	Energy	0.22%	0.13%	735	-0.08%	No
	4 Kinder Morgan Inc	Energy	0.28%	0.17%	475	-0.06%	Yes
	5 Hexagon AB	Information Technology	0.12%	0.02%	135	0.02%	No
<b>2019GlobalActive Equity</b>	1 Misumi Group Inc	Industrials	1.78%	2.12%	167	-0.05%	No
	2 Incyte Corp	Health Care	1.30%	0.15%	68	0.21%	No
	3 MarketAxess Holdings	Financials	3.03%	0.03%	17	0.26%	No
	4 HDFC Bank Ltd	Financials	3.31%	0.04%	7	0.85%	No
	5 Amazon.com Inc	Consumer Discretionary	3.39%	1.29%	92	1.03%	No

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# CARBON DISCLOSURE METRICS

## Top Modelled Contributors

The level of carbon disclosure is based on each company's Scope 1 emissions, which can be classified as **fully disclosed**, **partially disclosed**, or **modelled**. The table below shows the top contributors to each portfolio's C/R intensity whose Scope 1 CO<sub>2</sub>e is classified as **modelled**. These may be prime candidates for company engagement.

	Name	Sector	VOH Weight	Carbon Weight	Company C/R (tCO <sub>2</sub> e/mGBP)	Company C/R Contribution	Climate 100+*
2019EMActiveEquity	1 Ternium SA ADR	Materials	0.29%	8.04%	4,499	-7.16%	No
	2 Hoa Phat Group JSC	Materials	0.22%	1.89%	3,724	-1.63%	No
	3 SK Holdings Co Ltd	Industrials	0.32%	3.95%	645	-0.74%	No
	4 Tube Investments Of India	Consumer Discretionary	0.11%	0.65%	3,078	-0.54%	No
	5 Packages Ltd	Materials	0.06%	0.28%	926	-0.12%	No
2019LowCarbonPassiveEquity	1 Mitsui & Co	Industrials	0.38%	3.14%	601	-2.26%	No
	2 HollyFrontier Corporation	Energy	0.12%	2.37%	974	-1.96%	No
	3 Berkshire Hathaway	Financials	0.67%	1.87%	555	-1.29%	Yes
	4 Itochu Corp	Industrials	0.09%	0.53%	385	-0.29%	No
	5 Atmos Energy Corp	Utilities	0.28%	0.38%	549	-0.26%	No
2019GlobalPassiveEquity	1 Berkshire Hathaway	Financials	0.68%	0.84%	555	-0.28%	Yes
	2 Nucor Corp	Materials	0.04%	0.26%	1,139	-0.18%	No
	3 Mitsui & Co	Industrials	0.07%	0.25%	601	-0.09%	No
	4 HollyFrontier Corporation	Energy	0.02%	0.15%	974	-0.09%	No
	5 Norwegian Cruise Line Holdings Ltd	Consumer Discretionary	0.03%	0.11%	1,699	-0.09%	No
2019UKPassiveEquity	1 Wizz Air Holdings Plc	Industrials	0.09%	0.19%	955	-0.12%	No
	2 Ibstock Plc	Materials	0.04%	0.04%	787	-0.02%	No
	3 Bluebird Bio Inc	Health Care	0.00%	0.00%	86	0.00%	No
	4 Rocket Internet SE	Consumer Discretionary	0.00%	0.00%	92	0.00%	No
	5 PureCircle Ltd	Consumer Staples	0.01%	0.00%	354	0.00%	No
2019Aggregate	1 Ternium SA ADR	Materials	0.03%	1.42%	4,499	-1.32%	No
	2 SK Holdings Co Ltd	Industrials	0.03%	0.70%	645	-0.35%	No
	3 Hoa Phat Group JSC	Materials	0.02%	0.34%	3,724	-0.31%	No
	4 Berkshire Hathaway	Financials	0.34%	0.49%	555	-0.21%	Yes
	5 HollyFrontier Corporation	Energy	0.03%	0.28%	974	-0.19%	No

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# FOSSIL FUEL & STRANDED ASSETS EXPOSURE METRICS

## Financial Exposure to Fossil Fuel Activities

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 showing the combined value of holdings with business activities in either fossil fuel extraction or fossil fuel energy generation industries. This helps to identify potentially stranded assets that would become more apparent as economies move towards a low carbon economy.

Extraction-related activities include the following:

- Crude petroleum and natural gas extraction
- Tar sands extraction
- Natural gas liquid extraction
- Bituminous coal underground mining
- Bituminous coal and lignite surface mining
- Drilling oil and gas wells
- Support activities for oil and gas operations

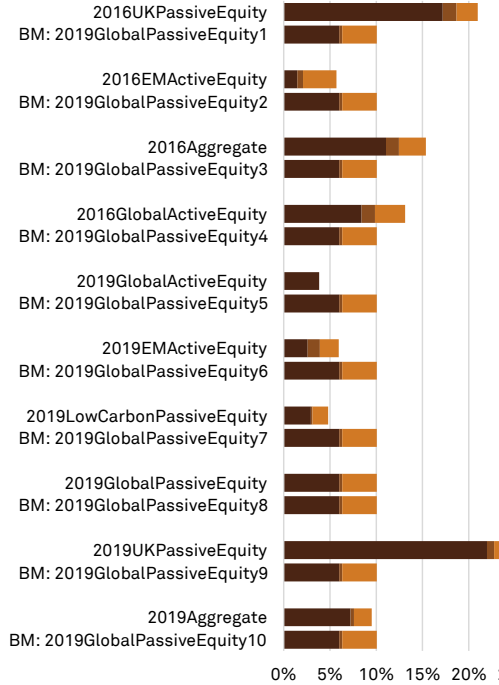
Energy-related activities include the following:

- Coal power generation
- Petroleum power generation
- Natural gas power generation

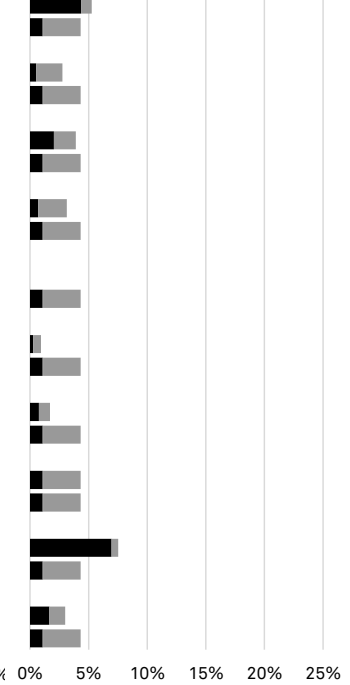
The left-hand chart shows the percentage share of the portfolio's total value invested in companies that derive anything above 0% of their total revenues from fossil fuel extraction and/or energy.

The right-hand chart highlights exposure to coal related activities only.

### VOH Exposure to Fossil Fuel Activities



### VOH Exposure to Coal Activities



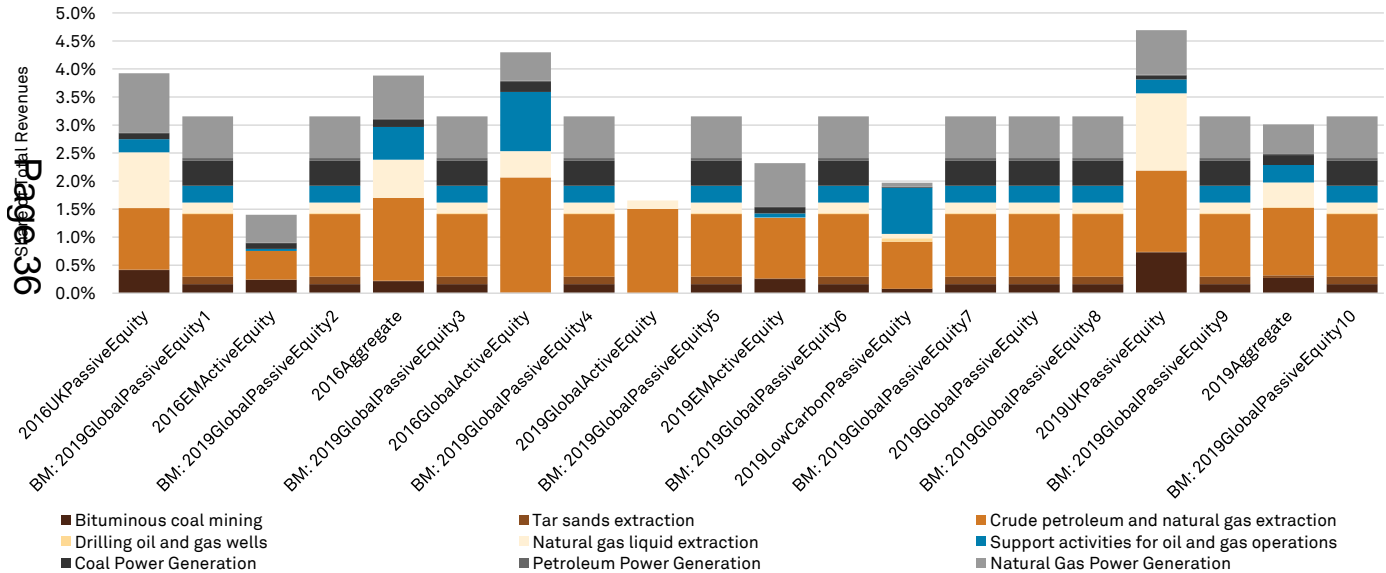
- Extraction Only
- Coal Extraction Only
- Extraction & Energy
- Coal Extraction & Energy
- Energy Only
- Coal Energy Only

# FOSSIL FUEL & STRANDED ASSETS EXPOSURE METRICS

## Fossil Fuel Activities Revenue Breakdown

The previous page gives an indication of the combined weight in the portfolio of companies engaging in fossil fuel related activities above a given revenue threshold. The chart below, however, gives an indication of the level of revenue dependency that investees have in these activities, broken-out by type.

Fossil Fuel Related Revenue Share



TCFD GUIDANCE FOR ASSET OWNERS / MANAGERS: RISK MANAGEMENT RECOMMENDED DISCLOSURE (B)  
 Asset owners should describe how they consider the positioning of their total portfolio with respect to the transition to a lower-carbon energy supply, production, and use. This could include explaining how asset owners actively manage their portfolios' positioning in relation to this transition. Asset managers should describe how they manage material climate-related risks for each product or investment strategy.

Source: FSB TCFD (2017) Implementing the Recommendations of the TCFD

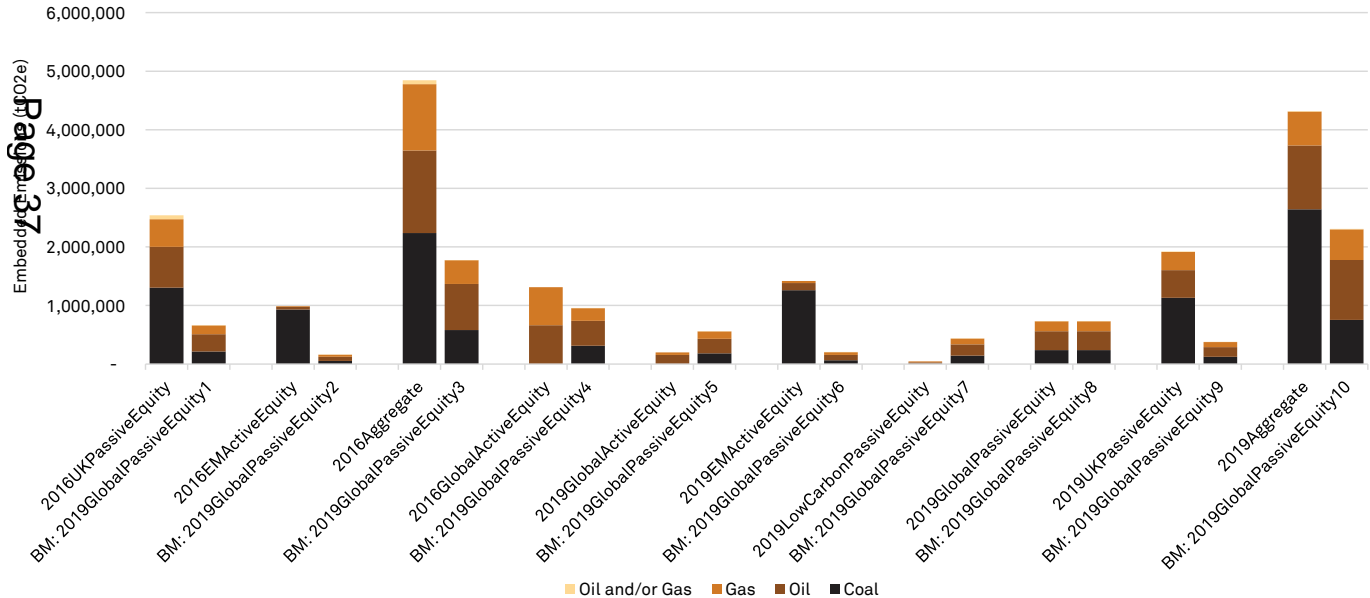
# FOSSIL FUEL & STRANDED ASSETS EXPOSURE METRICS

## Emissions from Reserves

Trucost is able to analyse two additional metrics that provide additional insights relevant to stranded asset risk. First, are the carbon emissions embedded within company owned fossil fuel reserves which can be considered 'unburnable' if 2°C targets are to be achieved. Second, are the capital expenditures set aside for future fossil fuel related activities such as further exploration and extraction. Both metrics are based on disclosures published by investees.

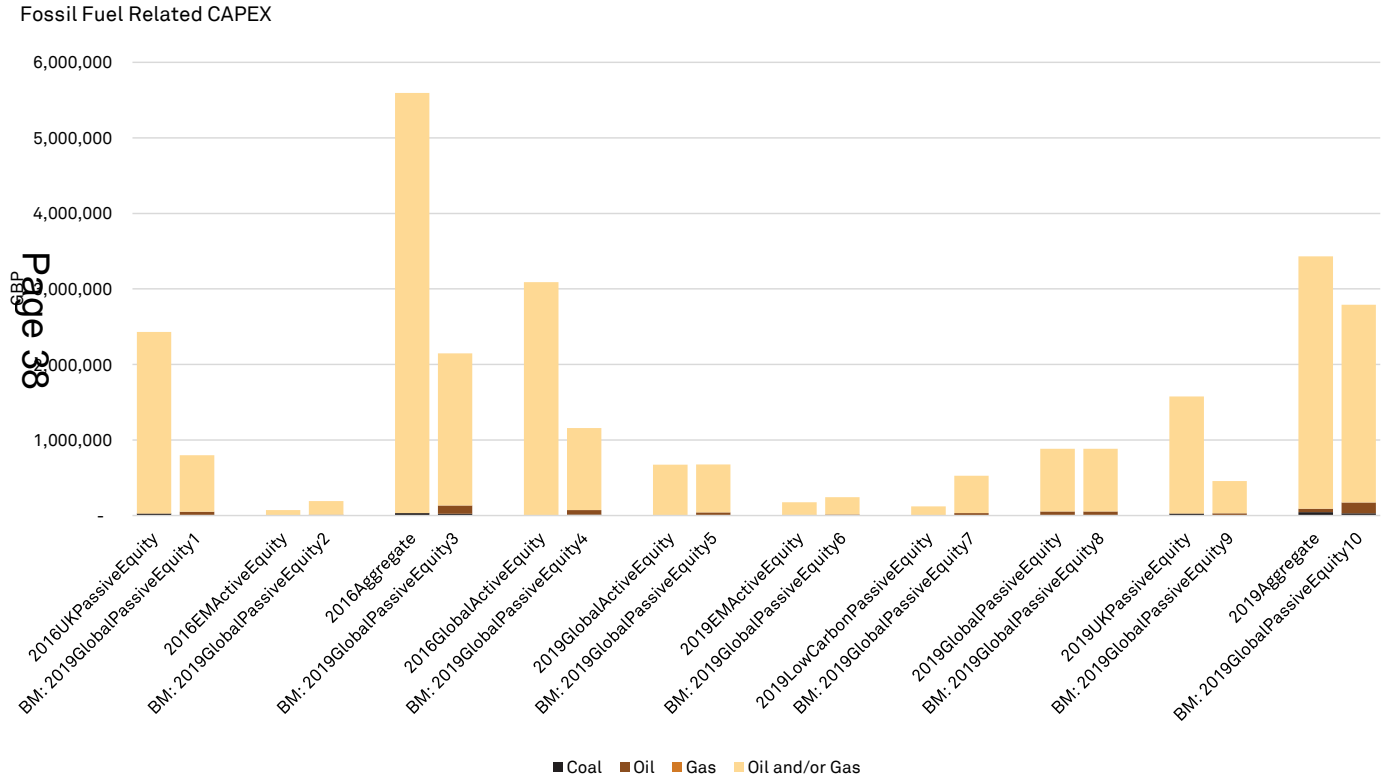
The first chart below shows the total tonnes of apportioned "future" CO<sub>2</sub> from reserves, broken down by reserve type. The second chart shows the total apportioned capital expenditure on fossil fuel related activities, again broken out by reserve type.

Future Emissions from Reserves



# FOSSIL FUEL & STRANDED ASSETS EXPOSURE METRICS

## Emissions from CAPEX



# FOSSIL FUEL & STRANDED ASSETS EXPOSURE METRICS

## Watch Lists

The tables below highlight companies within each portfolio that are considered of greatest relevance to the stranded assets analysis.

The **Portfolio Level Fossil Fuel Revenues** table is ranked by the total apportioned fossil fuel revenue contribution to the portfolio. The table also shows the company-level dependency of each investee on fossil fuel revenues, split between 'Energy' and 'Extraction' activities.

The **Environmental Impact From Fossil Fuel Activities** table is ranked by the weighted-average environmental **Impact Ratio** of each company in the portfolio. The impact ratio refers to a company's fossil fuel related direct environmental damage costs divided by its fossil fuel related revenues. Companies burning coal for energy, for example, will have a higher impact ratio than those offering support activities for oil and gas operations.

### Portfolio Level Fossil Fuel Revenues

	Name	Company		
		VOH Weight	Company FF Energy Revenue	Company FF Extract Revenue
<b>2016UKPassiveEquity</b>	1 Royal Dutch Shell PLC	8.23%	0%	13%
	2 Scottish & Southern Energy	0.83%	50%	0%
	3 BP	4.14%	0%	9%
	4 Glencore Plc	1.14%	0%	5%
	5 Centrica	0.68%	1%	2%
<b>2016EMActiveEquity</b>	1 Enka Insaat ve Sanayi AS	0.92%	46%	0%
	2 Bukit Asam (Persero) Tbk PT	0.25%	0%	98%
	3 Lukoil PJSC	0.31%	1%	28%
	4 CNOOC Ltd.	0.38%	0%	77%
	5 Petrobras SA	0.32%	20%	18%
<b>2016Aggregate</b>	1 Royal Dutch Shell PLC	3.81%	0%	13%
	2 Scottish & Southern Energy	0.31%	50%	0%
	3 Halliburton Co	0.36%	0%	100%
	4 BP	1.54%	0%	9%
	5 Marathon Oil Corp	0.32%	0%	100%
<b>2016GlobalActive Equity</b>	1 Halliburton Co	0.67%	0%	100%
	2 Marathon Oil Corp	0.59%	0%	100%
	3 Southwestern Energy Co	0.18%	0%	66%
	4 Royal Dutch Shell PLC	1.39%	0%	13%
	5 EOG Resources	1.34%	0%	71%

### Environmental Impact From Fossil Fuel Activities

Name	Company	
	Portfolio Weight	Impact Ratio
1 Rio Tinto PLC	1.56%	37%
2 Glencore Plc	1.14%	36%
3 BHP Group Ltd	1.04%	21%
4 Royal Dutch Shell PLC	8.23%	3%
5 Anglo American Plc	0.57%	37%
1 Vale S.A.	0.26%	37%
2 Bukit Asam (Persero) Tbk PT	0.25%	37%
3 China Petroleum & Chemical Corp	0.39%	3%
4 CNOOC Ltd.	0.38%	3%
5 Lukoil PJSC	0.31%	4%
1 Rio Tinto PLC	0.58%	37%
2 Glencore Plc	0.42%	36%
3 Royal Dutch Shell PLC	3.81%	3%
4 BHP Group Ltd	0.39%	21%
5 Anglo American Plc	0.21%	37%
1 Hong Kong and China Gas Co Ltd	0.70%	20%
2 EOG Resources	1.34%	3%
3 Royal Dutch Shell PLC	1.39%	3%
4 Pioneer Natural Resources	1.07%	3%
5 Marathon Oil Corp	0.59%	3%

# FOSSIL FUEL & STRANDED ASSETS EXPOSURE METRICS

## Watch Lists

### Portfolio Level Fossil Fuel Revenues

	Name	Weight	Company	
			VOH FF Energy Revenue	Company FF Extract Revenue
<b>2019GlobalActive Equity</b>	1 EOG Resources	3.82%	0%	71%
	2			
	3			
	4			
	5			
<b>2019EMActiveEquity</b>	1 Lukoil PJSC	0.48%	1%	28%
	2 Enka Insaat ve Sanayi AS	0.75%	46%	0%
	3 Bukit Asam (Persero) Tbk PT	0.27%	0%	98%
	4 Petrobras SA	0.52%	20%	18%
	5 Oil & Natural Gas Corp Ltd	0.39%	0%	58%
<b>2019LowCarbon PassiveEquity</b>	1 Marubeni Corp	0.19%	0%	22%
	2 Schlumberger Ltd	0.33%	0%	100%
	3 Halliburton Co	0.14%	0%	100%
	4 Mitsui & Co	0.38%	0%	21%
	5 TechnipFMC Ltd	0.11%	0%	49%
<b>2019GlobalPassive Equity</b>	1 Royal Dutch Shell PLC	0.66%	0%	13%
	2 Tokyo Electric Power Co. Holding In	0.02%	75%	0%
	3 Chevron Corp	0.57%	0%	27%
	4 Schlumberger Ltd	0.14%	0%	100%
	5 ConocoPhillips	0.16%	0%	100%
<b>2019UKPassiveEquity</b>	1 Royal Dutch Shell PLC	9.57%	0%	13%
	2 BP	5.00%	0%	9%
	3 Scottish & Southern Energy	0.53%	50%	0%
	4 Glencore Plc	1.40%	0%	5%
	5 BHP Group Ltd	1.92%	0%	39%
<b>2019Aggregate</b>	1 Royal Dutch Shell PLC	1.84%	0%	13%
	2 EOG Resources	0.97%	0%	71%
	3 BP	0.93%	0%	9%
	4 Scottish & Southern Energy	0.10%	50%	0%
	5 Schlumberger Ltd	0.11%	0%	100%

### Environmental Impact From Fossil Fuel Activities

Name	Portfolio Weight	Company Impact Ratio
		Company Impact Ratio
1 EOG Resources	3.82%	3%
2		
3		
4		
5		
1 Bukit Asam (Persero) Tbk PT	0.27%	37%
2 Reliance Industries Ltd	0.51%	3%
3 CNOOC Ltd.	0.47%	3%
4 Lukoil PJSC	0.48%	4%
5 MOL HUNGARIAN OIL AND GAS N	0.40%	3%
1 Rio Tinto PLC	0.26%	37%
2 Mitsui & Co	0.38%	14%
3 Hong Kong and China Gas Co Ltd	0.08%	20%
4 Wesfarmers Ltd	0.04%	37%
5 Royal Dutch Shell PLC	0.30%	3%
1 Rio Tinto PLC	0.24%	37%
2 BHP Group Ltd	0.34%	21%
3 Glencore Plc	0.09%	36%
4 Anglo American Plc	0.08%	37%
5 Wesfarmers Ltd	0.07%	37%
1 Rio Tinto PLC	2.46%	37%
2 Glencore Plc	1.40%	36%
3 BHP Group Ltd	1.92%	21%
4 Anglo American Plc	1.01%	37%
5 Royal Dutch Shell PLC	9.57%	3%
1 Rio Tinto PLC	0.53%	37%
2 Glencore Plc	0.26%	36%
3 BHP Group Ltd	0.42%	21%
4 Anglo American Plc	0.19%	37%
5 Royal Dutch Shell PLC	1.84%	3%

# FOSSIL FUEL & STRANDED ASSETS EXPOSURE METRICS

## Key Takeaways

### Financial Exposure to Fossil Fuel Related Activities

- Across all the portfolios and the analysis years (2016 and 2019), the UK Passive Equity portfolios have the highest VOH exposure to fossil fuel activities. The exposure has increased by 3% from 21% in 2016 to 24% in 2019. Around 90% of this exposure is attributed to extraction activities across both years.
- The 2019 Global Active Equity portfolio has the lowest VOH exposure to fossil fuel activities across all portfolios analysed with 3.82% exposure coming only from extraction activities.
- Over time, financial exposure to fossil fuel activities can change due to either active or passive reasons. Investors may actively reduce exposure by divesting from companies engaged in fossil fuel related activities. Alternatively, exposure may change passively, for example if valuations of companies engaged in fossil fuel related activities rises or falls relative to other companies in a portfolio.
- Coal power generation is considered one of the most critical sectors to transition away from if global carbon reduction targets are to be achieved.

### TCFD Relevance

- The TCFD identifies emissions per unit of fossil fuel reserve - or 'embedded emissions' - as a climate related metric associated with transition risk.
- Companies deriving significant revenues from fossil fuel related activities, dependent on fossil fuel reserves for their market valuations, or investing heavily in fossil fuel related activities (such as exploration), run the risk of becoming 'stranded assets'.
- In the TCFD's supplemental guidance for the financial sector, there are also recommendations to disclose exposure to 'carbon related assets' (e.g. companies engaged in fossil fuel extraction and power generation) which can be expressed in units of currency, or - as shown in the analysis above - as a percentage of total portfolio value.

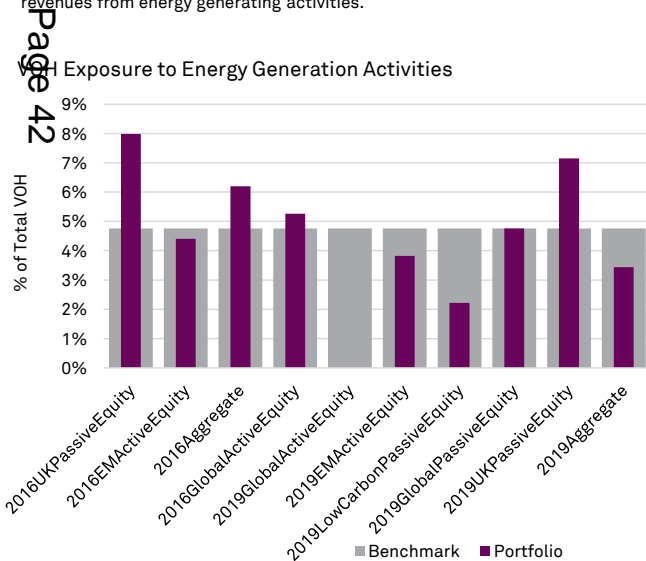
# 2 DEGREE ALIGNMENT: ENERGY TRANSITION

## Financial Exposure to Energy Generation & Energy Revenue Breakdown

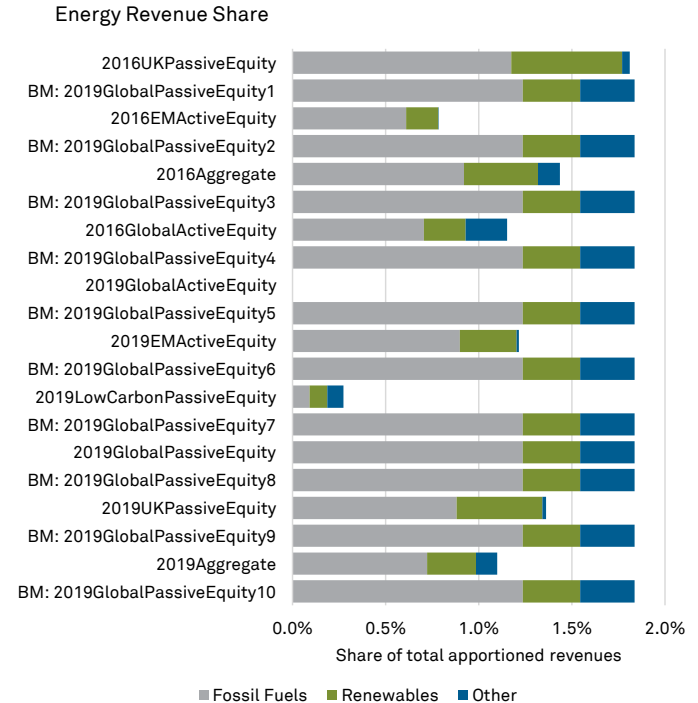
The energy sector will play a critical role in any strategy geared towards achieving 2 degree alignment targets. Energy generating companies can be considered climate-aggregators (fossil fuels) or climate-mitigators (renewables). The full list of energy types considered is shown below:

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

To determine the overall level of exposure each portfolio or benchmark has to energy generation, the chart below shows the percentage share of the total value invested in companies that derive anything above 0% of their total revenues from energy generating activities.



In order to highlight the level of revenue dependency that investees have in energy generating activities, the chart below shows the apportioned energy revenues associated with each portfolio. The revenues are broken out by type - fossil fuel (aggregator), renewable (mitigator), or other.



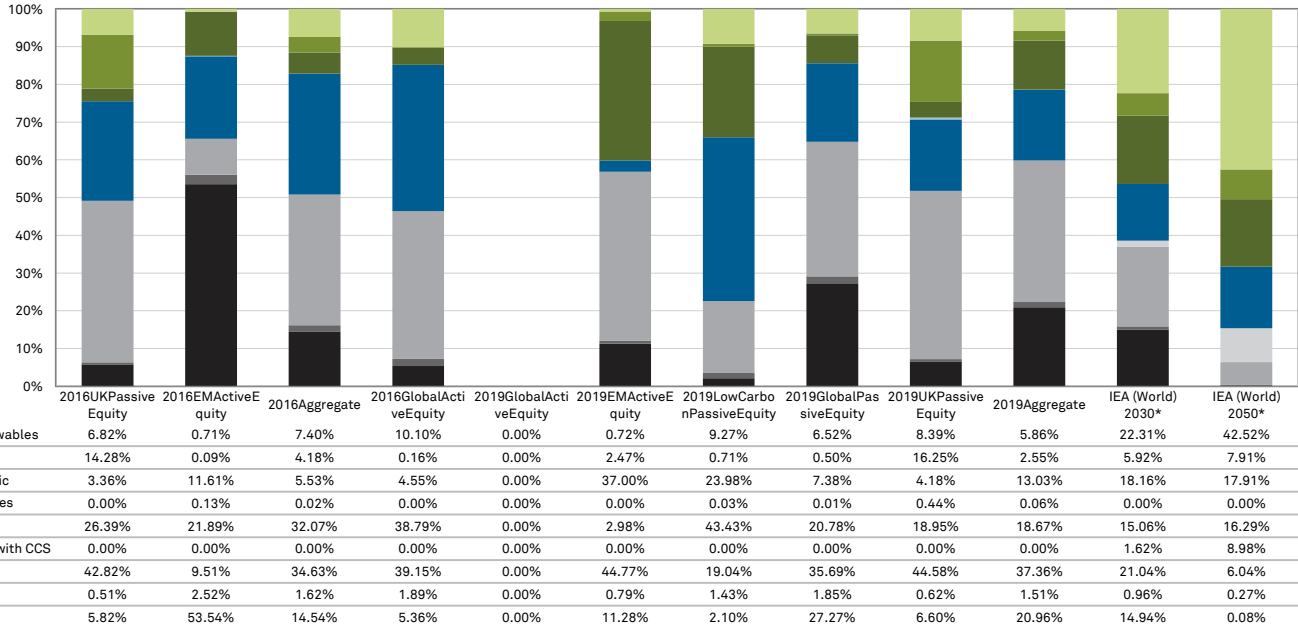


# 2 DEGREE ALIGNMENT: ENERGY TRANSITION

## Energy Generation Mix

In addition to energy revenue analysis, Trucost collects disclosed information relating to the amount of physical units of power (GWh) generated by companies in a portfolio. Understanding a portfolio's energy mix allows it to be compared not just against benchmarks that reflect the economy of today, but also against forward looking benchmarks that - as suggested by the International Energy Agency - are what is required for the low-carbon economy of tomorrow.

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\* The content within the 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.

# 2 DEGREE ALIGNMENT: ENERGY TRANSITION

## Key Takeaways

### Financial Exposure to Energy Generation

- As a percentage of VOH, the UK Passive Equity portfolio is the most exposed to energy generation related revenues, standing at 7% in 2019 from 8% in 2016..
- The exposure of all other portfolios ranges from 2-6% of their total VOH, with the 2019 Low Carbon portfolio having the lowest exposure at 2%.

### 2 Degree Alignment of Energy Mix

- All portfolios (except the 2019 Low Carbon Passive Equity portfolio) have higher share of fossil fuel power and lower share of renewable power in their energy mix than the IEA's 2030 and 2050 2 degree aligned world energy mix.
- All portfolios have a sizable dependency on power generated from fossil fuel, ranging from approximately 55-65% of GWh generated (with the exception of the 2019 Low Carbon Passive Equity portfolio). There has been an increase in this dependency from 50% in 2016 Aggregate portfolio to 60% in 2019 Aggregate portfolio.
- The Low Carbon Passive Equity portfolio appears less dependent on fossil fuel power, with 44% of energy share coming from nuclear power. This is due to presence of utilities like Iberdrola SA, Duke Energy Corp, which have high nuclear power generation activities.
- The 2019 Global Active Equity portfolio has no values in the 2 Degree Alignment: Energy Transition section as it does not include any utility companies that disclose information on the units of energy produced.

### TCFD Relevance

- The TCFD identifies energy generation mix as a type of transition risk metric. The 2 degree alignment of a portfolio's energy generation mix can thus be used to highlight the level of exposure to potential policy action aimed at transitioning to a low-carbon economy over different time horizons.

# APPENDIX

## 1. TCFD Recommended Disclosures and Supplementary Guidance for Asset Owners and Managers

	Governance	Strategy	Risk Management	Metrics & Targets
Recommended Disclosures for All Sectors	<ul style="list-style-type: none"> <li>a) Describe the board's oversight of climate-related risks and opportunities.</li> <li>b) Describe management's role in assessing and managing climate-related risks and opportunities.</li> </ul>	<ul style="list-style-type: none"> <li>a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.</li> <li>b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.</li> <li>c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</li> </ul>	<ul style="list-style-type: none"> <li>a) Describe the organization's processes for identifying and assessing climate-related risks.</li> <li>b) Describe the organization's processes for managing climate-related risks.</li> <li>c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management</li> </ul>	<ul style="list-style-type: none"> <li>a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.</li> <li>b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.</li> <li>c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.</li> </ul>
Supplemental Guidance for Asset Owners / Asset Managers		<p>Asset owners should describe how climate-related risks and opportunities are factored into relevant investment strategies. This could be described from the perspective of the total fund or investment strategy or individual investment strategies for various asset classes. Asset managers should describe how climate-related risks and opportunities are factored into relevant products or investment strategies. Asset managers should also describe how each product or investment strategy might be affected by the transition to a lower-carbon economy.</p> <p>Asset owners that perform scenario analysis should consider providing a discussion of how climate-related scenarios are used, such as to inform investments in specific assets.</p>	<p>Asset owners / managers should describe, where appropriate, engagement activity with investee companies to encourage better disclosure and practices related to climate-related risks to improve data availability and asset owners' / managers' ability to assess climate-related risks.</p> <p>Asset owners should describe how they consider the positioning of their total portfolio with respect to the transition to a lower-carbon energy supply, production, and use. This could include explaining how asset owners actively manage their portfolios' positioning in relation to this transition. Asset managers should describe how they manage material climate-related risks for each product or investment strategy.</p>	<p>Asset owners / managers should describe metrics used to assess climate-related risks and opportunities in each fund / product or investment strategy. Where relevant, asset owners / managers should also describe how these metrics have changed over time. Where appropriate, asset owners / managers should provide metrics considered in investment decisions and monitoring.</p> <p>Asset owners / managers should provide the weighted average carbon intensity, where data are available or can be reasonably estimated, for each fund / product or investment strategy. In addition, asset owners / managers should provide other metrics they believe are useful for decision making along with a description of the methodology used.</p> <p style="text-align: right;">Source:TCFD</p>

# APPENDIX

## 2. Apportioning

Many of the exposure metrics calculated by Trucost rely on the apportioning of company owned resources/pollutants to the port folio or benchmark. Apportioning, as an approach, is built on the principle of ownership. That is, if an investor owns - or in the case of debt holdings, finances - 1% of a company, then they also 'own' 1% of the company's resources/pollutants.

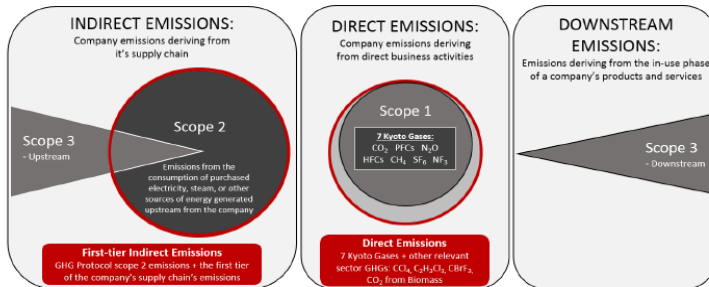
For equity only portfolios the apportioning factor is usually obtained by dividing the value of holding by the company's mark et capitalisation on the date of analysis. For debt only, or mixed portfolios, the larger of enterprise value and market capitalization on the date of holding is used as the denominator. This approach is used to minimize the risk of apportioning 'spikes' when an enterprise value approaches zero (or is negative).

The company level resources/pollutants are then multiplied by the apportioning factor to arrive at resource/pollutant quantities specific to each holding. The portfolio level resources/pollutants is the sum of all of these quantities.

## 3. Scopes

The right scope of emissions to include in footprint calculations is dependent on the breadth of view that the analyst wishes to take. Restricting the scope to direct operational emissions only (scope 1) removes the risk of double counting carbon, but also limits the level of insight provided as much of what can be considered exposure to 'carbon risks' may exist in the supply chain of investees. Trucost recommends widening the scope of analysis to uncover more of these potential risks. The full list of scopes available is shown below:

- **Direct (Scope 1)** = CO<sub>2</sub>e emissions based on the Kyoto Protocol greenhouse gases generated by direct company operations.
- **Direct (Other)** = Additional direct emissions, including those from CCl<sub>4</sub>, C<sub>2</sub>H<sub>2</sub>Cl<sub>3</sub>, CBrF<sub>3</sub>, and CO<sub>2</sub> from Biomass.
- **Purchased Electricity (Scope 2)** = CO<sub>2</sub>e emissions generated by purchased electricity, heat or steam.
- **Non-Electricity First Tier Supply Chain (Scope 3)** = CO<sub>2</sub>e emissions generated by companies providing goods and services in the first tier of the supply chain.
- **Other Supply Chain (Scope 3)** = CO<sub>2</sub>e emissions generated by companies providing goods and services in the second to final tier of the supply chain.
- **Downstream (Scope 3)** = CO<sub>2</sub>e emissions generated by the distribution, processing and use of the goods and services provided by a company.



# APPENDIX

## 4. Data Collection

Trucost's unique approach to environmental data collection and modelling enables near complete coverage of most investment universes, despite often low levels of reporting among investees. A four step process is used as part of our data gathering exercise.

1. **Analyse Financial and Sector Data** - A company's financials are analysed, collecting consolidated revenues for all companies and specifying their reporting scopes and operational boundaries.
2. **Map Activities to Trucost's Environmentally Extended Input-Output (EE-IO) Model** - Trucost's EE-IO model uses 450+ business activities (broadly aligned to the NAICS, with some additional sectors included to distinguish key activities with materially different physical impacts) to model a company's environmental impacts by assigning portions of each company's revenues to one or more of these activities. The EE-IO model then estimates the pollutant emissions and resource use associated with each business activity, both directly (for a company's own operations) and across the supply chain, using the revenue sector breakdown.
3. **Incorporate Disclosures and Public Registry Data** - Trucost searches all publically disclosed data sources of companies to find usable environmental data that will be used to overwrite Trucost's modelled estimates. Trucost ensures the scope and time horizon of any environmental data found matches that of its financials.
4. **Company Engagement and Data Verification** - Trucost analysts quality check the entire research process internally, then share the results with each company directly via a secure online portal. Companies are given one month to respond to Trucost to verify its data or directly engage to provide either refined, additional or non-public information. If appropriate and applicable data is provided, Trucost will integrate this into its analysis before publishing the data to our subscribers.

All data collected as part of the process described above will be assigned a 'disclosure flag', indicating the source of each specific data-point. These flags will fall into one of three possible 'disclosure categories', Full Disclosure, Partial Disclosure or Modelled.

- **Full Disclosure** - Trucost has used data disclosed by a company in an un-edited form as it matches the reporting scope and accuracy required by the research process.
- **Partial Disclosure** - Trucost has used data disclosed by a company but has made adjustments to match the reporting scope required by its research process (e.g. where a company discloses its emissions deriving from 85% of its operational sites, this data is used to model 100% of its emissions). Values may also be derived from a previous year's disclosed data using changes in business activities and consolidated revenues.
- **Modelled** - In the absence of usable disclosures, the data has been modelled using Trucost's EE-IO model.

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