Menhaden

Menhaden Capital PLC
Reporting Impact 2018

Impact Report

A Resource Efficient Route to Returns

As a publicly-listed investment trust, Menhaden's core aim is to generate long-term profits for shareholders. To achieve this, the Company looks to invest in high quality and predictable businesses which can deliver sustainable returns.

The Portfolio Manager uses a fundamental, research-oriented approach to identify potential investee companies. Their investment process includes an assessment of resource efficiency. This covers topics such as product re-design, reducing raw/waste materials and emissions, product re-cycling, re-use, or re-purposing, and the extent of environmental disclosures and reporting. This approach helps Menhaden make a positive impact on society and the environment.

As part of this approach the Board strongly believes that the communication of the environmental metrics of the portfolio, alongside the Company's financial performance is of significant value to the shareholders. That is why in this Impact Report Menhaden has attempted to quantify and report on, to the extent possible, the positive impacts of its portfolio. This is the third year in which Menhaden has reported on impact and this report reflects this three-year period as well as for 2018.

A Thematic Portfolio

The Portfolio Manager has consistently organised the Company's portfolio around four investment themes: i) clean energy production; ii) sustainable transport; iii) resource and energy efficiency; and iv) water and waste management.

Clean energy

A total of six clean energy companies generated approximately 54,000 MWh of electricity in 2018. These include investments such as X-ELIO, a global leader in renewable energy, whose total clean energy generation increased by 30% on the previous year.

Sustainable transport

The additions of rail firms to the sustainable transport holdings has contributed to a significant increase in total fuel savings and emissions avoided, compared to other

Total greenhouse gas emissions saved	Water saved	Clean electricity generated	Waste saved from landfill
+40,000 tCO₂e	+72,000 m³	+54,000 MWh	654 tonnes

forms of transport. Over five million litres of fuel have been saved this year by the three holdings in this theme.

Resource and energy efficiency

This theme covers a wide range of companies that have created energy efficiencies or emission reductions through their products or services. One of Menhaden's new allocations in 2018 was Ocean Wilsons Holding, a company with a strong set of initiatives to reduce internal water consumption.

Waste & water management

Two companies were added in this theme in 2018. These were US-based Waste Management and NJS, a small Japanese engineering consulting firm. Through its business activities Waste Management diverted nearly 14 million tonnes of waste from landfill. The company has reported a total 54 million tonnes of avoided CO_2 equivalent from recycling materials and converting waste-to-energy.

Our Impact in 2018

Each year Menhaden estimates the total greenhouse gas emissions, water and waste levels saved through its investee firms. The assessment is made across the scope of Menhaden's listed portfolio companies and including its largest private holding X-ELIO. All calculations are based on the proportion that Menhaden holds of each entity as of 31 December 2018 and is based on best estimates using publicly disclosed data. A full account of the methodology is available in the technical annex online.

Menhaden's share of its portfolio holdings in 2018[1] helped generate over 54,000 MWh of clean electricity, equivalent to powering over 14,000 houses for a year and helped avoid over 40,000 tonnes of greenhouse gases being emitted to the atmosphere – equivalent to taking 27,000 cars off the road.

[1] Does not include NJS for whom limited sustainability data was available. For a full explanation of our impact methodology please see Appendix www.menhaden.com.

Impact Report
continued

Impact reporting is an evolving practice and the Company acknowledges that some of the methods and data expressed here tell only a partial picture. The Company recognises that some of our holdings, by the nature of their business, do intrinsically have some negative environmental impacts too. However, we hope that this data demonstrates that investing in companies and projects that take environmental, social and governance (ESG) factors into account can be an approach that benefits both profits and the planet.
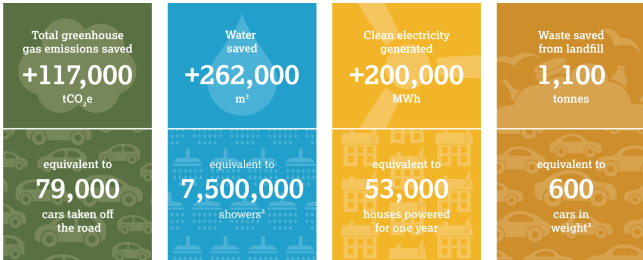
A Move Towards Solid Returns

In this reporting period the investment strategy of the Portfolio Manager has been one characterised by a move towards sustainable returns for the long run. This is reflected in the Company's approach to impact too.

Hence, as well as investments in potentially high-growth, high-impact entities such as Calvin Capital, an asset investment company which built its foundations on the UK smart meter roll out, the Company has also allocated capital to providers of the large-scale infrastructure required for a low carbon economy. For example, new investments this year include those in rail companies Union Pacific and Canadian Pacific and in Brazilian maritime services provider Oceans Wilson. Shipping offers the lowest quantity of carbon dioxide (CO_2) emissions on a per unit basis compared to other transport, and railroads provide the most resource efficient means of land transportation.

The Company's investment in Alphabet is also a stake in the future clean energy market. Google, for whom Alphabet is the parent company, is the world's largest corporate buyer of renewable power, with their commitments reaching 2.6 gigawatts (2,600 megawatts) of wind and solar energy.

Three Years of Reporting Impact

Since 2016 Menhaden has calculated an annual estimate of the positive impacts of its share of its portfolio holdings against four key criteria: greenhouse gas (GHG) emissions saved, clean electricity generated, water saved and waste diverted from landfill. After taking into account changes to the portfolio companies and methods for calculating the impacts of different companies, our best estimate of our impact over a three-year period is demonstrated in the following graphic:

Total greenhouse gas emissions saved	Water saved	Clean electricity generated	Waste saved from landfill
+117,000 tCO₂e	+262,000 m³	+200,000 MWh	1,100 tonnes
equivalent to 79,000 cars taken off the road	equivalent to 7,500,000 showers³	equivalent to 53,000 houses powered for one year	equivalent to 600 cars in weight³

Sustainable Development Goals

Menhaden is a supporter of the UN Sustainable Development Goals (SDGs) and contributes to the challenge of achieving them through many of its portfolio companies. We consider our four investment themes contribute to at least six SDGs as follows:

Clean Energy Production

Australian wind and solar developer Infigen Energy has been one of the driving forces behind the nation's shift from a coal powerhouse to a global leader in renewable energy generation. In 2018, the firm generated more than 1,549 GWh of clean energy[2].

Renewable energy holdings such as X-ELIO and Brookfield Renewable Partners make an important contribution to ensuring the economy aligns with the Paris Agreement commitment to keep global warming below 2ºC.

Resource and Energy Efficiency

Waste Management's recycling and repurposing solutions demonstrate the integral role the circular economy can play in diverting waste from landfills. The company has reported a total of 54 million tonnes of avoided CO_2-equivalent (CO_2e) from recycling materials and converting waste-to-energy[3].

Sustainable Transport

Freight companies Union Pacific and Canadian Pacific Railway are reducing greenhouse gas emissions for the transportation of goods. Moving freight by rail instead of by truck cuts GHG emissions by 75%[4].

Water and Waste Management

Environmental engineering firm NJS treats wastewater at its sewage stations, restoring the water supply, protecting the planet from toxins, and helping to combat water scarcity.

Maritime services firm Ocean Wilsons Holdings protects ecosystems by reducing pollution and toxins through streamlined supply chains.

[2] https://www.infigenenergy.com/wp-content/uploads/2018/08/FY18-Results-Presentation.pdf
[3] http://sustainability.wm.com/operations/carbon-footprint.php
[4] https://www.aar.org/issue/freight-rail-and-the-environment/

Menhaden portfolio impacts around the world

A diversified, multi-regional approach to investing means the positive environmental impacts of Menhaden's portfolio companies are felt around the globe.

1. Canada

Canadian Pacific Railway has improved fuel efficiency by 16% since 2012 through upgraded infrastructure, technology and fuel practices. The firm has sent close to 750,000 scrap wood rail ties to power generation facilities for energy recovery[5].

2. USA

Waste Management's use of single-stream recycling, where all recyclables are mixed together in one collection bin, has on average led to 40% more recyclable materials collected. The company now boasts 50 single-stream facilities and has purchased more than one million tons of additional recycling capacity[6].

3. Peru

Solar provider **X-ELIO** has developed the 21 MW Tacna Solar Park and the 20 MW Panamericana Solar Park in Peru. The two solar farms combined avoid more than 34,000 tonnes of CO_2/year, while supplying nearly 30,000 households with clean energy[78].

4. Uruguay

Renewable energy developer **Terraform Power** has played a central role in the diversification of Uruguay's energy mix with the installation of its Carapé I and II wind farms. The two wind projects generate more than 360,000 MWh of renewable energy annually, enough to meet the electricity needs of over 158,000 Uruguayans[9].

5. UK

Asset investment company **Calvin Capital** is helping the UK's largest energy suppliers to meet the government's commitment to offer smart meters to all homes and small businesses by the end of 2020, which is expected to deliver billions in total savings through reduced energy use. To date, Calvin Capital has funded approximately 3.5 million smart meters[10].

6. France

Aircraft component manufacturer **Safran's** LEAP engine has set the gold standard for the aviation industry. The engine reduces fuel consumption by 15% and nitrogen oxide emissions by 50% compared to current industry standard engines[11].

[5] https://www.cpr.ca/en/about-cp/corporate-sustainability
[6] http://www.wm.com/thinkgreen/how-we-thinkgreen.jsp
[7] https://x-elio.com/project/tacna-solar-2/
[8] https://x-elio.com/project/panamericana-solar-2/
[9] https://www.iadb.org/en/news/news-releases/2013-10-31/project-to-increase-wind-power-generation-in-uruguay%2C10620.html
[10] https://www.calvincapital.com/smart-metering
[11] https://www.safran-group.com/media/20110628_leap-greener-more-efficient

7. China

Manufactured in Harbin in China, **Airbus**' A350 XWB airliner uses state-of-the-art engineering aerodynamics and advanced technologies to record a 25% reduction in CO_2 emissions and nitrogen oxide emissions that are 31% lower than the International Civil Aviation Organization's industry standard[12].

8. Taiwan

Alphabet, through its subsidiary Google, is the world's largest corporate buyer of renewable power. At its data centres, such as the one in Changhua County Taiwan, the firm uses night time cooling and thermal energy storage systems to make them 50% more energy efficient than the industry average.[13]

9. Australia

Windfarm developer **Infigen Energy** generates more than 1,549 GWh of clean energy annually through its seven wind farms across Australia. All of Infigen's generators are 100% Greenpower accredited[14] and it is a member of the We Mean Business Coalition and the Clean Energy Council.

[12] https://www.airbus.com/company/responsibility-sustainability/minimising-environmental-impact.html
[13] https://www.google.com/about/datacenters/inside/locations/changhua-county/
[14] https://www.infigenenergy.com/wp-content/uploads/2018/08/FY18-Results-Presentation.pdf

APPENDIX

Menhaden PLC is a UK-listed investment company that seeks to generate long-term shareholder returns by investing in companies and opportunities which deliver or benefit from the efficient use of energy and resources.

Since 2017, Menhaden's PR specialists, ESG Communications have been requested to produce an Impact Report, which details the environmental benefits of investing in the companies that Menhaden has in its portfolio.

To support this work, ESG Communications commissioned Carbon Smart to quantify the environmental benefits of each publicly listed organisation included in Menhaden's portfolio. The biggest private holding, X-ELIO, is also included in the analysis. This is the third year Carbon Smart have quantified these benefits. The following report details the quantification of benefits for each company and documents the approach taken and key assumptions made.

Approach

Carbon Smart reviewed each company in scope to calculate the resource consumption (electricity, fuel, water and waste) and greenhouse gas (GHG) emissions avoided. All calculations have been based on publicly available information shared by the individual companies.

To arrive at an environment benefit calculation, Carbon Smart followed one of the approaches listed below (in order of preference):

1. Product/services – Resource savings and GHG emissions avoided due to the products and services the business offers (e.g. renewable energy)

2. Flagship product – Resource savings and GHG emissions avoided from a flagship product (e.g. electric vehicles)

In cases where either:

- Insufficient information was publicly available to calculate the savings through the business' offerings or

- The products or services of the business did not have a specific environmental benefit, the following alternative approaches were applied:

3. Peer efficiency review – Resource savings and GHG emissions avoided in comparison to an industry peer (e.g. Airbus vs. Boeing)

4. Sector efficiency review – Resource savings and GHG emissions avoided based on efficiency gains across a sector/industry (e.g. maritime industry review)

5. Internal savings – Resource savings and GHG emissions avoided through internal, company-wide initiatives, helping the organisation to produce or deliver their products and services more efficiently

It is expected that the savings from product/services significantly outweigh the benefits of internal savings.

All environmental benefit figures have been calculated for the 2018 reporting year. Carbon Smart followed the DEFRA Environmental Reporting Guidelines and the GHG reporting protocol to calculate the emissions saved. The most recent available GHG conversion factors were used to calculate the GHG emission savings: for international electricity generated the 2016 IEA grid average factors were applied and for all other resources the 2018 DEFRA carbon conversion factors were used, unless otherwise stated.

Menhaden's share of avoided resource consumption and emissions production

The following table provides a breakdown of Menhaden's share of avoided resource consumption and emissions production for each organisation by theme. The share of benefits attributable to Menhaden is based on its % ownership (equity) in the company. Private equity companies, with the exception of X-ELIO, have not been included in this analysis.

Theme	Company	% ownership	Electricity (kWh)	Fuel ('000 litres)	Waste (tonnes avoided to landfill)	Water (cubic meters)	Carbon (tCO$_2$e)
Clean energy	X-ELIO	2.690%	15,924	▪	▪	20,701	6,8869
	Atlantica Yield	0.154%	8,525	▪	▪	11,082	4,463
	Brookfield Renewable Energy	0.041%	10,593	▪	▪	13,930	3,729
	Terraform Power	0.156%	11,210	▪	▪	14,741	4,145
	Infigen Energy	0.523%	7,747	▪	▪	10,188	5,903
Sustainable transport	Airbus	0.012%	▪	202	10	▪	464
	Canadian Pacific	0.014%	▪	2,586	–	▪	6,503
	Union Pacific	0.004%	▪	2,253	28	▪	5,709
Resource and energy	Air Products and Chemicals	0.009%	▪	▪	0.16	872	18
	Safran	0.017%	▪	▪	6	6	3
	Alphabet	0.001%	▪	▪	0.50	88	82
	Ocean Wilsons Holdings	0.700%	▪	▪	–	128	6
Water and Waste	NJS Co Ltd	0.351%	▪	▪	▪	▪	▪
	Waste Management Inc.	0.004%	244	▪	609	320	2,384
	Total		**54,242**	**5,041**	**654**	**72,056**	**40,295**

▪ = Indicator not applicable to theme

▪ = There are no environment benefit figures for NJS Co Ltd due to insufficient publicly available information on the sustainability benefits of their products or their company emissions and reduction activities

APPENDIX
continued

Calculation approach and assumptions

The following section details the calculations carried out, the approach taken and the assumptions made for each company.

Clean Energy theme

X-ELIO

Calculation: product/service
Annual clean energy generated and total GHG emissions avoided using renewable energy, rather than energy from a local grid, and water use avoided when compared to coal fired generation.

Approach
X-ELIO disclose total clean energy generated (MWh) and GHG emissions avoided (tonnes of CO2e) for 2017. The total energy generation figure was used to calculate water avoided.

Key assumptions
- Assumed 2017 generation figure is the most up to date and accurate figure for X-Elio's portfolio.

- Assumed all solar PV facilities replaced coal fired stations to calculate water avoided.

Atlantica Yield

Calculation: product/service
Annual clean energy generated and total GHG emissions avoided using renewable energy, rather than energy from a local grid, and water use avoided when compared to coal fired generation.

Approach
Atlantica Yield disclose total clean energy generated (GWh) and GHG emissions avoided (tonnes of CO_2e) for 2017. For the first time, in 2017, Atlantica Yield included both renewable energy and "efficient gas" production in their total energy generation and emissions avoided figures. This was included in this year's figures. The total clean energy generation figure was used to calculate the water avoided figure, assuming clean energy is replacing coal fired stations.

Key assumptions
- Latest public report covers 2017 data, which was used as a proxy for 2018.

- Assumed all clean energy generation replaced coal fired stations to calculate water avoided.

Brookfield Renewable Energy

Calculation: product/service
Annual clean energy generated and total GHG emissions avoided using renewable energy, rather than energy from a local grid, and water use avoided when compared to coal fired generation.

Approach
In 2018, Brookfield Renewable Energy disclosed total clean energy generated (GWh). Carbon Smart has used this total energy generation figure to calculate GHG emissions and water avoided. This represents an improvement in the scope of reporting considering, in previous years, Brookfield Renewable Energy did not disclose the total energy generated for the year but instead stated their generation capacity. Historically, Carbon Smart would use industry standard renewable energy calculation tools to calculate annual consumption estimates based on the type of facility, the generation capacity and the location of the system.

Key assumptions
- Assumed 2018 generation figure is the most up to date and accurate figure for Brookfield Renewable Energy portfolio.

- GHG emissions avoided calculations: based on grid emission factors of country/region that the clean energy systems are based in (e.g. USA, Brazil, Colombia, Europe). Split of generation by country/region was disclosed by Brookfield Renewable Energy.

- Water avoided calculations: based on the assumption that the clean energy produced by Brookfield Renewable Energy has replaced energy generated by a coal fired station.

Terraform Power

Calculation: product/service
Annual clean energy generated and total GHG emissions avoided using renewable energy rather than energy from a local grid and water use avoided when compared to coal fired generation.

Approach
In 2018, Terraform Power disclosed total clean energy generated (GWh). Carbon Smart used the total energy generation figure to calculate GHG emissions and water avoided. This represents an improvement in the scope of reporting considering, in previous years, Terraform Power did not disclose the total energy generated for the year but instead stated their generation capacity. Historically, Carbon Smart would use industry standard renewable energy calculation tools to calculate annual consumption estimates based on the type of facility, the generation capacity and the location of the system.

Key assumptions
- Assumed 2018 generation figure is the most up to date and accurate figure for Terraform Power portfolio.

- GHG emissions avoided calculations: based on grid emission factors of country/region that the clean energy systems are based in (e.g. USA, UK, Canada, Chile, Portugal, Spain, Uruguay). While Terraform Power reported on the total generation figure for 2018, they had not split generation by country but have provided split of capacity by country. Carbon Smart assumed generation split is in line with capacity split.

- Water avoided calculations: based on the assumption that the clean energy produced by Terraform Power has replaced energy generated by a coal fired station.

Infigen Energy

Calculation: product/service
Annual clean energy generated and total GHG emissions avoided using renewable energy rather than energy from a local grid and water use avoided when compared to coal fired generation.

Approach
In 2017, Infigen Energy disclosed total clean energy generated (GWh). Carbon Smart has used this total clean energy generation figure to calculate GHG emissions and water avoided. This represents an improvement in the scope of reporting considering, in previous years, Infigen Energy did not disclose the total clean energy generated for the year but instead stated their generation capacity. Historically, Carbon Smart would use industry standard renewable energy calculation tools to calculate annual consumption estimates based on the type of facility, the generation capacity and the location of the system.

Key assumptions
- Assumed 2017 generation figure is the most up to date and accurate figure for Infigen Energy portfolio.

- GHG emissions avoided calculations: based on grid emission factor for Australia as all assets are based in Australia.

- Water avoided calculations: based on the assumption that the clean energy produced by Terraform Power has replaced energy generated by a coal fired station.

Sustainable Transport theme
Airbus
Calculation: peer comparison & internal savings
Annual fuel and GHG emissions avoided using Airbus compared to Boeing airplanes (peer comparison). Waste diverted from landfill due to internal reduction initiatives (internal savings).

Approach
Fuel and GHG emissions saved by using Airbus airplanes rather than Boeing airplanes flying for one year. These calculations have been based on all Airbus aircraft delivered in 2018. The approach remains the same as last year and comparisons of new aircraft models have been included.

Key assumptions
- GHG emissions avoided calculations: Carbon Smart took the difference in GHG emissions attributable to distance flown by Airbus aircraft and comparable Boeing aircraft (Carbon Smart assumption).

- Flight distance: Weighted average annual distance flown in the US by aircraft of each type is a reasonable proxy for the average distance flown worldwide.

- Aircraft numbers: The delivered volume of aircraft for 2018 is a reasonable representation of the new aircraft in operation in 2018.

- Comparable aircrafts: Carbon Smart selected comparable aircrafts between Airbus and Boeing.

Union Pacific Corporation

Calculation: flagship product & internal savings
Annual fuel and GHG emissions avoided by freighting goods by rail (flagship product) compared to by road via trucks. Waste diverted from landfill due to internal reduction initiatives (internal savings).

Approach
Union Pacific Railway disclose the total fuel consumption of their locomotives and the total gross tonne-km (the movement of one tonne of goods over one kilometre) for 2017. Using these figures Carbon Smart calculated fuel and GHG emissions associated with Union Pacific in 2017 and compared these figures to fuel use and GHG emissions associated with transporting the same weight of goods, across the same distance, by truck.

Key assumptions
- Assumed an average of medium- and heavy-duty trucks as an alternative to rail transport.

- Used US Environmental Protection Agency data to estimate fuel savings and GHG emissions avoided.

Canadian Pacific Railway

Calculation: flagship product
Annual fuel and GHG emissions avoided by freighting goods by rail compared to by road in trucks.

Approach
Canadian Pacific Railway disclose the fuel efficiency of their locomotives and the total gross tonne-km (the movement of one tonne of goods over a kilometre) for 2017. Using these figures Carbon Smart calculated fuel and GHG emissions associated with Canadian Pacific in 2017 and compared these figures to fuel use and GHG

emissions associated with transporting the same weight of goods across the same distance by truck.

Key assumptions
- Assumed all rail trips were for the freighting of goods - Canadian Pacific Railway primarily specialises in the freighting of goods. The company runs a few passenger train services, but this is not a material part of the business.

- Assumed an average of medium- and heavy-duty trucks as an alternative to rail transport.

- Used US Environmental Protection Agency data to estimate fuel savings and GHG emissions avoided, as Canadian-based figures were not available.

Resources and Energy Theme
Air Products and Chemicals

Calculation: internal savings
Annual water, waste and GHG emissions saved through company-wide initiatives.

Approach
Air Products and Chemical publicly state their avoided water consumption, GHG emissions avoided, and waste diverted from landfill. Therefore, the savings are stated as per Air Products and Chemical's reports. The approach remains the same as last year, with updated figures.

Key assumptions
- Assumed the total GHG emissions saved, waste diverted from landfill and water saved figures reported by Air Products and Chemical are representative of the whole business.

Safran

Calculation: internal savings
Annual water, waste and GHG emission saved through company-wide initiatives.

Approach
Safran disclose data on total waste recycled, GHG emissions and water use in their 2017 annual report. Using this data, Carbon Smart has calculated waste diverted from landfill, GHG emission savings and water savings since the previous reporting year.

Key assumption
- Assumed the figures that Safran report on are representative of the whole business.

Alphabet

Calculation: product & internal savings

Annual GHG emissions avoided through Google Nest thermostat products, the procurement of renewable electricity and wider internal resource reduction initiatives. Waste avoided calculations are based on company-wide reduction initiatives. Water use avoided was calculated assuming use of coal fired generation instead of renewable sources.

Approach

Carbon Smart has calculated total GHG emissions avoided by taking into consideration the following data as reported by Google in its 2018 sustainability report:

- Total GHG emissions avoided from staff commuting in electric vehicles and shuttle buses

- Total tonnage of waste diverted from landfill

- Total electricity consumption, of which 100% is reported to have been sourced from renewable sources. Carbon Smart calculated the associated avoided emissions by assuming the electricity would have otherwise been procured from the national grid. Assumed that large majority of electricity consumption occurs in data centres. GHG emissions avoided calculations were based on grid emission factors of country/region where data centres are based (e.g. Finland, Netherlands, Ireland, Belgium, Chile, Singapore, Taiwan). Water use avoided was also calculated by considering use of water in conventional coal fired generation.

- Total energy saved by users using its flagship Nest thermostats. Using these figures, Carbon Smart calculated emissions avoided.

Key assumptions
- Assumed Google is a suitable proxy for Alphabet – Google is the only Alphabet subsidiary that appears to report on resource use and GHG emissions in detail (e.g. DeepMind and Waymo have limited information available in the public domain).

- Assumed the data reported by Google in sustainability report covers all Google's business activities.

Ocean Wilsons Holdings

Calculation: sector efficiency review & internal savings

Annual GHG emissions savings from efficiency gains in sea freighting industry, attributable to Ocean Wilsons due to the company's role in facilitating sea freighting. Annual water savings achieved through internal reduction initiatives.

Approach

Ocean Wilsons has two subsidiaries: Wilson Sons Limited and Ocean Wilsons Investments Limited. Ocean Wilsons holds a 58% interest in Wilson Sons - one of the largest providers of maritime services and operator of two ports in Brazil. Ocean Wilsons Investments Limited is a wholly owned Bermuda investment company and has no published information that can be used to claim benefits. As such, benefit calculations are solely based on Wilson Sons business activities; only 58% of the benefits calculated from Wilson Sons activities have been included.

Wilson Sons reports on total container ships that have entered and exited its Brazilian ports in 2017. Carbon Smart attributed ship efficiency gains since 2016 to the volume of containers that entered and exited Wilson Sons' ports in 2017. To calculate efficiency gains, Carbon Smart used CO_2e efficiency figures for an average container ship in 2016 vs. 2017, as reported by Business for Social Responsibility (BSR).

Note: Carbon Smart did not pursue a comparison of emissions avoided from sea freight in comparison to road freighting, as Brazil's main export/import markets are in Asia, Europe and USA. Therefore, a road transport comparison is not a suitable. A comparison to air freight was not deemed appropriate as the contents of the shipping containers is unknown. As such, it is impossible to say whether air freighting is a realistic alternative.

Key assumptions
- BSR report is the most robust and recent database on shipping fleet efficiencies

- Emissions avoided calculations: Accounted for total volume of container ships that were exported and imported from Wilson Sons ports in 2017. Assumed average distance travelled for a container ship using main export/import markets (i.e. China, Germany, US) for Brazil. Applied 2016 and 2017 CO_2 efficiency factor to the volume of container ships and calculated GHG emission savings, as containers have become 1% more efficient since 2017.

Water and waste theme

Waste Management Inc

Calculation: product/service
Annual waste diverted from landfill, energy generated through waste products and GHG emissions avoided. Water use avoided calculated by assuming use of coal fired generation instead of renewable sources.

Approach
Waste Management Inc. discloses total tonnage of waste recycled in 2017. The company also reports on total GHG emissions avoided through energy generation, reuse/recycling of materials and carbon sequestration. Carbon Smart used reported GHG emissions avoided figures to estimate total energy generation figures (kWh) and water avoided.

Key assumption
- Assumed the total GHG emissions saved and waste diverted from landfill figures in the company's report are representative of the whole business.

NJS Co Ltd
Due to insufficient publicly available information on the sustainability benefits of NJS Co Ltd's activities, Carbon Smart was not able to calculate any benefit/saving figures for the company.

If you have any queries or would like further
information please contact:

Ben Goldsmith - ben.goldsmith@menhaden.com

www.menhaden.com