



SOUTH HAMS DISTRICT COUNCIL

Footprint Report

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OUR MISSION

**To accelerate the move
to a decarbonised future.**

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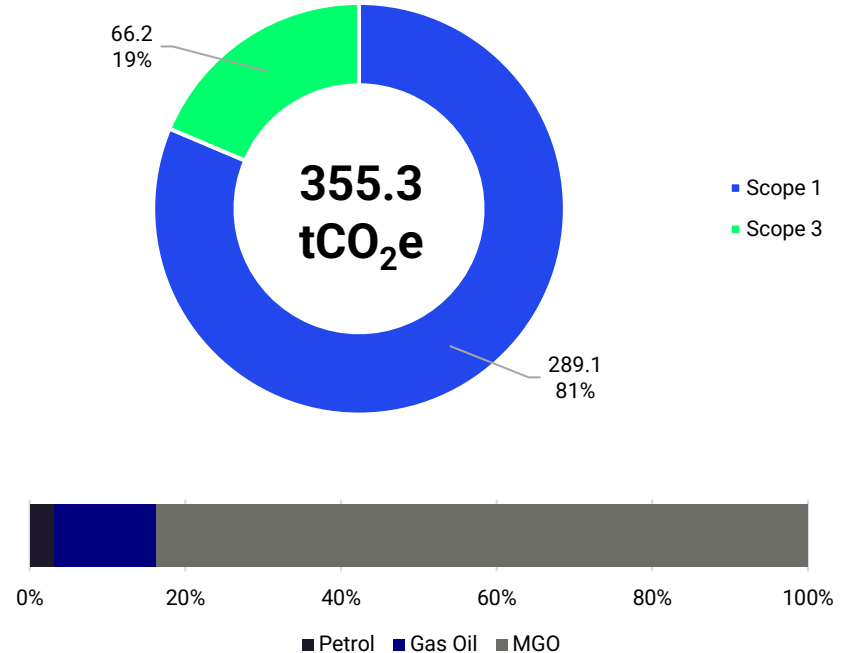
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Carbon footprint

- The total carbon footprint for the vessels owned and operated by SHDC and SHA for the period Oct '21 – Sep '22 has been calculated to be **355.3 tCO₂e**.
- This is the equivalent mass of emissions that would be produced if an average petrol car were to drive to the moon and back more than twice.
- These emissions can be split in to:
 - Scope 1 (**81%**) - those from the direct burning of fossil fuels within the engines to power the vessels
 - Scope 3 (**19%**) - those indirect emissions that arise from the extraction, refinement, transportation and distribution of the fossil fuels consumed by the vessels.
- The emissions arise from the combustion of three different fuel types:
 - Petrol, 3%
 - Gas Oil, 13%
 - MGO, 84%



FOOTPRINT REPORT

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FOOTPRINT REPORT

Introduction and Background

Climate change



Since the industrial revolution the amount of greenhouse gases (GHGs) in the atmosphere has increased by almost 50%. This has resulted in an increase in annual average global temperatures of about 1°C.^[1]

If we, as a global society, continue to emit GHGs at the current rate then we can expect the global average temperature to increase by a further 2.6 to 4.8°C by the end of the century.^[2]

Such warming will have serious implications: increased extreme weather events, droughts and crop shortages, rising sea levels, increased spread of typically geographically limited diseases. These particular implications and their knock-on effects are undoubtedly of grave concern.

Across the globe, almost all nations now understand the importance and urgency of addressing climate change. As such, most have signed the Paris Climate Accord – an agreement to limit global warming to well below 2°C and ideally 1.5°C.^[3]

The Intergovernmental Panel on Climate Change (IPCC) has run numerous scenarios to determine the carbon reduction pathways needed to limit warming to that outlined in the Paris Climate Accord – and these show that net zero emissions must be achieved between 2042 – 2059.^[4]

The UK made the decision to be net zero by 2050, the most ambitious national target at the time the decision was taken, in 2019.

Most businesses and public sector bodies are aware of the importance of limiting the effects of climate change and have set equivalent, or more ambitious targets, such as North Lincolnshire Council's 2030 net zero ambition.

[1] – https://cdiac.ess-dive.lbl.gov/pns/current_ghg.html

[2] – <https://royalsociety.org/topics-policy/projects/climate-change-evidence-causes/>

[3] – <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

[4] – https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter2_Low_Res.pdf

South Hams district council



South Hams District Council (SHDC) has acknowledged the significance and scale of the impacts that Climate Change poses to the residents, ecosystem, and infrastructure of South Hams.

As such in 2019 South Hams District Council declared a **Climate and Biodiversity Emergency**.^[1] As a result of this, SHDC has been developing a set of aims and plans, with the following being committed to:

1. That the Council aim to reduce its organisational carbon emissions to net-zero by 2030;
2. That the Council commit to working with partners through the Devon Climate Emergency Response Group to aim to reduce the District of South Hams' carbon emissions to net-zero by 2050 at the latest;
3. That the Council aim for a 10% Biodiversity Net Gain in the habitat value of its green and wooded public open space by 2025.

So far SHDC have created a footprint for their own organisational emissions (4,471 tCO₂e in 2020/21)^[2], this is being used to inform their decarbonisation plan. Furthermore, they are also tracking their area-wide emissions using the annually published BEIS sub-national emissions statistics^[3].

[\[1\] Climate Declaration](#)

[\[2\] SHDC GHG 20/21 Summary](#)

[\[3\] Climate Change and Biodiversity Strategy](#)

Salcombe harbour



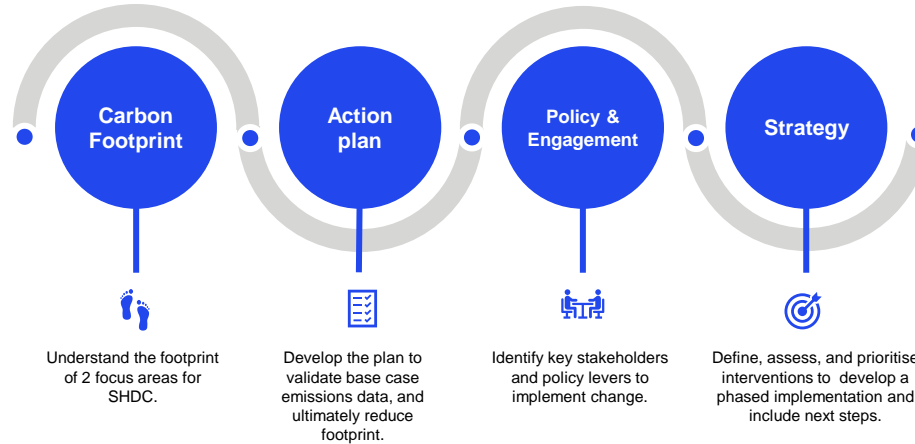
- Salcombe harbour is situated within the South Hams District region and is managed by the Salcombe Harbour Authority (SHA).
- The harbour is home to almost 6,000 different vessels, ranging from canoes to large motor boats, these are owned by members of the general public and moored within the harbour.
- Furthermore there are 10+ vessels owned and operated by SHA, including vehicle ferries which are owned by SHDC and managed by SHA.
- The vessels residing within the harbour are required to produce zero emissions in line with SHDC's are-wide net zero 2050 target, similarly the vessels owned and operated by the SHA will need to meet SHDC's organisational net zero target by 2030.
- Given the harbour's geographical location and sensitive biodiversity^[1], addressing climate change, acting on emissions and meeting net zero targets is a key priority.

“You can't manage what you don't measure”

- The emissions associated with the vessels both kept within the harbour and owned by the SHA/SHDC is currently unknown.
- Quantifying these emissions will be the first step in developing an action plan to reduce them.

[1] – [Salcombe Harbour Biosecurity Plan 2020](#)

Project plan



*Task 1 objective: Analyse baseline carbon footprinting data to support development of low carbon marine fleet for the council.
Analyse baseline carbon footprinting data to support development of low carbon marine fleet for the council.*

This first task focused on 2 areas:

1. Based on current Footprinting data of the organisation-owned assets, perform a refreshed carbon footprint of the current marine vessels with additional data.
2. Perform a baseline carbon footprint of all moored boats in Salcombe Harbour, and determine the next steps for improving accuracy.



FOOTPRINT REPORT

Methodology

Greenhouse gases

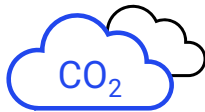
- Greenhouse gases are not limited to CO₂ and under the Kyoto protocol we must consider the emissions of several other GHGs when producing a footprint.
- Each GHG has a specific global warming potential (GWP).
- We measure all gases in tCO₂e – tonnes of carbon dioxide equivalent; this reflects the global warming potential of each gas relative to CO₂.
- When a footprint is quoted in terms of CO₂e, this means that all gases under the Kyoto protocol are included.



x310 GWP



Agriculture and soil management



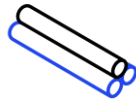
x1 GWP



Fossil fuel combustion



x ~10,000 GWP



Aluminium and semi conductor production



x1,500-15,000 GWP



Refrigeration and air conditioning



x24 GWP



Agriculture and waste



x23,900 GWP



Electricity supply equipment



x16,100 GWP

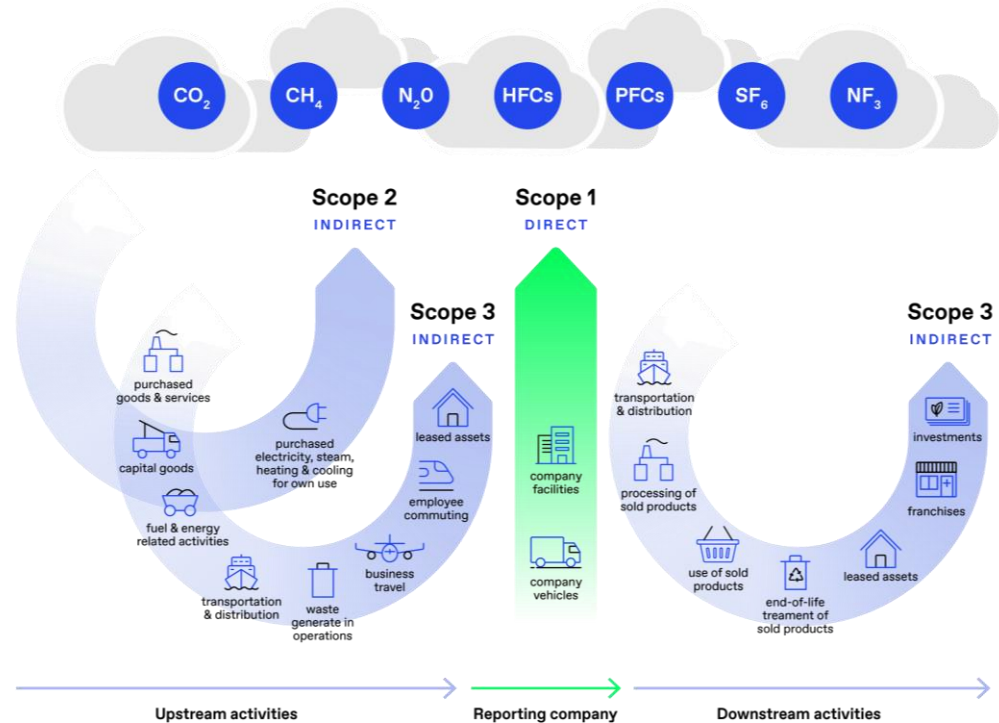


Semi-conductor and electronics production

Greenhouse gas protocol

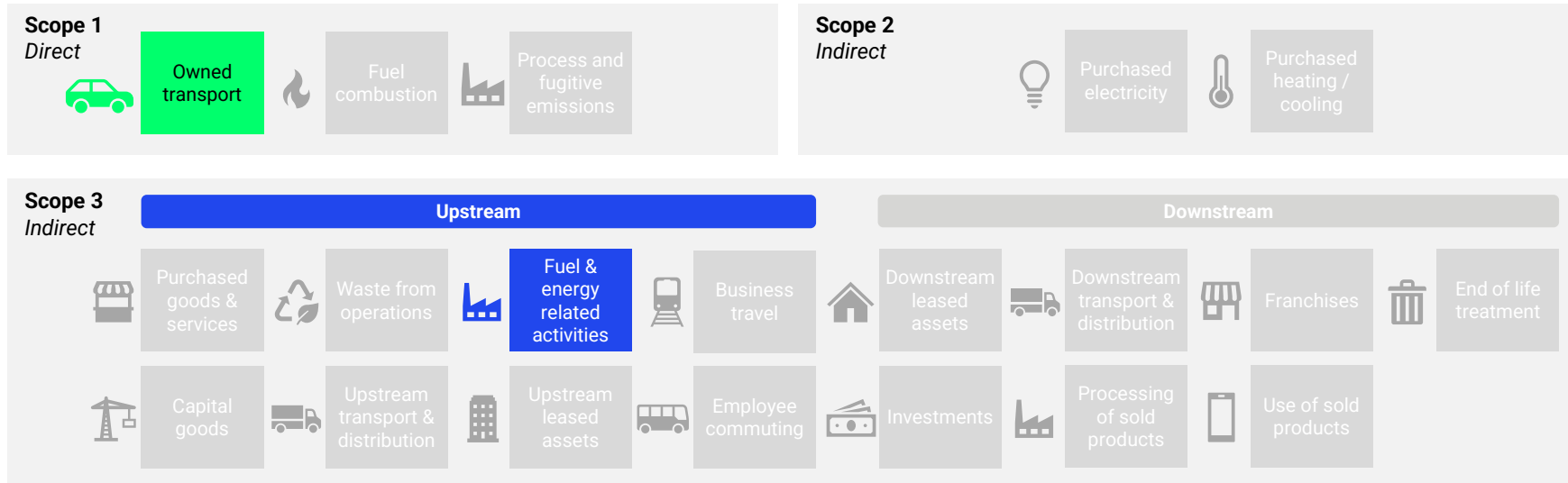
Corporate Standard

- Organisational greenhouse gas emissions are accounted for using the globally accepted greenhouse protocol – corporate standard.
- This sets a framework for understanding the boundary of emissions to be accounted for, how emissions should be calculated and how to categorise emissions.
- The image (right) provides an overview of how emissions are categorised. These can be explained as follows:
 - Scope 1:** emissions that are directly released by the organisation, either through combustion (e.g. gas boilers) or otherwise (e.g. refrigeration leaks)
 - Scope 2:** emissions that are indirectly produced by the organisation from the consumption of energy (e.g. electricity)
 - Scope 3:** emissions indirectly produced by an organisation from all other activities. Split by upstream (generally categorised as activities that an organisation pays for) and downstream (activities that are bought from an organisation).



Emissions boundary

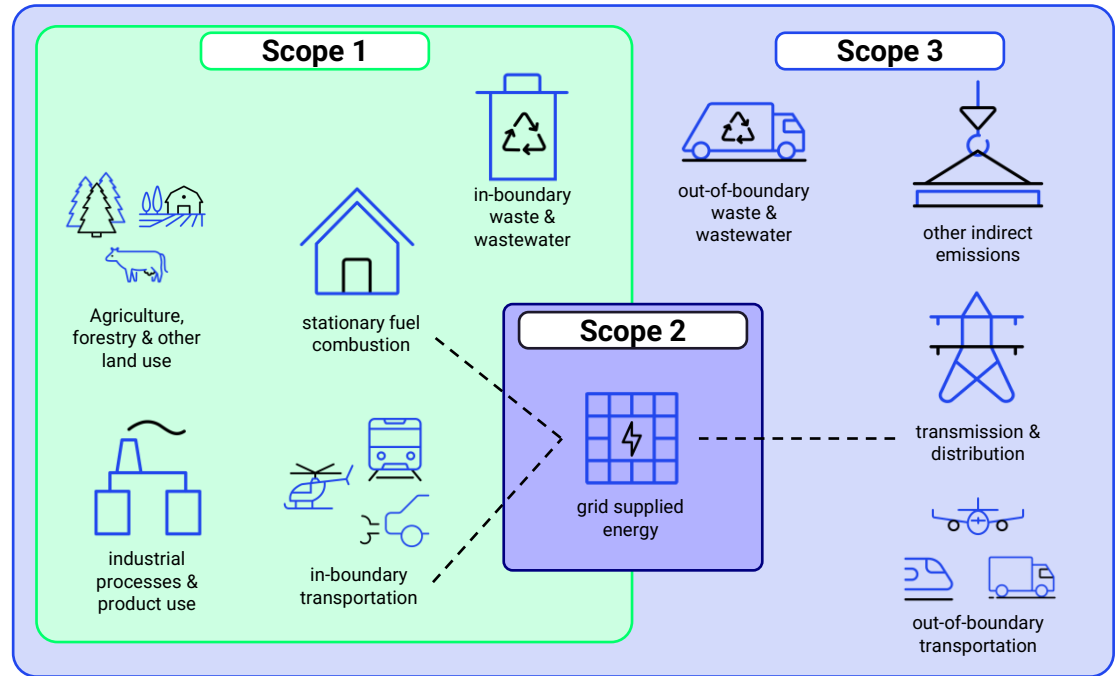
The agreed emissions boundary for the footprint being analysed within this project as agreed with SHDC is highlighted below. The emissions sources being reported on are ‘owned transport’ (SHA/SHDC owned vessels), and ‘Fuel & energy related services’; these are the proportional emissions associated with the extraction, refining, and transportation of fuel used within the SHA/SHDC owned vessels. All other emissions sources have been excluded for the purpose of this study.



Greenhouse gas protocol

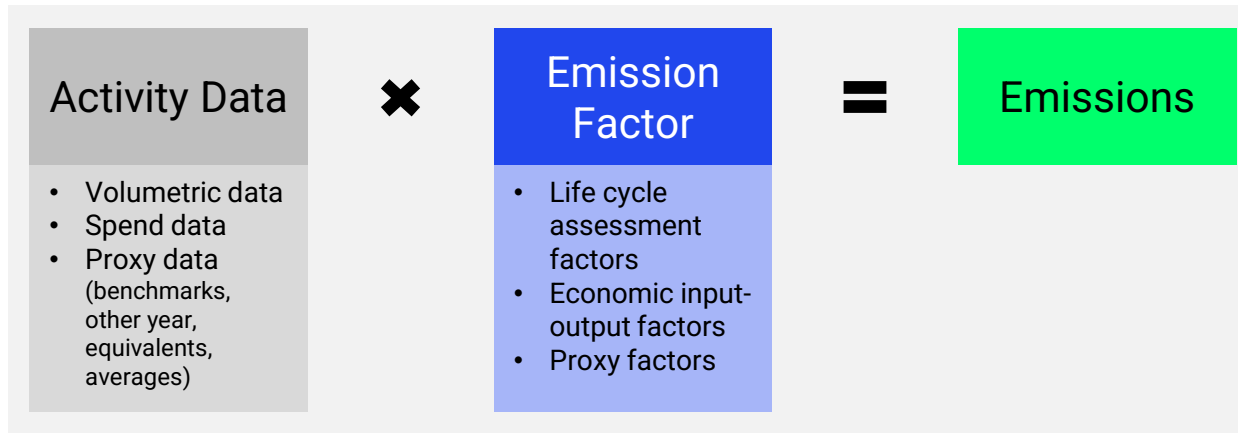
Global Protocol for Community-Scale Inventories

- The GHG protocol has also created a standard defining how regional emissions should be reported.
- This standard apportions emissions based on the geographical boundary of where they are produced:
 - Scope 1** – emissions from sources located within the geographical boundary
 - Scope 2** – emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the city boundary
 - Scope 3** - All other GHG emissions that occur outside the city boundary as a result of activities taking place within the city boundary
- As agreed with SHDC the emissions being included within the scope of this project are scope 1, in-boundary transportation (specifically vessels within Salcombe Harbour).
- All other regional emissions are excluded from the analysis of this project.



Calculating emissions

- The methodology used to calculate a carbon footprint follows the guidance set out in the GHG Protocol's *corporate standard*.
- This requires an activity to be matched to a relevant emission factor to calculate the actual emissions from that activity.
 - Activity may refer to emission sources such as gas and electricity consumption, fleet usage, purchasing goods and services. In each of these instances you should collect primary data (utility bills, expense forms, mileage cards) for each activity outlined under the GHG protocol and within the emission boundary. Where primary data is unavailable estimates can be made using proxies.
- Emission factors for numerous activities can be found publicly, and the most common activities have their relevant emission factors provided by [the UK Government](#).



Project approach



SHA/SHDC owned vessels

- The carbon footprint for SHA/SHDC owned vessels has been calculated using primary activity data in the form of fuel reports for the period Oct '21 – Sep '22.
- These have been provided on a vessel, date (dd/mm/yy), and fuel type breakdown for the majority of vessels; with the exception of ferries and tugs where data was provided on a fuel basis and partial annual average running.
- Emissions factors for all commonly used fuels (including all of those used by SHA/SHDC) were available from the BEIS emission reporting datasets.
- This has allowed for a detailed and accurate footprint to be calculated, with a vessel, fuel type, scope and time series breakdown.

Salcombe harbour vessels

- The individual fuel usage or distance travelled by each vessel owned by members of Salcombe harbour are not readily available.
- As a result, a survey approach will need to be taken to gather as much data as possible about the type and usage of the vessels moored within the harbour.
- This will yield the necessary data required to create a carbon footprint of the vessels moored within Salcombe harbour.

Owned vessel details

Vessel Name	Vessel Type	Fuel Type
Blackstone	Small craft	Red Diesel
Saltstone	Cygnus	Red Diesel
Poundstone II	Cygnus	Red Diesel
Eelstone	Cygnus	Red Diesel
Winstone	Ex-ships life boat	Red Diesel
Mewstone	Orkney dory	Unleaded Petrol
Sandstone	Orkney dory	Unleaded Petrol
Hamstone	Orkney dory	Unleaded Petrol
Limestone	Orkney dory	Unleaded Petrol
Searay	Dellquay dory	Unleaded Petrol
Mudstone	Dellquay dory	Unleaded Petrol
Eddystone	Zodiac	Unleaded Petrol
Tomstone	Wilson flyer	Unleaded Petrol
Brimstone	Dory	Unleaded Petrol
Hauley IV	Tug	MGO
Hauley V	Tug	MGO
Hauley VI	Tug	MGO
Tom Avis	Float	MGO
Tom Casey	Float	MGO



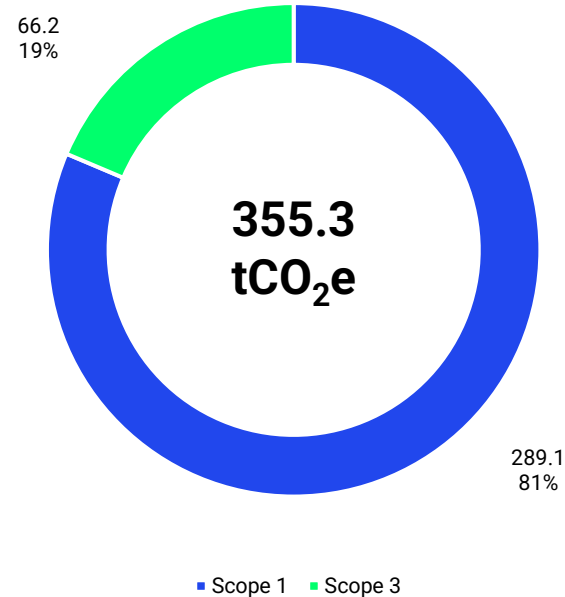
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Results

Owned vessel fleet

Emissions by scope

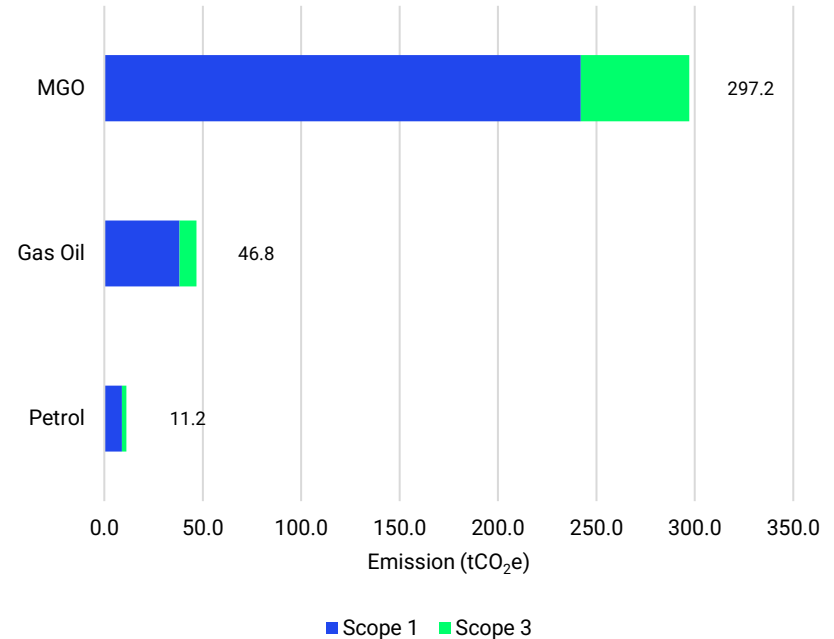
- The total carbon footprint for the vessels owned and operated by the SHA/SHDC for the period Oct '21 – Sep '22 has been calculated to be **355.3 tCO₂e**.
- This is the equivalent mass of emissions that would be produced if an average petrol car were to drive to the moon and back more than twice.
- These emissions can be split in to:
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Owned vessel fleet

Emissions by fuel

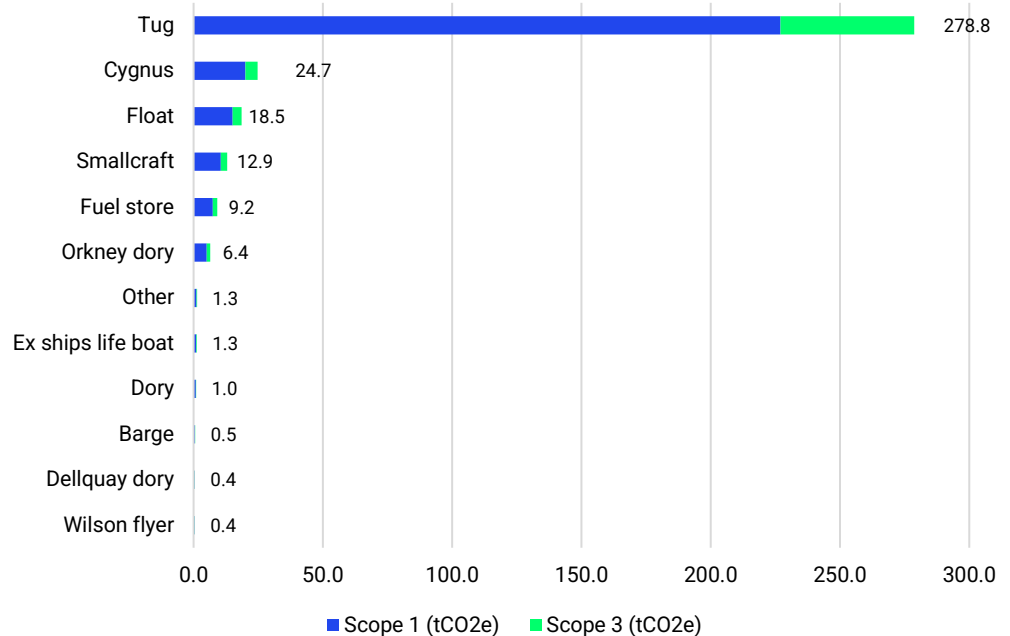
- The chart (right) details a breakdown of the emissions arising across the three different fuel types used within the SHA/SHDC vessel fleet.
 - The emissions have been further split in to scope 1 and scope 3.
- The overwhelming majority (84%) of emissions arise from the use of marine gas oil, entirely used by the small ferries, tugs and floats. Gas oil and unleaded petrol make up a much smaller proportion of emissions produced (13% and 3% respectively).



Owned vessel fleet

Emissions by vessel type

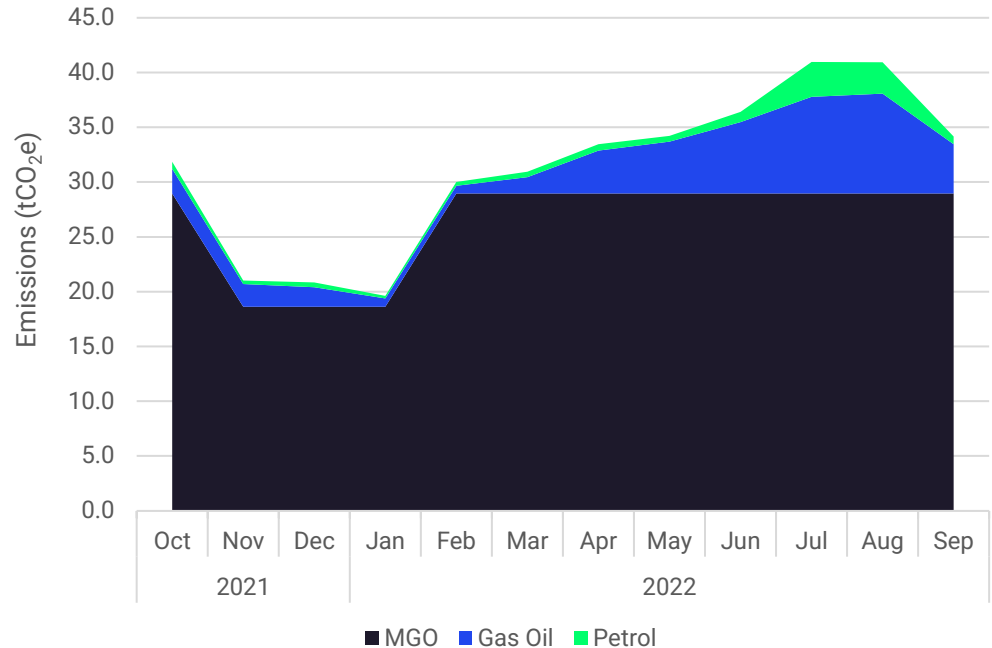
- Here we analyse the emissions breakdown by vessel type of the SHA/SHDC fleet as provided by SHDC.
- The top three emitting vessel types produce over 90% of all emissions; with the largest proportion of emissions from the use of the tugs (78% of total emissions).
- From this chart and the previous chart on emissions by fuel type it is clear that the tugs and floats need to be the predominant area of focus for SHDC if they want to meaningfully reduce their carbon footprint.



Owned vessel fleet

Time series emissions

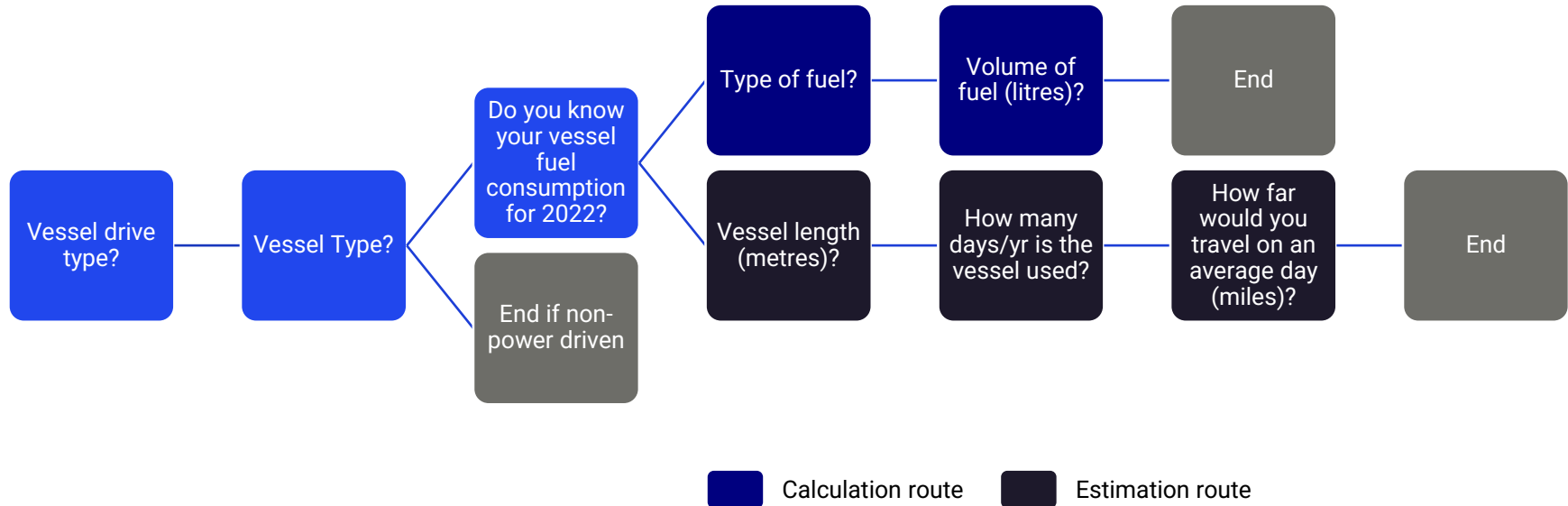
- This chart highlights the time series of emissions related to fuel consumption from the SHA/SHDC vessel fleet.
- Granularity of data on tug and float fuel consumption results in a fairly crude representation of emissions. The remaining vessels however have day by day fuel reports.
- Emissions during the peak summer period can be almost double that of the winter period.
- The time series analysis allows for an opportunity to optimise vessel usage to reduce emissions. For example by comparing emissions with demand for ferry crossings, could there be opportunities to reduce the number of crossings?



Salcombe harbour vessels

Survey

- A suggested survey has been created to collect the necessary data such that a carbon footprint can either be calculated or estimated. The survey questions and flow are provided below.





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Next Steps

Recommended next steps



Survey distribution

The survey that has been described in the results section of the report will need to be distributed to owners of vessels within Salcombe Harbour.

The most appropriate form should be taken to distribute the survey, that takes in to account privacy and GDPR.

Resulting data from the survey can be extrapolated across the known log of vessels that are kept within Salcombe harbour. See Appendices for further details on Norfolk Broads example.



Data collection

For the SHA/SHDC owned vessels there needs to be a step change in data collection and reporting to ensure an accurate as possible carbon footprint can be produced. This will be integral for understanding opportunities for decarbonisation and allowing for informed monitoring and reporting of progress.

Suggestions include:

Moving to digital fuel cards for owned vessels
Collecting more granular daily data on fuel usage in tugs and floats



Decarbonisation opportunities

Work should be undertaken to understand the decarbonisation opportunities available to South Hams District Council in terms of the operations and users of Salcombe Harbour. This should be based on understanding where the maximum impact can be made in terms of carbon reduction.

Fully understanding the quantified carbon reduction potential of these opportunities will be key, and will be essential in informing the sustainability strategy and action plan for South Hams District Council.

Project next steps



Objective: provide an overview of the challenges and opportunities of decarbonising the vessel owned fleet and the Salcombe Harbour moored vessels.

- *Assess other initiatives to determine impact of decarbonisation on the SHDC area.*
- *Research the role of the community along with opportunities and challenges in switching to a low-carbon marine future, including a high level economic benefit.*
- *Engage with key stakeholders to discuss challenges and key themes for future decision making.*



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Appendices

Assumptions

- All emissions factor used are based on BEIS emission reporting figures
- Float and tug monthly usage was assumed constant over the time periods provided
- All data has been provided for the period Oct 2021 – Sep 2022.

Stakeholders engaged

- Marcus McCheyne
- Chris Brook
- Chris Shears
- Cameron Sims-Stirling
- James Martyn
- Adam Williams
- Lloyd Turner

Data sources and quality

Emissions Source	Data Quality	Footprint Quality	Data Source	Comments
Petrol	Yellow	Yellow	Fuel log report data (monthly)	Primary activity data provided for all SHA owned vessels, disaggregated by date, fuel type, unit, volume, and vessel. Data was in written form and therefore liable to human error, processes should be automated in future. This data quality issue follows through to the quality of the footprint.
Gas Oil	Yellow	Yellow	Fuel log report data (monthly)	Primary activity data provided for all SHA owned vessels, disaggregated by date, fuel type, unit, volume, and vessel. Data was in written form and therefore liable to human error, processes should be automated in future. This data quality issue follows through to the quality of the footprint.
MGO	Red	Yellow	Anecdotal written	Data was provided in the form of typical usage across the year in the form of written data. Exact consumption data should be collected regularly and properly collated in a digital format.

Norfolk Broads Greener Boating Survey Launched

- The Norfolk Broads authority launched a survey via their website in 2019 to understand boating habits from their users.
- The objective was to achieve a more accurate base case Carbon Emissions of the Broads waterways, rather than using assumptions.
- The survey was open on their webpage for ~4 weeks and was set up via Survey Monkey.
- We would recommend a similar exercise is run for Salcombe Harbour, to help validate any assumptions made for the vessel usage at this time. This would give a more accurate base case, based on authentic usage data.
- Carbon Trust are aiming to discuss the survey results further with Norfolk Broads Authority. Results to be discussed in Task 2 of this project.

<https://www.broads-authority.gov.uk/news/greener-boating-survey-launched>



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