

An Initial Review of Greenhouse Gas Emissions within the Scope of Control and Influence of Exmouth Town Council

Martin Woods, Woods and Turvey Ltd, May 2020

Introduction

Woods and Turvey were commissioned by Exmouth Town Council (ETC) to conduct a survey of Greenhouse Gas Emissions that area within the Council's sphere of influence. This study was an initial assessment of what activities of ETC might have an impact of Greenhouse Gas (GHG) Emissions and what actions might be taken to improve them. This study does not follow a standard such as ISO 14064 or the Greenhouse Gas Protocol to give an inventory of ETC's GHG emissions into standardised scopes but recognises all GHG emissions that ETC may have influence over. This includes From the data collected it would be possible to complete a GHG inventory to one of these standards.

Methodology

Nearly every activity we do or product we buy will have a 'carbon footprint'- whether it be breathing in and out or building a house.

In his book, "How Bad are Bananas? – A Carbon Footprint of Everything", Professor Mike Berners-Lee compares Carbon Emissions to money:

"Carbon is just like money in that you can't manage it unless you understand it...Most of the time we know how much things cost without looking at the price tag...we know that a bottle of champagne is more expensive than a cup of tea but a lot cheaper than a house. So most of us don't buy houses on a whim. Our financial sense of proportion allows us to make good choices. Our Carbon instinct needs to just like the one we have for managing money.

"...That's where the similarity ends. Unlike with money we are not used to thinking about carbon costs. It's also much harder to know how much we are spending because we can't see it and it's not written down. Furthermore, unlike what happens when we spend a lot of money, we don't personally experience the consequences of carbon impact because its spread over 7 billion people and many years."

We are used to talking about a 'Carbon Footprint' but actually is shorthand for the 'best estimate of the full climate change impact of something'. Carbon Dioxide is the most dominant of many gaseous emissions that contribute to forced atmospheric warming and climate change – but there are others that are important too – we need to set an exchange rate between these different greenhouse gases to be able to compare them.

As an example to illustrate this the water cooler in Exeter Town Council's offices contains about 50g of a refrigerant called R134a. Like Carbon Dioxide R134a is also

a 'greenhouse gas' (GHG) – in that it causes heat to be trapped in the earth's lower atmosphere causing climate change – a bit like how glass traps heat in a greenhouse. R134a is actually far better at trapping heat in the atmosphere than Carbon Dioxide – about 1430 times more powerful. This figure 1430 is what we call R134a's "Global Warming Potential" (GWP). This Global Warming Potential (GWP) is our exchange rate – 1kg of R134a is equivalent to 1430kg of Carbon Dioxide

The Institute of Refrigeration found out that cooling equipment loses its charge of refrigerant gas on average once every 10 years - so in this study we have accounted for one-tenth of the refrigerant gas in the water cooler entering the atmosphere annually. So one-tenth of the R134a (ie 5g) is likely to be put into the atmosphere every year by Exmouth Town Council's water cooler. Rather than listing all the greenhouse gases emitted by Exmouth Town Council with their weights we convert to a common currency based on Carbon Dioxide which is given a Global Warming Potential of 1. The symbol we use for this common currency is kgCO_{2e} – i.e. kilogrammes of carbon dioxide equivalent.

So 5g of R134a has a carbon equivalence of $0.005\text{kg} \times 1430 = 7.1\text{kg}$

This figure alone does not tell us whether it is a good or bad thing to have a water cooler with R134a in the office. We could also consider the greenhouse gas emissions of the power stations that made the electricity to power the water cooler. A small water cooler will use about 50 units (kWh) of electricity per year. We can find out the Greenhouse Gas Emissions from electricity generation in the UK by checking figures annually published by DEFRA. These tell us that in 2019 the average greenhouse emissions for 1 kWh of mains electricity were 0.256 kgCO_{2e}. So the annual greenhouse emissions from generating the electricity used to power the water cooler are:

$$0.256\text{kgCO}_2\text{e} \times 50 \text{ units (kWh)} = 12.8\text{kgCO}_2\text{e}$$

This figure is obviously bigger than the figure associated with the R134a gas escaping from the water cooler. So, if a water cooler that contains R134a is more efficient in terms of electricity usage than one with a different refrigerant gas it may be worth the pay off. There are further areas of carbon footprint of the water cooler we could consider – like embedded carbon – which is the amount of Greenhouse Gas emitted in extracting the materials to make the water cooler and then to make it. The carbon footprint of the water cooler is actually quite a minor concern however, and you have probably already spent more time that you should considering it by reading this example - but it raises a number of points:

- 1) Carbon Footprints can be complex even for quite simple items – so we draw boundaries and we often make big assumptions. Inside the 'boundary' is the stuff we are going to measure and outside are things we are too small (not material) or we think are irrelevant to the carbon footprint of the thing we are looking at. We also make a list of our assumptions (see Appendix 1 for instance) so that we can come back and change our calculations if it turns out we got them wrong.

- 2) Nearly everything we do or buy emits greenhouse gases and so we are often trying to decide which method or product gives us the 'most bang for our carbon buck'. There are often several different right answers to this question.
- 3) We need to know what actions the carbon footprint should lead us to do otherwise it is useless – a bit like having 100,000 Vietnamese Dong and not really knowing whether you are rich or not.

The third point is especially true for this report. Exmouth Town Council could use their 'carbon footprint' to compare itself to other local authorities how it is doing. The problem with this is that no other local authority will carry out the same activities as Exmouth. It is more useful for Exmouth Town Council to look at the report and see where it might be able to make most improvements on its carbon footprint and to develop actions to reduce these. A year on year comparison of its carbon footprint will give an indication of whether ETC is moving in the right direction or not rather than looking at say Frome or Totnes.

A further aspect of carbon footprints is working out who was actually responsible for the greenhouse gases that were emitted from a certain activity or product. There are internationally agreed standards for accounting for greenhouse gases that lay down the rules for who should claim each bit of carbon emissions. These are mostly aimed at making sure the same Carbon Emissions (or Carbon Savings) are not counted twice. These split greenhouse gas emissions into 3 groups or 'scopes'. Scope 1 or 'direct emissions' are those that are caused directly by your organisation and would include emissions from burning fuel in vehicles, emissions of refrigerants from cooling equipment and burning fuel for heat and hot water in a building. Scope 2 are indirect emissions from purchased electricity or heat (someone else burned the fuel on your behalf). Finally scope 3 is things that are brought in or outsourced – such as capital items, transportation of goods, waste treatment etc. This often leads to a carbon footprint for an organisation where most of the emissions are in Scope 3 and are often thought of 'as someone else's problem'.

These scopes have not been applied to this study for a number of reasons:

- 1) Exmouth Town Council has influence over a much wider greenhouse gas emissions than its upstream and downstream supply chain. For instance consider that ETC held an environmental education day for all the primary schoolchildren of Exmouth. If a number of those children took the messages they learned home and improved their family's greenhouse gas emissions by better choices in transport use, energy use, waste creation the impact will be massive compared to the impacts of Exmouth Town Council's use of fuel for vehicles and heating. If we tried to fit this into a scope we would probably count the carbon footprint of the electricity to light the room rather than the lifetime of greenhouse gas reducing actions that might be taken by a town's worth of inspired primary school children.
- 2) Scopes are useful for making carbon footprint decisions on consumption choices comparable – e.g. Should I buy Blue Circle Cement or Lafarge Cement? Or maybe Lime Mortar? Exmouth Town Council does not offer

- its consumer the choice between themselves and say, Tiverton Town Council, so there is little requirement for comparing eggs with eggs
- 3) For a non-manufacturing organisation like Exmouth Town Council most of the emissions will be in scope 3. As these are often seen as ‘someone else’s problem’ the incentive to take action can be diminished.

Having said all this it should be pointed out that the data that has been generated could be put into a report with scopes should Exmouth Town Council ever require it.

The approach that has been adopted to decide what is within the scope of this study is to look at all activities and purchases of ETC that may have an global warming impact on a scale worth measuring and divide these into those which it has ‘control’ over and those which it has ‘influence’ over. Broadly speaking the ‘controlled’ activities are purchases, services provided, waste created and fuel burned by ETC. The activities that have ‘influence’ are areas of policy, education, support and partnership.

Exmouth Town Council has greater control over the greenhouse gas emissions of some activities and products than others. This level of control gives us an idea of how easy it is for ETC to change the level of these emissions. Coupled with information on the scale of the GHG emissions this helps us to quickly focus in on the areas where the greatest changes could most easily be made.

It would be nice to use one set of greenhouse gas conversion figures for consistency. Unfortunately DEFRA does not publish conversion factors for everything. Where possible, DEFRA’s GHG emission conversion factors 2019 have been used. Where this has not been possible conversion factors have been sourced from elsewhere such as published papers and books from trusted authorities. Many assumptions have been made and these are given in Annex 1. This will help 1) for you to question the methodology 2) for ETC to repeat this exercise in future 3) to get a feel for how accurate these figures are likely to be.

All Carbon Footprints involve some degree of estimation and generalisation and, as stated at the start, the aim is not to tell you your bank balance to the nearest penny but it is more akin to your bank manager telling you whether can afford to drink tea or champagne.

Results

Figure 1 on page 4 gives a list of activities that were deemed to be under ETC’s control and indicate a the estimated ‘level of control’ that ETC has over them.

Discussion of how a level of control was assigned to each activity is given in table 1 overleaf:

Table 1 Justification for assignation of control level to activities and products within the scope of the study

Activity	Control Level	Justification
	1 = lowest 8 = highest	
F-Gases in equipment	8	ETC makes the purchasing decision on Equipment that may contain F-Gases and have full control over upkeep and maintenance which have a bearing on the likelihood of the F-Gas to leak.
Paper Usage	8	ETC directly procures its paper and uses it in house.
Procurement of Vehicles	7	ETC purchase its own vehicles but not all types of vehicle may be useable for the purposes required for ETC.
Use of ETC Vans	7	ETC purchases its own vehicles and arranges maintenance. ETC does not operate the depot where they are stored and so difficult to install charging points for electric vehicles
Fuel for festival	8	ETC hires the generator for the festival main stage and pays for fuel usage of this generator
Plants/Flowers	8	ETC purchases flowers for its planters in town in summer and winter.
Printing	8	This relates to printing in house.
Chemical Use on Verges	7	Verges must be cleared for safety. Other options are available
Elec Use at Gorfin Hall	5	ETC owns Gorfin Hall and is responsible for the procurement of electricity and installation of electrical equipment such as lighting, heating and kitchen equipment but this is mostly used by hall users who are not ETC.
Councillor Travel for Meetings	5	ETC requires its councillors to attend meetings but does not stipulate how they travel. ETC requires representation for all wards and the geography of Exmouth means that it is difficult to meet at a geographically central location.
Waste Disposal from ETC	5	ETC is responsible for the activities that generate waste but procurement of waste disposal services is by the building owner.
Gas Usage at Exmouth Town Hall	4	Heating is provided as part of the lease of Exmouth Town Hall. ETC can influence this by using TRVs and not opening windows etc.
Elec Usage at Exmouth Town Hall	4	Lighting is probably the greatest use of electricity at Exmouth Town Hall and this is provided as part of the lease. ETC can ensure equipment turned off and low energy

		equipment is purchased where they are the procurer.
Water Usage at Gorfin Hall	3	ETC own the Hall and are responsible for fixtures and fittings and detecting leaks etc. ETC are rarely responsible for water consumption at the hall.
Water Usage at Ex Town Hall	2	ETC are provided with water for domestic purposes as part of the lease at Exmouth Town Hall. Water usage is mostly dictated by toilet flush size and monitoring for leakage.
Travel to Gorfin Hall	1	Exmouth Town Council have very little influence over how users of Gorfin Hall travel there.

Exclusions from this Study

Areas of Activity Excluded from the study with justification for doing so are given in table 2 overleaf

Table 2: Activities of ETC not included in this study with justification	
GHG emissions associated with legacy investments	These are very difficult to quantify. One possible method if reliable GHG emissions inventories exist for the companies invested in would be to look at ascribing a share of those emissions based on number of shares held. In practical terms the best way of influencing these emissions is to be a responsible shareholder and lobby for sustainable changes.
“Well to Tank” Emissions from fuels ie the emissions associated with extraction and refinement of diesel fuel	ETC has very little control over these but these should be considered when comparing different technologies. The will add about 20% to vehicle and generator emissions,
Watering of Flowers	Water is provided FOC from a borehole. GHG impacts are likely to be minor
Christmas Fair	Impacts are likely to be minor
Embedded GHG in Exmouth Town Hall	Offices are leased. Very difficult to put a meaningful figure so long after original building and refurbishments.
Tea and Coffee at meetings	The GHG emissions of a milky cup of tea or coffee are about 0.15kgCO ₂ e. About 60% of that figure is from the milk, 30% from heating (already accounted for) and 10% from the tea or coffee itself. For 1000 cups a year that would be an extra 105kg CO ₂ e per year. This is material in respect of other

	emissions but it is difficult to see how improvements could be easily made.
Travel to Gorfin Hall by Users	Difficult to influence, difficult to quantify without a survey.
Festoon Lights on Sea front electricity usage	Difficult to get figures – likely to be not material with LED lights
Allotment Water Usage	Considered as an area of influence – NB the allotment association may be eligible for free water surveys.
Plants in roundabouts	This is subcontracted to East Devon Council
Emptying of Dog Waste Bins	Sub-contracted to EDC
Litter Disposal at Festival	Likely to be around 100kg CO2e difficult to ascribe responsibility.
Embedded GHG of flower towers	An irregular purchase
Office Furniture	Irregular purchase
Civic Service	Coffee and Tea is main impact – see tea and coffee above
Mayor's Ball	Difficult to ascribe GHG to ETC
Delivery of Goods	Difficult to calculate GHG without knowing points of origin and transport modes but potentially big impact and an important area in future

Figure 2 on page 5 gives a visual representation of the scale of GHG emissions from the activities that ETC has control over.

Figure 3 on page 6 gives a list of GHG emissions over which ETC has influence. This list is deliberately narrow in scope and does not include, for example, the influence that ETC may have as an exemplar of GHG emission control more widely in the country.

Figure 4 compares the emissions of Exmouth Town Council to the GHG emissions of the population of Exmouth as a whole to illustrate the difference in scale between the two.

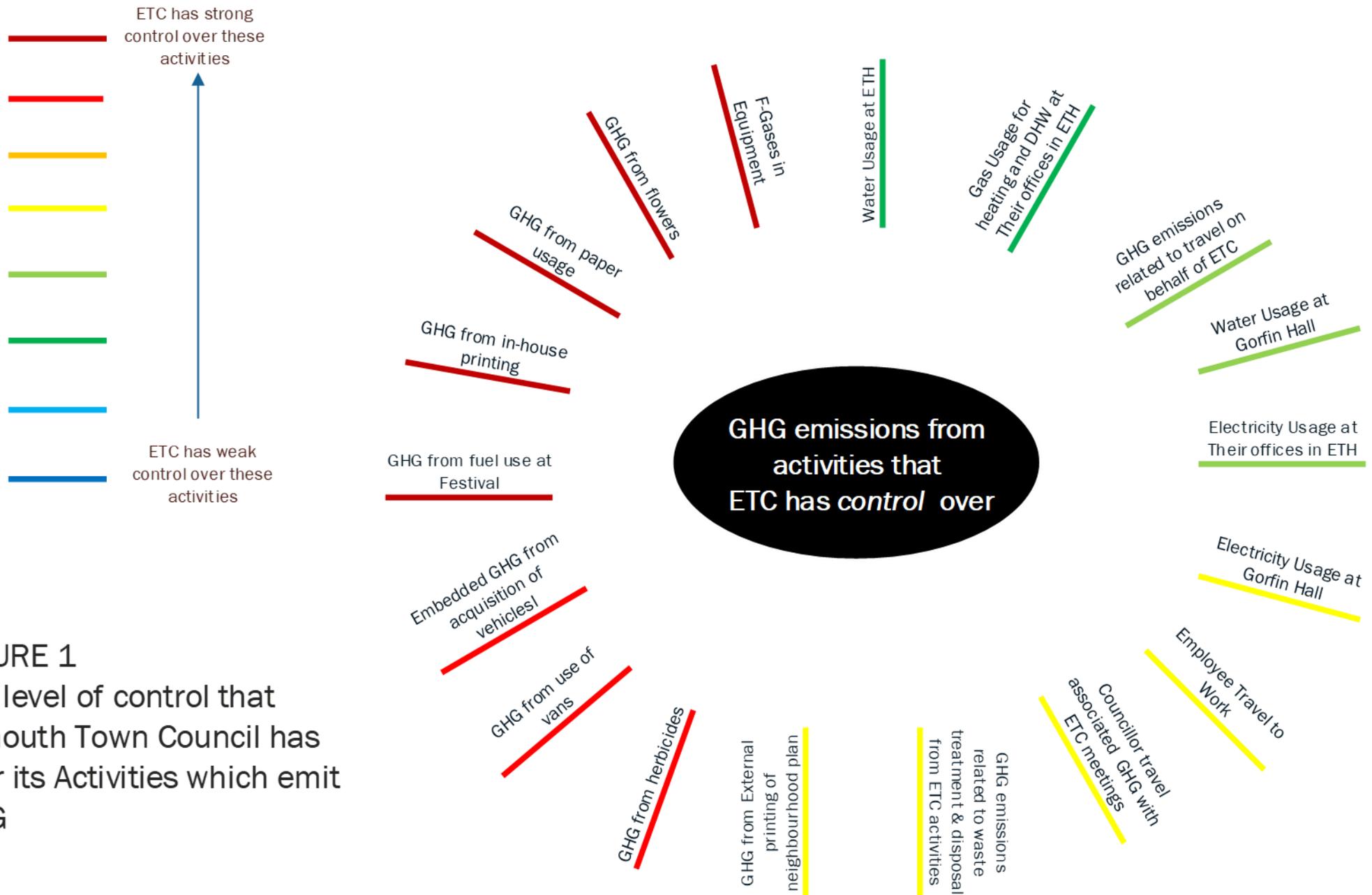


FIGURE 1
 The level of control that Exmouth Town Council has over its Activities which emit GHG

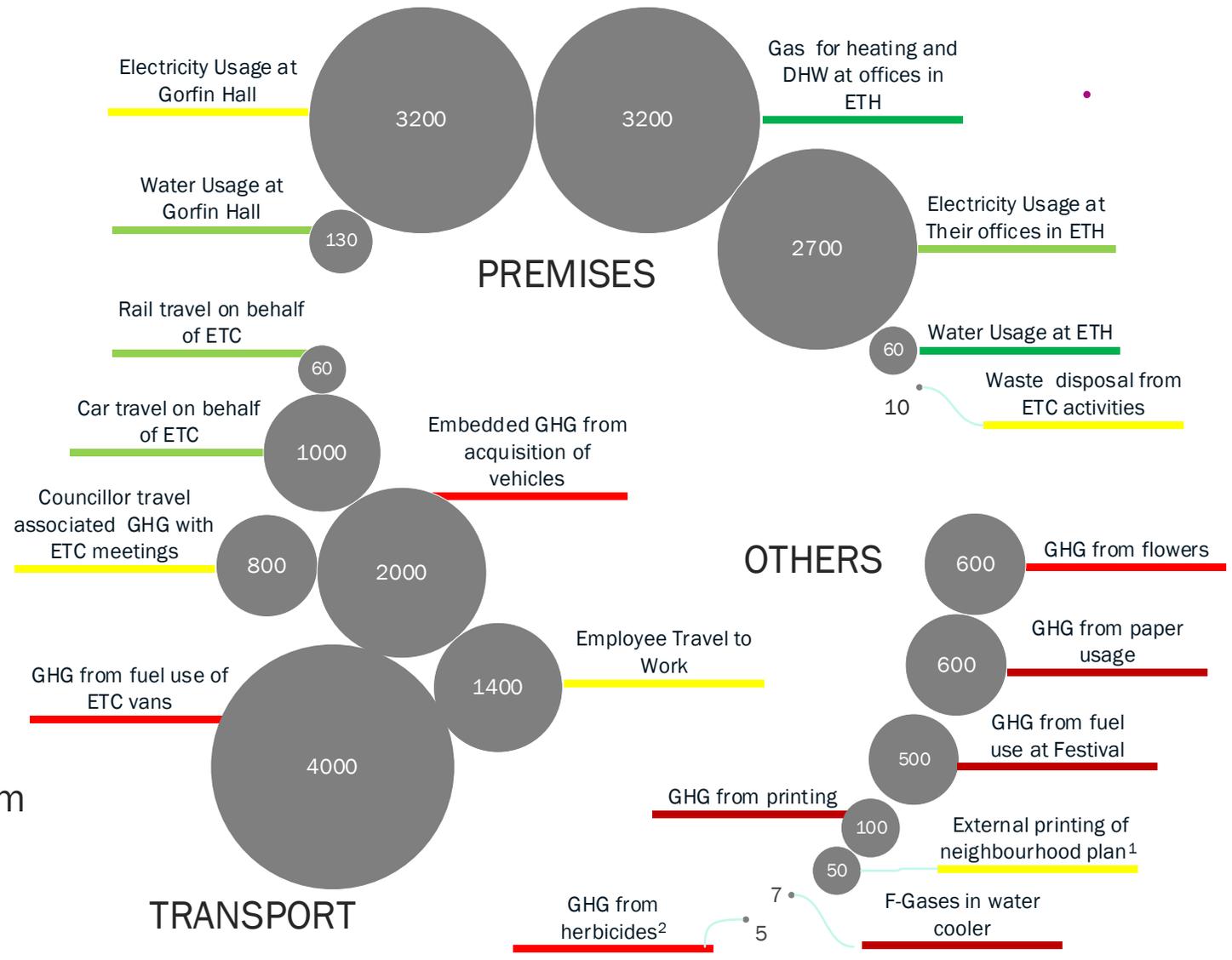
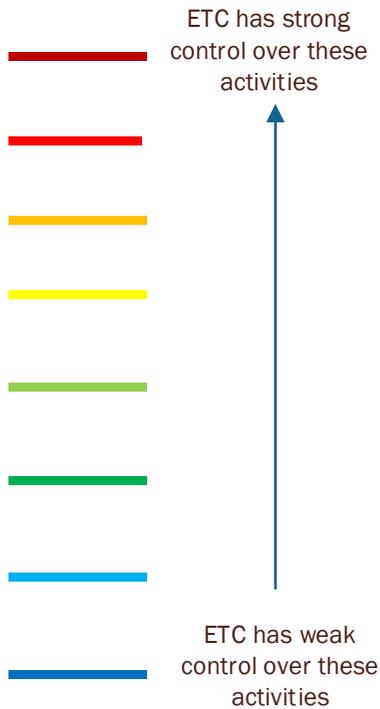


FIGURE 2
 GHG Emissions kgCO₂e from Exmouth Town Council's Activities over which it has control

Notes:

1 This is not an annual activity but has been included as part of 2019's GHG Emissions as illustration

2 This is the actual GHG emissions of the herbicide. The GHG emissions from change in land use sequestration for 5 litres of glyphosate could be as high as 7000kg

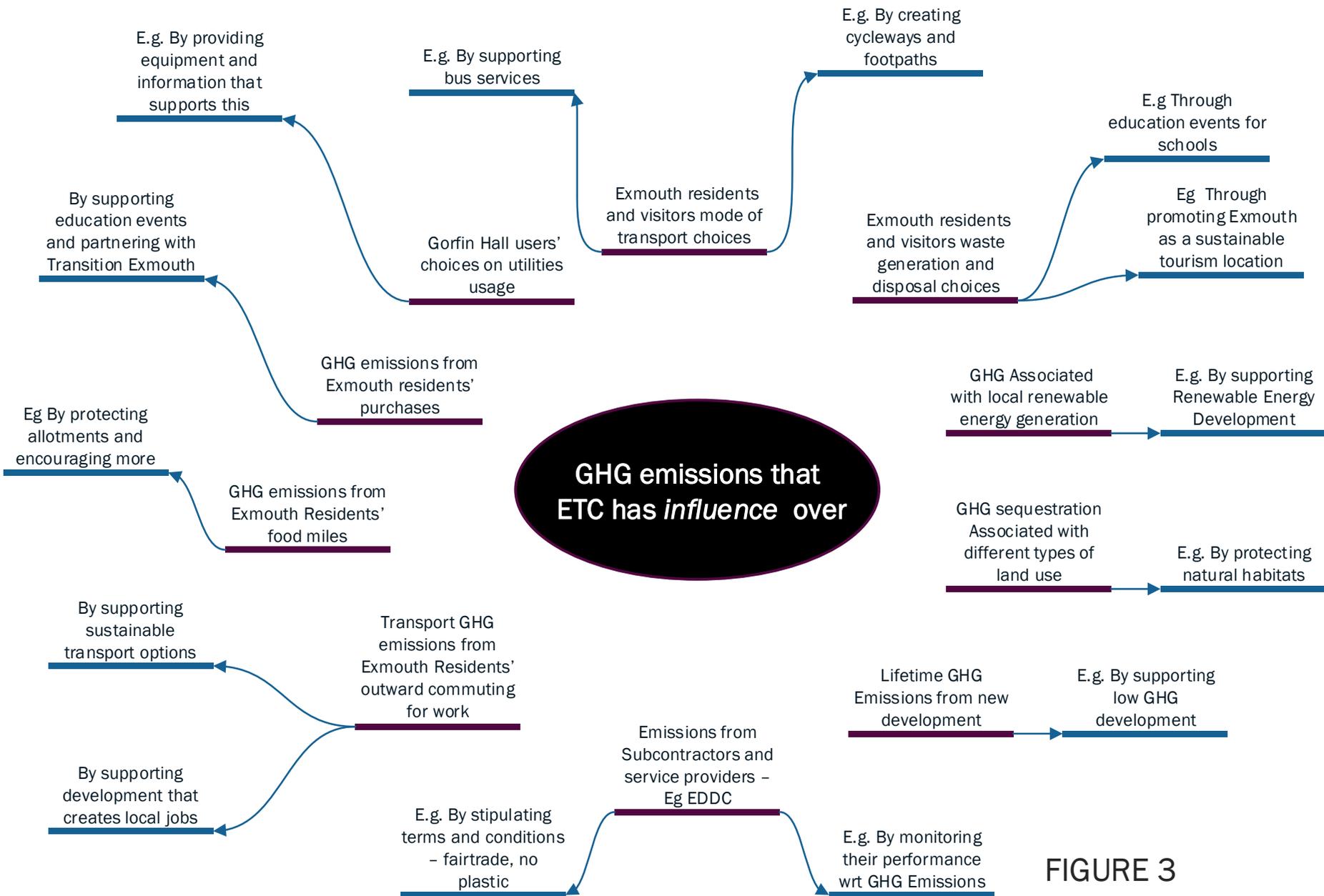


FIGURE 3
GHG Emissions over which it ETC has influence

Exmouth has a population of 34,400 (www.devon.gov.uk)

The Average consumption GHG emissions per capita in the UK are 8.46 tonnes of CO₂e per annum

This means that the population of Exmouth has total GHG emissions in the region of 291,024 tonnes CO₂ equivalent per year



If this large Grey box on this page represents 291,024 tonnes then the emissions of Exmouth Town Council are represented by the red box on the left (0.5% of the Exmouth Population Total)

There are ways that Exmouth Town Council can reduce their greenhouse gas emissions further and make this box even smaller. These opportunities should be taken where possible both for the goal of reducing ETC's GHG emissions and for demonstration and leading by example.

Bigger opportunities for GHG emission reduction lay with using the influence it has over the GHG emissions represented by the grey box. If Exmouth Town Council's activities lead to just a 1% reduction in the town of Exmouth's GHG emissions then there will have been a 25 fold return on its own carbon footprint.

Suggestions for Improvement

Exmouth Town Council's GHG Emissions within the scope of this study are 17 tonnes CO_{2e} per year. The scope of this study is wide and is broadly equivalent to what is called a 'consumption' carbon footprint i.e. it includes the GHG emissions of things it consumes such as paper and travel by public transport.

The 'consumption' GHG emissions per capita in the UK in 2017 were 8.46 tonnes CO_{2e} per year – it can be seen therefore that Exmouth Town Council's GHG emissions are approximately equivalent to 2 UK resident's GHG emissions from all sources for a year.

If Exmouth has a population of 34,400 this means that the average carbon footprint of Exmouth is 291,000.

It can be seen that Exmouth Town Council's Carbon Footprint is dwarfed by that of the population of Exmouth. This demonstrates the importance of Exmouth Town Council's work on energy, transport, waste, wild spaces, local food production etc on bringing down overall greenhouse gas emissions.

One scenario is to look at the environmental education day carried out by ETC last year with local schoolchildren. If we suppose that 10% of those children take the messages they learn home to their parents, siblings and grand-parents and this has a very small influence on behaviour. Even if this influence causes only a 1% reduction in the GHG emissions of Exmouth as a whole this is still 2,900 tonnesCO_{2e} per year – over 170 times the GHG emissions of ETC itself.

A crude measure of effectiveness of the work that ETC carry out in terms of GHG emissions could be the ratio of its own emissions to those of the population of Exmouth. A 'GHG bang per buck' ratio

GHG Emissions per capita of the general population have been falling year on year as methods of energy production and transport have become more efficient. This should give the spur to ETC to keep reducing its own GHG emissions to keep the GHG 'bang per buck' ratio down. The following are suggestions for what improvements could be made. We start with the largest emissions that ETC has most control over and work our way down.

Activity	Annual GHG Emissions kgCO ₂ e	Potential Saving	Comment Opportunity
<u>GHG from paper usage</u>	600	A target of 5-10% reduction per year should be achievable	ETC has already made great efforts with reduction of paper usage and is purchasing a certified sustainable brand (FSC). Keep working away at making reductions where possible – by better use of IT etc.
<u>GHG from fuel use at Festival</u>	500	Potential Saving 94 per year	Glastonbury has increased the amount of biofuel and renewables used to power the festival year on year. Biofuel may be a possibility for Exmouth Festival too: https://biofuels-news.com/news/glastonbury-festival-to-be-powered-by-biofuels-and-sunshine/
<u>GHG from printing</u>	100	The amount of printing carried out could be reduced annually by a similar target to paper usage. Say 5-10%	Better use of IT could allow less printing (NB this is not without its own GHG emissions)
<u>F-Gases in water cooler</u>	7	All 7kg per annum could be saved	Taking good care of the water ensuring it is not knocked or dropped and inspecting it regularly could mean that the cooler sees out its serviceable life without losing its refrigerant gas. Take note of what refrigerants are used when procuring cooling equipment and balance this with electrical efficiency.
<u>Embedded GHG from acquisition of vehicles</u>	2000	If the lifetime of the vehicle is increased by 10% then the annual emissions will fall by 10%	Savings can be made but information on which to base decisions can be hard to come by and the subject is complex. Embodied GHG emissions lower with each year or mile that is done by the vehicle so in general it makes sense to keep the vehicle for as long as it is reliable (unless it is doing very high mileage or has particularly poor fuel efficiency). Actions on this are as follows:

			<ol style="list-style-type: none"> 1) Servicing and Maintenance aimed at keeping the vehicle going for the maximum serviceable life. 2) Procurement of vehicles using a whole-life GHG emissions model. This can be difficult as the information to carry this assessment out can be hard to get hold of.
<u>GHG from fuel use of ETC vans</u>	4000	1-2% GHG emissions per mile much greater reductions for electric vehicles.	Better driving technique – eg gentle acceleration and deceleration with reduced braking can save up to 20% in Urban Conditions. Keeping tyres at the correct inflation can reduce emissions by 1% Driving in busy conditions can double GHG emissions. Depending on the vehicle, an electric vehicle will emit 20-60% fewer GHG emissions per mile than a petrol or diesel vehicle.
<u>GHG from flowers</u>	600	Target to understand this better first. In an Italian Study the highest GHG emissions from ornamental plant nurseries were 40% higher than the lowest	<p>In the Italian study the following factors were found to contribute the most to GHG emissions from the production of ornamental plants:</p> <ul style="list-style-type: none"> • Field grown plants had 20% of the GHG emissions of container grown plants grown in greenhouses. • Plastics accounted for 25-30% of GHG emissions – if plastics are used can these be reused? • Use of peat accounted for up to 50% of GHG emissions • Use of electricity accounts for 17-30% of GHG emissions • Use of fertiliser accounted for around 10% of GHG emissions
<u>Electricity Usage at Gorfin Hall</u>	3200	Installing Solar PV, changing lighting and going to a Renewable Only tariff could reduce this 100%	<p>ETC have had a quote for Solar PV panels rated at 5.36kW for the roof of Gorfin Hall. This estimates that 5611 kWh of electricity will be generated per year. The quotation also estimates that 80% of the generated electricity will be used at Gorfin Hall. This last figure is an overestimate as it has to be remembered that most electricity will be used for heating and lighting which is required at times of day and year when the generation from PV will be lower. If the electricity that is not used in Gorfin Hall can be put into the local grid then this will replace mains electricity elsewhere.</p> <p>The hall is lit by what appear to be T8 Fluorescent lights - LED lights will be 30% more efficient and, depending on the type chosen can last 5-10 times longer.</p>

			<p>Check that controls for lights and heaters are easy to use and that users of the hall are aware of their responsibilities for not overheating the space and for switching off lights when not required.</p> <p>The hall is heated by electric convector heaters which have the advantage of being easy to control and maintain. However they will be relatively high in terms of GHG emissions. Use of the heaters can be minimised by 1) ensuring drafts are controlled and 2) considering insulation options (bearing in mind that cavity wall insulation is probably not suitable.</p> <p>Electricity can be sourced that is matched to renewable production – see https://www.goodenergy.co.uk/business/ as an example of this.</p>
Employee Travel to Work	1400	First target should be understanding this better first.	<p>Carry out employee travel survey to ascertain more accurate figure for GHG emissions. The Covid 19 lockdown has given us a better idea of what can and can't be achieved working from home. Implementing these options also gives an organisation better resilience for extreme weather events and other such circumstances.</p>
Councillor travel associated GHG with ETC meetings	800	First target should be understanding this better first	<p>Carry out councillor travel survey to ascertain more accurate figures for GHG emissions. As above Covid-19 lockdown has given us a better idea of what is achievable remotely. Can meetings be scheduled to fit better with public transport and/or the opportunity to use the trip to carry out other functions such as shopping.</p>
Electricity Usage at Their offices in ETH	2700	First target should be understanding this better first	<p>Sub-metering of sections of ETH could be considered so that ETC's performance can be considered separately. I have worked the following two companies who specialise in energy metering and monitoring for about 15 years but others are available: Exwater Uk in Exeter https://exwateruk.com/ and C3 in Plymouth https://www.c3ntinel.com/</p> <p>Make sure equipment is switched off where it can be – during the walkaround of the offices it was noted that the microwave was left on – Most microwave ovens use more energy over their lifetime displaying the time (which is usually wrong! Than they do for cooking so switch off at the plug. The fridge was also left on in the meeting room – fridges will get down to temperature in about 30 minutes so it uses less energy to turn on only when required. Likewise the water cooler could be switched off at the weekend..</p>

<u>Water Usage at Gorfin Hall</u>	60	Avoiding leakage is a first priority. Reductions of 10-20% can be made if water efficient fittings not already fitted.	Automated metering and monitoring equipment can detect leakage almost instantaneously. See Exwater Uk in Exeter https://exwateruk.com/ C3 in Plymouth https://www.c3ntinel.com/ or others. Nearly all properties will see some leakage within a 20 year span and are usually undetected between meter readings (every 6 months). In that time a leak could have easily doubled or quadrupled annual water usage. The following technologies will save water – low volume flush and dual flush toilets (toilet flushing will account for the majority of water usage), compression taps, remote switching of stop tap (allows water to be switched off overnight and when hall not in use. Also better discipline of water usage by hall users.)
<u>Water Usage at ETH</u>	60		
<u>Car travel on behalf of ETC</u>	1300	Targets should be around how efficiently mileage can be covered or displaced rather than getting the absolute number down.	ETC could monitor how many miles that they displace annually by carrying out video-conferences/teleconferences/webinars etc. Car-sharing is already encouraged but this could be incentivised by paying the extra 5p that is allowable under HMRC rules. Where the employee's car is not efficient consider hiring more efficient vehicles. Where a journey has not been possible by public transport record the justification for travelling by car. Living in Devon it is sometimes not possible to travel easily by public transport and safety is a consideration here.
<u>Rail travel on behalf of ETC</u>	60	The first target is to get a more accurate figure for GHG emissions associated with train travel.	In general train travel has fewer GHG emissions than motor vehicles. This is partly based on the fact that the train will 'go anyway' whether you are on it or not. However, the arguments are not quite so clear if the choice is between a diesel train and an electric car carrying two people. ETC should develop a 'green travel policy' to inform decision-making on company travel..
<u>Gas for heating and DHW at offices in ETH</u>	3200	Targets should be set after understanding the options better.	See above remarks on Electricity Usage at ETH regarding sub-metering. ETC can ensure that they use any local controls such as Thermostats and Thermostatic Radiator Valves to avoid overheating the areas that they lease. Avoid opening windows where possible. Influence at a higher level could be brought to bear to encourage the landlord to maintain boilers to the highest levels of efficiency. New premises could be built that could reduce these GHG emissions by 80-90% but the embedded GHG emissions of constructing this would need to be considered

External printing of neighbourhood plan ¹	50	Targets could be set at on a kgCO _{2e} /kg of printed material basis	Work with printers to get more accuracy on what the actual GHG emissions are. Procurement of print services could consider GHG emissions.
GHG from herbicides ²	5	Little scope for reduction at present	Herbicides are used by ETC to kill weeds. The alternatives are to use machinery, more manpower or to cover the weeds – all options come with GHG emissions that might be higher. There is a wider issue regarding the fact that plants sequester carbon as they grow and when the plant dies this is generally stored in woody material and roots.
Waste disposal from ETC activities	10	A reduction of paper usage should see a reduction of waste – 5-10%	ETC should try to ascertain a more accurate figure for the GHG emissions associateA reduction of paper usage should see a corresponding reduction in waste.

Discussion

Exmouth Town Council should be justifiably proud of the work it has carried out so far in establishing policies and providing education aimed at reducing greenhouse gas emissions of its residents and visitors. ETC has clearly acted upon its own greenhouse gas emissions and has positive measures in place to reduce emissions.

However, improvements can be made and will need to be made by all organisations to attempt to reduce GHG emissions to levels where catastrophic climate change will not occur.

Exmouth Town Council has also taken the step of commissioning this report and putting a stake in the ground to quantify what its greenhouse gas emissions are. Seemingly this is a step taken by the more renowned environmentally minded district level councils but is a rare step for a smaller town council. This will allow Exmouth to take a 'measure to manage' approach to reducing GHG emissions allowing it to set priorities and get the most from investments.

Whilst Exmouth Town Council's GHG emissions are relatively small it has opportunities to influence a much larger set of emissions – ie those of its population, visitors and people employed in the town. Exmouth also has opportunities to influence beyond their local area as visitors may take the messages they learned on holiday home with them and also Exmouth has an opportunity to act as an exemplar to other town councils across the country.

Exmouth Town Council should use the findings of this report to:

- 1) Set a plan for how it will improve the accuracy of calculating its GHG emissions year on year.
- 2) Plan for how it might bring its influence to bear on wider GHG emissions of Exmouth Town.
- 3) Plan for how it will reduce its own emissions year on year.

Warning

It is important to note that certain goals of sustainability may not always be compatible with short term GHG emission reductions. An example of this from agriculture where, by some measures, a battery farmed chicken eggs have a lower carbon footprint than free range eggs. But this does not take into account the wider factors such as anti-biotic resistance due to use in livestock rearing or animal welfare. Sometimes the decisions will be easy to take and sometimes they won't. Whilst the numbers help with decision-making you have to make sure you understand the assumptions made and the boundaries drawn and consider other goals of sustainable development.

GLOSSARY

Carbon Footprint – Any one of a number of ways to account for the climate change impacts of an activity, product, individual or organisation.

Climate Change – In terms of this report indicates the changes to the global climate caused by increased heating of the Earth's atmosphere.

ETC – Exmouth Town Council

ETH – Exmouth Town Hall

GHG – Greenhouse Gas – A gas that will cause forced heating of the earth's atmosphere causing climate change and in terms of this report includes CO₂, CH₄, N₂O or R134a