FULCRUMCONSULTING

ELSENHAM ECO-TOWN

ECOLOGICAL FOOTPRINTING ANALYSIS

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TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

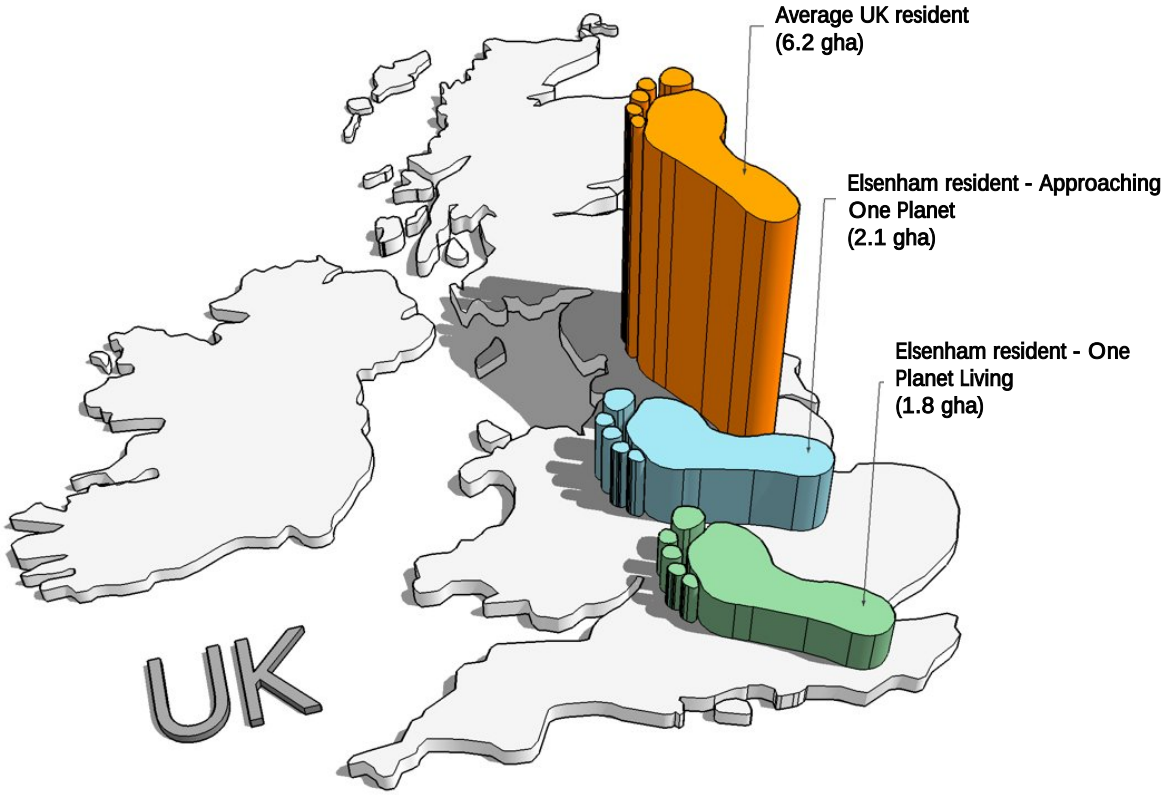
This report outlines the principles of Ecological Footprinting and provides a summary of ways in which Elsenham eco-town can enable a lifestyle of significantly reduced ecological impact.

The methodology which has been applied to measure eco-footprint is explained and referenced.

The analyses are reported as follows:

- A: Initial Analysis
- B: Approaching One Planet
- C: One Planet Living at Elsenham

The assumptions underlying each analysis are summarised, working towards a reduction from a 3 planet lifestyle with an ecological footprint of 6.19 global hectares per person, to a One Planet Living scenario with an ecological footprint of 1.8.



2 MEASURING SUSTAINABILITY

2.1 BACKGROUND

The concept of sustainable development as we understand it today has been around for the past thirty years, and the generally accepted definition as proposed by the Brundtland Report (1987) describes it as '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*.'

There are multiple opinions regarding the best way to measure sustainability. One widely referred to measurement indicator is 'carbon footprint', which is discussed further in section 1.4 below and the appendix to this report.

It is proposed that the 'Ecological Footprint', pioneered by Wackernagel and Rees (1996), is an appropriate methodology of assessing the overall sustainability of a development, and may be one of the best standardised methods available, as it considers the total resource use associated with the development built form and user behaviour lifestyle patterns within a defined built environment. There are some aspects such as air travel that cannot be captured directly within the built form, but for which reasoned assumptions can be made.

2.2 ECO-FOOTPRINTING

The ecological footprint (or eco-footprint) is a sustainability indicator expressing the relationship between society's consumption of natural resources and the natural environment. We place demands on the environment through the consumption of energy, materials, water and food, amongst others. The ecological footprint analysis equates the consumption of these natural resources and the Earth's ability to regenerate them.

Using 'area equivalence', Eco-footprinting aims to express how much of nature's 'interest' we are currently appropriating. It assesses the biologically productive land and marine areas required to produce the resources a population consumes, and to absorb the corresponding waste, using prevailing technology.

The ecological footprint analysis uses a common currency (global hectare); from it a broad range of impacts can be aggregated to derive ecological footprints for products, processes, individuals, organisation, regions and countries. It is a 'snapshot' measure and is based on a year-specific data. Figure 1 shows the area types that are commonly used to calculate an ecological footprint.

Figure 1. Area types (land and sea) used to calculate an ecological footprint[1]

Eco-footprinting is based on two key assumptions;

1. That we can reasonably measure the quantity of resources consumed and the wastes generated.
2. That we can quantify these resources and waste flows in terms of the biologically productive land required to produce these resources and absorb the wastes.

The footprint can be broken down into various components; the land required for energy and transport, built land, biodiversity land and bio-productive land and sea. It does not aim to capture all impacts, as not enough credible data is available, but only those which are the most significant.

The approach can be applied to assess the impact of consumption at the individual, local, regional and national level, as well as to a specific activity such as transport, where it is similar to lifecycle analysis.

2.3 USING ECO-FOOTPRINTING

Eco-footprinting is essentially a sustainability indicator and a useful tool for assessing the environmental impacts of a development and the environmental impacts of the individual residents who inhabit it.

The Code for Sustainable Homes is one of the most well known environmental assessment methods, but takes an entirely different approach to eco-footprinting. It is currently the predominant assessment methodology in England for assessing the environmental sustainability of a home in terms of performance in energy efficiency, water, materials, surface water run-off, waste, pollution, health and well-being, management and ecology. However it does not address transport or product consumption and can only capture some of the individual lifestyle impacts. It also does not provide an ultimate end point to sustainable design. Code Level 6 is the highest level of sustainability but this is not related to global sustainable levels of environmental impact.

[1] Source: http://www.steppingforward.org.uk/summ/fp.htm

In summary, the Code for Sustainable Homes is designed for a different purpose than ecological footprinting. For this reason, this methodology will not be adopted in this report.

Eco-footprinting, by adopting an equitable share of the earth's bio-productive land as the target for sustainable living, has the ability to provide this end point target.

Eco-footprinting is becoming a widely recognised procedure for measuring sustainability. It is being used by a growing number of government agencies, organisations and communities as a core indicator of sustainable resource use. It has been adopted by the European Commission as part of their European Common Indicators Project and is being considered by the UK Audit Commission as part of their Quality of Life Indicator Set.

2.4 ONE PLANET LIVING[2]

One Planet Living is a concept governing the principle of living within our means. If everyone lived as we do in the UK, we would need three planets to provide enough resources to meet our demands; this is unequivocally unsustainable. The 'One Planet Living' concept accepts the limitations of 'one planet' and encourages us all to live within our own means.

The concept of One Planet Living was developed by Bioregional and WWF.

To meet this criterion, everyone in the world is to have an equal share of the earth's resources, which currently equates to an eco-footprint of 1.8 global hectares (gha) per person [Bioregional Solutions – Living on One Planet, 2002]. This should be the ultimate aim of all development projects now and in the future.

These 1.8 global hectares do also include an allowance for other species other than our own. The World Commission on Environment and Development released in 1987 a report titled 'Our Common Future'. It recommends that at least 12% of the ecological capacity representing all ecosystem types should be preserved for biodiversity protection.

The eco-footprint of Elsenham eco-town has been calculated and compared to this figure of 1.8 hectares, in order to assess the extent to which it aligns with the ambitions of 'One Planet Living', as a standard for sustainability and ecological impact.

2.5 ECOLOGICAL FOOTPRINTING VERSUS CARBON ACCOUNTING

It is considered that eco-footprinting is an improved measure of sustainability in Elsenham compared to carbon-accounting when measuring individual lifestyle impacts, as it encompasses a broader range of impacts. Carbon-accounting gives a measure of the amount of carbon emitted, but without an agreed global defined limit on the world's carbon capacity this figure is not easily comparable to an end limit on what is sustainable. This can prove to be a particular limitation when trying to engage with the public. For example, information can be provided on how much carbon an individual emits annually, and how much it has increased in recent years, but without a clear and concrete limit, people may find the information intangible. More details regarding carbon footprinting analysis and considerations for Elsenham are included in the appendix to this report.

[2] Based on sectoral data assumptions from the Stockholm Environment Institute, University of YUork, John Bartlett.

> *"No tool for sustainability is complete and none will satisfy everyone. However, one thing is for certain – for all the political rhetoric these past three decades on the so-called 'environmental crisis', many global ecological trends continue to worsen. We need good sustainability indicators that capture the public's imagination."*
>
> *(Rees, 2000)* [3]

Eco-footprinting allows us to quantify our actions within specific limitations which represent an understanding of the earth's finite capacity. This has the potential to capture the public's imagination and is therefore deemed to be a more useful sustainability indicator.

3 WWF REPORT - 'COUNTING CONSUMPTION'

WWF's report 'Counting Consumption' (2006) attempted to improve our understanding of how *'the decisions we take every day affect the environment around us'*. It details the ecological footprint of each region in the UK, breaking down the information and suggesting improvements on a region by region basis.

3.1 THE EAST OF ENGLAND

The report finds that the per capita eco-footprint for the east of England is 5.64gha, which is above the national average of 5.36gha (Figure 2).

Figure 2-Regional Ecological Footprints (gha/cap)

The report breaks this footprint down into separate categories in order that the contribution from each category may be assessed (Figure 3).

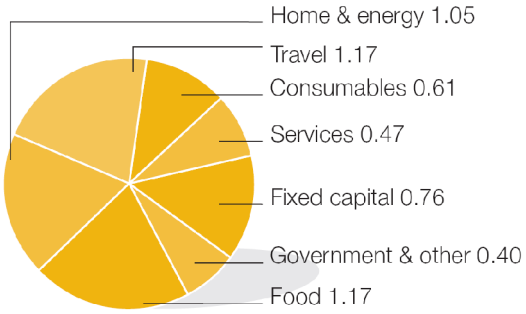


Figure 3- The East of England's Ecological Footprint (gha/cap)

These categories are specific to the particular study and focus on regional indicators and governance. These components cannot be replicated for Elsenham and are not detailed in the report. It is therefore difficult to imitate this analysis for

[3] Rees W (co-inventor of Ecological Footprints) 2000. Eco-footprint analysis: merits and brickbats

Elsenham, and it will not be possible to make direct comparisons between these values and Elsenham's figures. The report is, however, useful for a benchmark comparison of the current performance of the East of England against the rest of the UK, and highlighting a need for a 'sustainable design development' ethos.

4 A BASELINE ECO-FOOTPRINT FOR THE UK

4.1 ESTABLISHING A BASELINE

In order to analyse the effectiveness of the energy and resource saving schemes in Elsenham, it is useful to compare it against the average eco-footprint for the UK. The WWF report does not supply a methodology by which the information was calculated. Therefore it would be difficult to compare their results directly to the Elsenham calculations.

In order to gain a consensus as to the average eco-footprint for UK residents, several sources have been consulted. These include:

1. Bioregional Solutions - For Living on One Planet (Desai, Riddlestone-2002) at 6.19gha/person
2. South East England Regional Assembly - Findings of the Select Committee on Reducing the South East's Ecological Footprint (meeting chaired by Ian Chisnall -February 2008) at 5.43gha/person
3. Stabilizing the ecological footprint in the South East Plan: A Report To SEERA (Centre for Urban & Regional Ecology –July 2005) at 6.09gha/person

These reports all make use of slightly varying techniques for calculating the eco-footprint.

The technique which most usefully reflects the approach applied for Elsenham is the "Bioregional Solutions for Living on One Planet". The national average statistics provided in this study will therefore be used to compare Elsenham's eco-footprint.

4.2 BIOREGIONAL SOLUTIONS- LIVING ON ONE PLANET (DESAI, RIDDLESTONE - 2002)

The following analysis (from Bioregional Solutions, 2002) represents a typical UK lifestyle. The analysis is based on a four person household, where the inhabitant:

- Owns a car
- Holidays by plane every year
- Recycles 11% of their waste
- Eats out of season, highly packaged, imported food

T

he total eco-footprint is a summation of the following:

Category	Contributing eco-footprint (ha/cap/year)
Car mileage (10,000 kilometer per year)	0.90
Car Ownership (manufacture, maintenance, road infrastructure)	0.41
Public transport	0.00
Air Travel	0.30
Electricity and Gas (22,500 KWh per year)	0.45
Water (140 litres per person per day)	0.002
Domestic and waste	1.70
Office Footprint (energy and paper) (non-renewable energy and virgin paper)	0.80
Food (including transport but not packaging)	1.63
TOTAL	6.19

Table 1- Eco-footprint of different categories

This therefore suggests that an average UK eco-footprint could be 6.19 hectares per capita compared to a sustainable allowance of 1.8 gha. This equates to a broad comparison of 3 planets versus 1 planet.

It should be noted that the absence of public transport is a consequence of referencing to the 'Bioregional Solutions' typical UK lifestyle assumptions. Our analysis has grouped transport under a broader classification of travel and does factor in the use of public transport.

4.3 AREAS OF INFLUENCE

Most of the categories listed in section 4.2 have scope to incorporate a reduction for the associated eco-footprint for the proposed Elsenham Eco Town. The reduction is intended to be achieved through the use of cleaner energy, efficient use of resources, waste reduction, intelligent planning, local services and food supply, and more sustainable modes of transport.

It is assumed, however, that the eco-footprint due to air travel can not be directly affected by this scheme and will remain at the national average of 0.30 hectares per capita. In addition, it is assumed that the food consumption of an Elsenham resident will remain unchanged, but that the average distance travelled (or 'food miles') will be reduced due to local food initiatives being promoted.

The type of waste generated from a household is a product of its consumer purchases; it is not likely that the Elsenham Eco Town can directly influence their associated indirect purchases (i.e. plastic packaging). However, the proportion of these products that are reused and recycled *can* be influenced. A potential means to influence consumers behaviour could be achieved through the proposed Elsenham Co-Operative Ltd (ECL), which is explained further below.

5 ELSENHAM CO-OPERATIVE LTD. (ECL)

It is important to recognise that suitable education and training measures should be put in place to encourage the residents to engage, and to realise maximum potential benefits from the proposed sustainable infrastructure design and construction. Proper education and support for individual resident is proposed to promote lifestyle and behavioural changes , including effective use of sustainable design measures.

The proposed community management model under the Elsenham Co-operative Ltd. could provide support in achieving and monitoring the ecological impact, which could help reduce the Elsenham residents Ecological Footprint towards One Planet Living.

The company could provide services in the following categories:

- Multi-utility services
- Transport
- Health and Children
- Enterprise
- Green Ring

6 ECO-FOOTPRINT ANALYSIS OF ELSENHAM

6.1 METHODOLOGY

In order to determine Elsenham's eco-footprint, a person's individual lifestyle impact was divided into the following six categories:

- Energy
- Travel
- Water
- Food
- Waste
- Employment

The individual contribution of each category to the eco-footprint was then estimated and summated to form Elsenham Eco Town's predicted eco-footprint.

The eco-footprints are calculated using the Wackernagel and Rees methodology in which contributing variables are multiplied by a standard factor describing the resources used within each process and their corresponding global hectares. The factors vary for each category and are based on 'Sharing Nature's Interest' Chambers, Simmons and Wackernagel, 2004. This gives the number of global hectares required for that category per person based on their yearly requirements.

This broad-brush approach allows a reasonable estimate to be made with fairly limited information. The results of this analysis are then used to compare Elsenham's eco-footprint to national averages (as outlined by Bioregional Solutions – For Living on One Planet) as well as the requirements of the 'One Planet Living' concept.

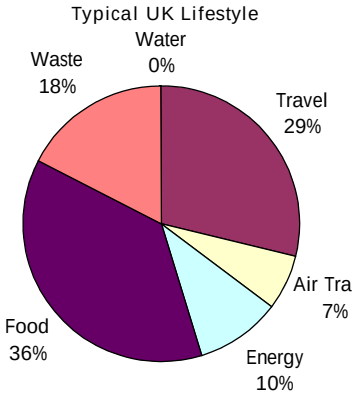
6.2 ANALYSES UNDERTAKEN

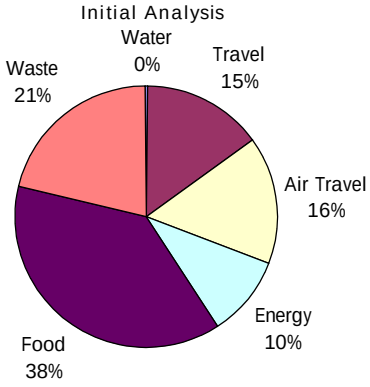
The eventual eco-footprint prediction for Elsenham will depend on the onerousness of the assumptions made in analysis. In order to accommodate this, three analyses have been undertaken; each with more demanding assumptions than the last, with the ultimate aim of achieving a footprint of 1.8gha/person.

The three analyses are described as follows:

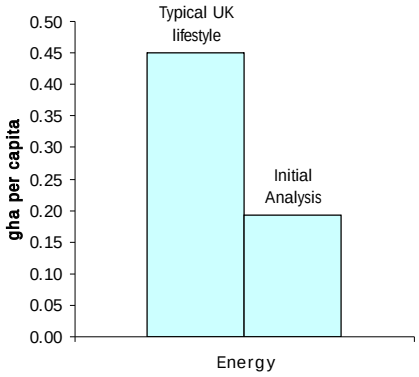
- A: Initial Analysis
- B: Approaching One Planet
- C: One Planet Living at Elsenham

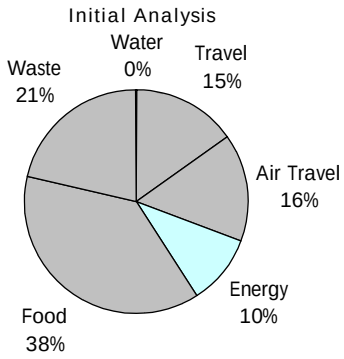
6.3 A: INITIAL ANALYSIS





6.3.1 Energy





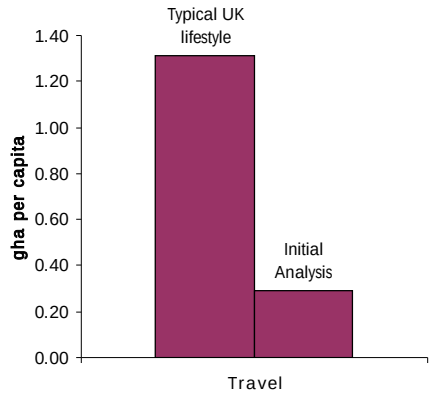
For the energy analysis, industry benchmarks describing good practice energy use for domestic and non-domestic buildings were used to estimate the amount of energy that may be required to service the town annually. These benchmarks reflect the energy efficiency measures likely to be provided within the buildings in line with government standards.

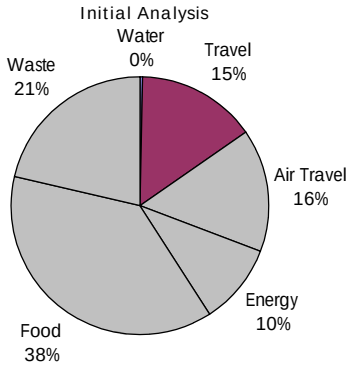
For analysis, the energy strategy was based on the approach in providing a 'Patchwork of Energy Systems'. This was considered by using a mix of renewable energy sources such as a proportion of heat and electricity from biomass crops,

hot water from solar thermal installations, cooling from ground coupled systems and electricity from PV. This is reflected in the global hectare factor.

The key result was that the ecological footprint due to energy demand was 0.19 hectares per capita. This compares to the national average of 0.45 hectares per capita, constituting a 57% reduction.

6.3.2 Travel

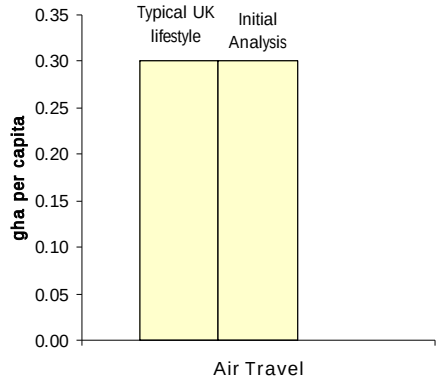


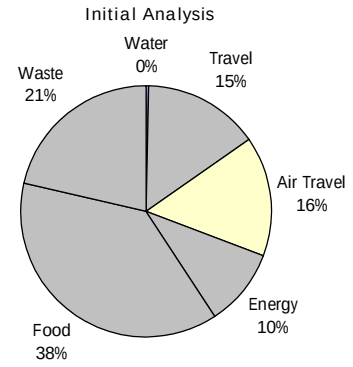


For the travel analysis, 80% of Elsenham's population was assumed to be of working age, of which is was assumed that 50% would find employment within the town[4]. Of this 50%, it was assumed that 80% would walk or cycle to their place of work and 20% of people would get the bus (with an average journey length of 0.8km).

Of the people travelling outside Elsenham for work (i.e. the remaining 50% of the working age population), it was assumed that 30% would travel by public transport with an average journey distance of 16km – the likely distance to surrounding employment nodes, and that the remaining 70% would travel by a private means of transport (with an average journey distance of 18km). A final factor of 1.6 was applied in order to account for non work-related travel.

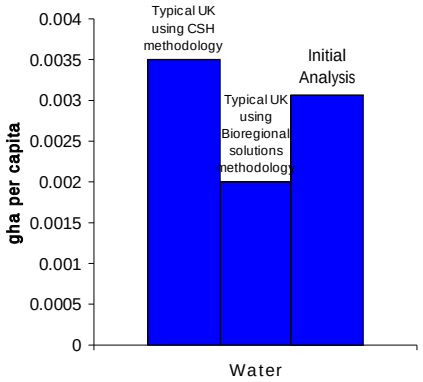
They key result was that the ecological footprint due to day-to-day travel is estimated at 0.29 hectares per capita; a 78% reduction on the national average. It was assumed that the eco-footprint due to air travel would not vary from the national average (as stated in section 4.3).

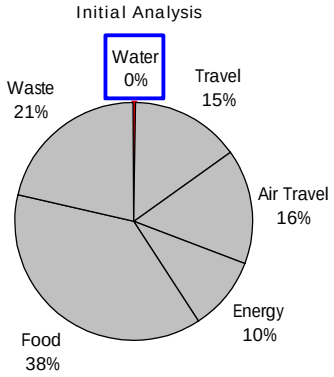




[4] From "Elsenham- A Strategic Master Plan", David Lock Associates, January 2008, page 33

6.3.3 Water



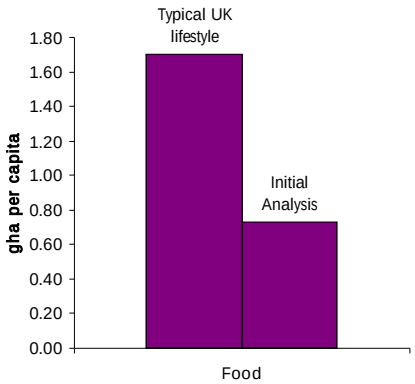


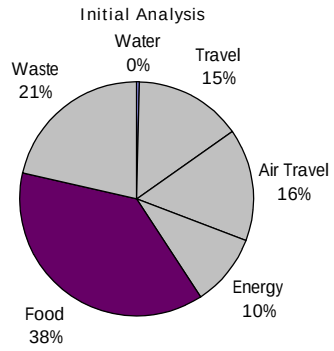
For the water analysis it was assumed that 100% of dwellings would conform to Code Level 4; the minimum compliance level for Eco-towns. Typical sanitary fitting specifications for Code Levels 4 were entered into the Code Water Calculator to determine the levels of mains water and rainwater use. As the Code for Sustainable Homes will be the methodology under which all housing in Eco-towns is assessed, it provides a robust basis for the assumptions.

The resulting eco-footprint for water is 0.003 hectares per capita. This constitutes an increase from the national average of 0.002 hectares per capita, as defined by "Bioregional Solutions for Living on One Planet". However, this 0.001 gha increase comes from the above mentioned discrepancy in methodological considerations between the two data sets (including variations in inputs). If the typical eco-footprint due to water of a UK resident is calculated by our methodology, assuming 100% mains water supply, the per capita eco-footprint would be 0.0035gha; this figure has been reduced by 14% to the final result of 0.003 gha.

It is also useful to note that the proportion that the water use adds to the eco-footprint is fairly negligible, so this discrepancy does not have a substantial influence on the final eco-footprint.

6.3.4 Food





For the food analysis it was assumed that the food requirement for the town would comply with the amount specified in the DEFRA national food survey in 2000,

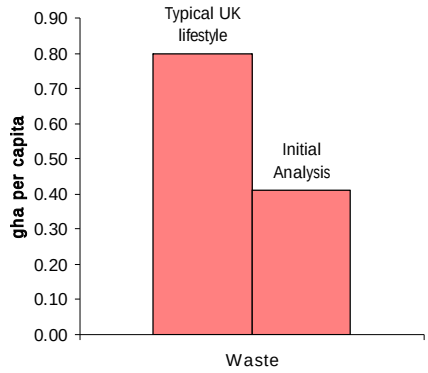
which was approximately 5.9kg/person/week of a mix of dairy, meat, fish, vegetables, fruits and grains.

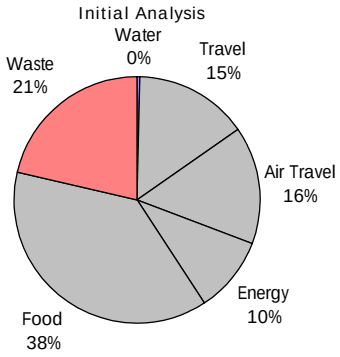
It has been established from discussions that approximately 47ha of arable food production land will be reserved to provide food to the community of Elsenham. An average 'productivity yield' – 7tonnes of food crops per ha – is applied to the area (Defra, Economic Reports: Agriculture and Food, 2007). This could provide approximately 333 tonnes of vegetables per year. The actual amount of hectares required to provide for this diet does not vary between Elsenham or the rest of the UK. However, the distance the food travels will have an impact.

It was assumed that the average distance travelled by imported and UK sourced food was 1500km (e.g. from Europe and the Mediterranean) and 50km respectively[5]. The amount of food grown on site was calculated at a rate of 7 tonnes per hectare per year[6]. This 'on-site' food was assumed to replace a proportion of the imported food.

The resulting eco-footprint for food is 0.93 hectares per capita; a 43% reduction on the national average.

6.3.5 Waste





The average waste production within the East of England area is approximately 23.8kg/household/week. This would amount to approximately 6,200 tonnes of waste per year for the Elsenham Eco Town.

In order to calculate the eco-footprint due to waste it was assumed that a high proportion of the waste would be recycled via a credible source separation scheme, which would reduce the amount of resources wasted.

The amount of waste was estimated using the DEFRA waste statistics from 2002-2003, which provides the pie chart in Figure 4:

[5] Food miles Report for Harlow: http://www.harlow.gov.uk/about_the_council/council_services/environment/enviromental_health/energy_efficiency/food_miles_facts.aspx, last viewed 24/06/08

[6] http://statistics.defra.gov.uk/esg/evaluation/ofs/annexb.pdf, last viewed 24/06/08

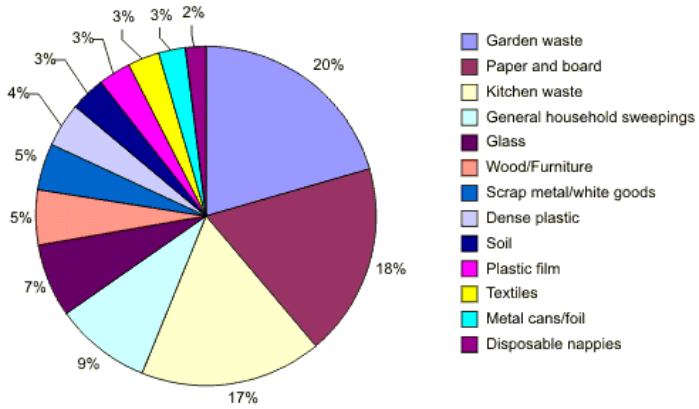


Figure 4- DEFRA Waste Pie Chart

These categories were then placed into broader categories as follows:

Waste type	% Composition
Non-recyclable waste	13
Waste paper	26
Waste glass	7
Waste aluminium/cans	8
Waste plastic	7
Compost	39

Table 2- Broader Categories of Waste

The eco-footprint for each category was then calculated and summated to form the total eco-footprint for waste. This resulted in an eco-footprint of 0.56 hectares per capita; a 57% reduction on the national average.

6.3.6 Employment

When modelling the eco-footprint of the employment areas (specific employment types are not identified at this point and therefore a basic 'employment' type is included), it was assumed that the energy part of the footprint (0.16 ha/cap[7]) would be reduced by the same proportion as the total energy (as calculated in 6.3.1). The paper usage was assumed to be reduced by 50%. This would be seeking to become a 'closed-loop employment paper scheme'.

The resulting eco-footprint from employment is 0.57 hectares per capita; a 50% reduction from the national average.

6.3.7 Summary of Initial Analysis results

This procedure has estimated that, under the initial analysis assumptions, the average eco-footprint of a resident of Elsenham Eco Town would be approximately 2.86 global hectares per person. This figure compares to the national average of 6.19 hectares, constituting a 54% reduction and reduction from a 3 planet lifestyle to around a 1.5 planet lifestyle.

Under the initial analysis assumptions, it is considered that the Elsenham Eco Town Masterplan would provide a significant improvement on the global effect of the resource use of a typical Elsenham, or UK Resident.

[7] Desai,P,Riddlestone,S,"Bioregional Solutions For Living On One Planet" GreenBooks,Devon(2002)

Based on the assumptions detailed earlier, it is predicted that most categories contribute to the reduction of Elsenham's eco-footprint. Figure 5 compares Elsenham's eco-footprint to the national average for each category.

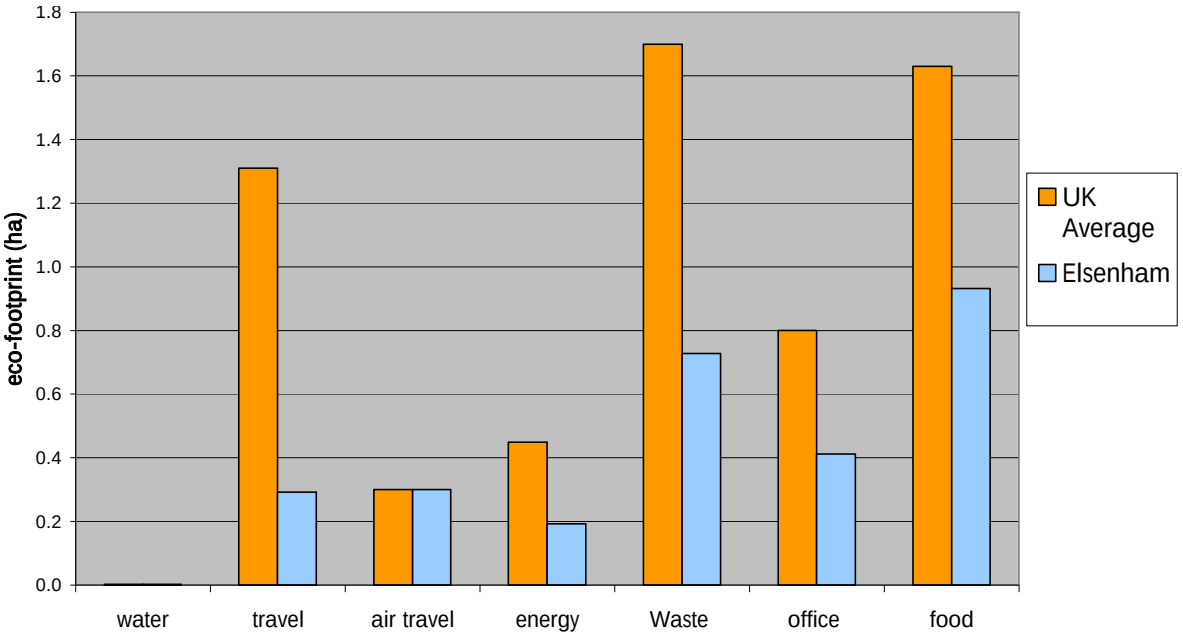


Figure 5- Reduction in Eco-Footprint per Category

Figure 6 gives the proportions that each section is predicted to contribute to the total eco-footprint for Elsenham.

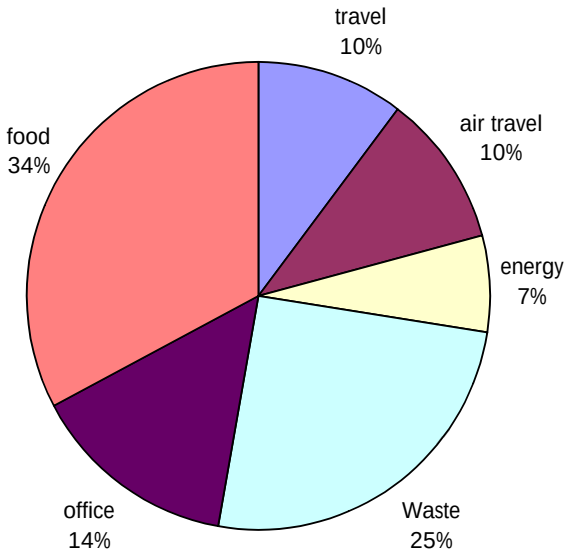
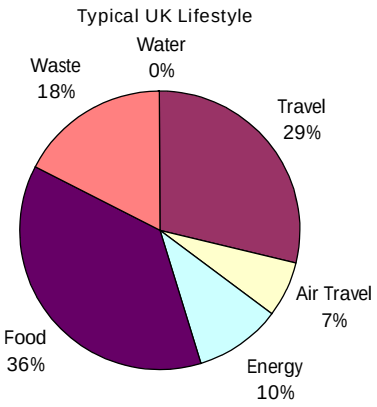


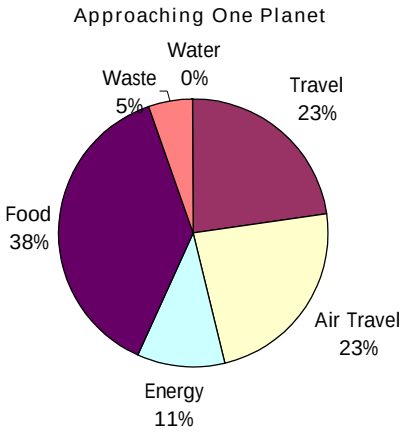
Figure 6- Proportion of Categories

From this we can see that the key contributing factors are waste and food which together constitute 59% of the total eco-footprint. This is due to intentions to achieve high levels of recycling and local food production. However, even the reduced figures are higher than other components and when considering further reductions to the eco-footprint these areas are still focus areas to target.

The eco-footprint for Elsenham, due to these initial analysis reductions, represents a 40,000 hectare reduction in the total land required to support Elsenham. This is equivalent to an area approximately four times the size of Greater London.

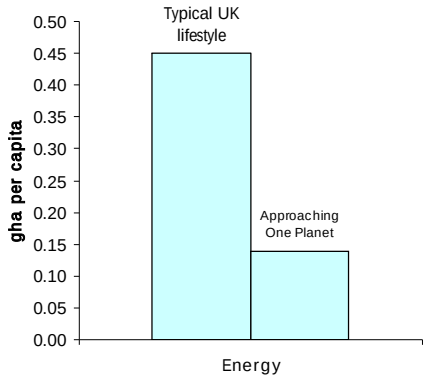
6.4 B: APPROACHING 'ONE PLANET'

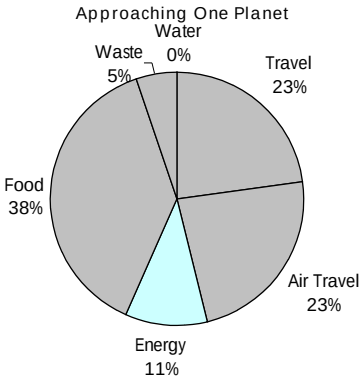




Further measures could be taken to reduce the eco-footprint of Elsenham eco-town, however, these assumptions would be more onerous and target both the proposed services and behavioural change. The assumptions made in assessing further reductions are detailed below:

6.4.1 Energy

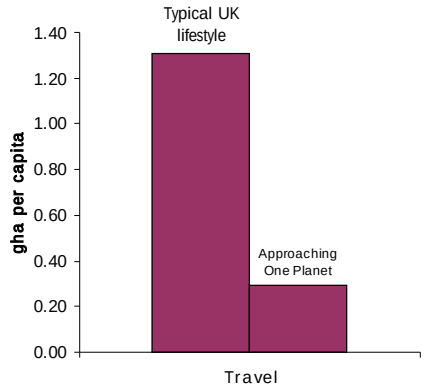


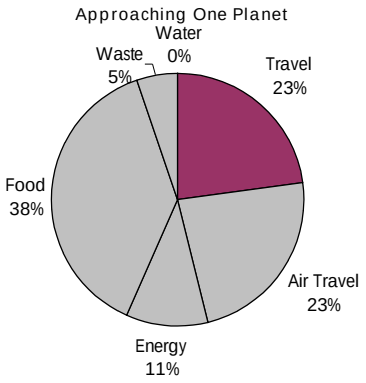


For energy supply, the eco-footprint could be reduced by supplying electricity by wind power (either on-site or off-site) rather than bio-mass. If it is assumed that electricity is supplied entirely by wind power, the eco-footprint for energy is reduced to 0.14 gha/cap. This represents a further 0.054 gha reduction in eco-footprint per capita.

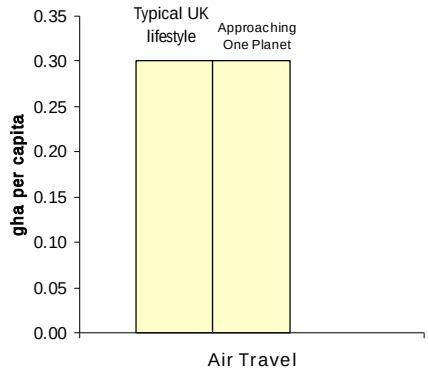
Sub-Classifications of biomass and limits to the eco-footprinting methodology for modelling biomass are such that biomass may be unfairly penalised in analysis. More detailed analysis as to the impact of different biomass fuel types would be recommend as design development progresses.

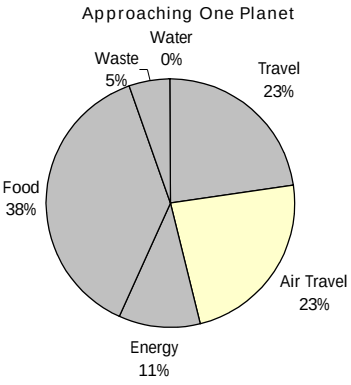
6.4.2 Travel



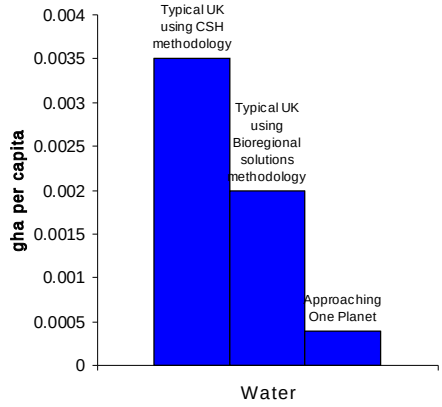


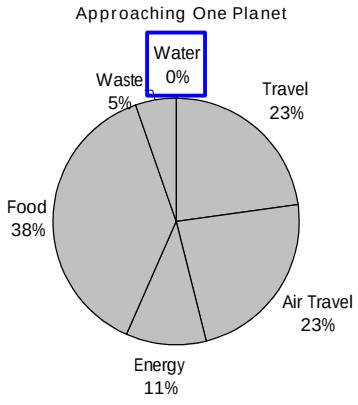
The travel footprint has been assumed to be the same as in the initial analysis, remaining at 0.29 gha per capita. However, due to improvements assumed in other areas, the percentage of travel footprint per capita has risen from 15% to 23%.





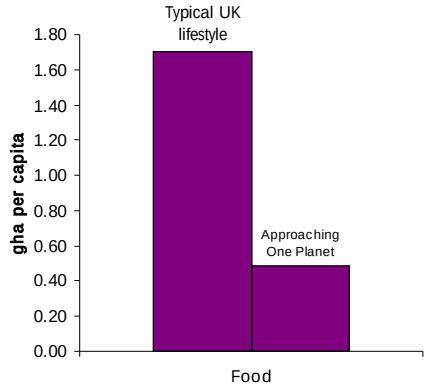
6.4.3 Water

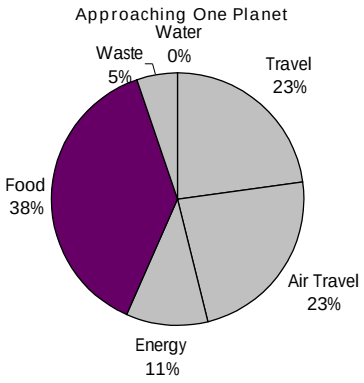




In order to improve the water footprint, a Code Level 6 water supply could be implemented to all houses in Elsenham. This would result in a water footprint of 0.00039 gha/cap; this is a huge reduction and the footprint is considered to be negligible.

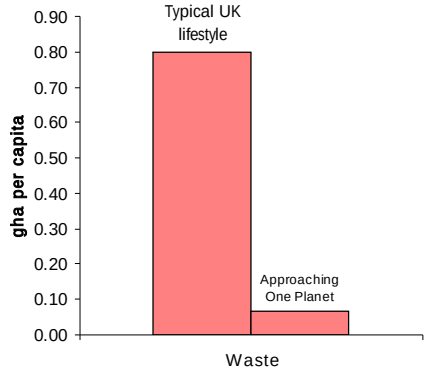
6.4.4 Food

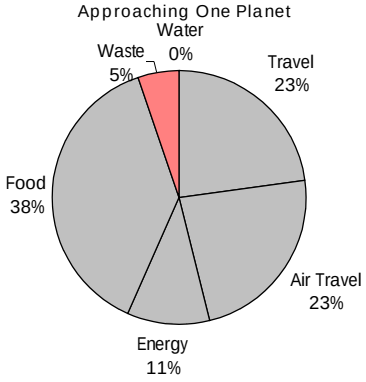




In order to reduce the impact of food, it is necessary to reduce the amount of imported food. If it is assumed that the imports are reduced to 40 % of total food consumption, then the resulting eco-footprint is 0.89 gha/cap.

6.4.5 Waste





In order to model how the eco-footprint of waste can be reduced, it was assumed that the consumption of all materials is reduced by 20% (rather than assuming people would recycle more). This could occur through the education of inhabitants about how to use products and engage in sustainable purchasing. This results in an eco-footprint for waste of 0.62 gha/cap.

6.4.6 Employment

For employment reductions it is assumed that paper use can be reduced by 75% by encouraging electronic storage systems, and that electricity is supplied by wind power. This results in an eco-footprint of 0.069 gha/cap, which compares to 0.41gha/cap on the previous set of assumptions.

6.4.7 Summary of Approaching One Planet Results

If the above assumptions are made, the total eco-footprint per person for the Elsenham Eco Town could be reduced to approximately 2.1 global hectares per person; constituting around a 65% reduction on the national average and reduction from a 3 planet lifestyle to around a 1.2 planet lifestyle.

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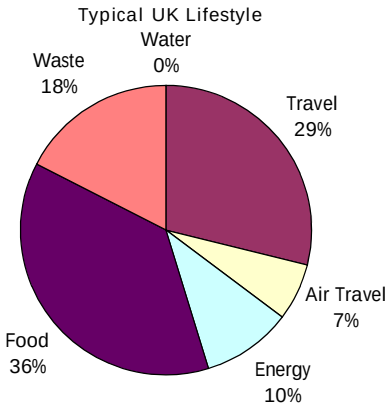
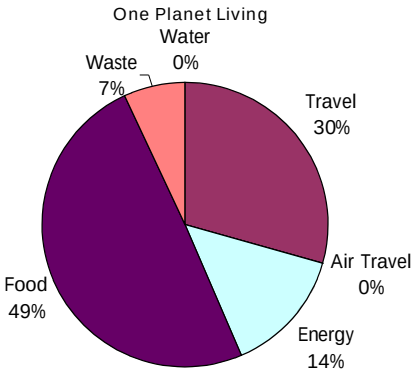
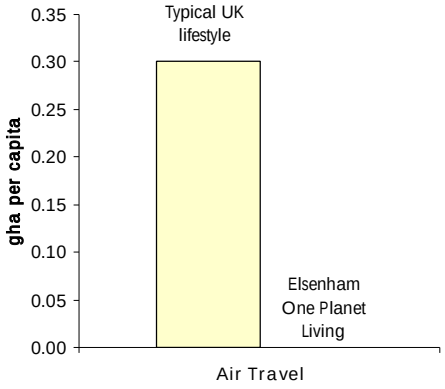
7 C: ONE PLANET LIVING







In order to fully achieve a 'One planet Living' eco-footprint of 1.8 global hectares per person one further reduction is applied. This relates to air travel.

Previous assumptions in this report concluded that it would not be possible to reduce the amount an Elsenham inhabitant travelled by air, which constitutes 10% of the total eco-footprint. However it may be viable to assume that an Elsenham inhabitant, who has made a conscious decision to live in an Eco Town and is constantly reminded of sustainable lifestyle choices, will not chose to holiday abroad. Applying the assumption that an Elsenham resident would not travel by air, and including all previous assumption in the Approaching One Planet analysis, One Planet Living may be achieved.

This would reduce the eco-footprint due to travel by 0.3 gha per person, constituting a total transport footprint of 0.29 gha per person. As a consequence of this, the total eco-footprint for an Elsenham resident is predicted to be reduced to the required 1.8gha/person for One Planet Living.

7.1 SUMMARY OF RESULTS

Figure 7 shows a comparison between the footprints derived from analysis two and three:

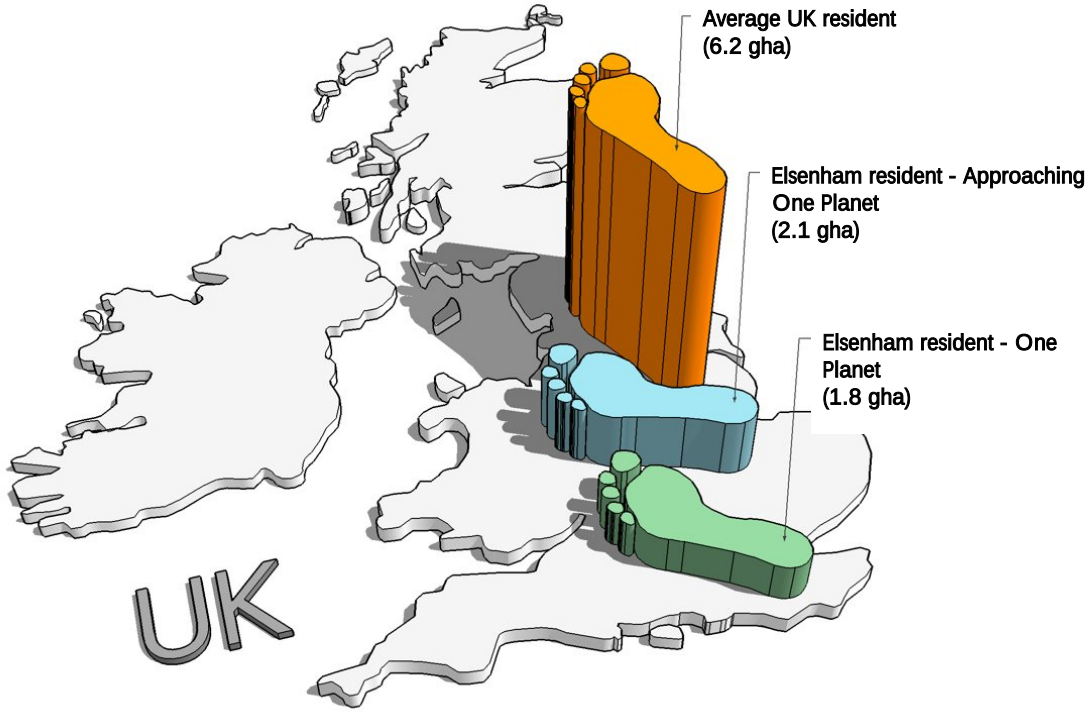


Figure 7- footprint comparison

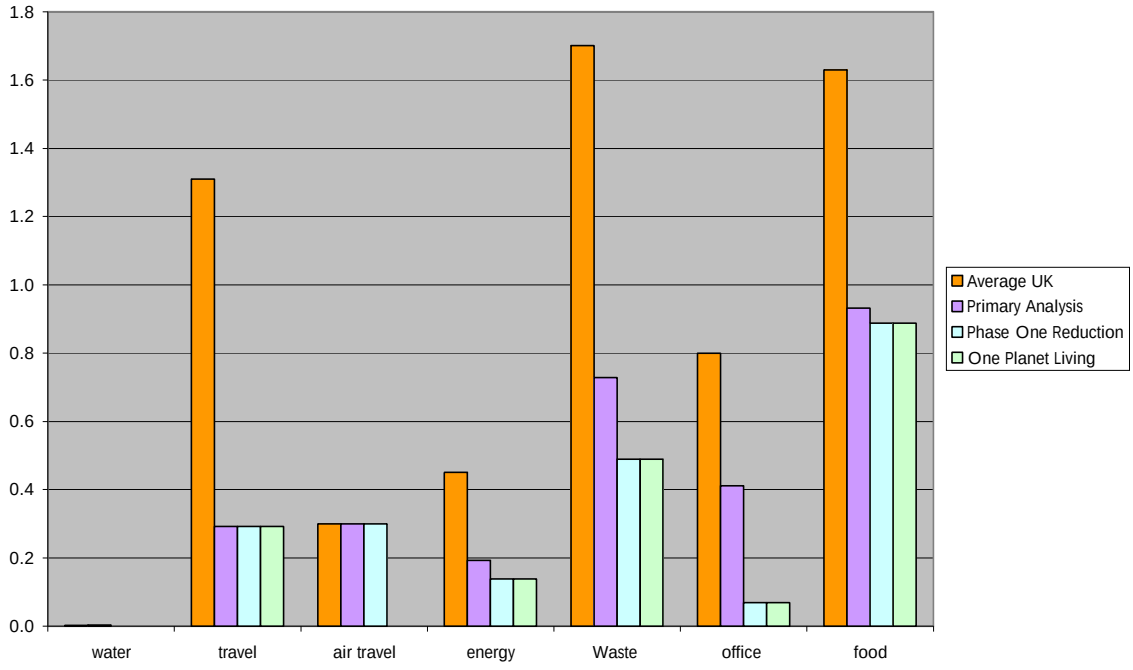


Figure 8- ComparisonBreakdown in the Reduction of Different Categorys

From these figures it is clear that the reduction achieved in the Primary Analysis constitutes the largest part of the reduction to 'One Planet Living' from a baseline of average UK figures.

8 CONCLUSION

There is the potential for the systems and processes described in the above sections to be designed into the Elsenham Eco-town development to enable a high level of sustainable living. There will, however, need to be a certain degree of behavioural change amongst residents to ensure that the systems and processes are used as designed both now and in the future, and to maximum environmental benefit.

This report has summarised the ecological footprint calculations that have been made for Elsenham Eco Town, as described in the current Masterplan ,supporting reports and their methodology and datasheets. The calculations have been based upon broad, but realistic assumptions that are clearly specified throughout the report.

The key conclusion was that Elsenham's projected per-capita eco footprint could be reduced significantly toward One Planet Living. The initial analysis figure of 2.86gha is highly exemplary but further reductions may be possible. Further recommendations have been made which would enable the eco-footprint of Elsenham to be brought in line with the target of One Planet Living.

Ecological footprints for UK lifestyle in hectares per person based on a 4 person household	**Water**	**Travel**	**Air Travel**	**Energy**	**Food**	**Waste**	**Employment**	**Overall Eco Footprint**	**Planets**
Typical UK lifestyle	0.0020	1.31	0.30	0.45	1.70	0.80	1.63	6.19	3.4
Elsenham with conventional lifestyle	0.0031	0.29	0.30	0.19	0.73	0.41	0.93	2.86	1.6
percent reduction	35%	78%	0%	57%	57%	49%	43%	54%	
Elsenham idealised	0.0004	0.29	0.30	0.14	0.49	0.07	0.89	2.18	1.2
percent reduction	80%	78%	0%	69%	71%	91%	46%	65%	
Elsenham One Planet Living	0.0004	0.29	0.00	0.14	0.49	0.07	0.89	1.88	1.0
percent reduction	80%	78%	100%	69%	71%	91%	46%	70%	
Global average								2.4	1.3
Global available								1.8	1.0

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Schedule of Revisions

Issue	Date	Remarks	Prepared by	Checked by
A	30th June 2008	Preliminary – For information and comment	Ellie Cosgrave	Ian Hamilton David Altabev
B	15th August 2008	Final Draft for Comment	Ellie Cosgrave	Ian Hamilton Chani Leahong
C	29th August 2008	Final Draft	Ellie Cosgrave Angel Bobes Arias	Chani Leahong
D	17th February 2009	For Publication	Ian Hamilton	Clare Wildfire