

“A Basingstoke that consumes all the waste it creates and generates all the energy it needs”

An initial contribution to Basingstoke Local Plan Revision

Basingstoke Transition Network, May 2020



Martin Heath

Basingstoke Transition Network

“Basingstoke will generate all the energy it needs, and consume all the waste it creates, before 2050¹.”

The science is clear – our climate is warming, and with potentially catastrophic results.

The IPCC², in its special report of October 2018 on the impacts of global warming of 1.5°C and above, was clear:

“The report finds that limiting global warming to 1.5°C would require “rapid and far-reaching” transitions in land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide (CO₂) would need to fall by about 45 percent from 2010 levels by 2030, reaching ‘net zero’ around 2050. This means that any remaining emissions would need to be balanced by removing CO₂ from the air.”

It further states that:

“Strengthening the capacities for climate action of national and sub-national authorities, civil society, the private sector, indigenous peoples and local communities can support the implementation of ambitious actions implied by limiting global warming to 1.5°C”.

The UK Government was the first in the world to set a legally-binding target of achieving net zero by 2050. This requires that, by that date, the UK emits in total no climate-changing gases.

Basingstoke is not immune from the far-reaching impacts that climate change will, if unmitigated, have on our borough, its business and its inhabitants.

The Basingstoke and Deane Borough Council (B&DBC) Horizon 2050³ vision makes it clear that the citizens of Basingstoke value highly their environment, clean air and clean water. This vision states that:

“Basingstoke will generate all the energy it needs and consume all the waste it creates before 2050.”

B&DBC fully recognises the challenge we all face and has gone a step further than our national government. In July 2019, the full Council unanimously agreed that a climate emergency should be declared.

The motion put to, and agreed by, Council was explicit. It stated:

This Council resolves to:

1. Declare a ‘Climate Emergency’;
2. Make Basingstoke and Deane Borough Council operations carbon-neutral by Dec 2022, by ensuring that 100% of its heating and electrical needs are met from renewable sources and by ceasing the purchase and/or lease of any vehicle that is not low-carbon;

¹ Horizon 2050 – A vision for Basingstoke and Deane <https://www.basingstoke.gov.uk/horizon2050>

² Intergovernmental Panel on Climate Change

³ Horizon 2050 – A vision for Basingstoke and Deane <https://www.basingstoke.gov.uk/horizon2050>.

3. Work towards making Basingstoke & Deane net zero carbon by 2030, ahead of the current 2050 target, ensuring that reducing carbon emissions is embedded in all relevant Council decision-making;
4. Develop carbon-reduction pathways, and climate-compliant strategies and plans, working with the County Council, LEP and other partners in both the public and private sector to prioritise all opportunities to introduce such zero-carbon and sustainable policies, action plans and targets;
5. Undertake a Local Plan review where the Borough proposes policies for adoption in all areas that will drive zero-carbon and sustainable development in Basingstoke & Deane;
6. Ensure **local people**⁴ are able to contribute to the formulation and scrutiny of the strategic actions needed to address the environment and climate emergency by consulting on proposals and by organising an annual 'Tackling the Environment and Climate Emergency' meeting, hosted by the CEP Committee, in addition to the wide range of existing opportunities for local people to make representations to the Council.

The Cabinet, in its meeting of September 10th 2019, fully endorsed the motion and declared a climate emergency. The Cabinet also made the following comments⁵.

Cabinet supported the climate emergency declaration and made a number of comments during the discussion which included:

- *It was important to recognise the influence and role the council can play in not only those areas the council has responsibility for, but in working with partners within the borough to make a difference.*
- *Environmentally-friendly living should be at the forefront of new homes built on Manydown. New homes should be greener and more environmentally-friendly, and should use less resources such as water and electricity, and generate fewer carbon emissions. The Manydown Standard should ensure the new Manydown development will be an example to developers of one of the greenest, most energy-efficient, low-carbon communities in the borough.*
- *The council needs to work with house builders, housing associations and developers in the borough to build sustainable homes fit for the future with adequate insulation, sustainable energy sources and electric charging points.*

The Council has made it clear that it wants to work with local partners in developing a robust response to the climate emergency, and it sees a revised Local Plan as a key process in developing that response. The Council also has a statutory duty under the Planning and Compulsory Purchase Act 2004 which requires that local plans include policies “designed to secure” that the development and use of land contributes to the mitigation of, and adaptation to, climate change.

Basingstoke Transition Network (BTN) has been active for many years in building awareness of the dangers of climate change and campaigning for such a response to be developed and actioned. It consists of a group of local volunteers that have a common interest in making Basingstoke & Deane a more sustainable place in which to live and work. Its members include people from many walks of life with a diverse and deep range of skills and expertise.

⁴ Our emphasis

⁵ See Cabinet meeting minutes 26/19.

By law, local plans must include “robust evidence-based carbon targets”. This document is BTN’s initial contribution to the revised Local Planning process and should be seen as part of the evidence base that can be used to set such targets.

It includes:

- An outline of where Basingstoke is in terms of climate change, ecosystems services and biodiversity.
- How its energy use, waste management, land use, farming methods and food consumption produce the greenhouse gases that are causing the climate emergency and weaken the ecosystem services and biodiversity that will help mitigate climate change, and
- A manifesto of how we might move from where we are today to a zero-carbon future.

It provides a baseline of where we are. We now need to work together to set targets and to develop a plan to get us to where we want to be.

This is very much our initial contribution and we are happy to work in partnership with Basingstoke & Deane Council, and other partners, in developing (and implementing) the plans that see us move from a borough that emits 1,400,000 tonnes of greenhouse gases in 2017 to one that emits none by 2030.

Energy is vital to our modern life, but most is produced from burning fossil fuels.

Energy is fundamental to our economy and society. We need it to move our goods and services and ourselves, we need to heat and cool our homes and buildings and we need it to power our electrical machines. However, the vast majority of the energy we use comes from burning fossil fuels (coal, oil and gas). Burning these fuels creates greenhouse gases such as Carbon Dioxide and Nitrous Oxide.

In addition, our industrial and agricultural processes generate yet more Carbon Dioxide and Nitrous Oxide and even more potent greenhouse gases such as Methane and Hydrofluorocarbons (HFC).

The people and businesses of Basingstoke and Deane are directly responsible for the emission of 1,400,000 tonnes of these greenhouse gases into our atmosphere each year.

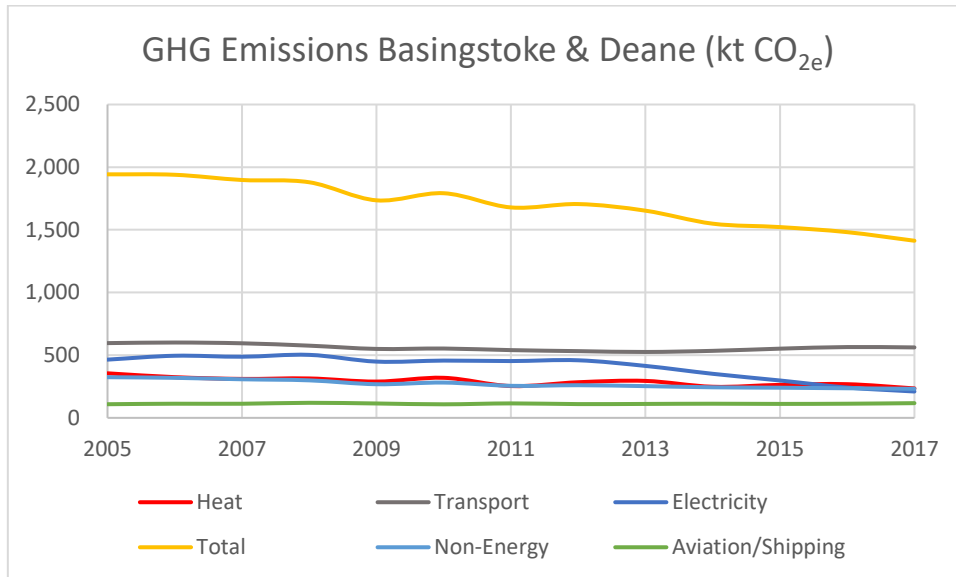
In our borough 80%⁶ of our emissions comes from burning fossil fuels (coal, oil and gas) to generate the energy we need. The rest comes from land use, air conditioning, agriculture and how we manage our waste.

Of the 80% that comes from fossil fuels approximately 48% is from transport, 17% from heating our buildings and the remaining 15% from generating the electricity we all use.

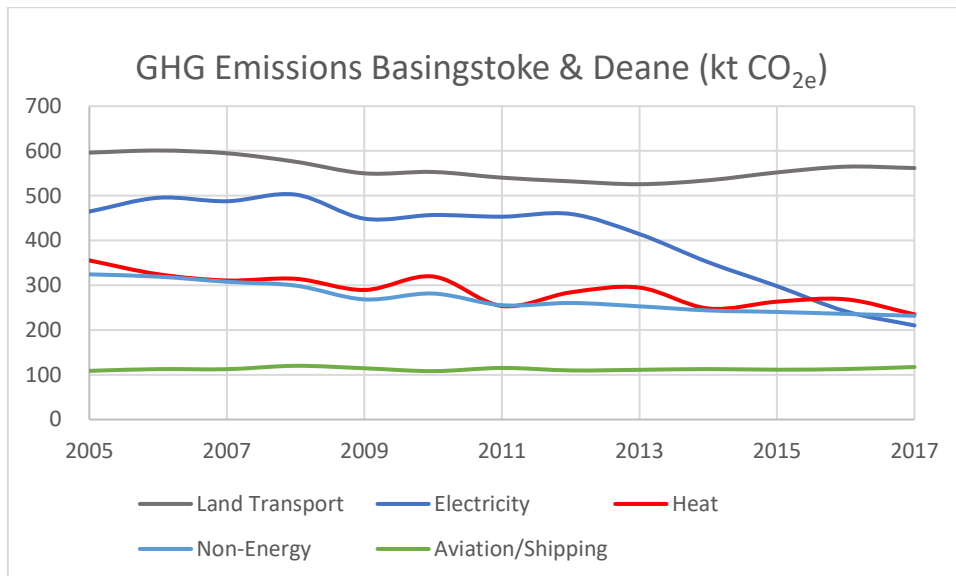
Over the past 12 years we have had some success in reducing overall emissions, particularly given that the population of our borough has grown by 11%.

⁶ This is from heating, surface transport, aviation and shipping, and electricity generation.

We have been on a gentle glide path reducing emissions from 1,943,000⁷ tonnes of greenhouse gases in 2005 to 1,413,000 tonnes in 2017. Figure 1 illustrates this descent. Getting to zero by 2030 will require an acceleration in our efforts.



Greater detail of the components of our total GHG emissions is shown below.



Overall emissions have reduced, but this is mainly due to the rapid growth of renewable electricity generation outside the borough, and a fall in industrial use of gas and electricity as the borough’s industry has left the area. Increased energy efficiency in domestic homes (new and existing) has also had an effect.

Non-energy sources of emissions have also fallen, mainly as a result of better management of methane production from waste.

⁷ All greenhouse gas (GHG) emissions are given in tonnes of CO₂ equivalent emissions for ease of comparison.

Figures for 2018 and 2019 are not yet available. The data and sources used for these graphs are shown in Appendix One⁸.

Achieving carbon zero by 2030 is an immense challenge.

Looking to the future, getting to 2030 and zero carbon requires that Basingstoke reduces GHG emissions by 140,000 tonnes per year for the next 10 years; not an impossible task, but a difficult one. Since 2005 this has only been achieved once, and that was due to an exceptionally mild winter (and a fall in heat requirements). However, the scope for further reductions in emissions is becoming limited.

Much of our electricity demand is met from renewable sources, but from outside the borough.

50% of our local electricity needs are already met from low-carbon sources, but almost all that is from outside the borough. Less than 2%⁹ of the borough's electricity needs are met from locally-generated electricity.

Further reductions in emissions from electricity generation will be harder to achieve but we will continue to benefit from national efforts to de-carbonise our electricity supplies. However, as we will return to later, we need a massive increase in our use of electricity as we electrify both our transport and heating systems.

Through our electricity consumption we, in B&D, are responsible for approximately 210,000⁸ tonnes of GHG per annum, albeit in other parts of the country. Over the next 10 years this could be reduced to zero through investment in renewable electricity generation and storage across the borough. Solar PV, wind, Anaerobic digestion and hydro-electric generation are the best technologies for this. The role of local and grid scale energy storage should also not be underestimated.

In conjunction with national infrastructure projects, these local investments in renewable generation and storage, eg offshore wind, tidal and nuclear, could reasonably be expected to get us to where we need to be.

Local and grid scale energy storage and smart networks should also be an integral part of the district's energy plans.

The bigger challenges are in heating and transport.

⁸ We have used official sources for all emissions data. These include Dept of Business, Energy and Industrial Strategy (BEIS) databases, the National Air Emissions Inventory database and BEIS produced data on local authority emissions. BTN have analysed these data and presented them in a more easily understood format in the above graphs. All the data used reconciles back to national statistics produced by the UK in accordance with its international treaty obligations. Detailed verification can be provided on request.

⁹ Renewable Energy Generation in Hampshire. Hampshire Renewable Energy Co-op report. April 2016.

About 25% of the borough's heating emissions come from industrial and commercial buildings; this is down from 40% in 2005, but this is due more to the decline in the borough's heavier, energy-intensive industry than anything else.

Emissions from heating our homes have fallen from 213,000⁸ tonnes in 2005 to about 180,000 tonnes. This is despite an 11% increase in the housing numbers. This shows that:

1. New homes are more energy-efficient than older ones and
2. Measures to increase home insulation have achieved a reduction in emissions.

It might also reflect the rise in winter minimum temperature over this timespan.

The vast majority of the borough's homes are heated by gas, but a significant number still use oil, and in some cases coal, as the main heating fuel. A reasonable estimate is that 15% of the emissions from domestic heating (30,000 tonnes) is still generated from oil and coal-fired boilers across our district. There is an opportunity to replace all oil and coal heating with electricity "fuelled" heat pumps which would significantly reduce the emissions associated with them. If all coal and oil-fired boilers were replaced, emissions from this source would rapidly reduce by 80% and would further fall as more electricity is generated from zero-carbon sources. As summer temperatures rise, more air-conditioning units will be required in domestic and commercial premises, adding an unknown but probably substantial emissions burden.

However, the primary means of reducing domestic heating and likely future air-conditioning emissions is via:

1. Further, and deep, insulation of the existing housing stock.
2. Ensuring all new homes are designed to be zero-carbon.
3. Replacement of existing gas-fired boilers with either heat pumps or hydrogen/bio-methane-burning boilers.
4. Replacement of oil and coal-fuelled heating systems with heat pumps and/or heat networks.

Heating our non-domestic buildings generates approximately 55,000⁸ tonnes of GHG emissions per year. The pathway to reducing this to zero is similar to that for domestic buildings, ie increase efficiency of existing stock, build zero-carbon buildings and replace existing gas heating. Heat networks may also play a role.

But Transport is the real challenge

By far the greatest challenges lie in reducing our transport-related emissions. They are the biggest contributor, and the levels have hardly changed over the last 12 years. In fact, emissions in 2017 are higher than in 2009. In transport, progress has stalled or even reversed.

1. Across the borough, transport-related emissions amount to 562,000⁸ tonnes from land transport. We are also responsible for a further 117,000⁸ tonnes from the air travel we undertake and from the international shipping we use for trade and cruising. These emissions contribute to climate change, but traffic-related emissions also have a significantly adverse effect on air quality.

Approximately 30% of road transport emissions are from M3 traffic. Whilst much of this is “transiting” the borough, a significant amount is due to local traffic using the M3 as a commuter route for by-passing the town.

Forty-three percent of our transport-related emissions are from traffic on our A-roads. Again, transit traffic along the A30, A303 and A34 will contribute to this total, but the majority will be from Basingstoke-bound or Basingstoke-originated traffic.

In addition, road transport users from our borough will be contributing to emissions in neighbouring districts as they travel through and to these areas.

International air travel that we in Basingstoke undertake adds 8% to our overall emissions.

Reducing transport emissions to zero over the next 10 years will be a massive task, but a vital one if we are to improve our air quality and mitigate climate change.

The route to achieving this will be multi-faceted, but will as a minimum include:

1. A reduction in the ownership and use of cars for travel.
2. An increase in the use of “active transport” – walking and cycling.
3. The electrification of transport, particularly cars and bikes, with investment in the required supporting infrastructure, eg charging points.
4. A move from diesel to hydrogen (or biofuel)-fuelled goods transport.
5. A significant shift of investment from roads to public transport.

The plan should also set targets for the reduction of transport-related emissions. These include: reductions in air pollution and the resulting morbidity; release of valuable land from parking use; and improved health and wellbeing from exercise.

Non-energy sources of emissions are significant, and cannot be ignored

Although many of our emissions are generated from producing the energy we need, a significant amount are from non-energy sources – this amounts to approximately 232,000⁸ tonnes in 2017. The main sources are Methane and Nitrous Oxides from farming, and Hydrofluorocarbons (HFC) from air-conditioning and refrigeration units.

Meat production accounts for 50% of the emissions from farming. There are considerable gains to be made by moving from a meat-based to a plant-based diet. Farming-originated Nitrous Oxide emissions could be reduced by better farming methods, eg low-till land management.

A note on cooling and refrigeration

Energy use and food and waste management account for approximately 97% of the greenhouse gas emissions that the people and businesses of Basingstoke emit. The only other significant single source of emissions is due to cooling and refrigeration. The gases used in refrigeration and air-

conditioning units are some of the most potent greenhouse gases known to humankind; they are often thousands of times more damaging than Carbon Dioxide. Fortunately, only a small amount of the gases are emitted. However, their impact should not be ignored, particularly as the need for AC and refrigeration grows as the climate warms. The best estimates for the emissions of these gases are approximately 40,000 tonnes per annum⁸.

Food and Land Management

Production, transport, storage, cooking and wastage of food are substantial contributors to greenhouse gas (GHG) emissions, and it is estimated that 12% of the UK's GHG emissions are due to diet, land use and agriculture.

Two gases are primarily implicated in GHG emissions from our farms and our diet. These are Methane and Nitrous Oxide. A best estimate of the amount of methane emitted due to our farming practices and diet in our borough is 137,000¹⁰ tonnes. Moving to a plant-based diet could reduce these emissions almost entirely.

Nitrous Oxide is a by-product of the way we manage our farmland, and from fertilizer application and ploughing and tilling land for crops. The potential for reduction here is smaller – Nitrous Oxides emissions are of the order of 54,000 tonnes⁸.

Ecosystems Services and Biodiversity

We are an integral part of our environment; we need to look after it as it looks after us. Clean air, clean water and a viable bio-sphere are vital to a prosperous life in our borough.

Arable agriculture in Basingstoke & Deane includes insect-pollinated crops such as rapeseed, beans, fruit and market-garden crops. South-east England grows 14% of the UK's rapeseed, 48% of small fruits, 42% of top fruits and 26% of glasshouse crops, so the nation depends on the borough's good management of these agricultural assets. Our agriculture is largely dependent on animal pollination.

Widespread wildflower and blossom availability is required to sustain the pollinators in between the flowering seasons of crop plants. Healthy populations of natural predators such as bats, ladybirds and hedgehogs reduce the need for pesticides and fertilizers to overcome crop losses due to pests.

Our plans to plant 11 million trees by 2022 to sequester CO₂ will be largely dependent on a healthy insect and animal population, but this will be compromised by epidemic diseases unless the diversity of both the trees and their natural inhabitants is respected.

Marine and terrestrial ecosystems are the sole sinks for anthropogenic carbon emissions, with a gross sequestration of 5.6 gigatons of carbon per year (the equivalent of some 60 per cent of global anthropogenic emissions).

¹⁰ This is in terms of CO₂ equivalent emissions.

Climate change, and our planning decisions, has seen ecosystem services decline and biodiversity losses accelerate over the past decades. These losses and declines must now be reversed. It is vital that all elements are addressed simultaneously and not in isolation. This means, for example, that solutions to air, water and soil quality has to be not just about reducing emissions but also about restoring fully-functional natural services that will help both wildlife and people to thrive.

Carbon Sequestration

Much of the discussion above has focused on reducing our GHG by

1. reducing our use of energy through better efficiency and, in parallel,
2. producing the energy we need from low-carbon and renewable resources and
3. improving the way we farm, manage our waste and change the food we eat.

There is a fourth strand in any carbon reduction strategy. The overall aim of de-carbonisation is firstly to reduce the amount of harmful gases that are emitted to the atmosphere, but, to avoid the most serious impacts of a changing climate, we will also need to remove some of the emissions that are already there. This is the concept of net zero, ie removing as many GH gases from the atmosphere as we are putting there.

The removal of GH gases is sometimes called offsetting or drawdown.

Methods of offsetting are largely confined to planting of trees, changes in land management, and the use of carbon capture and sequestration (CCS). The latter involves pumping high pressure CO₂ into underground storage or converting CO₂ into solid compounds.

Land management changes, encouragement of biodiversity, enhancement of ecosystem services and tree planting are likely to be more suitable for use in Basingstoke.

Off-site mitigation is sometimes taken to mean investing in carbon-reduction schemes outside the Borough. This is possible, for example, by the Borough investing in renewable energy schemes in other districts, or by planting trees in other parts of the country or world.

However, better environmental (and financial returns) may be available by investing in local schemes based in the borough.

A manifesto for action - consuming all the waste we produce; generating all the energy we need.

Basingstoke is at a turning point. We, and by that we mean everyone that lives and works here, have a once-in-a-lifetime opportunity to make our borough one of the most environmentally-responsible areas in the UK. We, as a borough, have tremendous plans to develop and grow. But that growth must be sustainable; if we cannot grow sustainably then we must choose not to grow at all. The Horizon 2050 project has set out the vision of the sort of place we want to be by 2050. The Climate Emergency Declaration has made the first step towards achieving that vision.

We have a unique and one-off opportunity to make Basingstoke a place truly to be proud of. A place that has the best environment possible and a place that has stepped up to its responsibilities to care for and nurture its people and its natural environment.

Climate change is a given. It is caused by human emissions of greenhouse gases (GHG). Most of these come from the combustion of fossil fuels to heat our buildings, to transport our goods and our people and to power our electrical machines. The rest mainly comes from our waste and from growing our food.

These emissions reduce the quality of the air we breathe.

In Paris in 2015, the world's governments accepted a legal obligation to limit the increase in the Earth's temperature to 1.5 degrees or less.

In October 2018, the IPCC confirmed that this is a goal we must achieve to avoid the worst impacts of climate breakdown. The IPCC concluded that we have just 10 years to reduce our GHG emissions to a safe level.

The IPCC was also clear that action is required at international, regional, national and local levels.

At a local level in Basingstoke the steps required to meet the 10-year deadline are becoming clearer.

We must:

1. Recognise that Basingstoke contributes to climate change mostly by burning fossil fuels, in the way we (mis)handle waste, in the way we grow our food and in the diets we consume. All this pollutes our air and damages our natural environment.
2. Understand that 80% of our emissions comes from generating the energy we need; energy that is used to heat our buildings (20%), run our transport (60%) and power our electrical gadgets and machines (20%).
3. Review how our energy requirements will change over the next 20-30 years based on our local plans for more buildings, a lot more vehicles and for a larger population.
4. Commit to exploiting technology and revising regulations to:
 - a. Increase our energy efficiency – stronger planning rules for new buildings and a co-ordinated low-carbon transport strategy.
 - b. Generate renewable energy locally – solar PV, wind turbines, anaerobic digestion/ bio-methane generation, heat pumps and combined heat and power.
 - c. Electrify our heating and transport systems.
5. Completely review our approach to transport and begin a rapid re-prioritisation of our investment in roads towards public transport and active travel.
6. Take advantage of the financial and environmental returns from investing in energy efficiency and renewables eg
 - a. High quality jobs in sustainable industries.
 - b. A 10%, or greater, return on investment.
 - c. Cleaner air.
 - d. A more attractive environment for the people and businesses of Basingstoke.
7. Understand that a further 20% of our GHG emission are due to the way we manage our land and our waste and the diet we eat.

8. Preserve and enhance biodiversity and ecosystem services that are essential to carbon sequestration and climate-change mitigation.
9. Develop a plan to de-carbonise the Borough, set targets for its delivery and make the Council leader and CEO responsible for implementing it.
10. Assess the impact that every Council decision will have on greenhouse gas emissions prior to any decision being made.
11. Understand that we have less than 10 years to deliver the changes we need.

“A Basingstoke that consumes all the waste it creates and generates all the energy it needs” is a great vision but requires leadership, commitment and resources to implement it.

We have an opportunity to create one of the cleanest, greenest and most attractive boroughs in the UK. We have a responsibility to ensure we do that. Let us not allow that opportunity to pass us by.

All of this takes political will and courage. But, more importantly, it means each of us steps up and takes responsibility for resolving the emergency we face.

BTN and its members are prepared to make this step.

Appendix One. Data and Sources

Estimated GHG Emissions Basingstoke and Deane (kilotonnes CO ₂ equivalent)							
	Heat	Land Transport	Electricity	CH ₄ /N ₂ O/HFC	Aviation/ Shipping	Other	Total
2005	355	596	465	324	109	93	1,943
2006	325	601	495	319	113	87	1,939
2007	311	595	488	308	113	84	1,898
2008	314	576	503	299	120	68	1,880
2009	289	550	449	268	115	64	1,735
2010	319	553	457	281	108	73	1,792
2011	254	540	453	255	115	61	1,679
2012	284	532	459	260	110	60	1,706
2013	295	526	414	253	111	54	1,653
2014	248	535	351	244	113	59	1,549
2015	263	552	298	240	111	57	1,522
2016	269	565	242	236	113	58	1,482
2017	235	562	210	232	117	57	1,413
2017 %	17%	40%	15%	16%	8%	4%	

Sources:

Final UK greenhouse gas emissions national statistics 1990-2018

<https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2018>.

UK local authority and regional carbon dioxide emissions national statistics: 2005-2017

<https://www.gov.uk/government/collections/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics>

National Atmospheric Emissions Inventory. <https://naei.beis.gov.uk/>

BTN Analysis of the above data.