Broads Authority

24 July 2020
Agenda item number 8

Climate Change action plan

Report by Carbon Reduction Project Manager

Purpose

This report provides updates on work done since November 2019 and progress in developing the Action Plan for the Broads area, and presents the initial carbon assessment of the Broads Authority.

Recommended decision

- To note the update on work undertaken since November 2019 and adopt the Action Plan set out in Appendix 1 including engaging with organisations that have responsibility for emissions in the Broads area to map a route towards zero carbon
- To consider whether the Broads Authority should set the target of a 1.5 degree compliant emissions curve for the Broads Executive area, in line with Tyndall Centre recommendations, and use this as the basis for public engagement and working with partners.

Contents

1. Introduction

1.1. This report follows on from the decision taken at the September 2019 Broads Authority meeting to recognise a climate emergency. A report (Responding to Climate Change emergency update report) was presented to members at the November 2019 Authority meeting, with a progress update outlining the governance of the carbon reduction project, the creation of a baseline for the Broads as a whole, and the timeline for developing an action plan. A draft report had been prepared for the cancelled March 2020 Authority meeting. This report builds on the March draft report, with further updates covering progress up until July 2020.

1.2. We have made good progress in establishing a carbon baseline for the Broads, which is included in the report, as well as further recommendations towards the net-zero target.

1.3. Appendix 1 sets out a list of ongoing and planned actions towards reducing the carbon footprint of the Broads Executive area. Appendix 2 sets out the Broads Authority Carbon Assessment.

2. Progress since previous report

2.1. The report presented to the Authority in November 2019 noted that we would:

- Produce a baseline for the Broads area, and identify projects that could support reducing the Broads area emissions;
- Calculate the carbon footprint of the Authority;
- Identify savings of 5% across all services for the financial year 2020/21; and
- Target at least 15 tonnes of CO_2 savings for the financial year 2020/21.

2.2. Progress in preparing a baseline for the Broads area is covered in section 4.

2.3. We have made a reasonable estimate of the Broads Authority's emissions, and have tracked the current rate of fall in the Authority's footprint. This has been around 2% a year since 2016, driven largely by falling emissions from the national electricity grid. There are some areas of uncertainty, and further work is needed to have a picture of the full footprint of the Broads Authority, particularly in relation to its supply chain.

2.4. In terms of savings, we have identified an adequate level of reductions that can be made to meet our target for the financial year 2020/21. We have also sketched out how we can reduce our emissions until 2025, which we need to assess against affordability. There is a gap between our ambition and identified savings in the years 2025-2030, which will require further work to identify the additional emission savings.

3. Covid-19 and climate change

3.1. In the short term, the Covid-19 crisis has caused a major reduction in global and UK emissions. While specific data on the area of the Broads is not available, there will have

been a fall in certain types of emissions. In particular, emissions from road transport and boat engines will have fallen, along with emissions associated with operating tourism businesses.

3.2. It should be noted that the Covid-19 impact on emissions does not equate to a systemic change. A significant fall in emissions was also noticed after the 2008 financial crisis. These gains were soon lost and global (and local emissions in Norfolk and Suffolk) rapidly grew again during the recovery period. In the UK these then returned to the previous trend of steady, but insufficiently rapid, falls.

3.3. There are a number of factors that may well lead to an increase in emissions from the Broads area in the second half of this year, including avoidance of public transport and an increase in 'staycations'. The latter would lead to an increase in emissions related to the Broads, but may be a net saving in global terms if they replace overseas visitors, and UK residents flying to overseas destinations.

Economic recovery following Covid-19 - risks and opportunities

3.4. Opportunities include a general desire to "build back better" rather than returning to the way things were before, with a greater interest in nature and an appreciation of its value to society.

3.5. The Government has indicated an intention for a green economic recovery. Providing there is a widescale funding for projects that both mitigate climate change and boost economic recovery, the Broads can make a good case to attract funding to support a sustainable tourism industry with good local employment and higher quality of life for residents.

3.6. The risks include a move away from public transport for access to and through the Broads, leading to higher emissions from transport. While tendencies to work from home will reduce traffic, this is likely to be offset in winter months from greater domestic heating, including from homes in the Broads area. This will be a particular challenge if it leads to a permanent reduction in rural bus and train services.

3.7. Another risk is that the expected sharp economic downturn might reduce finance available for investing in new climate mitigation measures. Without outside support, businesses and households may be unable to invest in projects such as insulation, rooftop solar, electrification, and carbon-free heating systems. These investments are, however, needed to make the transition to a zero-carbon economy.

4. Broads Executive area – baseline development

4.1. In the report to the Authority in November 2019 we set out that we planned to contract with SmallWorld Consulting, in partnership with the UK national park authorities, to create a consumption-based baseline for the Broads. Unfortunately there has been a delay in beginning this process. Initially this was due to a delay in getting all the authorities on board, and this has been compounded by the hit to finances from the Covid-19 outbreak.

4.2. We are planning to launch a joint contract with the South Downs National Park Authority for this assessment. Norfolk County Council is supporting us with this work and is willing to learn from the experience and potentially extend the work for the whole of Norfolk.

4.3. As a stop-gap methodology pending the SmallWorld Consulting report, we have used publicly available data from the National Atmospheric Emissions Inventory (NAEI) to produce an estimate of emissions from the Broads area. This covers Carbon Dioxide, Methane, and Nitrous Oxide, the three main greenhouse gases.

4.4. The total greenhouse gas emissions emitted from the Broads area in 2017 was approximately 205,295 tonnes of CO_2 Equivalent. The breakdown across the 3 main Greenhouse Gases (Methane, Nitrous Oxide, and CO_2) is shown below.

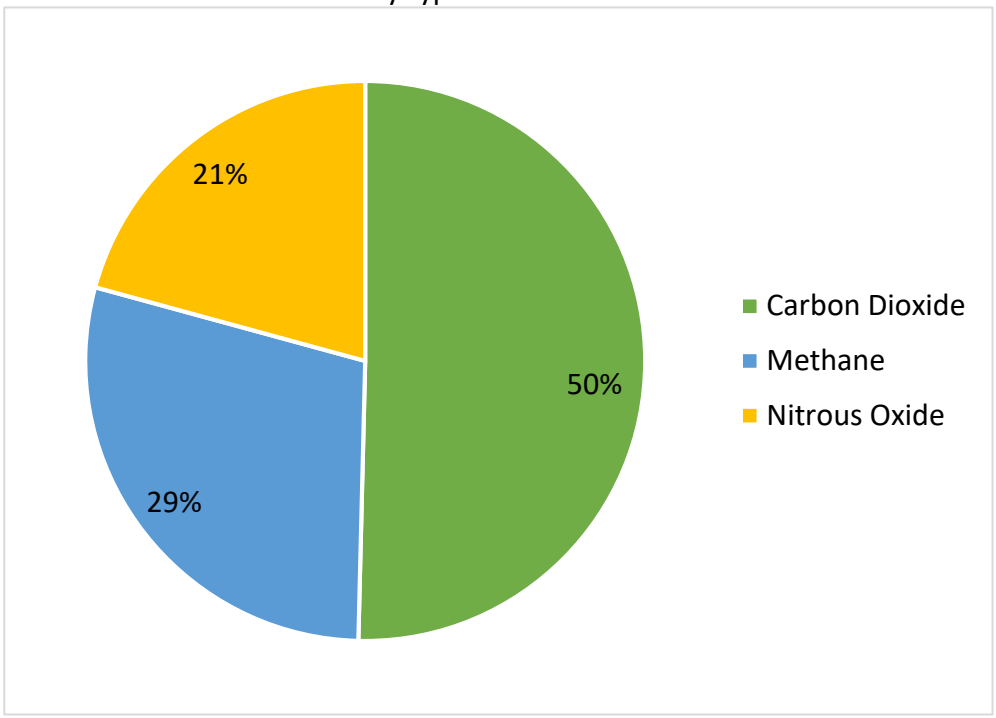
Table 1
Emissions from within the Broads Executive area

Greenhouse gas	**Tonnes**	**GHG equivalent**	**CO_2 equivalent conversion factor[1]**
Carbon Dioxide	103,453	103,453	1
Methane	1,742	59,228	34
Nitrous Oxide	143	42,614	298
Total	**-**	**205,295**	**-**
Per capita	-	34.22	-

[1] The conversion is based on the 5th Assessment Report of the International Panel on Climate Change. These compared the impact of different gases over 100 years, known as Global Warming Potential.

Figure 1

Share of Greenhouse Gases by type.



4.5. While this data is interesting, it is an incomplete picture as it excludes electricity use, and does not consider consumption in the Broads and exports of goods produced in the Broads to be consumed elsewhere. For example, fuel used by a family driving from Bristol for a holiday in the Broads is not captured in this data. At the same time, emissions from Cantley sugar factory are included because they are produced here, but to meet demand for sugar across the UK rather than just within the Broads area.

4.6. In 2017, the largest point source was the Cantley factory, which had emissions of 27,479 tonnes of CO_2, 13% of the Broads Total. Another large source of emissions is road transport, much of which will be vehicles passing through the Broads area, rather than emissions associated with the Broads. For example, the A47 and A1604, where they pass through the Broads area, result in nearly 10,000 tonnes of CO_2 a year. These two sources account for close to 20% of the CO_2 emissions in the Broads area.

4.7. This data is illustrative only, as the changes brought by the current pandemic are not reflected in the data, and the NAEI datasets are not available post 2017.

5. Pathway to net zero

5.1. Between 2010 and 2017, energy related CO_2 emissions[2] in the districts covering the Broads fell by 21%. This is an average of 3% a year. In this report, this trend will be referred to as the 'business as usual' scenario. If this trend continues, net zero would be reached around 2050. However, the Broads would exceed its share of the global carbon

[2] Tyndall Centre Carbon Budget tool, <https://carbonbudget.manchester.ac.uk/reports/>

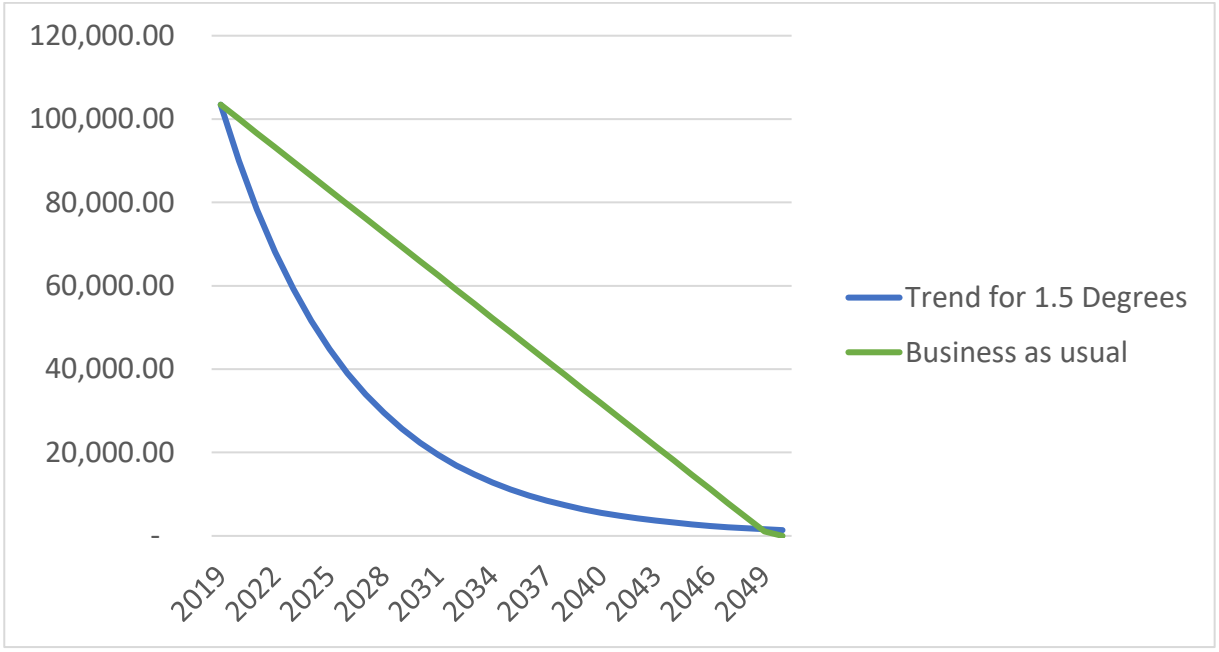
budget by approximately 2027. (The carbon budget is the total amount of CO_2 that can be emitted to remain within the global 1.5 degree climate budget).

5.2. The Tyndall Centre, based at the University of East Anglia, has produced a carbon budget tool for local authorities, the outcome of which was presented by Asher Minns to the November 2019 Authority meeting. This tool allocates a share of the global climate budget to individual districts within the UK, and plots a pathway for each district to follow if it is to make its fair contribution to meeting the Paris Climate Change Objectives. These calculations are being used for the BEIS supported Scatter tool, which allows local authorities to develop a decarbonisation pathway and set emissions targets.

5.3. Applying this tool to the districts overlapping the Broads area requires an emission reduction of 13% per year, each year until 2050, to keep the total emissions of these districts below 29MtCO_2. This is the total level of emissions considered reasonable for these districts based on the global carbon budget. This is a significant acceleration compared to business as usual.

5.4. The Tyndall target (see Fig.2) follows an exponential curve. If we were to target a linear pathway with the same reduction made each year, we would need cuts of 6.5% a year, with no slowing of pace, and a net-zero date of 2033. For context, the recent Lake District carbon budget exercise set 2037 as the earliest plausible date to reach Net Zero.

Figure 2
Business as usual compared to the recommended reductions



5.5. A delayed start requires a steeper curve later on in the process, and a significantly delayed start of 5 years would leave it essentially impossible to meet the 1.5 degree climate target.

5.6. Front loading would be essential to meeting the Tyndall target. This would see emissions fall by approximately 80% by 2030, compared to a linear trend where they would fall by 50% by 2030.

5.7. Meeting the Tyndall target will be extremely challenging, and will depend on a range of changes taking place in the national and regional economy. For example, electricity use is generally around 20% of emissions in Norfolk, and reductions in this area will depend in part on the national energy mix. We would need to work with a range of partners to try and achieve this target.

5.8. We would like to hear members' views on which indicative pathway to Net-Zero we should aim for, to use as the basis for public engagement and working with partners to communicate targets for the Broads area.

5.9. As highlighted above, there are anticipated steep falls in emissions this year. The level of the fall this year will not be known for some time, as it will depend on the characteristics of the "bounce back", which is still uncertain.

5.10. To begin moving the Broads towards a Net-Zero future, we have developed a list of potential projects, listed in Appendix 1. These projects alone will not be adequate to make the transition, and further projects will need be developed over the coming years.

6. Broads Authority carbon assessment

6.1. We have completed the carbon assessment for the Broads Authority emissions, which has estimated the annual footprint of the Authority at around 619 tonnes of CO_2 equivalent. The details of this assessment are in Appendix 2.

6.2. The actions identified for 2020 allow for an immediate saving of nearly 10% in the Authority's emissions, and a pipeline of future actions has been identified up until 2025. We have planned to go into more details on each potential future action to assess their feasibility, including affordability. There is a gap before 2030 where further savings have to be found, which will form an ongoing piece of work.

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Date of report: 10 July 2020

Broads Plan objectives: 10.1, 10.2

Appendix 1 – List of actions relating to the Broads executive area

Planned and proposed actions for 2020/2021

Action 1: Complete the Baseline and develop trends to zero carbon with Smallword Consulting

Partners: Lake District NPA, South Downs NPA, Smallworld Consulting Ltd.

Delivery date: Winter 2020

Description: We aim to complete a full carbon baseline of the Broads area to allow for future monitoring of the reduction in emissions in the Broads. We had hoped to complete this earlier, however this was delayed. We aim to complete the baseline by the end of 2020.

This will assist in targeting activities in future years.

Outputs:

- A baseline for the emissions from the Broads Executive area.
- A breakdown of these emissions by source.
- A trend line for the Broads, showing how each emission can be reduced towards zero, including the necessary increase in the take up of carbon by the land.
- A model that can be used to monitor progress over time.

Action 2: Promote green electricity to Broads residents

Partners: Norwich City Council

Delivery date: Ongoing

Description: Domestic Electricity is generally around 10% of the carbon footprint for Norfolk. One of the simplest ways for someone to cut their carbon footprint is to switch to a green electricity supplier. Although this does not immediately alter the CO_2 output of the electricity grid, it increases the demand for green energy on the grid and overtime will support the installation of more green electricity infrastructure.

Norwich City Council has already established its own Green Energy Supplier ROAR Power which supplies green electricity and gas to the East of England. Partnering with Norwich City Council to encourage the households and businesses in the Broads to switch energy supplier to a green tariff would start to reduce the CO_2 footprint.

An additional possibility is to encourage the take-up of "Virtual Power Plants," where groups of households and businesses install solar and batteries, and sell power to the grid to cover peak demand. We have had some initial conversations with Centrica to learn about the transferability of their recent Cornwall project. [3]

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[3] For More information, see <https://www.centrica.com/media-centre/news/2019/a-virtual-power-plant-for-every-home/>

Outputs:

- Increase in number of Broads Residents using Green Electricity.

Action 3: Peat mapping

Partners: Queen Mary University of London, Cranfield University

Delivery date: July/August 2020

Description: As part of the CANAPE project, we have begun a peat mapping exercise for the Broads area. The Broads area has previously been estimated to hold the equivalent of 39 million tonnes of CO_2 in its soil, however there are reasons to believe that this number is not fully accurate. The previous surveys did not account for the full depth of some of the peats, with some fens having 10 metres of high carbon brushwood peat underneath them. At the same time, some of the data is old, and does not take into account carbon that has been lost due to peat wastage. The new study will give a better idea of the amount of CO_2 stored in the Broads, and where the CO_2 is currently being lost/sequestered. This will help with targeting any offsetting projects in the Broads.

Outputs:

- An improved soil carbon map of the Broads, aiding decision making in protecting the soil carbon.
- A better estimate of the rate of loss/sequestration of carbon across the Broads.

Action 4: Public engagement

Partners: Broadland Futures Initiative, Broads Local Access Forum, Parish Forum, Broads Engage.

Delivery date: Ongoing

Description: A range of communication events to gather views from local residents and businesses on how to approach the climate change issue.

Additionally, we will work on methods to engage young people's opinions and ideas for the future.

During the Covid-19 crisis we have avoided raising the issue due to sensitivities around people and businesses experiencing extreme hardship. We are exploring how to communicate a message around "Build Back Better" that is suitable and sensitive to the needs of the Broads.

Outputs:

- Climate themed discussion at the BLAF.
- Broads Engage event focused on climate change issues.

Future actions and projects post 2020/2021

Action 5: Car free promotions

NB: In the draft paper for the March 2020 committee, this activity was proposed for the year 2020/2021. However due to Covid-19 impact, these plans are not viable while restrictions are in place on public transport.

Partners: Greater Anglia, First Bus, Broads Tourism, National Parks UK

Delivery date: September 2021 (TBC)

Description: A major component of CO2 emissions associated within the Broads are transport related. Some of this is outside the influence of the Broads Authority – for example the A47 currently accounts for 400 tonnes of CO_2 per kilometre as it passes through the Broads, and the majority of traffic will be travelling through the Broads rather than travelling to it.

As there are 15 railway stations in the Broads, a key aspiration should be to encourage access to the Broads through public transport. A family traveling to the Broads for a week's boating holiday will potentially use more fuel getting to the Broads by car than they will burn in a week on a motor cruiser.

As a starting point, we would like to tap into the awareness created by international "Car free day" in September to run a series of promotions on how to get into and around the Broads without using cars. In particular, safe routes to cycle from Norwich to the Broads attractions, walks that link between bus and train stops. (For example, take a bus to Loddon, walk to Surlingham, bus back to Norwich). One advantage to highlight to visitors is not bringing a car allows for non-circular routes.

Outputs:

- Series of blogs setting out how to access the Broads without a car.
- Car free day promotions, encouraging access via train, bus, bike and foot.
- Greater awareness of visitors of sustainable ways to access the Broads.

Action 6: Remote location electricity

Partners: Hethel Innovation

Delivery date: 2022/2023

Description: We are working with Hethel Innovation to develop a solution to provide electric charging posts for electric boats at locations too far from the electricity grid.

We have had several virtual meetings with Hethel Innovation and a number of their supported companies. We are investigating potential solutions for the Broads which could be trialled on site.

Outputs:

- Identify need and scope the characteristics for remote electric charging pillars.
- Identify the places where alternative (non-grid) power is needed.
- Design a method to provide power in remote locations.

Action 7: Hydrogen technology

Partners: University of Birmingham

Delivery date: 2022/2023

Description: The University of Birmingham is working on a partnership called "H2 Ships" which is developing technology around powering boats by hydrogen, including a demonstrator ship in Amsterdam. They have indicated that 2 years would be a feasible timescale for us to have a hydrogen boat operating on the Broads.

One key aspect is that bulk purchases make the technology significantly cheaper per unit, so there could be a benefit in partnering with larger boatyards to buy multiple fuel cells in one go.

This could also be part of the solution for the Hethel Innovation project, as one possibility is to power electric boats from hydrogen fuel cells, with the hydrogen delivered to remote sites by barge.

Outputs:

- Test the feasibility of a hydrogen design (desk study).
- Identify potential suppliers of hydrogen.
- Design a hydrogen bunkering system – potentially a portable refuelling barge that could supply hydrogen around the Broads.
- Develop and build a hydrogen powered mud-wherry as a demonstrator.

Action 8: Offsetting strategy

Partners: National Parks Partnerships, NPE, Local Landowners, Peatland Code (IUCN-UK)

Description: The National Park Authorities are looking at the potential for offsetting projects, and the National Parks Partnership is doing some initial scoping work on this issue. Within the Broads there is not the scope for large scale tree planting that may be possible elsewhere, as this would disrupt the open landscapes which are a key part of the Broads. However, there may be benefits to encouraging tree planting projects in the Broads Catchment, and thereby improving the water quality in the rivers entering the Broads, and helping the recovery of

wildlife in currently eutrophic areas. We are currently scoping potential locations for such projects.

Delivery dates: Ongoing

Outputs:

- Identify land areas with potential for additional GHG sequestration in the Broads.
- Partner with a certification scheme for carbon offsetting.
- Support marketing of carbon credits.

Appendix 2 – Broads Authority emissions

Definitions

CO_2e – Carbon Dioxide Equivalent. This measure compares Greenhouse Gases other than Carbon Dioxide to Carbon Dioxide.

Estimate of Broads Authority emissions 2019/2020

The Broads Authority Carbon footprint amounts to around 619 tonnes of CO_2e for the year from April 2018 to March 2019, or 4.7 tonnes of CO_2e per employee. For context, the CO_2e per capita emissions of the UK is approximately 5.5 tonnes CO_2e.

This is roughly broken down as follows:

Scope 1 – Direct emissions

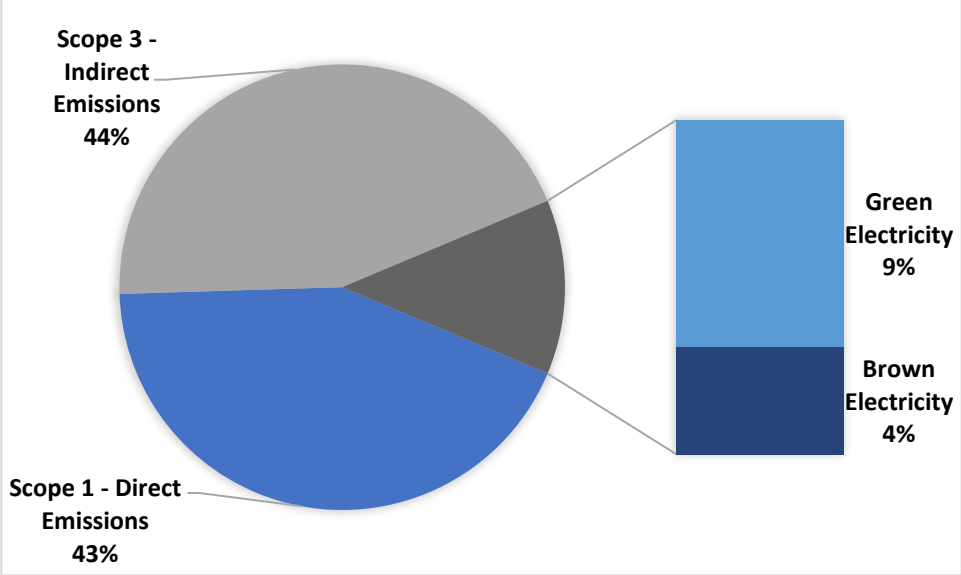
Source	**TCO_2e in tonnes**
Fuel for vehicles, vessels and Equipment	283
Gas	6
Heating Oil	2.5

Scope 2 – Electricity

Source	**TCO_2e in tonnes**
Yare House Electric	27.5
Other Electric (purchased under a green tariff)	0 (58 before applying green tariff)

Scope 3 – Indirect emissions

Source	**TCO2e in tonnes**
Materials	54
Equipment Purchases	84
Travel (Staff Commuting, Rail, flights, and use of private vehicles)	88
Waste Disposal	2
Well-To-Tank and Transmission	72
Total (Scope 1 + Scope 2 + Scope 3)	**619**



Comparison to the previous audit

A direct comparison with the audit carried out in 2010 is not possible as the methodologies are not identical, and is not necessarily useful. In particular the 2010 audit was carried out during the move from Colegate to Dragonfly House, which involved a substantial purchase of new office furniture and equipment, which distorted the scope 3 emissions in the previous assessment. (As identified by the authors of that study).

The Broads Authority approach to dredging has been substantially changed over the last 10 years, with an evolution in the type of machinery used. In particular the introduction of hydraulic excavators has increased the flexibility of the operations team, but also caused a noticeable increase in fuel use.

Note regarding Whitlingham Country Park

The figures calculated above include the operation of the Tourist Information Centre (TIC) at Whitlingham Country Park. No longer operating the Whitlingham TIC will reduce the Broads Authority footprint through;

- No longer buying gas to heat the TIC
- Reducing the number of vehicles we operate.

These amount to approximately 7 tonnes of CO_2 a year. As this is a transfer of the organisation's previous facility to another organisation, these will not be counted as CO_2 savings. Instead, for future years, we will measure the BA footprint against the 2018/19 baseline with the CO_2 associated with operating Whitlingham removed.