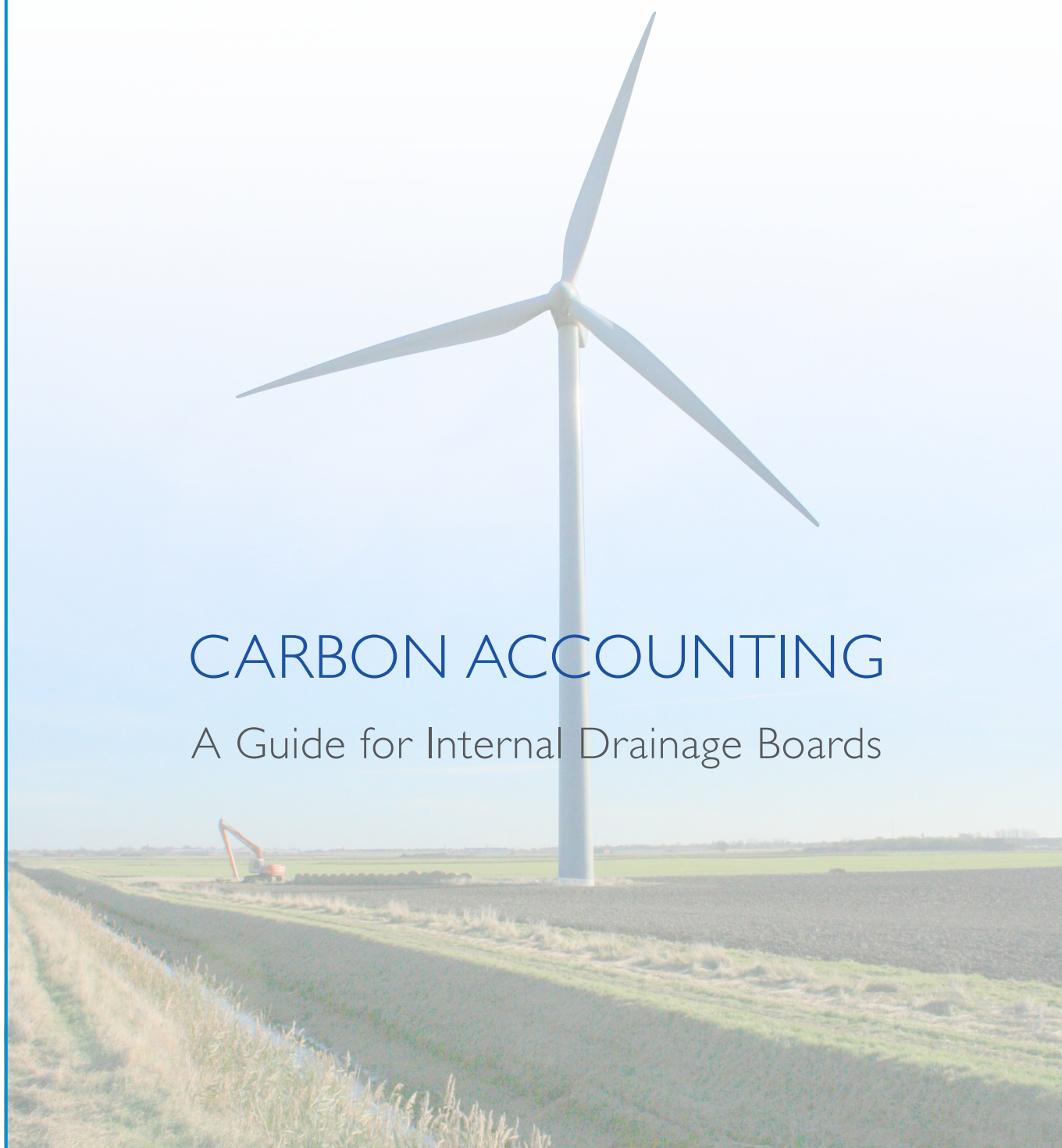




CARBON ACCOUNTING

A Guide for Internal Drainage Boards



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I INTRODUCTION

There is increasing pressure being placed on all of us to reduce emissions of greenhouse gases (GHGs) that contribute towards climate change. Internal Drainage Boards (IDBs) have responded by giving ADA a clear and urgent steer to develop guidance to assist them in developing their own emission reduction strategies in order to contribute towards the global effort. The first step is to help IDBs to calculate and benchmark their carbon emissions. The results will help to identify key emissions sources and prioritise actions to reduce carbon emissions.

There is a plethora of information and guidance available around carbon accounting but it can be lengthy, technical and non-sector specific. As a result, this document has been developed specifically for IDBs and the guidance presented is based on general best practice standards and approaches. It aims to present the key points of carbon accounting in a relevant and succinct way to enable IDBs to take their first steps into carbon accounting and reporting quickly and confidently. It provides some background to climate change policy and legislation and how it has driven the need to improve our understanding of carbon emissions.

This publication is the first in a series of climate change guidance for IDBs. Once an IDB is confidently accounting for and reporting on their carbon emissions, further guidance published by ADA will help IDBs to develop a carbon reduction pathway.

The technology is still trying to catch up with the ambitions of many organisations and sectors, including the water level and flood risk management sector. Improved understanding and quantification of significant CO₂ emission sources within the sector will help to incentivise and accelerate the development of CO₂ efficient technologies and solutions for the sector and for the benefit of all who are impacted by climate change.

I.1 What is Carbon Accounting? There are many terms commonly used to describe the analysis and definition of the carbon emissions that can be attributed either indirectly or directly to an individual or organisation. Carbon audits or inventories define current emission sources and volumes with the end calculation often known as a carbon footprint. Carbon calculators are used to develop carbon inventories and many are available for free on-line. There are many more that charge for their use and for the associated consultancy.

Carbon budgets describe what carbon emissions were expected or aimed for within a specified timeframe in the future. Carbon accounting includes both carbon inventories and carbon budgeting.

This guidance document is focused on carbon audits and further guidance published by ADA will cover carbon budgeting as part of the development of a carbon reduction strategy for IDBs.

I.2 Benefits of Calculating Carbon Emissions: Measuring carbon emissions, reporting on them and then taking action to reduce them will benefit more than just the environment and climate. There are direct and indirect benefits that the IDB can draw from the exercise including those listed below:

- Identify areas of energy or resource inefficiency where costs could be saved if improvements were made.
- Support project proposals for funding applications where environmental improvements are a scored element.
- Gain a better understanding of the organisations' exposure to climate change-related risks.
- Improve the organisations' environmental credentials, promoting recognition for early voluntary action which may be attractive to potential private investors and partners.

I.3 Policy and Legislation Background.

I.3.1 Kyoto Protocol. There was much less evidence of the impacts of greenhouse gases on climate change in 1992 than there is today. However concern was enough at the time that during the Rio Earth Summit, nearly all nations signed the UN Framework Convention on Climate Change (UNFCCC) and pledged to "stabilise" greenhouse gas emissions. Over the following 2 years, a treaty was developed which set binding emission reduction targets relating to seven GHGs for each UNFCCC signing party. Britain was legally committed to a reduction of 13% in GHG emissions by 2012 (based on 1990 levels). Developing countries were not mandated reduction targets as it was accepted that in comparison to developed

countries their contribution to the global accumulation of CO₂ in the atmosphere over the previous century was relatively small. The treaty also set out a rigorous monitoring and review process. It was this treaty that was ratified at Kyoto in Japan in 1997 and has since become known as the Kyoto Protocol. The agreement came into force in 2005.

1.3.2 2015 Paris Agreement. The 21st United Nations Climate Change Conference of Parties (COP) was held in Paris in 2015. This was a pivotal point in the challenge to tackle climate change as it set the target for global warming to be kept below 2 degrees in this century (preferably 1.5 degrees) above pre-industrialised temperatures. This target formed a legally binding agreement signed by over 190 UNFCCC member parties and is commonly referred to as the Paris Agreement. The Agreement came into force in November 2016 and runs on a 5-year cycle of increasingly ambitious targets to tackle emissions and adapt to climate change. Each Party is required to set “Nationally Determined Contributions” (NDCs) detailing the efforts they will make to meet the targets and there are requirements to report regularly on emissions and adaption progress.

1.3.3 What is the Carbon Law? International scientists developed the “Carbon Law” in 2017 as a strategy and roadmap to rapid de-carbonisation. The strategy recommends that in order to keep global warming to a maximum of 1.5°C, global GHG emissions must peak by 2020 and then halve every decade until 2050. This forms the basis of many organisational carbon reduction strategies.

1.3.4 Climate Change Act 2008. The Climate Change Act 2008 set out Britain’s efforts to self-impose tougher, legally binding GHG emission reductions in an attempt to become a global leader in tackling climate change. It provided a legal duty for the Government to reduce GHGs by 80% below 1990 levels by 2050 and to reduce carbon dioxide emissions by 26% by 2020. This represented the first legally binding climate change mitigation target set by a country. In 2019 the ambition was increased when the UK became the first developed nation to commit to at least a 100% reduction in GHG emissions compared to 1990 levels by 2050.

The Act also requires the Government to develop a series of five-yearly carbon budgets to define the pathway to emission reductions. These budgets set the maximum amount of GHGs which can be emitted in the UK over a five-year period. The current carbon budget runs until 2022.

1.3.4.1 Climate Change Committee (CCC). The Committee on Climate Change (CCC) was established by the Act as an independent, expert body to advise the government on appropriate carbon targets and budgets and climate change mitigation and adaptation. The Committee makes annual assessments and reports to Parliament regarding the progress made in reducing GHG emissions in line with carbon budgets.

1.3.4.2 Adaption Committee. A separate Adaption Committee within the CCC reports every 2 years on progress made in adapting to climate change. The Committee publishes the UK Climate Change Risk Assessment (CCRA) every 5 years which details the major risks and opportunities from climate change. One of the 6 main focus areas of the CCRA is flooding and coastal change. The CCRA informs the National Adaption Programme (NAP) which sets out how the Government will address those risks and opportunities. The current NAP runs from 2018 to 2023.

1.3.4.3 Adaption Reporting Power. To help to better inform the CCRA and the NAP, the Act gave power to the Government to ask certain organisations such as infrastructure providers and public bodies to report on their preparedness for climate change risks. There are currently 89 organisations who are expected to submit reports under this Adaption Reporting Power (ARP) for the third round of reporting, including the Environment Agency.

ADA has volunteered to become the reporting authority on the behalf of IDBs for the next round of reporting. A better understanding of current IDB emissions will be vital to inform this. At present, ADA would be reporting voluntarily on behalf of IDBs but recently the CCC have made recommendations to Parliament to make reporting mandatory for some organisations, particularly infrastructure sectors. It is prudent therefore for IDBs to familiarise themselves with carbon accounting as soon as possible in anticipation of a possible statutory duty to provide such data.

1.4 Technical Background.

1.4.1 Which gases are greenhouse gases? Gases which absorb infrared radiation (heat energy) emitted from earth and redirect or re-radiate the energy back to earth are known as greenhouse gases and are those which contribute to climate change. The table below sets out the 7 main greenhouse gases identified in Annex A of the Kyoto Protocol and an example of

their main sources:

GAS	EXAMPLE SOURCES
Carbon dioxide (CO ₂)	<ul style="list-style-type: none"> • Burning of fossil fuels • Decomposition of organic matter
Nitrous oxide (N ₂ O)	<ul style="list-style-type: none"> • Microbial break-down of nitrogen in soils under natural vegetation • Emissions as a result of nitrogen fertilisers from agricultural soils
Methane (CH ₄)	<ul style="list-style-type: none"> • Fossil fuel production and use • Ruminant livestock • Landfill
Hydrofluorocarbons (HFCs)	<ul style="list-style-type: none"> • Air conditioning & refrigeration
Sulphur hexafluoride (SF ₆) – Most potent GHG	<ul style="list-style-type: none"> • Insulating material for medium and high-voltage electrical installations.
Perfluorocarbons (PCFs)	<ul style="list-style-type: none"> • Aluminium manufacture • Electronics industry
Nitrogen trifluoride (NF ₃)	<ul style="list-style-type: none"> • Electronics manufacture

1.4.2 What is the Greenhouse Gas Protocol? The Greenhouse Gas (GHG) Protocol establishes comprehensive global standardized frameworks to account for and report on greenhouse gas emissions from private and public sector operations, value chains and mitigation actions.

The World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) agreed in 1997 to develop an NGO-business partnership to address the need for standardized methods for GHG accounting. The first edition of the Corporate Standard was launched in 2001 and The GHG Corporate Accounting and Reporting Standard has since become world's most widely used greenhouse gas accounting standard.

This document by ADA is based on guidance published by the GHG Protocol and guidance published by the UK Government which is itself based on the GHG Protocol.

1.4.3 Categorising CO₂ sources. The GHG Protocol categorises CO₂ emissions into 3 “scopes” according to the activity the emissions relate to:

- **Scope 1:** Known as direct emissions, are emissions into the atmosphere from sources owned or controlled by the organisation and relate primarily to fossil fuel combustion. Examples include fuel used by owned or controlled vehicles or machinery, such as mobile and static pumps, excavators, tractors and other company vehicles and any unintentional emissions, known as fugitive emissions which include leaks from owned appliances, storage tanks or air conditioning units etc.
- **Scope 2:** Known as indirect energy emissions, these relate to the generation of energy purchased and consumed by the organisation which includes electricity, cooling, steam and heat. The emissions are released at the point of generation.
- **Scope 3:** Known as indirect emissions, it is necessary to look further upstream and downstream in supply chains to identify scope 3 emissions. These are emissions that are being enabled at sources and locations away from the organisation as a consequence of the actions and choices of the organisation. These can include emissions related to purchased goods and services, employee commuting, transportation to and from the organisation, investments including pensions, waste disposal and business related travel.

The GHG Protocol aims to minimise the risk of double counting of emissions through this categorization into scopes.

1.4.4 What is a GHG conversion factor? A conversion factor is used to calculate how many tonnes or kg of carbon are emitted from an activity such as litres of fuel used, distance travelled or kilowatts of electricity used. The UK Government produces and annually updates GHG conversion factors for a range of common activities for use in reporting UK emissions, and publishes the information in a spreadsheet format on-line.

Carbon calculators generally operate by collecting a range of activity data then calculating the CO₂ emissions associated with each activity using built-in conversion factors.

- 1.4.5 What is a CO₂ equivalent (CO₂e)?** The CO₂ equivalent is a metric used to compare GHGs other than carbon on the basis of their global warming potential (GWP), using carbon dioxide as a baseline. Written as CO₂e, it is derived by multiplying the tonnes of gas by the associated GWP. For example, the GWP for methane is 25 and for nitrous oxide 298. This means that emissions of 1 million metric tonnes of methane and nitrous oxide is equivalent to emissions of 25 and 298 million metric tonnes respectively of carbon dioxide.

The UK Governments' greenhouse gas conversion factors provide the CO₂e for several GHGs associated with each activity. When determining the conversion factor that should be applied to an activity, unless otherwise stated, the total CO₂e, which includes the emissions from all associated GHGs, should be used as in the example below:

Activity	Country	Unit	Year	kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O
Electricity generated	Electricity: UK	kWh	2021	0.21233	0.21016	0.0008	0.00137

- 1.4.6 Carbon Calculators.** There are many carbon calculators available. Some are non-sector specific, free, simple and available on-line. Others are bespoke to an industry or can be developed for a single organisation or business at a charge. Those which charge for their use are often, but not always, more complex and may require specialist consultancy to understand and complete.

For those organisations which have a legislated duty to report on their environmental performance including their GHG emissions, associated guidance produced by the Government does not stipulate which carbon calculation method should be used. However it does recommend that a robust and accepted standard be used such as one of the following:

- GHG Reporting Protocol - Corporate Standard.
- International Organisation for Standardization, ISO (ISO 14064-1:2018).
- Climate Disclosure Standards Board, CDSB.
- The Global Reporting Initiative Sustainability Reporting Guidelines.

It also recommends that consistent methodologies are used to allow for meaningful comparisons of data over time and to enable individual organisations to compare and benchmark their results against their peers should they wish to do so.

2 PLANNING A CARBON AUDIT

2.1 **Principles of Carbon Accounting.** As with the collection, calculation and reporting of any data, there are a number of standard principles which should be taken into account when accounting and reporting carbon emissions data. These are set out by the GHG Protocol and the UK Governments' Environmental Reporting Guidelines as follows:

- **Relevance:** A GHG inventory should appropriately reflect the GHG emissions of the organisation and serve the decision-making needs of both internal and external stakeholders.
- **Completeness:** Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.
- **Consistency:** Use consistent methodologies to allow for meaningful comparisons of emissions over time. Document any changes to the data, inventory boundary, methods, or any other relevant factors.
- **Transparency:** Address all relevant issues in a factual and coherent manner. Disclose any assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
- **Accuracy:** Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.
- **Comparable:** Organisations should use a robust and accepted standard methodology when developing carbon inventories rather than inventing their own versions of potentially standard indicators. This will aid an organisation to benchmark their results and will help users of the data to judge their performance against their peers.

2.2 **Setting Organisational Boundaries.** For individual IDBs who have a simple, single level organizational structure, identifying the emissions for which it should take responsibility should be a straight forward matter. For those that operate collaboratively, such as IDB consortiums, emissions in terms of those related to channel maintenance and pumping operations should also be relatively easy to ring-fence. There may be a need to calculate what proportion of emissions arising from the central administration and management of such groups should be apportioned to each individual IDB but it is likely that an accounting mechanism is already in place to determine cost allocations for this which could also be used to allocate emissions in the same proportions. Whatever method is used it must be detailed as part of the calculation.

The GHG Protocol sets out a number of ways to delineate the organizational responsibility for GHG emissions. The most appropriate approach for IDBs is likely to be a "control approach". This approach dictates that 100% of all carbon-emitting activities which an organisation has either financial or operational control over should be included. Some other approaches are more applicable to other more complex corporate businesses. For more information and to review the most appropriate approach for each IDB, see the GHG Protocol Corporate Standard available on-line.

2.3 **Setting the Base Year.** The starting point of benchmarking carbon emissions doesn't have to be the current year but should be the closest possible point in time to which data is available. Previous financial years' data is likely to be more easily accessible but may not be complete or detailed enough to complete a full carbon inventory for the year. It is likely that on review of this guidance, time will need to be taken to identify what data needs to be collected and to design and implement processes to collect such data efficiently from the beginning of the next reporting period. The first reporting period is known as the base year.

However, particularly for IDBs, there are some other important considerations to be made when deciding upon a base year. IDBs are in a particularly complex situation in that emissions from their most significant sources are partly related to uncontrollable factors such as the weather. Choosing a single base year with this in mind needs careful consideration. It would be prudent to choose a year which could be considered "average" as far as is possible. Choosing a year where weather dictated the need for particularly high or low energy usage on average may risk masking or over-stating future efficiencies made. Where good data for a number of years already exists, it may be beneficial to calculate an average from a number of years as the base year.

It is advised that carbon accounting is undertaken annually and corresponds with the IDBs financial year.

2.4 **Defining Scope 1 and 2 Emissions.** Scope 1 and 2 emissions should be fairly straight forward for an IDB to account for and are likely to represent a significant proportion of an IDBs GHG emissions from fossil fuel and electricity consumed. In terms of the

GHG Protocol, scope 1 and 2 emissions are considered mandatory for reporting. Scope 3 emission reporting is optional partly due to the complexities involved. Many organisations focus on becoming confident with gathering and reporting scope 1 and 2 emissions only at first while developing processes to identify and gather data on their indirect or scope 3 emissions.

FUEL DATA

IDBs should begin to develop a process to routinely gather data on the volume and type of fuel used by each vehicle, pump and generator used by the IDB. This could be as simple as log books for recording the number of litres of fuel dispensed into each vehicle or pump etc., and kept with the asset or fuel cards. Recording litres of fuel used, rather than only mileage for a vehicle, should help to better identify any efficiencies achieved.

ELECTRICITY DATA

Many IDBs are already receiving and recording electricity consumption data by location and by individual pump. Some are receiving and recording detailed consumption data per day or even per hour. IDBs should aim to collect electricity consumption data in as much sub-divided detail as possible. This may mean requesting more detailed breakdowns from suppliers where possible or installing meters. Where energy used can be delineated by premises and pump, and particularly when it is accompanied by other data such as operating or occupancy times it will be much easier to identify where any efficiencies and reductions can be made and will highlight the success of efficiency strategies.

HEATING AND COOLING

Emissions from gas or oil heating and air conditioning in offices and depots would be relevant to many IDBs and should be included in scope 1 emissions reported. It is prudent to collect and report such data in as much detail as possible, as it is for electricity, for the same reasons, broken down by location and time where possible.

PUBLIC SECTOR CO-OPERATION AGREEMENTS (PSCA) AND OTHER WORK FOR THIRD PARTIES

Many IDBs undertake operations under a PSCA for the Environment Agency, local authority or for other third parties. The fuel used by IDB vehicles, plant and machinery or their contractors for such operations should be recorded separately and should not be included in the IDBs scope 1 emissions.

2.5 Defining Scope 3 Emissions Calculating scope 3 emissions can often be difficult because the data required is mostly held by the other organisations or people in the supply chain. However there is some scope 3 emissions data which should be relatively easy and quick for IDBs to gather and report each year. The calculation of emissions relating to employees travel to and from work for example may only require the IDB to develop an internal data collection process such as a simple annual survey or on-line questionnaire.

Going further with scope 3 emissions, the IDB can decide how far up or down their supply chain they try to gather emissions data for. The UK Governments' Greenhouse Gas Reporting Conversion Factors for the reporting year will need to be used to manually calculate the emissions associated with each defined activity. Some estimated conversion factors are also provided in the Governments' Environmental Reporting Guidance available on-line for common products and services.

Whichever approach the IDB wishes to take with calculating and reporting, it is important to adhere to the standard principles as set above and that all assumptions, exclusions and approaches are recorded and documented.

CONTRACTOR EMISSIONS

Many IDBs use contractors to undertake their channel maintenance operations. Any emissions related to work undertaken by contractors on behalf of IDBs should be included under scope 3 emissions, because the IDB directs the operations and has financial control over them. Conversely, any work that an IDB undertakes for a third party, including under a PSCA would not be expected to fall within the IDBs operational or financial control.

Recording the fuel used by contractor vehicles and machinery while undertaking IDB work may need a process to be developed in co-operation with the contractors but once set-up, the process should provide the IDB with the fuel usage data necessary to calculate the related emissions. Where contractors are used to undertake most of the IDBs' channel operations, this data will most likely represent the majority of the IDBs GHG emissions so will be a priority to determine.

An IDB may also consider accounting for other emissions related to the delivery of the contracted service including a proportion of contractor vehicle manufacture, premises costs and service administration. This may be simple where the contractor only uses specific vehicles or machinery only for IDB work. Where there are multiple clients for the contractor, careful liaison will be required to identify the proportion of emissions which should be attributed to the IDBs business in order to reduce the risk of double counting.

- 2.6 Emissions from Capital Works & Construction.** It is advised that IDBs first become confident in accounting for regular operational carbon emissions before trying to account for complex construction emissions. However it is prudent to put a process in place as soon as possible to enable emissions data to be gathered and recorded during construction projects. For example, any fuel used in construction vehicles or machinery that are working on a specific construction project could be recorded separately from the fuel used for regular operational activities even if the same fuel store and vehicles are used for both.

ADA has provided an example of a carbon calculator completed with IDB-relevant data which includes some emissions from construction. The worked-up example, called Example 2 is available from the ADA website.

Potential contractors for any construction projects should be asked about their emission reporting capabilities and which GHG calculation and reporting standards they follow. They should be able to provide examples of reports to evidence their competency. The ability to provide a verified standard of data should be part of the IDBs selection process.

Further guidance on calculating and reporting emissions from construction can be found on the GHG Protocol website.

- 2.7 Defining Sub-categories.** The GHG Protocol only requires that emissions are categorized into scope level. However it is often more beneficial if data within scopes is subdivided further. In line with the principles set out previously, the final carbon inventory report should be meaningful and useful to the user and this may only be achieved if data is sub-divided into emission sources. For example, rather than entering one total figure for all the diesel used by the IDB in a reporting year, it is likely to be beneficial to break down the fuel used by the IDB into sub-categories such as vehicles, pumping stations and pumps, to help to identify trends in emissions data.
- 2.8 Developing carbon inventories on different scales.** It may be advantageous to complete individual carbon inventories for each significant asset such as by pumping station or groups of pumping stations, office, depot or group of vehicles first and then the results from each asset sub-category combined to produce an overall consolidated IDB or consortium-level report.

3 GUIDANCE NOTES FOR CARBON CALCULATOR USE

Following a review of several carbon calculators including those of other RMA's, ADA has concluded that the most appropriate for IDBs is one that has been developed for use by local authorities. The Greenhouse Gas Accounting Tool was developed in partnership by the Government-owned Local Partnerships organisation (LP) and the Local Government Association (LGA).

The tool is a calculator which aligns to the GHG Protocol and is available on-line for free in an accessible Microsoft Excel format with accompanying guidance. The tool is editable and simple to use and produces summary tables and charts to help users to understand their most significant emission sources, which can then be used to prioritise actions to reduce carbon emissions. The results also correspond with the reporting requirements ADA will be bound by under the Government guidelines for Environmental Reporting for voluntary greenhouse gas reporting. The tool is available from the Local Partnerships website.

The template is editable so extra rows, tables and categories can be added where required and conversion factors can be added or amended where necessary. Some guidance on how to navigate the tool is provided within the spreadsheets and in a separate FAQ document available alongside the tool but is brief and very much geared towards a local authority setting.

Guidance on the completion of the LP/LGA calculator for IDBs is provided below along with 2 example approaches of how an IDB may wish to calculate their emissions.

3.1 Example 1 – Standard Approach (minimum requirements).

This example and associated guidance represents a carbon inventory for the whole IDB rather than an asset-specific sub-calculation as may be done per pumping station. This minimum data provision would not require the main structure of the LGA/LP carbon calculator template to be altered and existing tables could be utilized to enter the data. Other than data entry in the cells indicated, other changes to the spreadsheet should be avoided in order to preserve the built-in calculation formulas and links.

This Standard Approach would satisfy the GHG Protocol and the UK Governments' Environmental Reporting Guidelines minimum reporting standards for voluntary GHG reporting.

3.1.1 General.

- References to local authorities can be replaced with IDB references where required and other non-relevant notes removed with care if not required.

3.1.2 Scope 1.

- Amend table headings where required.
- Enter data for heating of all premises and all fuel used by all IDB owned vehicles, plant & machinery and pumps etc. for IDB operations*.

3.1.2.1 Fugitive Emissions. It is likely that fugitive emission sources for an IDB will be limited to domestic fridges in offices and depots, air conditioning units and air conditioning in owned vehicles. Calculating fugitive emissions is complex and is likely to only represent a small proportion of an IDBs overall emissions. However, refrigerant emissions are very potent so once an IDB is confidently reporting other scope 1 and 2 emissions, efforts should be made to calculate them where possible. The simplest calculation method is known as the Screening Method and is likely to be the most appropriate for IDBs. The method is set out by the GHG Protocol guidance available from their website.

Due to the complexity, ADA has not produced a worked example for fugitive emissions and has instead focused on the most likely significant sources of IDB GHG emissions.

3.1.2.2 IDB Pumps, mobile plant and machinery and other vehicles.

- In the IDBs fleet table, if data is to be entered in miles, it must be recorded against the most appropriate vehicle category listed. However, if the data is going to be entered in litres, vehicle descriptions can be overtyped with a more appropriate description provided that the vehicle is of the same fuel type. The same applies for petrol consumption. Suggested amendments to diesel sub categories are as follows:

“Diesel (average biofuel blend) – Static and mobile pumps” “Diesel (average biofuel blend) – Passenger vehicles”

“Diesel (average biofuel blend) – Mobile plant and machinery”

Suggested amendments to petrol sub categories are as follows:

- Petrol (average biofuel blend) – Passenger vehicles”
- Ensure all explanations are detailed in the notes section, including calculation methods, data collection methods, exclusions etc. and a breakdown of grouped data is provided where required.

*Many IDBs undertake operations under a Public Sector Co-operation Agreement (PSCA) for the Environment Agency, local authority or for other third parties. The fuel used by IDB vehicles, plant and machinery or their contractors for such operations should be recorded separately and should not be included in the IDBs scope 1 emissions. This fact should also be recorded in the scope 1 notes.

3.1.3 Scope 2.

- Amend table headings where required.
- Enter the annual figure for all electricity used by the IDB in buildings such as offices and depots where this is distinguishable from the electric used by electric pumps. Otherwise enter the total annual volume of electricity used for all purposes and amend the description of the cell to reflect total IDB energy use. The information required is likely to be detailed on the energy providers' bills.*
- Where electricity used by electric pumps is distinguishable from all other electricity use, it is recommended that the “Street Lighting” category description is amended to reflect the separate emission source for the IDBs i.e. “Electricity - Electric Pumps” and the total volume of energy used for pumping in the year entered against it.
- Enter the total mileage undertaken in electric vehicles by the IDB against the appropriate category, where the energy used to charge the vehicles is distinguishable from all other electricity used by the IDB. Otherwise enter the total annual volume of electricity used for all purposes in the first table as above and amend the description of the cell to reflect total IDB energy use.
- Ensure all explanations are detailed in the notes section, including calculation methods, data collection methods, exclusions etc. and a breakdown of grouped data is provided where required.

*Many IDBs undertake operations under a PSCA for the Environment Agency, local authority or for other third parties. The appropriate percentage of the total heating energy and electricity the IDB has used in the year which can be attributed to providing the outsourced services should not be included in the IDBs scope 2 emissions.

3.1.4 Scope 3 & Outsourced Scope 3.

All scope 3 data provision is optional for organisations who are submitting their GHG emissions voluntarily. It is only mandatory for “quoted” organisations, as specified by the Government and legislation, to submit scope 3 emission data. However there are some scope 3 and outsourced scope 3 emissions which are relevant to an IDB setting which could form a significant proportion of an IDBs overall GHG emissions in some cases. Use of contractors for channel operations and maintenance is one such example. For this reason we recommended that some scope 3 and outsourced scope 3 emissions are included as a minimum if contractors are used. There are also some simple scope 3 emissions relevant to most IDBs that could be recorded relatively easily such as staff travel. These significant and simple datasets have been included in the example (Example 1) provided by ADA.

3.1.4.1 Scope 3

- Amend table headings where required.
- Record all business mileage by car undertaken by staff in the year.
- Record the total water supplied and treated in cubic metres as per the IDBs water bills.
- Ensure all explanations are detailed in the notes section, including calculation methods, data collection

methods, exclusions etc. and a breakdown of grouped data is provided where required.

3.1.4.2 Scope 3 Outsourced.

- Amend table headings where required.
- Outsourced scope 3 data for IDBs is the proportion of their contractors' scope 1 and 2 data which can be attributed to the delivery of the IDB service.
- Record all the fuel used by contractors during the year whilst undertaking IDB operations, as provided by the contractor. This is required as a minimum.
- If providers' fleet data is to be entered in miles, it must be recorded against the most appropriate vehicle category listed. The preference is for data to be recorded in litres.

If the data is going to be entered in litres, vehicle descriptions can be overtyped with a more appropriate description, providing the vehicle being overtyped is of the same fuel type. The same applies for petrol consumption. Suggested amendments to diesel sub categories are as follows:

"Diesel (average biofuel blend) – Mobile Plant and Machinery"

Suggested amendments to petrol sub categories are as follows: Petrol (average biofuel blend) – Passenger vehicles"

- Record the % of the total electricity the contractor has used in the year which can be attributed to providing the IDBs service, as provided by the contractor. Where this cannot be provided, leave blank and provide an explanation of the omission in the notes.
- Record the % of the total heating energy the contractor has used in the year which can be attributed to providing the IDBs service, as provided by the contractor. Where this cannot be provided, leave blank and provide an explanation of the omission in the notes.
- Ensure all explanations are detailed in the notes section, including calculation methods, data collection methods, exclusions etc. and a breakdown of grouped data is provided where required.

3.1.5 Summary Tables & Charts worksheets. The summary tables worksheet will be the most relevant and useful GHG emission data to IDBs. The tables present the summaries of the significant emission sources as a percentage of overall IDB emissions which can be extracted to create separate charts if required.

3.1.6 Other worksheets. If the minimum requirements approach is being taken as in Example 1, the data in the remaining worksheets are not expected to provide any useful purpose for the IDB so can be ignored. They must be retained though as they provide some data used to calculate cells in the main scope spreadsheets.

3.2 Example 2 – Best practice. Example 2 also represents an overall IDB-level calculation but goes further than the minimum requirements in terms of emissions calculated. This best practice approach requires extensive editing of the template including adding tables and sub-categories which are relevant and useful to the IDB and other users. It also requires that the relevant conversion factors for each emitting activity are identified and entered. The resulting summary tables and charts will also need to be edited to ensure linked data from other tabs is picked up correctly and completely. Strong excel and data analysis skills will be required to enter and verify the data, and robust quality control checks for data accuracy and completeness will also be key.

In Example 2 provided by ADA, only the summary tables have been completed as it is likely that an IDB would want to generate bespoke charts.

For this approach, as demonstrated in the example, all worksheets in the workbook following the summary tables worksheet (the last 4 worksheets of the spreadsheet) are not relevant and can be ignored but should be retained.

Completion notes for individual sheets and tables have not been provided for IDBs wishing to take this approach as each IDB is likely to want to present their data differently. Instead general overall guidance for this approach is given.

3.2.1 Planning sub-categories. Careful thought should be paid to the emissions that the IDB is going to commit to calculate in the long-term and the processes that need to be put in place to efficiently and regularly gather the relevant data. This is because, in order to identify trends and in particular reductions in emissions following CO₂ reduction strategies, the same data will need to be gathered in the same way each year. Reporting emissions within a category one year but choosing not to the next may mask or appear to overstate reductions in emissions made. For example, unless the IDB commits to gathering data on the transportation of waste every year, it should not be included. Robust processes should be put in place with any suppliers and contractors to ensure that any data that is provided one year can continue to be provided in following reporting periods and will be calculated in the same way. Sometimes though changes are necessary and providing the explanations are detailed in the narrative to explain any differences then it should not invalidate the process.

3.2.2 Conversion factor sources In Example 2 provided by ADA, conversion factors from 2 sources as detailed below are used and the same sources should be used by the IDB. It is important that the description of the activity or source entered into the worksheet matches that of the associated conversion factor used to allow for data checking and efficient consolidation. For example, for vehicles, if litres of fuel is being recorded, then the fuel type not the vehicle type should be the activity description. If mileage is being recorded, then the vehicle type including fuel type used should be listed. Only data for which a conversion factor is available should be entered.

3.2.2.1 UK Governments' Greenhouse Gas Reporting Conversion factors

Where volume of activity is known in tonnes, miles, litres etc., the greenhouse gas reporting conversion factors as published on the UK Government website for the specified reporting year should be used to calculate the relevant CO₂e in tonnes. This includes but is not limited to fossil fuel consumption in litres, electricity use in kWh, miles travelled by vehicle type and materials by weight in tonnes.

3.2.2.2 UK Governments' Environmental Reporting Guidelines

(Including streamlined energy and carbon reporting guidance: March 2019)

For some materials and activities, particularly those related to scope 3 emissions, the only data an IDB may have is the cost in pounds. For these instances, the IDB can use the Environmental Reporting Guidelines published by the Government, which provides conversion factor estimates per £ spent for a range of common activities and materials, listed in Annex E of the guidelines. The guidelines are available from the Government website. The IDBs annual accounts can be analysed to identify all expenditure that corresponds with a category in Annex E for which a CO₂e estimate can be provided.

3.3 Quality Control Data accuracy is key with GHG emission calculating and reporting. It is recommended that there are several quality checks made of the calculations and that someone other than the person completing the carbon calculator checks the data:

1. Verify all emissions sources have been identified.
2. Verify all data entered – ensure that data entered corresponds to source data such as provider bills and invoices etc. accurately, with no estimations, errors or omissions
3. Ensure all sources, methodologies, assumptions, estimations, omissions, exclusions and inclusions have been explained fully. Enough information should be provided so that anyone taking over the responsibility for the calculation in later years is aware of the sources and methods used to calculate previous year's data.
4. Ensure all linked cells are calculating correctly when data is added and that the correct conversion factors are being used for each line of data.
5. If the IDB is adding data, tables, sub-categories and additional conversion factors in each scope which alter the summary tables and charts, ensure that all linked cells are calculating correctly.
6. If the IDB is adding conversion factors, ensure that the most up to date conversion factors are being used as published by HM Government each year on their website.

4 FAQ'S

4.1 What are the minimum thresholds for inclusion in a carbon inventory? This depends on many factors. However the basic principles dictate that data is considered to be material if, by its inclusion or exclusion, it can be seen to influence any decisions or actions taken by the users of the report. Example 2 of an IDB carbon calculation demonstrates that while some of the emissions from each individual source in scope 3 may not represent a significant proportion of the overall IDB emissions, all the small emissions added together can become a significant proportion of the IDB emissions and serve as a focus for emission reduction strategies in the future. The example demonstrates that the emissions associated with rail travel were so small they did not produce a figure. This could help a user of the report to recommend that more business travel is in future undertaken by rail.

4.2 Can I change previous years' calculations? There are situations where it may be necessary to recalculate previous years' emissions data or even revise the base year. These are expected to be rare in the case of IDBs however, it is possible and acceptable to do so where standard principles are followed.

Organic growth of operations would not need any recalculations, such as emissions relating expansion of an IDBs district, as the expansion would result in an increase in emissions. However, if one IDB moves from one consortium to another or if an IDB becomes part of a consortium, the consortiums' base year and following years may need to be recalculated to include/exclude the associated IDB figures. Further guidance on how to recalculate emissions following a restructure or merger, or when calculation methodology improves can be found in the GHG Protocol Corporate Standard.

4.3 Can I estimate figures? There may be some instances where a full years' data is not available for an emissions category. It is acceptable to calculate the emissions for the missing period using an average of the data available. The GHG Protocol Corporate Standard Guidance provides further details on the best approaches for estimating.

4.4 How do I count emissions from renewable energy? If the IDB buys its electricity from a renewable energy provider, the provider should be contacted to confirm the percentage of the supply that is supported by a Renewable Energy Guarantees of Origin (REGO) certificate. The energy provider should also be able to confirm the CO₂ emission conversion factor that can be applied to each Kwh of electricity consumed by the IDB. This can be recorded in the carbon calculator and included in the IDBs gross CO₂ total. See the Carbon Trust website for more information on how to obtain and record energy from renewable sources.

For other purchased "green" energy from non-renewable sources such as from providers who have certified offsets for a proportion of the energy they generate and sell, this would be reported separately in a net CO₂ total not the gross total. The 2009 version of the HM Government Environmental Reporting Guidelines provides more detailed information, particularly in Annex G, and is available from the .gov.uk website.

If the IDB generates and uses its own renewable electricity, the HM Government Environmental Reporting Guidelines state that the energy used by the IDB can be recorded as a zero emission within its gross CO₂ emissions, where backed up by REGO certificates. Any surplus energy exported to the grid would have to be recorded separately and used to generate a net CO₂ total, with the exported amount netted off up to total amount of electricity purchased back from the grid in high-use times. See the guidance for more information and helpful worked examples.

4.5 How do I count emissions from offsetting? Carbon emissions should always be recorded and reported as a gross figure prior to any offsets being applied. The gross figure should be the headline CO₂ emissions figure reported. Any carbon offsets such as from exporting surplus renewable energy or certified carbon credits should be recorded separately and used to calculate and report a separate net CO₂ figure. These offsets or external reduction activities must meet Defra's good quality criteria to be included, as set out in HM Government Environmental Reporting Guidelines available from the .gov.uk website.

More information on how to report and calculate external CO₂ reductions can be found via the guidelines detailed.

4.6 How do I record Biodiesel HVO (Hydrotreated Vegetable Oil) fuel use? There are currently no categories listed in the standard carbon calculation template for vehicles fuelled with HVO so one would need to be added or an existing line which wasn't going to be used could be overtyped. In order to record the emissions derived from the litres of fuel used by such vehicles during IDB operations, the correct conversion factor will have to be identified and entered into the relevant table, column and cell in the scope 1 worksheet along with the litres used (not miles). The conversion factor for HVO fuel can be found from the UK Governments' Greenhouse Gas Reporting Conversion Factors spreadsheet available on line for the

relevant year. Guidance provided relating to ADAs Example 2 will be helpful in understanding how to edit the worksheet for these purposes. An example of how this would look when entered onto the spreadsheet for 2021 is presented below:

IDB Pumps, mobile plant and machinery and other vehicles

Activity* Engine size below are for indicative purposes only	Consumption Units (Please Select)	Year	Consumption	Conversion Factor	Emission (tCO ₂ e)
Biodiesel HVO vehicles	Litres	2021-22	981	0.036	0.03
Diesel (average biofuel blend) - Passenger vehicles	Litres	2021-22	4,105	2.512	10.31

5 REPORTING CARBON EMISSIONS

For IDBs wishing to report their carbon emissions voluntarily to the Government, reporting guidance is presented in the UK Governments' Environmental Reporting Guidelines and includes a worked example of a report in Annex H. ADA has developed a reporting template for IDB use based upon this guidance which can be downloaded from the ADA website.

The ADA template has been designed so that much of the information can be copied and pasted into the report from the Local Partnerships Greenhouse Gas Accounting Tool (if it is used for the calculation) to minimise duplication of effort.

Completed reports for inclusion in the annual sector reporting by ADA should be submitted to ADA by the 1st October each year.

The report template can also be used to publish the IDBs carbon emission results through other channels such as their own website. Indeed, IDBs are encouraged to publish their carbon audits for transparency, to highlight their understanding and appreciation of the need to reduce GHG emissions and to bring attention to the contribution they make to the global effort.

5.1 Intensity Ratios. An intensity ratio is a recommended way of defining carbon emissions data in relation to a relevant organisational metric, known as a normalising factor, such as tonnes of CO₂e per sales revenue, per unit manufactured or per total square metres of floor space. This allows for the comparison of energy efficiency performance over time and between similar organisations. However it is very difficult to identify such an organisational metric for IDBs which is consistent and relevant across all IDBs and which reflects the influence and spatial variability of the weather. The most suitable organisational metric for IDBs is one which is most likely to reflect costs associated with these and other varying factors therefore we recommend that kg CO₂e per £ of expenditure is used. More information on intensity ratios is provided within the Environmental Reporting Guidelines.