MACQUARIE

Green Impact Reporting Criteria

December 2025

This document describes how "green impact" associated with a "green investment" (both terms defined in the Green Investment Policy) into a business, infrastructure or project (hereafter referred to as a "project") disclosed by a Macquarie Group entity or Macquarie Asset Management ("MAM") fund entity applying the Green Investment Policy (the "Disclosing Entity") has been calculated and disclosed. Such disclosures shall reference the applicable dated version of this document. Application of the criteria detailed herein is the responsibility of the MAM Green Analytics team, acting on behalf of the Disclosing Entity, with support from applicable legal, compliance and risk support functions. This document should be read in conjunction with the Appendices, which set out sector-specific criteria, GHG emission factors and other technical details. These reporting criteria are management-defined and draw on reference guidelines for appraisal and evaluation purposes.

Quantified Green Impact

Calculation methodology

Overall approach

The environmental benefit or Green Impact arising from a project is estimated by comparing the project's impact against an alternative outcome (scenario) if the project in question had not taken place. This alternative outcome is referred to as the 'baseline'. Green Impact is calculated using the equation below and can be applied to any of:

- GHG savings (kilotonnes CO_2e),
- energy demand reduction (MWh),
- tonnes additional materials recycled (t) or tonnes waste to landfill (t) avoided
- tonnes of air quaity emissions (NO_x, SO_x, PM_{10} and $PM_{2.5}$) avoided (t)
- Fossil fuel consumption avoided (toe)

with a beneficial Green Impact (saving, reduction, etc.) expressed as a positive number:
Green Impact = (Baseline impact) less (Project impact)

Renewable energy generated (GWh) is reported as the project's net power generated from renewable sources. Electrical power storage capacity (MW) and electrical energy storage capacity (MWh) is reported as the project's installed storage capacity.

Reference guidelines

These reporting criteria follow the guidance on appraisal and evaluation of GHG emissions prepared by the International Financial Institution (IFI) Framework for a Harmonised approach to Greenhouse Gas Accounting[1] (energy generating and energy consuming projects), together with guidance from the GHG Protocol for Project Accounting[2] (all projects). Note that the reporting and disclosure that a Disclosing Entity follows is detailed herein and not necessarily in line with these aforementioned reference guidelines. GHG emissions reduction for non-domestic energy efficiency projects is determined in alignment with the International Performance Measurement and Verification Protocol (IPMVP).[3] GHG emissions reduction and other Green Impacts arising from waste projects are determined using an appropriate life-cycle assessment (LCA) tool,[4] applying the guidelines set out at Appendix 3 to this document. Air quality emissions avoidance and fossil fuel avoidance are determined using emission factors derived from the principles set out in the IFI approach.

Approach to calculating Green Impact

For each project, reporting boundaries and relevant project operating parameters are determined for the appropriate period in line with the sector-specific notes set out at Appendix 1 (e.g. feedstock consumed, energy generated or required). Forecast parameters incorporate suitably conservative estimates (such as 10-year P90 uncertainty analysis, where available). To address uncertainty around future-looking estimates of performance, we may also undertake sensitivity analysis that considers a range of scenarios and project parameters. From this, the relevant project Green Impact is calculated.

For calculating GHG emissions, the relevant project operating parameters are converted into CO_2e using the appropriate emission factors as set out at Appendix 2, unless more appropriate project-specific information is available. Having determined the project's Green Impact, a similar methodology is applied to determine the Green Impact of the baseline. The baseline is determined in accordance with the relevant sector-specific notes set out at Appendix 1. Again, the baseline's operating parameters are converted into GHG emissions or other Green Impact metrics using the relevant emission factors set out at Appendix 2.

The relevant dimension of Green Impact of a project is estimated for reporting purposes for each of two relevant time-horizons, as follows:

- Prior year actual: Green Impact is estimated using the most recent avilable data for each project's actual performance as provided to the Disclosing Entity for the prior year and then applying the methodology outlined above. Actual Green Impact is calculated by projects annually in respect of the reporting period (for MAM fund entities this is April to March).
- Estimated future lifetime Green Impact: For each project an estimate is made of the anticipated future operating parameters (e.g. feedstock consumed, energy generated or required) for each year of the anticipated remaining life of the project. This is then compared to the appropriate baseline in accordance with the methodology set out above.

The future estimated Green Impact is calculated of all projects to which the Disclosing Entity has made a binding commitment to deploy its capital, and for which it does not have reason to believe that the project will not proceed.

1. https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting/ifi-twg-list-of-methodologies
2. http://www.ghgprotocol.org/standards/project-protocol
3. http://www.evo-world.org/
4. An example of an appropriate LCA tool is the WRATE tool, an environmental assessment tool for waste projects originally developed by the Environment Agency

Actual Green Impact is calculated of all projects which are operational and for which the Disclosing Entity investment has achieved financial close. Financial close is defined as being the key date in respect to the financing or other relevant investment documents on which the commitment was realised.

The remaining time-horizon or lifetime of a project is the anticipated economic lifetime of the project. In calculating Green Impact, an estimate is included of each of the elements which are expected to contribute individually to >5% of the total GHG emissions for a project. Where information is not readily available, appropriately conservative estimates are made with the exact approach for estimation decided on a case-by-case basis. A consistent approach is sought in calculating a project's GHG emissions to enable comparisons to be made between areas and over time.

The Green Impact of projects where operating data is not available (i.e. those in development or construction) are estimated either prior to investment using projected project operating parameters for any year of operations or on a lifetime basis or, following investment, using actual project data. These estimations are made using technical reports from third parties, which are reconciled with the information used in the financial model to use the most appropriate estimation. Where necessary, these estimations can then be externally verified to ensure that appropriate project parameters are used. For detailed information on sector specific project parameters, see Appendix 2.

Reported lifetime Green Impact

The Disclosing Entity reports the total estimated lifetime Green Impact, alongside the component time horizons, which is a summation of the prior years' actual and estimated future lifetime Green Impact. The exception to the calculation methodology described above is for energy storage, where the lifetime Green Impact is the summation of installed capacity.

Green Impact is reported for new investments in the reporting period and for all investments to date, which comprise new, retained and exited projects. Actual Green Impact is only included for the Disclosing Entity's period of ownership. See Project exits below for detail on inclusion of Green Impact from exited projects.

Data collection

Data is submitted by projects annually and goes through an automatic validation process at the point of data submission, prior to being subject to quality procedures by the MAM Green Analytics team.[5]

Project eligibility for reporting

The Disclosing Entity only reports estimated Green Impact for projects where a Disclosing Entity has provided a binding commitment to make a principal investment at, or subsequent to, the project reaching final investment decision (FID), and where the MAM Green Analytics team has made a conclusive determination that the requirements of the Green Investment Policy have been met. Projects become eligible for Green Impact reporting only once both of these conditions have been satisfied.

For investments in projects that have not yet reached FID – e.g. where a Disclosing Entity has provided development funding only – Green Impact is not reported, due to the relative uncertainty over potential future Green Impact.

Allocation of Green Impact to investments

A proportion of the whole investments' Green Impact is attributed to a Disclosing Entity.

For capital managed by third party funds where the Disclosing Entity is a limited partner investor, only the Green Impact attributable to capital committed to or drawn-down in respect of identifiable projects is attributed to the Disclosing Entity and not the Green Impact attributed to capital committed to funds, but not yet committed or drawn-down to projects.

For investments made by MAM-managed fund entities, Green Impact is attributed as a proportion of fund share. Fund share for each investment is calculated as the percentage of enterprise value owned, where equity is included on a fair value basis. This is in line with the fund share calculation applied by MAM in investor reporting of private market funds.

Review and re-estimation of Green Impact

Each year, the estimated remaining lifetime Green Impact data for each project in the Disclosing Entity's portfolio is reviewed. This will be based on the original anticipated lifetime Green Impact data made at the time of investment.

The Disclosing Entity may choose to revise forecast Green Impact if it believes the operating parameters of a project have changed in such a way as to affect future Green Impact predictably, reliably and for the anticipated remaining lifetime of the project.

5. Further information on these processes may be made available on request

Examples of such circumstances may include permanent changes to fundamental technical parameters (e.g. installed generation capacity), contractual terms (e.g. quantity of feedstock procured), or operational parameters (e.g. operating hours).

The need for such a reforecast would be triggered if the annual review of actual Green Impact performance provides reasonable evidence that the basis of previous estimates has materially and permanently changed, leading to >5% change in forecast remaining lifetime performance. We expect greater variability of performance as compared to forecast until a project has completed three years of operation at full capacity, and consequently would not expect to reforecast Green Impact for projects in their first three to five years unless actual performance variances could be attributed to permanent operating parameter changes.

Any re-estimate will be made using the same methodology as for a new investment, as set out in this document. Prior to the commencement of operation of a project, anticipated Green Impact is not reforecast, save in the case that the project is terminated.

Project exits

Where the Disclosing Entity has ceased its involvement in a project, either through expiry or full repayment of a loan facility, or through sale of the entirety of its equity interest, the project's actual Green Impact up to the point of exit is included in the lifetime.

For all assets that were acquired by a MAM fund, actual Green Impact of the asset's projects up to the point of exit is included in the lifetime Green Impact. The estimated future lifetime Green Impact is no longer reported in the lifetime Green Impact. This is in line with the allocation approach for funds.

Project cancellations and refinancing

Cancellations – for all investments to date, where a project is cancelled in such a way that the Disclosing Entity believes that it will either permanently cease operating or will not become operational or otherwise is deemed to be ineligible for continued Green Impact Reporting by the Disclosing Entity, the future estimated Green Impact will be removed permanently from the Disclosing Entity's reported Green Impact.

Reporting of aggregate Green Impact

When reporting Green Impact in the Green Impact Statements, numbers are rounded to the nearest integer value prior to being added up to the total.

Whilst all the Green Impact figures in the Green Impact Statements are determined in good faith, they are not subject to exact and certain measurement. In each case they are estimated on the basis of well-informed assumptions and projections, and necessarily require the application of reasonable interpretation and professional judgment. In the case of anticipated future performance, as with any predictions about the future, the actual result may differ to that which is forecast.

Exclusions

Emissions associated with the embedded energy of constructing or decommissioning green infrastructure projects are generally not considered to be material in Green Impact calculations and are not included within emissions reduction calculations, unless there is evidence to suggest these are likely to affect a calculation by more than 5%.[6] However, GHG emissions associated with the lifecycle process of preparing biomass feedstock (for example in the manufacture of biomass for power) are always considered. Further details are provided in the Appendices to this document.

External assurance

The Green Impact Statements are externally assured by an independent auditor prior to publication. These metrics are assured against the ISAE3000 standard under limited assurance.

6. Note that in respect of waste project GHG emissions, LCA tools generally do include an estimate of the embedded GHG emissions associated with the construction of projects.

Appendix 1 - Sector-specific criteria

1.1 Wind, solar and small-scale hydro power

Scope

This covers investment in all types of wind energy, solar energy and small-scale (<10 MW) hydro power projects.

Project Green Purpose(s)

The purpose of a wind farm, solar farm or hydro power project is to produce renewable electricity. This, in turn, reduces emissions and avoids fossil fuel usage, leading to increased efficiency in the use of natural resources.

Project Impact

The emissions associated with production of electricity at a wind farm, solar farm or small-scale hydro power project are assumed to be zero.

Baseline Impact

The baseline is assumed to be the equivalent power produced by variable generation Combined Margin. The emissions associated with the baseline are determined by using the appropriate emission factor for variable generation Combined Margin electricity as set out in Appendix 2.

Green Impact

From the above, emissions reductions are estimated either prior to investment using projected project operating parameters for any year of operations or on a lifetime basis or, following investment, using actual project data. Projected project parameters are obtained through technical reports conducted by third party technical advisors. These may be in the form of an energy yield assessment, using a probability distribution. Where available, a 10-year P90 value for energy generation is used as a conservative estimate. However, where a 10-year P90 is not available, the project parameters will be matched to those used in the financial model.

1.2 Waste – Materials Recovery Facility (MRF)

Scope

This includes facilities that involve identifying and sorting waste, then extracting and preparing materials that can be either re-used or re-processed into new products.

Project Green Purpose(s)

The purpose of MRFs is to increase recycling rates, which avoid the production of virgin material. This reduces GHG emissions as well as improving the efficiency in the use of natural resources and protecting the natural environment by avoiding waste-to-landfill.

Project Impact

This is calculated using an LCA tool and involves a calculation for the MRF relevant GHG emissions arising including electricity used to power the machinery to sort the feedstock including transportation of waste to/ from the MRF.

Baseline Impact

It is assumed (unless there is project specific evidence to the contrary) that waste treated by the MRF would otherwise go to landfill. The GHG emissions associated with this outcome are calculated using an LCA tool. The baseline includes the production of additional virgin materials which would need to be produced if recycling did not take place.

Green Impact

GHG emissions reduction from the MRF is calculated by subtracting the project emissions from the baseline emissions (using projected project operating parameters for any year of operations or on a lifetime basis or, following investment, using actual project data). Using the same methodology, the additional materials recycled by key category (e.g. paper/ card, ferrous metals, non-ferrous metals etc.) is also calculated, together with the avoided waste-to-landfill. Projected project parameters for waste projects are matched to those used in the financial model (including, for example, throughput and anticipated waste composition).

1.3 Waste – Waste Pre-Treatment Facility (WPTF)

Scope

This includes investment in waste pre-treatment facilities which produce stabilised waste outputs such as refuse-derived fuel and includes technologies such as mechanical biological treatment, mechanical heat treatment and other waste autoclave technologies that apply pressure to treat waste.

Project Green Purpose(s)

The purpose of WPTF includes (i) stabilising and drying the waste into RDF, in order to enable increased energy recovery; (ii) stabilising waste prior to landfill to reduce GHG emissions; (iii) extracting increased recyclable materials to increase recycling rates. This reduces GHG emissions as well as improving the efficiency in the use of natural resources and protecting the natural environment by avoiding waste-to-landfill.

Project Impact

The project is defined as the treatment of waste using WPTF, together with subsequent treatment of the residual waste by the most likely technology destination. An LCA tool is used to calculate the associated emissions, together with projected recycling of materials (which avoids the production of virgin materials) and residual waste to landfill.

Baseline Impact

An LCA tool is used to calculate the associated emissions, together with projected recycling of materials and residual waste to landfill.

Green Impact

GHG emissions reduction from the WPTF is calculated by subtracting the project emissions from the baseline emissions (using projected project operating parameters for any year of operations or on a lifetime basis or, following investment, using actual project data). Using the same methodology, any additional materials recycled by key category (e.g. paper/ card, ferrous metals, non-ferrous metals etc.) is also calculated, together the avoided waste-to-landfill. Projected project parameters for waste projects are matched to those used in the financial model (including, for example, throughput and anticipated waste composition).

1.4 Waste – thermal treatment Energy from Waste (EfW)

Scope

This includes investment in all types of thermal treatment of residual waste, although it excludes thermal treatment technologies which rely exclusively upon RDF or SRF produced to a required specification.

Project Green Purpose(s)

The purpose of EfW facilities is two-fold: (i) to divert waste from going to landfill; and (ii) to recover energy from the waste. Together this reduces GHG emissions and protects the natural environment by avoiding waste-to-landfill.

Project Impact

This is calculated using an LCA tool and involves a calculation relevant GHG emissions including emissions arising on the conversion of waste to energy and transportation of waste to/from the EfW. It also includes the GHG saving of electricity generated by the EfW, which is assumed to displace the equivalent electricity generated by using firm generation Combined Margin electricity (as set out in Appendix 2) and any benefit from additional recycling of materials which avoids production of virgin materials.

Baseline Impact

In the absence of project-specific information, it is assumed that the destination of the residual waste is landfill. The associated GHG emissions are calculated using an LCA tool.

Green Impact

GHG emissions reduction from the EfW is calculated by subtracting the project emissions from the baseline emissions (using anticipated project operating parameters for any year of operations or on a lifetime basis or, following investment, using actual project data). Using the same methodology, the additional materials recycled by key category (e.g. ferrous metals, non-ferrous metals etc.) is also calculated, together with the avoided waste-to-landfill. The renewable energy generated (i.e. energy recovery from biogenic waste) is also reported. Projected project parameters for waste projects are matched to those used in the financial model (including, for example, throughput and anticipated waste composition).

The re-use of ashes (for example in aggregates) is included in materials recycled.

1.5 Waste – composting solutions

Scope

This section covers investment in all types of composting including in-vessel composting and open-composting.

Project Green Purpose(s)

The purpose of composting is to reduce GHG emissions arising on the breakdown of the organic matter, when compared to the alternative of landfill emissions, as well as to provide compost-like output which avoids the manufacture of compost. Together this reduces GHG emissions, protects the natural environment by avoiding waste-to-landfill and improves the efficient use of natural resource by increasing materials recycling.

Project Impact

This is calculated using an LCA tool and involves a calculation for the IVC plant of the relevant emissions arising on the conversion of waste to energy including transportation of waste to/ from the IVC plant.

Baseline Impact

In the absence of project-specific information, it is assumed that the destination of the residual waste is landfill. The associated GHG emissions are calculated using an LCA tool.

Green Impact

GHG emissions reduction from the IVC plant is calculated by subtracting the project emissions from the baseline emissions (using anticipated project operating parameters for any year of operations or on a lifetime basis or, following investment, using actual project data). Using the same methodology, the additional materials recycled by key category (e.g. compost-like output etc.) is also calculated, together with the avoided waste-to-landfill. Projected project parameters for waste projects are matched to those used in the financial model (including, for example, throughput and anticipated waste composition).

1.6 Non-Domestic Energy Efficiency (NDEE)

Scope

The scope for NDEE includes investments deployed at non- domestic sites (i.e. commercial and public sector properties) to reduce energy consumed, with a focus on the reduction in Scope 1 and 2 emissions (but not Scope 3 emissions arising at other sites) through the retrofit of existing sites.

Project Green Purpose(s)

The project purpose is to reduce energy demand and associated emissions through the implementation of Energy Conservation Measures (ECMs).

Project Impact

The project emissions are those associated with the site(s) relating to the Project following the implementation of ECMs. This is calculated by following the IPMVP, which ensures a consistent application of the following key elements of energy demand reduction and associated savings:

- Definition of range of ECMs
- Estimation of appropriate lifetime of the ECMs
- Identification of project boundaries
- Selection of appropriate monitoring and verification methodology
- No energy saving is attributed to additional capacity added to a site through the project. The associated emissions is calculated by taking the reduced energy demand and converting this into a saving by applying the appropriate emission factors in line with Appendix 2.

Baseline Impact

The project baseline is the assumed energy demand of the site(s) relating to the project prior to implementation of any additional ECMs. The associated emissions are calculated by taking the baseline energy demand and converting this into a saving by applying the appropriate emission factors in line with Appendix 2.

Green Impact

The relative emissions saving is calculated by subtracting the Project emissions from the baseline emissions as calculated using projected project operating parameters for any year of operations or on a lifetime basis or, following investment, using actual project data. The reduction in energy demand and renewable energy generated are also reported.

1.7 Biomass power

Scope

This section covers investment in large scale biomass heat/power plants of >1 MWe capacity using a variety of biomass feedstock. It includes plants which are the result of a conversion of part or all of their capacity from coal power to biomass, as well as dedicated new build biomass plants.

Project Green purpose(s)

The project purpose is the production of renewable electricity and, potentially, heat. This, in turn, reduces GHG emissions and avoids fossil fuel usage (efficiency in the use of natural resources).

Project Impact

The emissions associated with combusting biomass are calculated using the Ofgem approved biomass power life-cycle emissions calculator tool as set out in the Ofgem guidelines,[7] or an international equivalent calculator, which estimates the secondary emissions associated with the biomass lifecycle. Primary emissions from the combustion of sustainably sourced biomass are assumed to be zero. Where any non- biomass fuel is also combusted (e.g. fossil fuel mitigant), the associated GHG emissions should be calculated using the appropriate emission factor in Appendix 2, unless project specific information is available.

Baseline Impact

For dedicated new build biomass plants, the baseline is assumed to be the equivalent power produced by firm generation Combined Margin. The GHG emissions associated with the baseline are determined by using the appropriate emission factor for firm generation Combined Margin electricity (as set out in Appendix 2).

For biomass power produced at plants converted from coal, the baseline is regarded as coal-fired power production, based on a conservative estimate of the anticipated future coal operation that would occur if the conversion project did not take place and using the appropriate emission factor for coal in Appendix 2, unless project-specific information is available. To the extent that biomass power production upon conversion is greater than the anticipated coal- fired power production, it is then assumed that the converted biomass plant displaces firm generation Combined Margin electricity, using the appropriate emission factor (as set out in Appendix 2). Where heat is also generated and exported, the GHG intensity of the heat that is displaced is calculated. Unless there is project specific information available, this is assumed to be gas heat using a boiler with 80% efficiency.

Green Impact

From the above, GHG savings are estimated either prior to investment using projected project operating parameters for any year of operations or on a lifetime basis or following investment using actual project data for each of the project and the baseline and the Green Impact calculated accordingly. The renewable energy generated is also reported. Projected project parameters for biomass projects are matched to those used in the financial model (including, for example, throughput and anticipated waste composition).

1.8 Battery Energy Storage Systems (BESS)

Scope

This covers investment in BESS projects that provide grid services, behind the meter services and/or off-grid services to enable the adoption of low-carbon energy generation potentially including directly enhancing the commercial viability of low-carbon energy generation.

Project Green Purpose(s)

The project purpose is dependent on the services provided. BESS project services have the potential to promote environmental sustainability by enabling the adoption of low-carbon energy generation. Such services include:

- grid frequency response services that compensate for low system inertia caused by wind and solar energy;
- arbitrage services, such as peak load-shifting, that displace demand to times when it can be met by lower-carbon generation;
- improving the efficiency of generation ramp-up to meet peak demand periods; and/or
- avoiding renewables curtailment during over-generation from intermittent renewables.

Green Impact

The Green Impact of BESS projects is in the effect of enabling low-carbon energy generation; the magnitude of this effect is deemed to be proportionate to BESS projects' capacity parameters.

Therefore, the metrics used to report Green Impact for BESS projects are total electrical energy storage capacity (MWh) and total electrical output power capacity (MW).

7. https://www.ofgem.gov.uk/publications-and-updates/uk-solid-and-gaseous-biomass-carbon-calculator

1.9 Electric Vehicle (EV)

Scope

This section covers investment into EV projects that provide electric vehicles (cars) leasing to end users.

Project Green Purpose(s)

The project purpose is the provision of electric vehicles to displace Internal Combustion Engine (ICE) vehicles and therefore reduce GHG emissions, improve resource efficiency and improve air quality (by reducing tailpipe emissions).

Project Impact

The emissions from EVs are embedded emissions from the manufacture of the EV, and emissions associated with EV charging, which is calculated using relevant electricity-related emission factors, actual mileage, and EV efficiency.

Baseline Impact

The project baseline is the emissions from the manufacture and the operations (i.e. tailpipe emissions) of an equivalent ICE vehicle that provides the same level of service as the EV, as determined on a case-by-case basis.

Green Impact

The Green Impact of EV projects is in the effect of displacing ICE vehicles and is therefore calculated by subtracting the project emissions (embedded EV emissions plus emissions associated with EV charging) from the baseline emissions (embedded ICE emissions plus ICE operational emissions).

From the above, GHG savings are estimated either prior to investment using projected project operating parameters (mileage and vehicle efficiency), for any year of operations or on a lifetime basis, or following investment using actual project data for each of the project and the baseline, with the Green Impact calculated accordingly.

Projected project parameters for EV projects are aligned with the financial model and can include, for example, number and type of vehicles leased.

Appendix 2 - Emission factors

2.1 Fuel source related emission factors:

- For most fuels, the 'Fuels' figures are used, as set out in the latest Government Conversion Factors for Company Reporting, using the data relevant to Scope 1 (excluding Scope 3 'Well To Tank' emissions).
- For biofuels, the 'Bioenergy' figures are used, as set out in the latest Government Conversion Factors for Company Reporting, including both the Scope 1 emissions (zero CO_2 emissions for biomass and biogas) and Scope 3 'Well To Tank' emissions.
- For bioenergy projects, the air quality emissions produced are considered as equivalent to the project counterfactual. These include NO_x, SO_x, PM_{10} and $PM_{2.5}$.

2.2 Electricity-related emission factors:

- The emission factors used to determine the GHG emissions associated with baseline grid electricity are derived from the IFI approach to GHG accounting for renewable energy projects[8] and the IFI approach to GHG accounting for energy efficiency projects.[9]
- The emission factors used to determine Air Quality emissions avoidance and fossil fuel avoidance associated with baseline grid electricity are derived from lifecycle analysis quantifying the marginal counterfactual emissions and fossil fuel consumption, based on the same principles of the IFI approach for GHG emissions avoidance.
- The IFI dataset of marginal grid emission factors is periodically updated to reflect the latest information on electricity grids and associated forecasts of future grid GHG emissions. The IFI Working Group on GHG Accounting agreed on the IFI Dataset of Default Grid Factors (v3.2)[10] which were published in April 2022. Projects that commence operations on or after 1st December 2021 adopt the latest version (v3.2) dataset. Projects that commenced between 1 July 2019 and 1 December 2021 adopt the IFI Dataset (v2.4). Projects that commenced operations prior to 1 July 2019 adopt the IFI (Interim) Dataset (v1.0).
- To provide an accurate reflection of the Disclosing Entity's expected impact, the GHG reduction from project investments that had not yet commenced operations in previous years, including exited projects, is re-estimated with the latest IFI dataset where applicable.
- The IFI approach documents determine baseline emission factors by calculating a 'Combined Margin' emission factor that is a blend of 'Build Margin' and 'Operating Margin'. This approach is based on the UNFCCC Clean Development Mechanism Tool to calculate the emission factor for an electricity system,[11] which is aligned with the GHG Protocol for Project Accounting.[12]
- Operating Margin represents the marginal existing generating capacity, and its generated output, that will most likely be displaced by the project.
- Build Margin represents the prospective new generating capacity, and its generated output, that would be affected by the project, based on an assessment of planned and expected new generation capacity. The IFI common dataset uses an average of the annual emission intensities of new electricity generation project over the next 8 years under the New Policy Scenario (NPS) of the most recent IEA World Energy Outlook as an estimate of the Build Margin.
- The IFI approach documents set out two different Combined Margin emission factors per country or grid, which are determined as follows:
  - For variable generation (e.g. wind energy, solar PV, small-scale hydropower) the Combined Margin is determined as 75% Operating Margin: 25% Build Margin
  - For firm generation (e.g. energy from waste, combined heat and power, biomass, large hydropower) and reduced electricity consumption (i.e. energy efficiency), the Combined Margin is 33% Operating Margin: 67% Build Margin

8. https://unfccc.int/sites/default/files/resource/Renewable%20Energy_GHG%20accounting%20approach.pdf
9. https://unfccc.int/sites/default/files/resource/Energy%20Efficiency_GHG%20accounting%20approach.pdf
10. https://unfccc.int/sites/default/files/resource/Harmonized_IFI_Default_Grid_Factors_2021_v3.2_0.xlsx
11. https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf/history_view
12. http://www.ghgprotocol.org/standards/project-protocol

Appendix 3 - Guidelines on use of emissions calculator for waste plants

1. In order to determine the Green Impact of Waste sector projects, use of an appropriate life-cycle assessment (LCA) tool is required, adjusted to use prescribed emission factors and other requirements as set out below. If the LCA tool does not provide the required functionality to appraise a particular type of technology or scenario, then a similar alternative life-cycle assessment methodology should be proposed for Green Analytics team approval in line with the wider principles set out in these guidelines and in accordance with good industry practice.
2. In addition to the guidelines for waste already set out in this document, to ensure consistency of GHG appraisal both across different waste projects and also between waste projects and those of other sectors, the following assumptions should be used when calculating the GHG saving of a waste project, unless otherwise agreed or recommended as appropriate by an independent consultant:
   - Electricity grid mix should be set to ensure an emission factor equal to the firm generation Combined Margin electricity as set out at Appendix 2 for the life of the project.
   - Where heat is displaced, the baseline emissions displaced should be determined by using a default setting: Heat, natural gas, industrial furnace low-NOX>100 kW or such other setting as may be more appropriate in the particular circumstances of the case.
   - Landfill gas capture rate should remain at a default capture rate of 75% for landfill gas and combustion in gas engines to generate electricity to export to the national grid and should not be altered save in the case of good evidence of an alternative benchmark.
   - The quantity of waste analysed should be equal to that used in the Disclosing Entity's investment financing appraisal base case, or a lower amount as may be conservatively estimated.
   - In the absence of project specific data, it should be assumed that waste travels the same distance and using the same type of transport in the baseline example as in the project scenario.
   - User-defined, rather than default, data should be used so far as possible for inputs relating to the project, including for the anticipated efficiency of the plant, waste composition profile, journey distances and mode of transport of waste.
   - Where a waste pre-treatment facility is being assessed, suitable advice will be sought to determine an appropriate counterfactual.
   - For any waste type or treatment not otherwise provided for in the LCA tool, a user-defined life-cycle analysis process is applied in line with the principles of this document.

Appendix 4 - Glossary

AD	Anaerobic digestion – an energy-from-waste technology by which biodegradable waste is broken down to produce methane and digestate.
Build margin	A concept defined in the GHG Protocol Guidelines for Quantifying GHG Reductions from Grid - connected Electricity Projects[13] and referring to the marginal technology which is constructed to provide additional power capacity in an electricity grid based on prevailing economic conditions.
CO_2e	Carbon dioxide equivalent – a measure of the global warming potential of a range of greenhouse gases (see Appendix 2 for details), expressed in terms of the equivalent warming of one unit of carbon dioxide gas.
Government Conversion Factors	The latest UK Government conversion factors for company reporting.[14]
ECM	Energy conservation measure – a measure taken to reduce energy demands typically in a building or industrial facility.
EfW	Energy-from-waste.
GHG	Greenhouse gas – a gas with material global warming potential.
GHG Protocols	Series of protocols for calculating the greenhouse gas emissions arising from a facility, developed by the Waste Resources Institute and the World Business Council for Sustainable Development.
IPMVP	International performance measurement and verification protocols developed by the Efficiency Valuation Organisation.[15]
IVC	In-vessel composting – a type of infrastructure for composting biodegradable waste.
LCA	Life-cycle analysis – the analysis of the lifecycle effects of a process, frequently applied to greenhouse gas emissions analysis.
MRF	Materials recovery facility.
NDEE	Non-domestic energy efficiency.
Operating margin	A concept defined in the GHG Protocol Guidelines for Quantifying GHG Reductions from Grid- connected Electricity Projects[16] and referring to the marginal technology operating to provide power in an electricity grid at any point in time, based on prevailing economic conditions.
RDF	Refuse-derived fuel – a fuel derived from waste and produced by a waste pre-treatment facility. Sometimes also referred to as SRF.
Scope 1	A term of reference used by the GHG Protocols to describe all direct GHG emissions arising from a site.
Scope 2	A term of reference used by the GHG Protocols to describe all indirect GHG emissions arising at a site from consumption of purchased electricity, heat or steam.

13. http://www.ghgprotocol.org/standards/project-protocol
14. https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting
15. http://evo-world.org/
16. http://www.ghgprotocol.org/standards/project-protocol

Scope 3	A term of reference used by the GHG Protocols to describe all indirect GHG emissions arising at a site and not classed as Scope 1 or Scope 2, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, outsourced activities, waste disposal, etc.
SRF	Solid recovered fuel – a fuel derived from waste produced by a waste pre-treatment facility. Sometimes also referred to as RDF.
WPTF	Waste pre-treatment facility.
WRATE	Waste and Resources Assessment Tool for the Environment, a lifecycle-based environmental assessment tool used to appraise waste projects.

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