

IMPACT ASSESSMENT

AIB Renewable Energy Impact Assessment

For eligible Renewable Energy projects

December 2022



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Abbreviations

Solar PV: Solar Photovoltaics

CSP: Concentrated Solar Power

OM: Operating Margin

EF: Emission Factor

CM: Combined Margin

1. Introduction

Aligned with its sustainability strategy, Allied Irish Banks (“**AIB**”) is intending to issue green bonds to finance and / or refinance loans that meet the requirements as described in the AIB Green Bond Framework (“**Framework**”)¹. The objective of the Framework, and subsequent green bonds issued from it, is to fund projects or assets that mitigate climate change by reducing emissions, protect ecosystems, or otherwise have a positive environmental impact. The Framework has been aligned to the ICMA Green Bond Principles and has received a Second Party Opinion from Sustainalytics.

The ICMA Green Bond Principles are a set of voluntary guidelines that recommend transparency and disclosure and promote integrity in the development of the green bond market by clarifying the approach for issuing a green bond. The Framework, therefore, has four key components:

1. Use of Proceeds
2. Process for Project Evaluation and Selection
3. Management of Proceeds
4. Reporting

For each green bond issued, AIB asserts that it will adopt (1) Use of Proceeds, (2) Process for Project Evaluation and Selection, (3) Management of Proceeds, (4) Reporting, as set out in the Framework.

AIB, at its discretion but in accordance with the Green Bond Principles, will allocate the net proceeds of the Green Bonds to an eligible loan portfolio of new and existing green loans (“Eligible Green Project Portfolio”). The Eligible Green Project Portfolio is to be financed and/or refinanced in whole or in part by an allocation of the bond proceeds.

Renewable Energy assets located in Ireland, the UK, across the EEA and the USA:

- Loans to finance or refinance equipment, development, manufacturing, construction, operation, distribution and maintenance of renewable energy generation. Eligible renewable energy sources include:
 - Solar Energy: Photovoltaics (PV), Concentrated Solar Power (CSP) and Solar Thermal facilities.
 - Wind Energy: Onshore and offshore wind energy generation facilities and other emerging technologies
 - Geothermal Energy: Geothermal power plants with life cycle emissions lower than 100g CO₂e/kWh

1.1. Who We Are

The Carbon Trust are a trusted, expert guide to Net Zero, bringing purpose led, vital expertise from the climate change frontline. We have been pioneering decarbonisation for more than 20 years for businesses, governments and organisations around the world.

¹ [AIB Green Bond Framework \(2022\)](#)

We draw on the experience of over 400 experts internationally, accelerating progress and providing solutions to this existential crisis. We have supported over 3,000 organisations in 50 countries with their climate action planning, collaborating with 150+ partners in setting science-based targets, and supporting cities across 5 continents on the journey to Net Zero.

The Carbon Trust's Green Finance team helps financial institutions navigate the risks and opportunities of climate change and the transition to a low carbon economy. We are independent experts who understand the environmental impacts, technologies and global markets that underpin green asset classes. We leverage this bottom-up understanding to create bespoke solutions and help financial institutions deliver genuinely green outcomes. We offer a comprehensive advisory and assurance service for green bonds and loans. We provide feasibility assessments, help identify eligible assets (Green Tagging), and build Green Bond and Loan Frameworks. For assuring green bonds and loans, we provide Second Party Opinions and certifications to recognised standards. We are approved verifiers to the Climate Bonds Initiative Standard and we are members of the ICMA Green Bond Principles, contributing in both cases as technical advisors. As impartial experts, we advise on methodologies and reporting on the environmental impacts of the use of proceeds, giving investors clarity and reassurance on the impact of their investment.

2. Methodology

2.1. Reporting Principles

Reporting of the environmental impacts of green bonds is evolving and is a relatively new concept. However, AIB is committed to reporting on the method used to calculate the avoided GHG emissions for its Green Bond Framework based on:

- PCAF's *The Global GHG Accounting and Reporting Standard for the Financial Industry (November 2020)*², chapter 5.3 Project Finance;
- *IFI GHG Accounting for Grid Connected Renewable Energy Projects (July 2019)*³;
- Green Bond Principles, *Voluntary Process Guidelines for Issuing Green Bonds (June 2022)*⁴; and,
- ICMA Harmonised Framework for Impact Reporting (2022)⁵.

AIB follows the key recommendations outlined in the Green Bond Principles, with external reviewers present across their reporting process. In addition, AIB is committed to reporting greenhouse gas emissions in accordance with the five principles contained within the Greenhouse Gas Protocol, namely relevance, completeness consistency, transparency, and accuracy.

In accordance with the principles of reporting described above, AIB commits to transparent disclosure of any assumptions and estimations used in the calculation of its reporting framework.

² [PCAF \(2020\). The Global GHG Accounting and Reporting Standard for the Financial Industry. First edition.](#)

³ [AHS-001 - IFI Approach to GHG Accounting for Renewable Energy Projects](#)

⁴ [ICMA \(2022\), Green Bond Principles, Voluntary Process Guidelines for Issuing Green Bonds](#)

⁵ [ICMA \(2022\), Harmonised Framework for Impact Reporting](#)

2.2. Scope of Calculations and Reporting

AIB intends to report the expected or actual quantitative environmental impact of RE assets it finances or co-finances through its green bonds issuance. The reporting includes the estimated reduction or avoidance in greenhouse gases (“GHGs”) estimated to have occurred from its RE holdings. AIB also evaluates other indicators that are appropriate to report for environmental impact and performance, such as energy generation figures by type. At this stage, social and other economic indicators are not within the scope of the green bonds in question. Governance indicators are also not in scope.

AIB undertakes to report the environmental impact of projects it finances or co-finances through its green bonds based, where possible, on the actual environmental performance of the asset. Where this is not possible, expected performance is used. The reporting includes both green indicators and resulting emissions reductions or avoidance, both of which require assumptions and calculations. The reporting is based on the net-benefit resulting from the asset in a given period of operation, rather than the gross emissions change before or after the life of the asset or project.

Calculations include project-by-project impacts, as well as aggregated results across the portfolio of assets financed or co-financed with the proceeds of AIB’s green bonds. Environmental indicators are attributed to AIB on a project-by-project basis, based on the current percentage share financed (where applicable) and disbursed by the bank. The reporting is undertaken on an annual basis, covering the previous 12-month period and considers any dynamic changes in the assets financed or co-financed that occur from one reporting period to another.

In accordance with the principles of reporting described above, AIB has, and continues to commit to transparent disclosure of any assumptions and estimations used in the calculation of its reporting framework.

2.3. Environmental Impact Methodology

2.3.1. Renewable Energy Environmental Impact

Renewable energy generation is a low GHG emission energy source and has an environmental benefit in replacing energy generated from fossil fuel-based power generation. Energy generated from renewable sources reduces the demand for fossil fuel sources and therefore reduces emissions of greenhouse gases into the atmosphere. In an electricity grid, renewable generation will displace fossil fuel sources and reduce the emissions intensity of the electricity grid. This is known as avoided emissions and AIB has calculated the avoided GHG emissions associated with its RE assets, namely geothermal, solar and wind assets.

For wind and solar PV assets, the actual (or estimated) energy generation was multiplied by a consolidated country-specific electricity emission factor (EF) for the relevant country grid electricity mix. In line with PCAF recommendations, the Operating Margin (OM) was used as the emission factor. The OM represents the marginal generating capacity in the existing dispatch hierarchy that will most likely be displaced by the project. The full dataset for the OM emission factors is published by IFI AHG-001⁶. This approach was undertaken instead of the IFI combined margin (CM) as the OM provided the best

⁶ [IFI TWG - List of harmonized GHG accounting standards/approaches and guidelines developed](#)

outlook on which operations will most be affected, and ultimately which technologies were most likely to have been reduced over the period of a year. The results are reported in tonnes of Carbon Dioxide (tCO₂).

For geothermal energy, while in line with PCAF, wind and solar PV are assumed to have no operational carbon, for geothermal this is not the case, and as such a project specific emission factor will be used to determine the emissions associated with the asset, for comparison with a usual grid scenario. If the actual project specific emission factor was not available, then a separate relevant alternative would be used from Carbon Trust studies.

2.3.2. Renewable and Avoided Emissions Calculation

RE assets are broken down by project and include Geothermal, Solar PV and Wind assets. The assets are then further broken down by country and, in 2022, included 17 countries where AIB financed or part financed eligible RE projects.

The emissions associated with RE are calculated based on the actual energy generation/export from the facility, multiplied by the emission factor for geothermal energy generation.

To calculate the baseline emissions, or the emissions from power generation had the RE project not taken place, the energy generation/export data is multiplied by a consolidated country-specific electricity emission factor, or grid average carbon intensity, for the relevant country grid electricity mix (see Table 1). To calculate the avoided emissions, the emissions associated with RE are subtracted from the baseline emissions.

To account for data availability challenges when estimating the emissions from RE, we have provided two options to account for different data granularity (where “i” is half hours from 1 – 17,520 for the measurement year and j is monthly data (1 – 12)).

Option 1 – Half Hourly

$$\begin{aligned}
 & \text{Avoided emissions (tCO}_2\text{)} \\
 &= \left(\sum_{i=1}^n \text{Generation (MWh)}_i \times \text{Renewable Energy Specific Emission Factor} \right) \\
 & - \left(\sum_{i=1}^n \text{Generation (MWh)}_i \times \text{Grid Operating Margin Carbon Intensity} \right)
 \end{aligned}$$

Option 2 – Monthly/Annually

$$\begin{aligned}
 & \text{Avoided emissions (tCO}_2\text{)} \\
 &= \left(\sum_{j=1}^n \text{Generation (MWh)}_j \times \text{Renewable Energy Specific Emission Factor} \right) \\
 & - \left(\sum_{j=1}^n \text{Generation (MWh)}_j \times \text{Grid Operating Margin Carbon Intensity} \right)
 \end{aligned}$$

All qualifying assets began operation in years dating before 2023 and therefore were operating and generating energy in the reporting period. Assets that are not yet operational are excluded from the

assessment. For each asset, AIB recorded the energy generation in the given year through actual production figures on a half-hourly, monthly or annual basis. Where actual data is unavailable, P50 estimates are to be used. P50 estimates are as a reasonable estimate in statistical modelling of energy generation and are commonly used in the evaluation of renewable energy assets.

Table 1 IFI Methodology emission factors

Country	OM Emission Factor	Unit	Source	Comments
Belgium	252	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
Finland	267	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
France	158	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
Germany	650	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
Ireland	380	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
Netherlands	326	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
Norway	47	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
Portugal	389	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
Spain	402	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
Sweden	68	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
United Kingdom	380	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	
United States	416	kgCO ₂ /MWh	The IFI Dataset of Default Grid Factors v.3.2	

UK & Ireland	380	kgCO ₂ /MWh	<u>The IFI Dataset of Default Grid Factors v.3.2</u>	<u>Average emissions between countries</u>
Spain & Portugal	395	kgCO ₂ /MWh	<u>The IFI Dataset of Default Grid Factors v.3.2</u>	<u>Average emissions between countries</u>
Norway & Sweden	57	kgCO ₂ /MWh	<u>The IFI Dataset of Default Grid Factors v.3.2</u>	<u>Average emissions between countries</u>
France, Spain, Portugal, Belgium & Germany	370	kgCO ₂ /MWh	<u>The IFI Dataset of Default Grid Factors v.3.2</u>	<u>Average emissions between countries</u>

2.3.3. Attributed impact to AIB

In some cases, AIB does not finance the entire project. As a result, the avoided emissions are adjusted by the share of financing attributable to AIB. This share is calculated by taking the amount outstanding on the deal and dividing by the project value:

$$\text{Attribution Factor} = \frac{\text{Amount of AIB Financing Outstanding (mEUR)}}{\text{Total Project Value (mEUR)}}$$

2.3.4. Annual Avoided Impact

Once the attribution factor was determined, as well as the project emissions using the emission factors in Table 1, the avoided emissions attributed to AIB for 2023 were x t CO₂.

$$\text{Financed avoided emissions} = \text{Attribution factor} \times \text{Avoided emissions}$$

Table 2 Annual avoided emissions

Annual avoided emissions 2022	tCO₂
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Published in the UK: 2022