Impact Report for Bonds and Loans

Commerzbank Green Bonds

MORNINGSTAR | SUSTAINALYTICS

IMPACT REPORTING

Impact Summary

Evaluation Date 18 December 2024

Issuer Location Frankfurt, Germany

Sustainalytics has calculated the estimated impact achieved by the 2020 Green Bond, 2022 Green Bond and 2023 Green Bond (collectively, the "Commerzbank Green Bonds") issued by Commerzbank AG ("Commerzbank") in September 2020, June 2022 and September 2023, respectively. Since issuance, EUR 1,607 million has been allocated to investments globally in the Renewable Energy category. For the representative year, Sustainalytics has calculated 1,357,807 tonnes of avoided emissions in CO_2e.

€1,607M
Allocated funds

1,358
Annual emissions avoided ($ktCO_2e$)

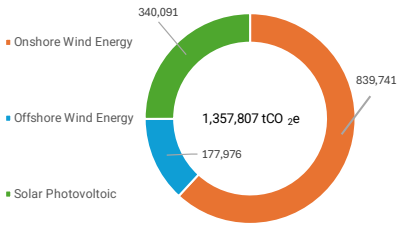
53
Projects

295K
Cars driven for one year

9
Countries

89M
Trees, yearly sequestration

Financed Avoided CO_2e emissions by Technology and Location of Investment by Country



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Introduction

Commerzbank Aktiengesellschaft (AG) ("Commerzbank" or the "Bank") is a European banking institution headquartered in Frankfurt, Germany, with its primary operations concentrated in Europe. The Bank transacts approximately 30% of Germany's foreign trade and specializes in two business segments: private and small business customers, and corporate clients. Between 2020 and 2023, Commerzbank issued the Commerzbank Green Bonds and allocated the proceeds according to the Commerzbank Green Bond Framework dated September 2018, on which Sustainalytics provided a Second-Party Opinion, evaluating it as credible, impactful and aligned with the Green Bond Principles 2018 (GBP).[1]

Commerzbank engaged Sustainalytics to quantify the environmental benefits of the projects financed with the proceeds from the Commerzbank Green Bonds. Using established methodologies, Sustainalytics has estimated avoided emissions from Commerzbank's renewable energy projects. This report presents the details of our findings, including a description of the methodology used to calculate the impacts.

Scope of Work and Limitations

Commerzbank has engaged Sustainalytics to calculate the environmental impacts of the projects financed through the green bonds issued. For this work, Sustainalytics relied on the data provided by Commerzbank on the amount allocated and the technical data on the projects financed.

Sustainalytics' impact reporting is aligned with ICMA's June 2024 Handbook - Harmonized Framework for Impact Reporting.[2] The methodology and assumptions made for the impact calculation are outlined in the methodology chapter.

As part of this engagement, Sustainalytics exchanged information with various members of Commerzbank's management team to understand the sustainability impact of its projects. Through these exchanges, Commerzbank's representatives have confirmed that:

(1) They understand it is the sole responsibility of the Commerzbank to ensure that the information provided is complete, accurate and up to date;

(2) They have provided Sustainalytics with all relevant information;

(3) Any provided material information has been duly disclosed in a timely manner.

Sustainalytics also reviewed relevant public documents and non-public information.

[1] The Green Bond Principles are administered by the International Capital Market Association and are available at https://www.icmagroup.org/assets/documents/regulatory/green-bonds/green-bonds-principles-june-2018-270520.pdf

[2] ICMA , "Handbook - Harmonized Framework for Impact Reporting", 2024, at Handbook-Harmonised-Framework-for-Impact-Reporting-June-2024.pdf (icmagroup.org)

Impact Findings

For reporting, Sustainalytics follows the ICMA Harmonized Framework for Impact Reporting, which synthesizes market expectations and outlines recommendations for impact reporting to create a standardized reporting structure and to enhance the understanding of the impact to all stakeholders including bond investors. [3,4]

Table 1 below provides a summary of the projects for which Sustainalytics has calculated the impacts at the portfolio level. Tables 2-4 provide project level details for the allocated projects by use of proceeds financed under each bond. Project level avoided emissions can be found in the Appendices. These metrics correspond to the representative year during the bond term to maturity and are based on the share of project financing.

Table 1: Summary of Impact – Commerzbank Green Bonds[5,6]

Bond Name	Bonds' ISIN	Allocated Amount	Remaining Bond Tenure	Financed Annual Emissions Avoided	Financed Emissions Avoided/M EUR
		M EUR	Years	tCO_2e/year	tCO_2e/year/M EUR
2020 Green Bond	DE000CB0HRQ9	502	1.7	346,865	691
2022 Green Bond	DE000CZ45W57	502	3.2	279,676	557
2023 Green Bond	DE000CZ439B6	602	4.7	731,265	1,214

Table 2: Summary of Impact- 2020 Green Bond

Technology Type	Invested Amount	Financed Generation	Financed Capacity	Financed Annual Emissions Avoided	Financed Emissions Avoided/M EUR
	M EUR	MWh	kW	tCO_2e/year	tCO_2e/year/M EUR
Onshore wind energy	97	252,384	98,422	120,996	1,249
Offshore wind energy	216	239,911	71,735	134,935	624
Solar photovoltaic	189	212,100	150,551	90,934	481

Table 3: Summary of Impact- 2022 Green Bond

Technology Type	Invested Amount	Financed Generation	Financed Capacity	Financed Annual Emissions Avoided	Financed Emissions Avoided/M EUR
	M EUR	MWh	kW	tCO_2e/year	tCO_2e/year/M EUR
Onshore wind energy	159	280,794	104,756	126,398	795
Solar photovoltaic	222	247,975	184,328	110,237	497
Offshore wind energy	121	81,786	25,423	43,041	355

[3] ICMA , "Handbook - Harmonised Framework for Impact Reporting", 2024, at Handbook-Harmonised-Framework-for-Impact-Reporting-June-2024.pdf (icmagroup.org)
[4] ICMA, "Harmonized Framework for Impact Reporting for Social Bonds", 2023, at Harmonised-framework-for-impact-reporting-for-social-bonds-June-2023-220623.pdf (icmagroup.org)
[5] Commerzbank has communicated to Sustainalytics that the bank can call the bond one year prior to the maturity year.
[6] Due to rounding, the summarized amounts may not match the exact amounts in other tables.

Table 4: Summary of Impact- 2023 Green Bond

Technology Type	Invested Amount	Financed Generation	Financed Capacity	Financed Annual Emissions Avoided	Financed Emissions Avoided/M EUR
	M EUR	MWh	kW	tCO_2e/year	tCO_2e/year/M EUR
Onshore wind energy	340	1,400,044	504,350	592,346	1,742
Solar photovoltaic	262	303,269	300,392	138,919	529

Methodology

Sustainalytics developed its own methodologies for quantifying GHG avoidance and other metrics, including leveraging publicly available best-in-class methodologies, protocols and frameworks that are currently industry best practice. First, our estimation practices and general principles rely on the GHG Protocol.[7] Our methodologies are based on guidance provided by the IFI Approach to GHG Accounting for Renewable Energy Projects,[8,9] notably on calculation methodology and global emissions. In addition, we rely on the Partnership for Carbon Accounting Financials' (PCAF) Global Accounting Standard[10] for guidance on estimation where data is not readily available and assumptions must be made. Finally, the UN's Clean Development Mechanism[11] provides guidance and information, serving as the foundation for these and other methodologies, including those implemented in this report.

Renewable Energy

New energy generated by the projects is assumed to crowd out a mix of current and upcoming planned generation capacity, as well as their associated emissions. The approach taken to calculate the carbon avoidance is based on the comparison between:

a) The emissions of the renewable energy projects, which are often (but not always) zero; and
b) The baseline emissions or emissions occurring in the absence of the project. For electricity generation, these emissions are based on the energy mix used to supply electricity to the local grid.
c) Financed project avoided emissions are calculated using the share of project financing of the total project emissions avoided from the above calculations.

Data Sources and Assumptions

- For the projects included in this report, capacity (measured in MW) data was provided by the issuer, and the annual generation (MWh) was estimated based on the average capacity factor per country.[12]
- For zero-carbon technologies such as solar and wind, the emissions per unit of generation are assumed to be 0 gCO_2e/kWh.
- The baseline emission factors for the countries where projects are located were sourced from IFI.[13] To account for emissions from upstream activities, Sustainalytics applies an additional indirect emissions factor.[14]
- In the case of the Nordic countries, the grids are highly interconnected, and a common emission factor is recommended by the Nordic Position Paper,[15] which is 315 gCO_2e/kWh. Energy storage technology with undefined generation has been assumed to be zero carbon.

[7] Greenhouse Gas Protocol, "About Us", at: https://ghgprotocol.org/about-us
[8] IFI, "IFI Approach to GHG Accounting for Renewable Energy Projects", (2015), at: https://documents1.worldbank.org/curated/en/758831468197412195/pdf/101532-WP-P143154-PUBLIC-Box394816B-Joint-IFI-RE-GHG-Accounting-Approach-clean-final-11-30.pdf
[9] IFI, "International Financial Institutions Framework for a Harmonised Approach to Greenhouse Gas Accounting", (2015), at: https://www.worldbank.org/content/dam/Worldbank/document/IFI_Framework_for_Harmonized_Approach%20to_Greenhouse_Gas_Accounting.pdf
[10] PCAF, "About PCAF", at: https://carbonaccountingfinancials.com
[11] CDM, "Methodologies Booklet", at: https://cdm.unfccc.int/methodologies/documentation/index.html
[12] International Renewable Energy Agency, Statistics Time Series, at: https://www.irena.org/Data/View-data-by-topic/Capacity-and-Generation/Statistics-Time-Series
[13] UNFCCC, "Harmonized Grid Emission Factor Dataset", at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Funfccc.int%2Fsites%2Fdefault%2Ffiles%2Fresource%2FHarmonized_IFI_Default_Grid_Factors_2021_v3.2_0.xlsx&wdOrigin=BROWSELINK
[14] Calculated by Sustainalytics based on:
UK Government, Department for Business, Energy & Industrial Strategy, "Government conversion factors for company reporting of greenhouse gas emissions", at: https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting
International Energy Agency, "IEA Country Profiles", at: https://www.iea.org/countries and UNFCCC, "Harmonized IFI Default Grid Factors", at: https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting/ifi-twg-list-of-methodologies
[15] Nordic Public Sector Issuers, "Position Paper on Green Bonds Impact Reporting", (2024), at https://www.kuntarahoitus.fi/app/uploads/sites/2/2020/02/NPSI_Position_paper_2020_final.pdf

Appendix 1: 2020 Green Bond - Renewable Energy Impact by Project

Project Name	Country	Technology	Allocated Amount	Share of total Project Financing	Project Generation	Financed Generation	Project Capacity	Financed Capacity	Direct Emissions Avoided	Indirect Emissions Avoided	Financed Annual Emissions Avoided	Financed Emissions Avoided/ M EUR
			K EUR	%	MWh	MWh	kW	kW	tCO_2e/year	tCO_2e/year	tCO_2e/year	tCO_2e/year/ M EUR
Project 1	Germany	Onshore wind energy	447	1%	35,615	499	21,600	302	18,641	4,481	324	724.93
Project 2	Spain	Onshore wind energy	8,739	10%	203,018	20,302	93,600	9,360	128,589	16,735	14,532	1,662.88
Project 3	France	Onshore wind energy	68	1%	8,981	99	4,700	52	1,115	612	19	277.48
Project 4	France	Onshore wind energy	475	2%	30,573	673	16,000	352	3,797	2,084	129	272.67
Project 5	United Kingdom	Offshore wind energy	99,389	4%	2,706,245	100,131	860,000	31,820	1,667,249	220,775	69,857	702.87
Project 6	Germany	Onshore wind energy	9,927	66%	14,840	9,809	9,000	5,949	7,767	1,867	6,368	641.47
Project 7	United Kingdom	Offshore wind energy	37,530	2%	2,989,457	50,821	950,000	16,150	1,841,728	243,880	35,455	944.71
Project 8	Germany	Onshore wind energy	1,308	9%	11,872	1,092	7,200	662	6,214	1,494	709	542.28
Project 9	Belgium	Offshore wind energy	41,937	3%	1,588,889	54,022	487,200	16,565	323,930	101,466	14,463	344.88
Project 10	Germany	Onshore wind energy	7,245	15%	27,701	4,017	16,800	2,436	14,498	3,485	2,608	359.92
Project 11	Germany	Onshore wind energy	5,045	42%	16,488	6,991	10,000	4,240	8,630	2,075	4,539	899.57
Project 12	USA	Onshore wind energy	23,676	3%	3,091,974	80,391	1,091,500	28,379	1,089,872	251,749	34,882	1,473.34
Project 13	USA	Onshore wind energy	33,285	7%	1,840,171	123,291	649,600	43,523	648,631	149,827	53,497	1,607.21
Project 14	Germany	Onshore wind energy	3,158	12%	13,850	1,662	8,400	1,008	7,249	1,743	1,079	341.69
Project 15	Germany	Onshore wind energy	3,489	11%	32,647	3,559	19,800	2,158	17,087	4,108	2,310	662.19
Project 16	Netherlands	Solar photovoltaic	7,344	68%	8,570	5,810	11,400	7,729	2,399	542	1,994	271.51

Project 17	USA	Offshore wind energy	37,421	1%	3,881,917	34,937	800,000	7,200	1,368,314	316,066	15,159	405.10
Project 18	USA	Solar photovoltaic	23,335	3%	446,230	15,172	300,000	10,200	157,289	36,332	6,583	282.11
Project 19	Netherlands	Solar photovoltaic	6,228	73%	8,570	6,282	11,400	8,356	2,399	542	2,156	346.14
Project 20	USA	Solar photovoltaic	59,088	13%	416,481	55,808	280,000	37,520	146,803	33,910	24,216	409.82
Project 21	USA	Solar photovoltaic	10,362	8%	163,618	12,271	110,000	8,250	57,673	13,322	5,325	513.84
Project 22	USA	Solar photovoltaic	82,735	19%	631,118	116,757	424,300	78,496	222,459	51,386	50,661	612.33

Appendix 2: 2022 Green Bond - Renewable Energy Impact by Project

Project Name	Country	Technology	Allocated Amount	Share of total Project Financing	Project Generation	Financed Generation	Project Capacity	Financed Capacity	Direct Emissions Avoided	Indirect Emissions Avoided	Financed Annual Emissions Avoided	Financed Emissions Avoided/ M EUR
			K EUR	%	MWh	MWh	kW	kW	tCO_2e/year	tCO_2e/year	tCO_2e/year	tCO_2e/year/ M EUR
Project 23	Germany	Onshore wind energy	50	0.40%	10,882	44	6,600	26	5,696	1,369	28	565.03
Project 24	USA	Solar photovoltaic	17,052	12%	76,305	9,233	51,300	6,207	26,896	6,213	4,006	234.94
Project 25	France	Solar photovoltaic	1,015	2%	82,692	1,406	75,000	1,275	10,270	5,638	270	266.42
Project 26	Spain	Solar photovoltaic	1,188	7%	41,288	2,684	23,800	1,547	26,151	3,403	1,921	1,616.59
Project 27	USA	Solar photovoltaic	7,929	3%	371,858	9,668	250,000	6,500	131,074	30,277	4,195	529.06
Project 28	USA	Onshore wind energy	135,495	11%	2,370,466	258,381	836,800	91,211	835,552	193,003	112,113	827.43
Project 29	France	Onshore wind energy	803	2%	25,223	580	13,200	304	3,133	1,720	112	138.95
Project 30	Germany	Solar photovoltaic	12,028	10%	172,081	17,208	180,400	18,040	90,065	21,651	11,172	928.76
Project 31	Netherlands	Solar photovoltaic	7,330	79%	10,073	7,998	13,400	10,640	2,819	638	2,745	374.49
Project 32	Germany	Onshore wind energy	3,625	12%	37,594	4,398	22,800	2,668	19,676	4,730	2,856	787.73
Project 33	Italy	Solar photovoltaic	5,205	28%	15,049	4,214	12,700	3,556	5,161	1,170	1,773	340.61
Project 34	Netherlands	Offshore wind energy	39,709	2%	1,977,292	39,546	600,000	12,000	553,428	125,163	13,572	341.78
Project 35	Germany	Onshore wind energy	3,253	15%	26,711	3,873	16,200	2,349	13,980	3,361	2,514	772.89
Project 36	USA	Solar photovoltaic	127,426	12%	1,329,765	163,561	894,000	109,962	468,721	108,269	70,970	556.95
Project 37	USA	Solar photovoltaic	35,938	9%	285,587	24,275	192,000	16,320	100,665	23,253	10,533	293.09
Project 38	United Kingdom	Offshore wind energy	81,529	5%	898,725	42,240	285,600	13,423	553,682	73,318	29,469	361.46

Project 39	Netherlands	Solar photovoltaic	6,791	57%	13,606	7,728	18,100	10,281	3,808	861	2,652	390.54
Project 40	Germany	Onshore wind energy	15,851	49%	27,701	13,518	16,800	8,198	14,498	3,485	8,776	553.66

Appendix 3: 2023 Green Bond - Renewable Energy Impact by Project

Project Name	Country	Technology	Allocated Amount	Share of total Project Financing	Project Generation	Financed Generation	Project Capacity	Financed Capacity	Direct Emissions Avoided	Indirect Emissions Avoided	Financed Annual Emissions Avoided	Financed Emissions Avoided/ M EUR
			K EUR	%	MWh	MWh	kW	kW	tCO_2e/year	tCO_2e/year	tCO_2e/year	tCO_2e/year/ M EUR
Project 41	Germany	Onshore wind energy	1,761	8%	18,797	1,579	11,400	958	9,838	2,365	1,025	581.96
Project 42	Finland	Onshore wind energy	50,284	25%	429,719	107,430	188,100	47,025	89,999	32,444	30,611	608.75
Project 43	Netherlands	Solar photovoltaic	7,070	71%	10,449	7,408	13,900	9,855	2,925	661	2,542	359.59
Project 44	Germany	Onshore wind energy	1,728	6%	18,797	1,034	11,400	627	9,838	2,365	671	388.49
Project 45	Germany	Solar photovoltaic	98,399	28%	299,711	83,320	314,200	87,348	156,865	37,710	54,092	549.72
Project 46	USA	Onshore wind energy	141,914	22%	3,931,892	868,948	1,388,000	306,748	1,385,930	320,135	377,040	2,656.82
Project 47	Netherlands	Solar photovoltaic	43,381	86%	36,684	31,585	48,800	42,017	10,268	2,322	10,840	249.87
Project 48	Germany	Onshore wind energy	1,006	3%	45,343	1,406	27,500	853	23,732	5,705	913	907.30
Project 49	USA	Onshore wind energy	84,406	24%	1,087,786	262,156	384,000	92,544	383,427	88,568	113,751	1,347.65
Project 50	France	Solar photovoltaic	12,777	59%	13,231	7,766	12,000	7,044	1,643	902	1,494	116.93
Project 51	Netherlands	Solar photovoltaic	51,714	88%	65,024	57,286	86,500	76,207	18,200	4,116	19,660	380.17
Project 52	USA	Onshore wind energy	58,928	11%	1,393,725	157,491	492,000	55,596	491,266	113,477	68,336	1,159.66
Project 53	USA	Solar photovoltaic	49,109	23%	495,315	115,904	333,000	77,922	174,591	40,329	50,291	1,024.06

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