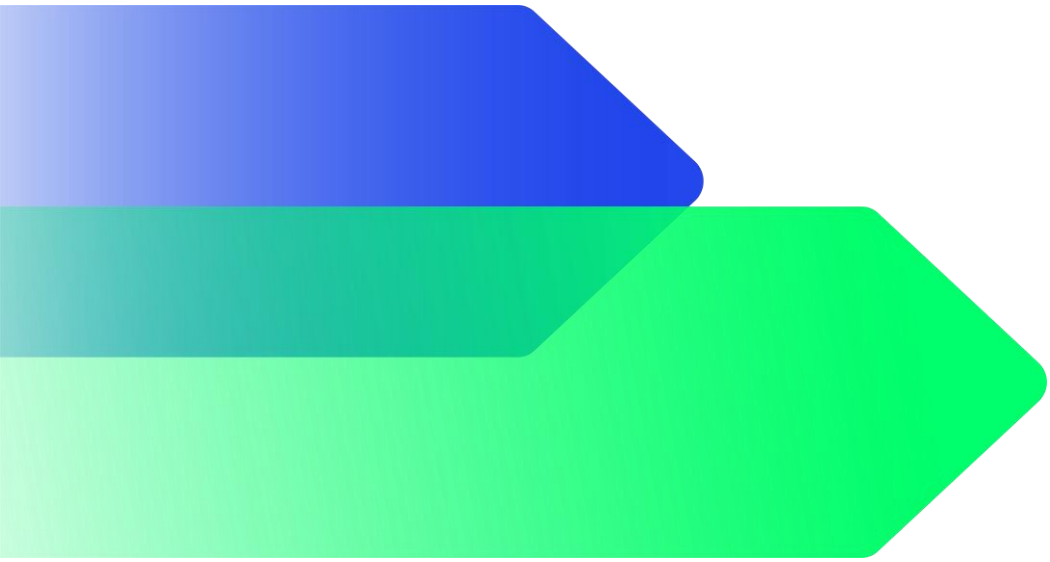
AL RAJHI BANK

Sustainable Finance Impact Assessment 2025

For eligible sustainable projects under Al Rajhi Bank's Sustainable Finance Framework

February 2025



The Carbon Trust's mission is to accelerate the move to a decarbonised future.

Authors:

Toby Kwan
Senior Manager, Sustainable Finance
toby.kwan@carbontrust.com

Maria Fernanda Velez
Senior Associate, Sustainable Finance
maria.fernandavelez@carbontrust.com

Harry O'Higgins
Analyst, Finance & Infrastructure
harry.ohiggins@carbontrust.com

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Abbreviations

ACU	Air Conditioning Unit
BESS	Battery Energy Storage Systems
GBP	Green Bond Principles
GHG	Greenhouse Gas
GLP	Green Loan Principles
ICMA	International Capital Markets Association
IFI	International Financial Institutions Working Group on Greenhouse Gas Accounting
KSA	Kingdom of Saudi Arabia
LMA	Loan Market Association
LSTA	Loan Syndications and Trading Association
PCAF	Partnership for Carbon Accounting Financials
PV	Photovoltaic
RE	Renewable Energy
SBG	Sustainability Bond Guidelines
SBP	Social Bond Principles
SDG	Sustainable Development Goals
SLP	Social Loan Principles
WBCSD	World Business Council for Sustainable Development

Introduction

Al Rajhi Bank Sustainable Finance Framework Overview

Aligned with international and country-specific sustainability initiatives, Al Rajhi Bank ("**Al Rajhi**" or the **"Bank"**) intends to issue green, social or sustainability bonds, sukuk, loans and other debt instruments ("**Sustainable Financing Instruments**")[1]. The Sustainable Financing Instruments will fund Eligible Sustainable Projects that conform to the sustainable finance principles listed below:

- the International Capital Market Association ("**ICMA**") Green Bond Principles ("**GBPs**") 2021, Social Bond Principles ("**SBP**s") 2021and Sustainability Bond Guidelines ("**SBGs**") 2021; and/or
- the Loan Market Association ("**LMA**") Green Loan Principles ("**GLPs**") 2021 and Social Loan Principles ("**SLPs**") 2021.

The Framework has received a Second Party Opinion from S&P Global Ratings[2].

In alignment with the above principles and guidelines, the Bank's Sustainable Finance Framework (the **"Framework"**) is presented through the four core components of the GBPs, SBPs, SBGs, GLPs and SLPs (the "**Principles**") as well as their recommendation for external review:

- Use of Proceeds;
- Process for Project Evaluation and Selection;
- Management of Proceeds; and
- Reporting.

Bonds and sukuk issued under the Framework may take the form of public transactions or private placements, in bearer or registered format, and may take the form of senior unsecured or subordinated issuances. Such sukuk, bonds, and any loans entered under the Framework will be standard recourse to-the-issuer obligations and investors will not bear the credit risk of the underlying allocated eligible asset exposures. Al Rajhi, at its discretion but in accordance with the principles, will allocate an amount at least equivalent to the net proceeds of the Sustainable Financing Instruments, to finance and/or re-finance, in whole or in part, sustainable projects which meet the eligibility criteria of the Framework (**"Eligible Sustainable Projects"**). Eligible Sustainable Projects will be recorded in the Sustainable Finance Register (the **"Register"**) and classified under the categories of eligible projects defined in the Framework (**"Eligible Sustainable Project Categories"**).

[1] Al Rajhi Sustainable Finance Framework

[2] Al Rajhi Second Party Opinion

Figure 1: Eligible Sustainable Project Categories

Green = eligible environmental category Blue = eligible social category

Reporting Principles

Reporting of the environmental impacts of green bonds is evolving and is a relatively new concept. However, the Carbon Trust is committed to reporting on the method used to calculate the avoided GHG emissions based on:

- PCAF's The Global GHG Accounting and Reporting Standard for the Financial Industry (November 2020), Chapter 5.3 Project Finance[3],
- Climate Bonds Standard V3.0[4]
- IFI GHG Accounting for Grid Connected Renewable Energy Projects (July 2019)[5],
- Green Loan Principles (Feb 2021),
- Green Bond Principles, Voluntary Process Guidelines for Issuing Green Bonds (2021)[6], and,
- ICMA Harmonised Framework for Impact Reporting (2023)[7].
- WBCSD Guidance on Avoided Emissions[8]

[3] The Global GHG Accounting and Reporting Standard for the Financial Industry (Dec 2022)
[4] Climate Bonds Standard V3.0 | Climate Bonds Initiative
[5] Harmonized IFI Grid Factors 2021
[6] LSTA Guidance
[7] Handbook Harmonised framework for impact reporting (June 2023)
[8] WBCSD Guidance on Avoided Emissions (Mar 2023)

Scope of Calculations and Reporting

Al Rajhi intends to report the expected or actual quantitative environmental and/or social impact of the Eligible Sustainable Projects it finances or co-finances through its Sustainable Financing Instruments. The reporting includes the reduction or avoidance of greenhouse gases ("**GHGs**") estimated to have occurred, attributable to the Eligible Sustainable Projects. Al Rajhi also evaluates other indicators that are appropriate to report for environmental and/or social impact and performance, such as energy generation figures by type of technology and number of beneficiaries of mortgage subsidies.

Al Rajhi undertakes to report the environmental and/or social impact of projects it finances or co-finances through its Sustainable Financing Instruments based, where possible, on the actual environmental and/or social performance of the asset. Where this is not possible, expected performance is used. The reporting includes social indicators, green indicators, and resulting emissions reductions or avoidance, all 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.

Al Rajhi Bank will allocate an amount at least equivalent to the net proceeds of the Sustainable Financing Instruments issued under the Framework to finance and/or re-finance, in whole or in part, sustainable projects which meet the eligibility criteria of the Eligible Sustainable Project categories, as defined above. A maximum 3-year look-back period would apply for refinanced projects and Al Rajhi Bank expects each issuance under this framework to be fully allocated within 2 years from the date of issuance. The Bank will, where possible, disclose to investors the expected share of financing versus refinancing for any Sustainable Financing Instrument.

In accordance with the principles of reporting described above, Al Rajhi has committed, and continues to commit, to transparent disclosure of any assumptions and estimations used in the calculation of its reporting framework. For clarity, Al Rajhi has engaged the Carbon Trust to assess and estimate the impacts of its Allocated Eligible Sustainable Asset Portfolio, which includes assets classified as Renewable Energy, Energy Efficiency, Sustainable Water Management, and Affordable Housing, only.

Avoided Emissions

Avoided emissions form a core component of the impact assessment. They provide an insight into the wider positive impact in the form of GHG emissions avoided or reduced as a result of the product and/or services, in comparison to a base reference scenario. Existing as a subsection of avoided emissions, this assessment will also consider the enablement from a solution (product/service) and whether that allows for the same or similar function to be performed with significantly less GHG emissions. By providing these solutions, companies enable avoided emissions in the wider system, outside of their value chain. Avoided emissions, along with the entire impact assessment will be calculated on a year-by-year basis.

At the core of the avoided emissions assessment is the reference scenario. This portion of the assessment looks to understand the context of the investment and what is directly being replaced/reduced as a result of the investment. The reference scenario must be a credible alternative to reflect the reality of the region. Where avoided emissions are calculated, the reference scenario will be described in each of the relevant sector methodology sections. This is summarised in the graph and equation below:

$$\textbf{Avoided emissions} = \sum Reference\ Scenario\ Emissions - Solution\ Emissions$$

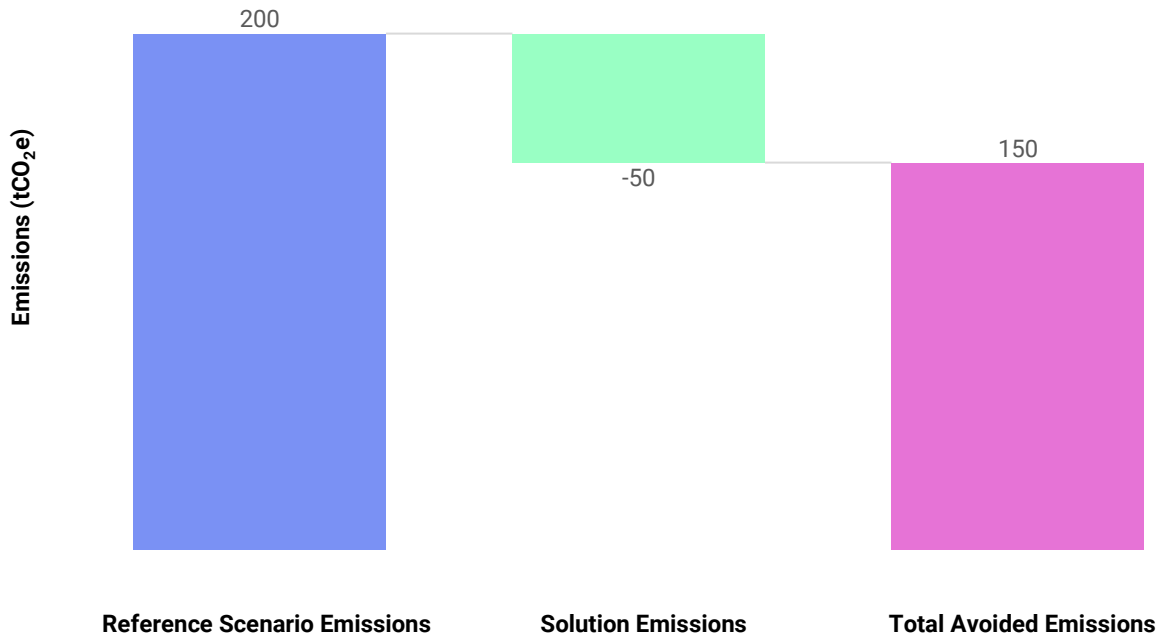

Figure 2 - Avoided emissions calculation example

Al Rajhi Bank Avoided Emissions and Attribution

When carrying out the impact assessment, an attribution factor was applied to all assets in line with PCAF's methodology. This factor helps us understand the share of Al Rajhi's exposure and contribution to the impact of the project. In the case of investments made via Al Rajhi's subsidiaries and owned entities, including joint ventures entered into by its subsidiaries, only the issuer's share of the investments will be applicable as an allocation to the eligible projects.

$$\textbf{Project Avoided Emissions} = Attribution\ Factor \times Project\ Avoided\ Emissions$$

In the process of considering investments for allocation under the Sustainable Financing Instruments, Al Rajhi will discount the portion of the Eligible Sustainable Projects that have been disbursed by one or several other issuers.

The calculation of the attribution of emissions and avoidance takes the outstanding investment amount and divides it against the total project value. This is summarised in the equation below:

$$\textbf{Attribution Factor} = \frac{Al\ Rajhi\ Outstanding\ Investment\ Amount}{Total\ Project\ Value}$$

Al Rajhi Eligible Sustainable Project Impact Highlights

- **Out of the 10** projects, 9 are already operational and just 1 **is currently under construction**.




3 solar PV projects have received financing with an attributed avoided emissions of 372,595 tCO_2e.

1 biodiesel powered plant has received financing with an attributed avoided emissions of 58 tCO_2e.

1 battery energy storage project has received financing with an attributed avoided emissions of 4,382 tCO_2e.

1 district cooling project received financing with an attributed avoided emissions of 3 tCO_2e.



2 sewage treatment plant projects have received financing with attributed wastewater treated of 17,058,429 m^3.

1 desalination plant project has received financing with an attributed avoided emissions of 11,899 tCO_2e.

1 affordable housing project has received financing, subsidizing 89,147 beneficiaries.

Total Allocated Sustainable Financing (USD)

7.746 billion

Number of Eligible Project Categories

4

Number of Eligible Projects

10

Operational Attributed Avoided Emissions (tCO_2e)

388,937

Under Construction Estimated Attributed Avoided Emissions (tCO_2e)

1.5*

**From District Cooling*

Total Attributed Avoided Emissions (tCO_2e)

388,935

Sector Breakdown of Sustainable Financing Allocation

The following section will present the results of the impact assessment on a category-by-category basis, covering projects financed by Al Rajhi Bank's 7.746 billion USD of outstanding Sustainable Financing Instruments as of 31 December 2024, within the Sustainable Finance Register. All results are provided as the attributed value, along with a qualitative description of the impact. All results presented below include the actual and/or expected scope 1 and 2 emissions for both operational and under-construction projects.

In line with the Framework, the Sector Breakdown will focus on the environmental and social (where relevant) impact of the projects.

Renewable Energy

As of 2022, Saudi Arabia's total energy supply was made up primarily of oil at 64.2% and natural gas at 35.7%, with the remaining being made up of renewables (wind, solar, etc) and biofuels and waste at <1%, respectively.[9]

As of 2021, 79% of the country's emissions (including energy used in transportation and construction), were coming from fossil fuel sources. To combat this, the Saudi Green Initiative was announced in 2021 and aims to achieve a 50% share of renewables in the total energy mix by 2030.[10]

Solar PV Impact

Saudi Arabia has a renewable energy capacity target of 130 GW installed capacity by 2030, of which 58.7 GW is expected to come from solar and 40GW from wind. In 2023, installed renewable energy capacity stood at 2.7 GW, generating around 1% of electricity, including around 1.8 GW of solar. As of this report, Al Rajhi has financed 3 solar PV projects, all of them are operational. As of this report, Al Rajhi has financed 3 solar PV projects, all of them are operational. The total RE capacity of these projects is 2,140 MW, with an attributed annual RE generation of 629,697 MWh and attributed annual avoided emissions of 372,595[11] tCO2e.

Number of Projects:	3
Relevant Project Locations:	Saudi Arabia
Total Capacity of Renewable Energy Plants (MW):	2,140
Attributed Annual Renewable Energy Generation (MWh):	629,697
Attributed Capacity (MW)	291
Attributed Annual Avoided Emissions (tCO_2e):	372,595

[9] Saudi Arabia - Countries & Regions - IEA
[10] Saudi Arabia Climate Change Data – Climate Watch
[11] BESS included in this section and removed in the combined results in Appendix 1.the avoided emissions generated from the BESS project were subtracted from the solar PV project. As the battery is off grid, the benefit associated with generating RE has already been accounted for.

Biofueled Plants Impact

Between 2002 and 2021, Saudi Arabia produced no biodiesel.[12] However, as Saudi Arabia aims to increase renewables within its share of electricity mix as per Vision 2030, alternative sources of energy such as biofuel, or biodiesels are starting to be included in the mix. This can be seen through the announcement of large projects such as ACWA Power's Memorandum of Understanding with Neutral Fuels to supply Saudi Arabia's Red Sea Development project.[13]

To support increasing Saudi Arabia's renewable energy contribution to the total energy mix, Al Rajhi has contributed to the financing of 1 biodiesel-fuelled plant project, which is fully operational. The total capacity generated from this biodiesel fuelled powerplant is 109 MW, with 1,276 MWh attributed annual renewable energy generated and 58 tCO_2e attributed annual avoided emissions. The production and avoided emissions increased ~2.2x as the plant is fully operational now.

Number of Projects:	1
Relevant Project Locations:	Saudi Arabia
Total Capacity of Renewable Energy Plants (MW):	109
Attributed Annual Renewable Energy Generation (MWh):	1,276
Attributed Annual Avoided Emissions (tCO_2e):	58

Battery Energy Storage Impact

To support the rapid increase in renewable energy generation, concurrent investment into battery energy storage infrastructure and assets is also needed. Battery energy storage systems ("**BESS**") are essential in the scale up of renewable energy, as they play a critical role in effectively managing grid stability and reliability amidst fluctuations in renewable energy output and electricity demand.[14]

Al Rajhi has financed 1 BESS plant which is partly operational and partly under construction. It possesses an electrical storage capacity of 1,200 MWh, total export of 28,208Wh and attributed annual avoided emissions of 4,382 tCO_2e. [16]

Number of Projects:	1
Relevant Project Locations:	Saudi Arabia
Electrical Storage Capacity (MWh):	1,200
Total Export (MWh)[15]	28,208
Attributed Annual Avoided Emissions (tCO_2e):	4,382

[12] Saudi Arabia Biodiesel production, 1949-2023 - knoema.com
[13] ACWA Power signs MoU with Neutral Fuels to Supply Red Sea Project
[14] IEA – Energy Storage 2023
[15] Considering an assumed round trip efficiency of 85%
[16] We note that the BESS project is co-located with one of the solar PV projects part financed by Al Rajhi. To avoid double counting the benefit from BESS, the avoided emissions generated from the BESS project were subtracted from the solar PV project. As the battery is off grid, the benefit associated with generating RE has already been accounted for.

Energy Efficiency

Based on the 2020 Saudi Arabia Energy Report by KAPSARC, cooling remains a major source of energy consumption, accounting for 50% of Saudi Arabia's total annual electricity consumption in buildings.[17] Saudi Arabia has introduced a number of energy efficiency measures such as insulation standards for new buildings and tightened minimum energy performance standards for Air Conditioning Units ("**ACUs**").

Investing into Energy Efficiency improvements will also provide societal benefits across Saudi Arabia by reducing utility costs. Saudi Arabia is a global hotspot, with temperatures rising more than 3.0 degrees Celsius in Riyadh and surrounding cities over the last 40 years.[18] Cooling is a necessity to ensure health and wellbeing.

District Cooling Impact

The investment into district cooling plants will offer a more energy efficient solution as opposed to individual ACUs, with the aim of installing cost effective technology that provides a significant benefit to the energy intensive buildings sector.

The installation of district cooling will further help reduce Saudi Arabia's dependence on fossil fuels, with the project financed by Al Rajhi to expected to run on solar PV, BESS and biodiesel-fuelled power plants.

Al Rajhi currently finances 1 district cooling project, with 1 operational plant and 1 under construction plant, with total refrigerant production of 32,500 tr, attributed annual energy savings of 4.79 MWh and attributed annual avoided emissions of 3.0 tCO_2e. Energy savings and avoided emissions have both increased by 2% and 3% respectively.

Number of Projects:	1
Relevant Project Locations:	Saudi Arabia
Total Refrigerant Production (tr)	32,500
Attributed Annual Energy Savings (MWh):	4.79
Attributed Annual Avoided Emissions (tCO_2e):	3.0

Sustainable Water and Wastewater Management

Despite being one of the world's driest countries, Saudi Arabia has the third highest per capita fresh-water consumption in the world.[19] Saudi Arabia aims to focus on increasing water supplies by increasing desalination and strategic storage capacity, as well as increasing usage of treated wastewater, to address clean water which is one of the main targets of Vision 2030. [20 & 21]

[17] Saudi Arabia Energy Report - KAPSARC
[18] The Future of Cooling in Saudi Arabia - Technology, Market and Policy Options - KAPSARC
[19] Water Resources in the Kingdom of Saudi Arabia: Challenges and Strategies for Improvement | SpringerLink
[20] Addressing Water security in arid and water stressed in KSA | UN SDGs
[21] Vision 2030 | Kingdom of Saudi Arabia

Wastewater Treatment Plants Impact

Saudi Arabia is geographically prone to droughts and desertification[22]. Wastewater treatment is crucial for improving water security for the region through enhanced infrastructure, but also for supporting greater access to and availability of clean water.

Properly treated wastewater can be a reliable water source for many purposes including the protection of various ecosystems, reducing the transference of diseases, and improving quality of life and socio-economic development within the region overall.[23]

Al Rajhi currently finances 2 fully operational wastewater treatment projects, with attributed annual wastewater collected of 17,815,302 m^3 and attributed annual wastewater treated of 17,058,429 m^3. Volume of treated wastewater is +36% YoY due to increased inflow supply from the Saudi Water Partnership Company.

Number of Projects:	2
Relevant Project Locations:	Saudi Arabia
Attributed Annual Wastewater Collected (m^3):	17,815,302
Attributed Annual Wastewater Treated (m^3)	17,058,429

Desalination Plants Impact

Climate and weather-related disasters have increased five-fold over the last five decades, with droughts expected to get significantly worse in the future due to climate change. Humans are expected to use 56% more water by 2030 than is sustainable, given that the world's freshwater supply is dwindling. Leading to the increased demand for investment in desalination plants. Saudi Arabia has been at the forefront of investment within the Gulf region, with the first desalination plant reported to have been built in 1907 in Jeddah.[24]

Al Rajhi has financed one desalination plant which includes two projects. One has been operational since 2022, and the other 30,000 m^3/day plant was commissioned on April 15th, 2024. Now in operation, metric outputs have significantly increased across the board. They produce an attributed annual energy savings of 19,127 MWh (+43% YoY) and attributed annual avoided emissions of 11,899 tCO_2e (+45% YoY)

Number of Projects:	1
Relevant Project Locations:	Saudi Arabia
Attributed Annual Water Treated Output (m^3):	1,553,450
Energy Reduced per m^3 (kWh/m^3)	25.45
Attributed Annual Energy Savings (MWh):	19,127
Attributed Annual Avoided Emissions (tCO_2e):	11,899

[22] Chapter 3 : Desertification — Special Report on Climate Change and Land
[23] The role of wastewater treatment in achieving sustainable development goals and sustainability guideline | Energy Nexus
[24] Sustainable seawater desalination: Current status, environmental implications and future expectations - ScienceDirect

Affordable Housing

Saudi Arabia, as part of its Vision 2030, has goals of increasing home ownership to 70% by 2030. To support this, the Real Estate Development Fund and the Ministry of Housing have come up with housing support programs. The housing support program provides a monthly profit subsidy on the profit rate based on the first SAR 500,000 of the funding amount, where beneficiaries with monthly income less than SAR 14,000 are 100% subsidised in terms of profit rate.[25]

Al Rajhi has worked closely with the Real Estate Development Fund and Ministry of Housing to finance or re-finance government-supported or government-subsidized mortgages, as well as development and construction of homes, that are covered under housing support programs. The Bank's Sustainable Financing Instruments have financed the construction of 35,659 housing units, benefitting 89,147 individuals.

Number of Housing Units Constructed	35,659
Number of Individuals Benefitting from Affordable Housing	89,147

[25] Housing support program (REDF).
It is noted that there is a discrepancy between the figures quoted within this impact assessment report and those within the link referenced, as programme details have been updated since Al Rajhi's initial involvement. Al Rajhi's housing support programme figures as stated in this report are accurate and in line with the programme at the time of Al Rajhi's initial involvement.

Appendix 1: Detailed Results

1.1. Summary of the Impact of Al Rajhi's Allocated Eligible Asset Portfolio with a Year-On-Year Comparison– Total Amount of Operational and Under Construction Projects

Category	No. of Eligible Projects	Total Allocated Sustainable Financing[26] (million USD)	YoY	Attributed Capacity (MWe)	YoY	Attributed Production (MWh)	YoY	Attributed Energy Savings (MWh)	YoY	Attributed Avoided Emissions (tCO_2e)	YoY
Renewable Energy	**4**	**316**	***-1%***	**318**	***-2%***	**630,973**	***-1%***	**0**	***0%***	**372,653**	***-2%***
Solar PV	3	298	*-1%*	291	*-2%*	629,697	*-1%*	0	*0%*	372,595	*-1%*
Biodiesel	1	17	*2%*	27	*2%*	1,276	*119%*	0	*0%*	58	*119%*
Battery Storage	**1**	**118**	***2%***	**60**	***2%***	**0**	***0%***	**0**	***0%***	**4,382**	***4%***
Co-Located BESS	1	118	*2%*	60	*2%*	0	*0%*	0	*0%*	4,382	*4%*
Energy Efficiency	**1**	**24**	***2%***	**0**	***0%***	**0**	***0%***	**5**	***2%***	**3**	***3%***
District Cooling Plant	1	24	*2%*	0	*0%*	0	*0%*	5	*2%*	3.0	*3%*
Water Management	**3**	**122**	***0%***	**0**	***0%***	**0**	***0%***	**19,127**	***43%***	**11,899**	***45%***
Sewage Treatment Plant	2	89	*0%*	0	*0%*	0	*0%*	0	*0%*	0	*0%*
Desalination Plant	1	34	*2%*	0	*0%*	0	*0%*	19,127	*43%*	11,899	*45%*
Affordable Housing	**1**	**7,072**	***127%***	**0**	***0%***	**0**	***0%***	**0**	***0%***	**0**	***0%***
Affordable Housing Project	1	7,072	*127%*	0	*0%*	0	*0%*	0	*0%*	0	*0%*
Total	**10**	**7,652**		**378**		**630,973**		**19,132**		**388,937**	

[26] Note that the within this Impact report refer to the amounts within the scope of the impact calculation, for which there could be slight discrepancy with the figures included in the Allocation Report. The Allocation Report from the Bank includes working capital facilities, deemed eligible under the Bank's Sustainable Finance Framework and ICMA principles, whereas the figures within this Impact Report does not include working capital facilities. Furthermore, the scope of the impact calculation excludes the Clean Transportation project, as the project is in early stages of development.

1.2. Summary of the Impact of Al Rajhi's Allocated Eligible Asset Portfolio – Total Amount of Operational Projects

Category	No. of Eligible Projects[27]	Total Allocated Sustainable Financing[28] (million USD)	Attributed Capacity (MWe)	Attributed Production (MWh)	Attributed Energy Savings (MWh)	Attributed Avoided Emissions (tCO_2e)
Renewable Energy	**4**	**316**	**318**	**630,973**	**0**	**372,653**
Solar PV	3	298	291	629,697	0	372,595
Biodiesel	1	17	27	1,276	0	58
Battery Storage	**1**	**118**	**60**	**0**	**0**	**4,382**
Co-Located BESS	1	118	60	0	0	4,382
Energy Efficiency	**0**	**12**	**0**	**0**	**2**	**1**
District Cooling Plant	0	12	0	0	2	1
Water Management	**3**	**122**	**0**	**0**	**19,127**	**11,899**
Sewage Treatment Plant	2	89	0	0	0	0
Desalination Plant	1	34	0	0	19,127	11,899
Affordable Housing	**1**	**7,072**	**0**	**0**	**0**	**0**
Affordable Housing Project	1	7,072	0	0	0	0
Total	**9**	**7,640**	**378**	**630,973**	**19,129**	**388,935**

[27] Projects not 100% operational are counted as Under Construction for the 'No. of Eligible Projects' column, but all other impact metrics are split by the % of the project that has been completed.

[28] Refer to footnote 26.

1.3. Summary of the Impact of Al Rajhi's Allocated Eligible Asset Portfolio – Total Amount of Under Construction Projects

Category	No. of Eligible Projects[29]	Total Allocated Sustainable Financing (million USD)[30]	Attributed Capacity (MWe)	Attributed Production (MWh)	Attributed Energy Savings (MWh)	Attributed Avoided Emissions (tCO_2e)
Energy Efficiency	**1**	**12**	**-**	**-**	**2**	**1.5**
District Cooling Plant	1	12	-	-	2	1.5
Total	**1**	**12**	**-**	**-**	**2**	**1.5**

[29] Projects not 100% operational are counted as Under Construction for the 'No. of Eligible Projects' column, but all other impact metrics are split by the % of the project that has been completed.

[30] Refer to footnote 26.

Methodology

The following section breaks down the methodologies used to calculate the impact of each eligible category included within the assessment. The assessment looks to calculate the impact of Al Rajhi's investments between the timeframe of January 2024 to December 2024.

In line with the ICMA Harmonised Framework for Impact Reporting[31], the impact assessment consists of both a qualitative and quantitative assessment. Where possible, a qualitative assessment accompanies the qualitative calculations detailed below. Many of the projects included within the Register are currently still in the planning or procurement phase, with a lack of data/information available. In these cases, a qualitative assessment has been carried out around the expected regional benefits of the technologies that are being invested in.

Renewable Energy

As disclosed within the Framework, Al Rajhi has committed to investing in renewable energy assets in projects related to the production, transmission and storage of energy from the following renewable sources:

- Solar (PV and Concentrated Solar Power with a minimum of 85% power generation derived from solar sources),
- Wind energy,
- Green hydrogen and green ammonia (from electrolysis powered by 100% renewable energy including wind and solar),
- Biofuels produced from waste sources, such as used cooking oil,
- Biomass from sustainable feedstock only

This category is designed to be aligned to the Sustainable Development Goal ("**SDG**") 7, Affordable and Clean Energy, with a particular focus on achieving the goal of "By 2030, increase substantially the share of renewable energy in the global energy mix".

The resulting metrics included in the assessment where applicable are:

- Capacity of renewable energy plant(s) constructed or rehabilitated in (MW)
- Annual renewable energy generation in MWh/GWh (electricity) and GJ/TJ (other energy)
- Annual GHG emissions reduced/avoided in tonnes of CO2 equivalent (where possible) (tCO_2e)

[31] ICMA Handbook: Harmonised Framework for Impact Reporting (June 2023)

Solar PV and Wind Energy Impact Methodology

Renewable energy generation is a low GHG emissions 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.

For wind and solar PV assets, the actual (or estimated) energy generation was multiplied by a consolidated country-specific electricity emissions factor 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 emissions factors is published by IFI AHG-001[32]. This approach was undertaken instead of using the IFI combined margin as the OM provided the best outlook on which operations would most be affected, and ultimately which technologies were most likely to have been reduced over a year. The emissions associated with RE are calculated based on the actual energy generation/export from the facility, multiplied by the emission factor for energy generation.

The equation for estimating the avoided emissions from RE can be seen below (where "i" is half hours from 1 – 17,520 for the measurement year):

$$\boldsymbol{Project\ Avoided\ emissions\ (tCO_2)} = \left(\sum_{i=1}^{n} Generation\ (MWh)_i \times Renewable\ Energy\ Specific\ Emission\ Factor\ (kgCO_2e/MWh)\right) - \left(\sum_{i=1}^{n} Generation\ (MWh)_i \times KSA\ Grid\ Operating\ Margin\ Carbon\ Intensity\ (kgCO_2e/MWh)\right)$$

The qualifying assets began operation in 2023 and therefore were operating and generating energy during the reporting period. Assets that are not yet operational are reported on separately within the assessment to highlight future potential impacts. For each asset, Al Rajhi's borrowers provided the energy generation in the given year through actual generation figures on an annual basis.

Biofueled Plants Impact Methodology

Biofuels refer to liquid fuels and blending components produced by biomass called feedstock. This feedstock can be from food crops or waste and agricultural residues. The two most common types of biofuels in use today are ethanol and biodiesel[33]. Biodiesel can be blended with petroleum diesel in any

[32] Renewable Energy GHG accounting approach

[33] Office of Energy Efficiency & Renewable Energy

percentage, including B100 (pure biodiesel) and, most commonly B20 (20% biodiesel and 80% petroleum diesel)

Given the project name and biodiesel supplier for this plant were disclosed to Carbon Trust, the avoided emissions calculations assume a biodiesel blend of B20.

$$\textbf{Project Avoided emissions } (tCO_2) = (\sum_{i=1}^{n} \textit{Project consumption } (l)_i \times \textit{Diesel Emission Factor } (kgCO_2e/l) - (\sum_{i=1}^{n} \textit{Project consumption } (l)_i \times \textit{B20 Mix Emission Factor } (kgCO_2e/l))$$

Energy Storage Facilities Impact Methodology

The emissions associated with the energy storage facility ("**ESF**"), are calculated based on the net import minus net export stored within the facility, multiplied against the emission factor of the connected electricity system, average carbon intensity for imports and operating margin for exports. Please note this methodology is simplified and may, depending on how the battery energy storage asset is utilised, indicate a higher carbon saving than is the case. To minimise this risk, data for electricity storage projects should ideally be as granular as possible (using half-hourly data or monthly data) – in the absence of actual data, estimates and proxies will be used and referenced.

For ESFs that are co-located to a renewable energy source, the imported electricity will be estimated to have no emissions associated with it. The emissions for the energy storage facility will be calculated as below:

$$\textbf{Energy Storage Facility emissions } (kgCO_2) = (\sum_{i=1}^{n} \textit{Energy Import } (MWh)_i \times \textit{Country Average Grid Emission Factor } (kgCO_2e/MWh)) - (\sum_{i=1}^{n} \textit{Energy Export } (MWh)_i \times \textit{Country Average Grid Emission Factor } (kgCO_2e/MWh))$$

The baseline can be considered as a hypothetical scenario in which the ESF financed by Al Rajhi was not present within the grid. In other words, the baseline refers to what would have happened if Al Rajhi had not, in recent years, increased the avoidance of carbon-intensive electricity generation sources and increased the resilience of the electricity grid, it calculates the emissions that would have occurred if the grid had continued to operate as usual, using either the typical grid emission factor or the average operating margin emission factor.

The baseline for CO_2 emissions varies depending on the strategy deployed from the ESF. For times when the ESF is not directly co-located with a renewable energy plant, the baseline will be the average grid emission factor (either half hourly, monthly, or annually). It should also be noted that the approach taken is a conservative estimation of the avoided baseline emissions.

If the primary operating mode is to provide grid support services such as balancing, dynamic containment, firm frequency response or inertia response, the counterfactual baseline is assumed to be a plant at the operating margin. If ESFs provide both turn-up (charge) and turn-down (discharge) services, the ESF will need to maintain "headroom" in the battery at all times. For simplicity, the assumption made by the Carbon Trust is that when the ESF provides grid support services, the state-of-charge of the battery is 50% (half-full).

The impact of this assumption is that when compared to the counterfactual average operating margin plant, only half of the nominal battery capacity is used (the turn-up service part) multiplied against the number of hours the ESF has been operational. This is then multiplied against the average operational margin grid carbon intensity of the host country.

Grid stability services counterfactual baseline

$$\boldsymbol{Grid\ Stability\ Services\ Baseline\ Emissions\ (kgCO_2)} = Half\ the\ capacity\ of\ the\ ESF\ (MWh) \times\ time\ ESF\ is\ operational\ (h) \times KSA\ grid\ operational\ margin\ (kgCO_2e/MWh)$$

Once the estimate for the emissions from the grid that would have taken place without the ESF (the baseline), and the emissions associated with the ESF were obtained, the avoided emissions were calculated by subtracting the ESF emissions from the baseline, depending on the strategy as per the below formula:

$$\boldsymbol{Avoided\ emissions\ (tCO_2)} = \left(\sum_{i=1}^{n} Energy\ Storage\ Facility\ emissions\ (kgCO_2e)\right) - \left(\sum_{i=1}^{n} Grid\ stability\ services\ counterfactual\ baseline\ (kgCO_2e)\right)$$

Energy Efficiency

Al Rajhi has committed to invest in projects that reduce energy consumption by at least 20% compared to the average national energy consumption of an equivalent project or technology, such as:

- District cooling systems,
- Upgrade in grid infrastructure to improve electricity transmission efficiency and reduce transmission losses,
- Investment in smart energy grids, energy meters, management systems and battery storage facilities, and
- Upgrading older generation (3G/4G) telecommunications infrastructure and networks to 5G

For the avoidance of doubt, improvement activities that result in the lock in of fossil fuel technologies will be excluded.

This category is designed to be aligned with SDG 7, Affordable and Clean Energy. With a particular focus on achieving the goal of "By 2030, double the global rate of improvement in energy efficiency".

Where applicable, the metrics produced through the assessment include:

- Annual energy savings in MWh (electricity) and GJ/TJ (other energy savings);
- Number and breakdown by type of energy-efficient technologies and products installed;
- Avoided emissions (tCO_2e).

District Cooling Impact Calculation

As a community-focused product, district cooling systems ("**DCS**") create a network of pipes to cool buildings across a neighbourhood or region. DCS typically provides significantly higher energy efficiency by providing greater flexibility of cooling generation over time, reducing electricity usage compared to air conditioning systems. The implementation of district cooling is anticipated to be a direct replacement to conventional air conditioning units which are used to cool individual units.

To calculate the emissions associated with DCS, the energy consumption required was multiplied against the consolidated country-specific emission factor. For the baseline, the energy consumption required to produce the equivalent amount of refrigeration for a conventional air conditioning unit was multiplied against the consolidated country-specific emission factor. The equation for estimating the energy saved and avoided emissions from district cooling can be seen below (where "i" is half hours from 1 – 17,520 for the measurement year):

$$\begin{aligned}&\boldsymbol{Avoided\ emissions\ (tCO_2)}\\&= \left(\sum_{i=1}^{n} District\ Cooling\ Electricity\ Consumption\ (MWh)_i\right.\\&\left.\times\ KSA\ Grid\ Emission\ Factor\right)\\&-\left(\sum_{i=1}^{n} Equivalent\ A/C\ \ Refrigerant\ Electricity\ Consumption\ (MWh)_i\right.\\&\left.\times\ KSA\ Grid\ Emission\ Factor\right)\end{aligned}$$

Based on the Refrigeration Tonnage of the DCS, the consumption was determined against the equivalent tonnage of an individual unit. As a close comparison in geography and system, the data was sourced from a study carried out for the Government of Dubai.

Sustainable Water and Wastewater Management

In line with the SDG categories, in the Sustainable Finance Framework, Al Rajhi committed to investing in projects related to construction, upgrades, renovations or improvements for transportation and treatment of wastewater, such as:

- Water and wastewater treatment plants ("**WWTP**") including reuse of WWTP effluents;

- Sewer systems and pumping station;

Projects that increase water-use efficiency, such as water recycling and reuse projects, water saving systems, technologies and water metering. This also includes water desalination projects running on reverse osmosis technology with a carbon intensity of less than 100gCO_2e/kWh over the residual asset life (the asset may be partially powered by renewables).

Where applicable, the metrics produced through the assessment include:

- Number of improved water treatment facilities built or upgraded;
- Annual water savings (in m³);
- Annual volume of wastewater treated and/or avoided (in m³);
- Amount (in m³) or % of water treated;
- Amount of waste reduced (in tonnes);
- Avoided emissions (tCO_2e).

Sewage Treatment Plants Impact Calculation

It is recognised that water use, wastewater treatment and energy consumption are often closely interlinked, and therefore where such projects result in energy savings, these bring GHG. The metrics used to measure the impact of the wastewater treatment plants were the following:

- Annual absolute amount of wastewater treated before and after the project in m^3 and as %.

As there is no direct reference scenario for sewage plants, the assessment focused on the qualitative benefits of the service along with the direct quantities of treatment that were provided by the borrowers.

Desalination Plants Impact Calculation

Climate change is inflicting longer and more frequent droughts on the Middle East, thus the methods of desalination that Saudi Arabia has been increasing through the years.

Al Rajhi's Sustainable Finance Framework follows the recommendations from the Climate Bonds Initiative (CBI) Taxonomy where desalination plants need to have an average carbon intensity at or below 100gCO_2e/kWh over the residual asset life. These are on a reverse osmosis technology powered entirely by renewables.

- The annual absolute amount of water desalinated;
- Annual tCO_2e/kWh.

The reference scenario for the desalination plant was looking at comparing the equivalent portion of water produced by the desalination plant on an annual basis against the current operating desalination plants in KSA[34]. Data was provided by the operating entities managing the desalination plant.

[34] Decarbonatization in desalination sector in KSA | Department of Economic and Social Affairs

$$\textbf{Avoided emissions } (tCO_2) = \sum(\text{Desalination Plant Energy Consumption per Annum (kWh)} \times \text{KSA Grid Emissions Factor } (\text{kgCO}_2\text{e/kWh}) - \sum(\text{Average Desalinsation Plant Energy Consumption per Annum (kWh)} \times \text{KSA Grid Emissions Factor } (\text{kgCO}_2\text{e/kWh}))$$

Affordable Housing

In line with the Saudi Vision 2030 goals to increase affordable home ownership for Saudi Nationals, Al Rajhi has committed to financing and/or refinancing government-supported or government-subsidised mortgages in partnership with mortgage financing programmes for the provision of affordable housing as well as projects related to the development and construction of homes covered under such programmes. The target population are those who are eligible for government-supported affordable housing mortgage financing schemes.

This category is designed to be aligned with SDG 11, Sustainable Cities and Communities, with a focus on increasing home ownership to 70% by 2030.

The assessment of the benefits of investment in affordable housing are based on the below metrics:

- Number of housing units constructed;
- Number of individuals benefitting from subsidised housing.

$$\textbf{Number of Housing Units Constructed} = \frac{Total\ Affordable\ Housing\ allocation}{Average\ size\ of\ loan\ application}$$

$$\textbf{Number of Inviduals Benefitting from Affordable Housing} = \frac{Number\ of\ Housing\ Units\ Constructed}{Average\ number\ of\ individual\ beneficiaries\ per\ loan\ application}$$

In determining the number of loan applications (i.e., number of housing units constructed), Al Rajhi has used an average loan application size of SAR 750,000, and an approximate average of 2.5 individual beneficiaries per loan application.

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+44 (0) 20 7170 7000

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