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Second Party Opinion

PG&E Recovery Funding LLC's Proposed $1.4 Billion Senior Secured Recovery Bonds Series 2024-A

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Location: United States **Sector:** Utilities

Alignment With Principles

Aligned = ✓ Conceptually aligned = O Not aligned = ✕

✓ Green Bond Principles, ICMA, 2021 (with June 2022 Appendix 1)

See Alignment Assessment for more detail.

Medium green

Activities that represent significant steps towards a low-carbon climate resilient future but will require further improvements to be long-term low-carbon climate resilient solutions.

Our Shades of Green Analytical Approach >

Strengths

The system hardening and microgrids/resilience zones projects financed in the transaction are important initiatives for wildfire risk mitigation. PG&E's service territory is highly exposed to wildfire risk, thus the projects financed by this transaction will be relevant in a low-carbon, climate-resilient future.

PG&E Corp. is committed to decarbonizing its grid and has a strong climate transition plan. The company is focused on achieving a net-zero energy system by 2040. In 2022, 95% of PG&E's electricity came from greenhouse-gas-free resources.

Weaknesses

No weaknesses to report.

Areas to watch

PG&E's assets are exposed to physical climate risk but the company is taking measures to enhance its climate resiliency. PG&E is aware of its physical climate risks such as heat waves, frequent storms, wildfires, drought, sea level rise, and floods. It has conducted an enterprise-wide climate adaptation and vulnerability assessment to evaluate the impact of climate change on its assets, operations, and services. Physical climate risks can pose significant material operating, financial, and regulatory risks.

A host site for the long-term storage of U.S. nuclear waste has not been determined. However, PG&E follows regulations and stores spent fuel on-site on an interim basis until it can be transferred to a long-term repository. Additionally, we expect the Diablo Canyon Power Plant, which provides significant carbon-free electricity to customers, to close by 2030.

Eligible Green Projects Assessment Summary

We assess eligible projects under issuer's green finance transaction based on their environmental benefits and risks, using Shades of Green methodology.

Climate change adaptation	**Medium green**
System hardening	
Microgrids/resilience zones	
Upfront financing costs	

See Analysis Of Eligible Projects for more detail.

Issuer Sustainability Context

This section provides an analysis of the issuer's sustainability management and the embeddedness of the financing transaction within its overall strategy.

Company Description

Oakland, Calif.-based PG&E Corp. is a holding company with its primary operating subsidiary Pacific Gas and Electric Co. (the utility), which is a public utility operating in Northern and Central California. The utility is one of the largest electric energy and natural gas utilities in the U.S. It serves 5.5 million electricity distribution and 4.5 million natural gas distribution customers, including residential, commercial, industrial, and agricultural customers. It owns about 7.8 gigawatts of generating capacity, with greenhouse-gas-free and renewable generation accounting for more than 80% of total capacity. In 2023, the utility delivered greenhouse-gas-free electricity to retail customers. The utility also operates about 18,000 miles of transmission lines and 108,000 miles of distribution lines. Its natural gas operations comprise distribution main pipelines, local transmission pipelines, and storage facilities.

PG&E Recovery LLC, a wholly owned subsidiary of the utility, has proposed issuing $1.4 billion of senior secured recovery bonds (Series 2024-A) to recover costs it incurred between Nov. 1, 2022, and April 30, 2024, for system hardening projects, microgrids and resilience zones projects, and related upfront financing costs across its operations in California. PG&E Recovery Funding LLC previously issued $983 million of senior secured recovery bonds in November 2022 (Series 2022-A) and $860 million of senior secured recovery bonds in November 2021 (Series 2021-A).

Material Sustainability Factors

Climate transition risk

Climate transition risks are highly material to stakeholders but tend to have more bearing on electricity and gas networks, given their critical role in energy delivery. They are directly exposed to upstream generators, which are a leading cause of greenhouse gas emissions. These drivers make the sector highly susceptible to increasing public, legal, and regulatory pressure to accelerate climate goals and are highly relevant for stakeholders globally. We expect the ongoing decarbonization of the energy sector to triple its reliance on renewable power, which will entail significant grid expansion. In the gas network sector, the continued focus on reducing the reliance on methane-emitting natural gas could diminish growth prospects, making it more difficult to effectively manage regulatory risk.

Physical climate risk

Networks operate fixed assets that span large service territories, highly exposing them to physical climate risks. These factors can cause network service disruptions for large populations, elevating stakeholder materiality. Issuers have been impaired by wildfires, hurricanes, and winter storms. During these events, the utility may incur higher costs, which typically increases leverage.

Impact on communities

Community impacts are more acute for stakeholders given how close networks are to where people live and work. Energy and water services are essential for community health and well-being globally. Stakeholder impacts arise from the construction and siting of lines—especially in areas unaccustomed to industrial development and in indigenous territories. This is accelerating to meet climate goals and where local governments grant eminent domain. Moreover, service disruptions, fires, gas explosions, inadequate or contaminated drinking water, and untreated wastewater pose severe, and sometimes irreversible, community health and safety hazards. Water utilities also manage shared water resources where drought conditions can introduce tough trade-offs among community stakeholders and wastewater treatment plants, which release unpleasant odors and are often in disadvantaged communities.

Waste and recycling

Nuclear power generates hazardous radioactive waste that has a long half-life and lacks viable disposal options. This can prompt community resistance to disposal sites. Additionally, end-of-life management--the dismantling, recycling, or processing of waste--exposes companies to financial, reputational, or litigation risks if not properly planned and provisioned, especially for nuclear plants. Moreover, companies in the sector making significant investments in renewable energy increasingly face risks disposing of renewable assets at the end of their useful lives, especially with regard to battery storage.

Access and affordability

The affordability and reliability of networks are under pressure from climate-related risks, exacerbating materiality for stakeholders. Energy and water are essential services supporting human health and wellbeing and global economic development. Energy transition and physical climate risks will likely amplify service disruptions or steep price increases. These dynamics can affect households' purchasing power and the competitive strengths of local industries, which make this highly material for stakeholders. Additionally, for water utilities, pollution in source water can affect the availability and useability of supply. However, the industry's reliability remains high and we expect this to continue given that water utilities use long term-integrated resource planning, which accounts for these risks. Moreover, while utility bills increase, they tend to rise at a rate lower than inflation. Additionally, regulators continue to allow utilities to use mechanisms to smooth volatility and to offer income assistance programs, which underpins a more moderate impact.

Issuer And Context Analysis

The transaction's projects aim to address some of PG&E's most material sustainability factors, including climate transition and physical climate risk. The projects financed by the transaction relate primarily to PG&E's wildfire mitigation strategy and aim to address climate transition risk and physical climate risk, issues particularly relevant given the utility's geographic context. The company's California operations are exposed to severe heat waves, strong storms, wildfires, drought, floods, and sea level rise. To that end, PG&E expects its investments in adaptation and resilience measures for its power grid to reduce the risk of wildfire ignition and also serve to support the company's transition to providing renewable energy to its customers in California. Additionally, PG&E faces material operational issues related to community engagement, nuclear waste management, and the access to--and affordability of--power. PG&E is addressing these risks through its enhanced powerline safety systems, nuclear waste management practices, and providing discounted rates for certain customers, among other initiatives.

PG&E has a strong climate transition plan and is focused on achieving a net-zero energy system by 2040. By 2030, the issuer has committed to reducing its combined scope 1 and 2 emissions by 50% and lowering scope 3 emissions by 25% (from a baseline year of 2015). As of 2022, PG&E achieved 39% of its scope 1 and 2 goal and 20% of its scope 3 goal. Further, PG&E supports California's renewable energy targets; in 2022, customers received 95% greenhouse-gas free electricity, with nearly 40% coming from Renewable Portfolio Standard-eligible sources such as solar, wind, small hydroelectric, and biopower, with the Diablo Canyon nuclear power facility providing a substantial portion of the firm's carbon-free electricity for its customers. While the Diablo Canyon facility was originally scheduled to close in 2025, regulators have extended the shutdown date to 2030. Providing alternative generation sources once this nuclear generation is retired will likely be important for PG&E to maintain and expand its carbon-free generation portfolio.

PG&E's physical climate risks reflect the long life and fixed nature of its assets. PG&E's infrastructure is exposed to physical risks intensified by climate change, in particular wildfires. A series of significant fires in California in 2017 and 2018 caused substantial financial, operating, and regulatory impacts for the company. PG&E was found liable for causing some fires, resulting in financial liabilities approaching $25 billion. To mitigate such risks, PG&E has conducted an enterprise-wide climate adaptation and vulnerability assessment to evaluate the impact of climate change on its assets, operations, and services. PG&E will continue to assess its physical risks and must file them with the California Public Utilities Commission (CPUC) every four years.

PG&E's primary business activities can have substantial impact on local communities. For instance, wildfires sparked by equipment could result in the displacement of residents and possible injury, destruction of homes, and disruption of communities. PG&E addresses this risk by enhancing customer and community safety, such as through its Enhanced Powerline Safety Settings, which are designed to automatically turn off power within one-tenth of a second if a wildfire threat is detected. PG&E relies on its Emergency Preparedness and Response organization to prepare for any natural disasters, such as earthquakes, wildfires, floods, heavy winds, and blizzards. PG&E manages the social risks in its supply chain related to human rights through its supplier code of conduct.

PG&E's nuclear generation assets produce radioactive waste, which the company has policies to address. It follows nuclear storage regulations. After it produces electricity at Diablo Canyon, nuclear fuel is temporarily stored at an independent spent fuel storage installation site. Once the federal government establishes a repository, it will eventually be transferred there for long-term storage.

PG&E is focused on providing service that is accessible, affordable, and equitable to its customers. Support to customers with limited financial means include partnering with the California Arrearage Payment Program to provide discounted rates for electricity and gas residential consumers. PG&E also has other programs to accommodate customers' financial circumstances, such as the California Alternate Rates for Energy Program, a budget billing program, Relief for Energy Assistance through Community Help Plan, and Family Electric Rate Assistance Program. The company also has an initiative to eliminate the use of propane and wood-burning appliances in disadvantaged communities and thus decrease pollution and health risks and reduce energy costs for these customers.

Alignment Assessment

This section provides an analysis of the transaction's alignment to the Green Bond Principles.

Alignment With Principles

Aligned = ✓ Conceptually aligned = ○ Not aligned = ✗

✓ Green Bond Principles, ICMA, 2021 (with June 2022 Appendix 1)

✓ Use of proceeds

The issuer commits to using the net proceeds issued under the transaction to recover costs for eligible green projects identified in its 2022-2024 wildfire mitigation plans and incurred between Nov. 1, 2022, and April 30, 2024, pursuant to the CPUC financing order. Refer to the Analysis of Eligible Projects section for more information on our analysis of the environmental benefits of the use of proceeds.

✓ Process for project evaluation and selection

PG&E's wildfire mitigation plans outline the process for project selection and its evaluation of how these projects mitigate social and environmental risks. All eligible projects funded by the bond must be identified in the plans. The recovery costs must be authorized by the CPUC through a financing order. We note that the utility conducted the projects after receiving regulatory approval from the CPUC and must follow applicable local, state, and federal environmental regulations.

✓ Management of proceeds

A special-purpose entity will issue the bonds and transfer the proceeds to PG&E, which will use them to refund a line of credit it used to finance the projects. The expenses PG&E incurred exceed the amount of the bond proceeds, thus there is no requirement for the temporary management of proceeds. The bond prospectus requires that the CPUC issue a separate financing order for additional recovery bonds issued under the Wildfire Financing Law.

✓ Reporting

PG&E discloses its planned and actual project capital expenditure, key project performance metrics, third-party project audit results, and certain environmental and social metrics in its quarterly and annual reports. These include measures tracking the performance of each project type, including miles of line inspected, miles of transmission line cleared of vegetation, number of pieces of damaged equipment replaced, and number of weather stations installed, among others.

Analysis Of Eligible Projects

This section provides details of our analysis of eligible projects, based on their environmental benefits and risks, using the Shades of Green methodology.

PG&E commits to use the proceeds from the bond issuance to recover costs for pre-identified projects defined in its 2022-2024 wildfire mitigation plans and incurred between Nov. 1, 2022, and April 30, 2024, pursuant to the CPUC financing order.

The Series 2024-A bonds will be divided into several tranches representing different maturities. These bonds are secured by, and the debt servicing will be covered by, the right to a special, irrevocable, non-bypassable charge known as the fixed recovery charge, which is paid by all existing and future consumers in PG&E's service territory as it existed on the date of the financing order. The Series 2024-A issuance is pursuant to a separate financing order and those bonds are secured by a separate fixed recovery charge. The principal amount, maturity date, interest rate, and financing costs of the bond tranches will be finalized at pricing.

PG&E expects to allocate approximately 94% of proceeds to system hardening projects, approximately 3.5% to microgrids and resilience zones projects, and approximately 2.5% to upfront and pre-securitization financing costs.

Medium green

Activities that represent significant steps towards a low-carbon climate resilient future but will require further improvements to be long-term low-carbon climate resilient solutions.

Our Shades of Green Analytical Approach >

Overall Shades of Green assessment

Based on the project category shades of green detailed below, and consideration of environmental ambitions reflected in PG&E's proposed $1.4 billion senior secured recovery bonds, Series 2024-A, we assess the transaction as Medium green.

Green project categories

Climate change adaptation	
Assessment	**Description**
Medium green	1. System Hardening • PG&E's system hardening program focuses on the mitigation of potential catastrophic wildfire risk caused by distribution overhead assets. This program targets the highest wildfire risk miles and applies various mitigation measures such as line removal, conversion from overhead to underground, application of remote grid alternatives, mitigation of exposure through relocation of overhead facilities, and in-place overhead system hardening. 2. Microgrids/Resilience Zones • Resilience zones will be built around pre-installed interconnection hubs (PIH)—permanent plug-and-play infrastructure enabling temporary generation to connect to the distribution grid at pre-determined locations. Generally, PIHs will consist of a transformer and associated interconnection equipment, ground grid, and grid isolation and protection devices. Pre-installing this equipment will reduce the time to connect temporary generation to the grid (though time to provide power to the location will depend on when temporary generation is secured and transported to the site). 3. Upfront financing costs

Analytical considerations

- We assess the system hardening projects as Medium green because these investments are important for a low-carbon, climate-resilient future. PG&E's infrastructure is exposed to physical climate risks such as wildfires, sea level rise, flooding, extreme heat, sea level rise, and drought-driven subsidence. The system hardening projects target the highest wildfire risk miles and apply mitigations such as line removal, conversion from overhead to underground, and other measures to increase asset resiliency.
- We assess the microgrids and resilience zones projects as Medium green. As part of its Community Wildfire Safety program, PG&E is implementing additional precautionary measures to help further reduce wildfire risk. For public safety, PG&E may need to turn off electricity to communities in high-fire-threat areas amid extreme fire danger conditions. These microgrids and resilience zones projects will deploy equipment to safely facilitate providing temporary power to community services during public safety power shutoffs, contributing to wildfire risk mitigation. These projects reduce wildfire risk by turning off transmission lines that go through high-risk zones such as forests. Such microgrids and resilience zones projects have an important role in a low-carbon, climate-resilient future.
- PG&E has conducted an enterprise-wide climate adaptation vulnerability assessment to evaluate the impact of climate change on its assets, operations, and services. To assess near-term and long-term climate change impacts, PG&E assessed 2030, 2050, and 2080.It must file these assessments with the CPUC every four years.
- PG&E identifies its eligible projects for the transaction through several steps. Per PG&E's wildfire mitigation plans, the utility uses planning risk models to identify higher wildfire risk locations on the grid. PG&E also uses its public safety power shutoff look-back studies to identify circuits or circuit segments where more targeted mitigation projects would reduce impact to customers, should power be shut off for public safety. It factors in weather data to planning risk models and the public safety power shut-off look-back studies. Once PG&E identifies a grid location at higher wildfire risk, it prioritizes projects on the wildfire risk. PG&E aims to complete voluminous projects in different locations across the service territory so that every year significant permanent risk is reduced.
- The project construction can result in significant embodied emissions from construction. PG&E does not measure or manage them, which we would view as a stronger practice.
- For the application of remote grid alternative projects within the system hardening project category, all remote grids comprise solar and battery resources and most also have a backup propane generator to ensure system availability. PG&E has nine operating remote grids, and one is 100% renewable. PG&E is continually evaluating other renewable options, but they are not yet feasible. PG&E is also making operational improvements to increase the share of renewable energy in remote grid systems. In 2023, the renewable energy proportion was 81%, and PG&E forecasts this will be 85% in 2024.
- Concerning the temporary generation associated with the microgrids and resilience zones projects, microgrids installed during that time were, in large part, powered by diesel generators. However, the PIH systems are designed to be agnostic to the generation source. A non-diesel type generator could be used as the technology allows.

S&P Global Ratings' Shades of Green

Assessments	Dark green	Medium green	Light green	Yellow	Orange	Red
Description	Activities that correspond to the long-term vision of an LCCR future.	Activities that represent significant steps toward an LCCR future but will require further improvements to be long-term LCCR solutions.	Activities representing transition steps in the near-term that avoid emissions lock-in but do not represent long-term LCCR solutions.	Activities that do not have a material impact on the transition to an LCCR future, or, Activities that have some potential inconsistency with the transition to an LCCR future, albeit tempered by existing transition measures.	Activities that are not currently consistent with the transition to an LCCR future. These include activities with moderate potential for emissions lock-in and risk of stranded assets.	Activities that are inconsistent with, and likely to impede, the transition required to achieve the long-term LCCR future. These activities have the highest emissions intensity, with the most potential for emissions lock-in and risk of stranded assets.
Example projects	Solar power plants	Energy efficient buildings	Hybrid road vehicles	Health care services	Conventional steel production	New oil exploration

Note: For us to consider use of proceeds aligned with ICMA Principles for a green project, we require project categories directly funded by the financing to be assigned one of the three green Shades.

LCCR--Low-carbon climate resilient. An LCCR future is aligned with the Paris Agreement, where the global average temperature increase is held below 2 degrees Celsius, with efforts to limit it to 1.5 C, above pre-industrial levels, while building resilience to the adverse impact of climate change and achieving sustainable outcomes across both climate and non-climate environmental objectives. Long term and near term--For the purpose of this analysis, we consider the long term to be beyond the middle of the 21st century and the near term to be within the next decade. Emissions lock-in--Where an activity delays or prevents the transition to low-carbon alternatives by perpetuating assets or processes (often fossil fuel use and its corresponding greenhouse gas emissions) that are not aligned with, or cannot adapt to, an LCCR future. Stranded assets--Assets that have suffered from unanticipated or premature write-downs, devaluations, or conversion to liabilities (as defined by the University of Oxford).

Related Research

- Analytical Approach: Second Party Opinions: Use of Proceeds, July 27, 2023
- FAQ: Applying our Integrated Analytical Approach for Use-of-Proceeds Second Party Opinions, July 27, 2023
- Analytical Approach: Shades of Green Assessments, July 27, 2023
- S&P Global Ratings ESG Materiality Maps, July 20, 2022

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