Second-Party Opinion

# Verizon Green Financing Framework

## Evaluation Summary

Sustainalytics is of the opinion that the Verizon Green Financing Framework (the "Framework") is credible and impactful and aligns with the four core components of the Green Bond Principles 2018 and the Green Loan Principles 2020. This assessment is based on the following:

**USE OF PROCEEDS** The eligible categories for the use of proceeds – Renewable Energy, Energy Efficiency, Green Buildings, Sustainable Water Management, Biodiversity and Conservation – are aligned with those recognized by both the Green Bond Principles 2018 and the Green Loan Principles 2020. Sustainalytics considers that Verizon's investments in these eligible categories will lead to positive environmental impacts and advance the UN Sustainable Development Goals ("SDGs"), specifically SDGs 6, 7, 8, 9, 11, & 15.

**PROJECT EVALUATION / SELECTION** Verizon's Sustainability and Treasury teams will be responsible for determining if potential investments are in conformance with the eligibility criteria of the Use of Proceeds. This is in line with market practice.

**MANAGEMENT OF PROCEEDS** Verizon will track allocations using its internal recording system. Pending full allocation, proceeds will be managed in line with its liquidity policy. Verizon has stated its intention to allocate the majority of the net proceeds within three years of issuance. This is in line with market practice.

**REPORTING** Verizon intends to produce a Green Financing Report annually until full allocation. This report will detail the amounts allocated to each category and provide relevant quantitative impact metrics, where feasible. This is in line with market practice.

| | |
|---|---|
| **Evaluation date** | September 3, 2020[1] |
| **Issuer Location** | New York, USA |

**Report Sections**




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[1] This document is an update of the second-party opinion published February 4, 2019.

# Introduction

Verizon Communications Inc. ("Verizon", the "Issuer" or the "Company") is a U.S.-based holding company that, acting through its subsidiaries, is one of the world's leading providers of communications, information and entertainment products and services to consumers, businesses and government entities. With a presence around the world, Verizon offers data, video and voice services and solutions on its networks that are designed to meet customers' demand for mobility, reliable network connectivity, security and control. he United States' largest wireless network.

Verizon has developed the Verizon Green Financing Framework, dated September 2020 (the "Framework") under which it intends to issue green bond(s) or other debt instruments (each a "Green Financing Instrument") and use proceeds to finance and/or refinance, in whole or in part, existing and/or future projects that deliver positive environmental impacts within Verizon's own operations and for the customers it connects. The Framework defines eligibility criteria in five areas:

1. Renewable Energy
2. Energy Efficiency
3. Green Buildings
4. Sustainable Water Management
5. Biodiversity and Conservation

In 2019, Verizon engaged Sustainalytics to review and provide a second-party opinion on the Verizon Green Bond Use of Proceeds Document.[2] In 2020, Verizon engaged Sustainalytics to review its Framework and provide an updated second-party opinion on the Framework's alignment with the Green Bond Principles 2018 (the "GBP") [3] and the Green Loan Principles 2020 (the "GLP").[4] This Framework has been published in a separate document.[5]

**Scope of work and limitations of Sustainalytics Second-Party Opinion**

Sustainalytics' Second-Party Opinion reflects Sustainalytics' independent[6] opinion on the alignment of the reviewed Framework with the current market standards and the extent to which the eligible categories are credible and impactful.

As part of the Second-Party Opinion, Sustainalytics assessed the following:

- The Framework's alignment with the Green Bond Principles 2018, as administered by ICMA, and the Green Loan Principles 2020, as administered by LMA[7];
- The credibility and anticipated positive impacts of the use of proceeds;
- The alignment of the Issuer's sustainability strategy and performance and sustainability risk management in relation to the use of proceeds.

For the use of proceeds assessment, Sustainalytics relied on its internal taxonomy, version 1.5, which is informed by market practice and Sustainalytics' expertise as an Environmental, Social, and Governance ("ESG") research provider.

As part of this engagement, Sustainalytics held conversations with various members of Verizon's management team to understand the sustainability impact of their business processes and planned use of proceeds, as well as management of proceeds and reporting aspects of the Framework. Verizon representatives have confirmed (1) they understand it is the sole responsibility of Verizon to ensure that the

[2] The 2019 second-party opinion, including an excerpt of Verizon's Use of Proceeds Document, is available at: https://www.sustainalytics.com/wp-content/uploads/2019/02/Verizon-Green-Bond-Second-Party-Opinion.pdf
[3] The Green Bond Principles are available at https://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp/.
[4] The Green Loan Principles are available at https://www.lsta.org/content/green-loan-principles
[5] The Verizon Green Financing Framework is available on Verizon Communications Inc.'s website at: https://www.verizon.com/about/investors/fixed-income
[6] When operating multiple lines of business that serve a variety of client types, objective research is a cornerstone of Sustainalytics and ensuring analyst independence is paramount to producing objective, actionable research. Sustainalytics has therefore put in place a robust conflict management framework that specifically addresses the need for analyst independence, consistency of process, structural separation of commercial and research (and engagement) teams, data protection and systems separation. Last but not the least, analyst compensation is not directly tied to specific commercial outcomes. One of Sustainalytics' hallmarks is integrity, another is transparency.
[7] In addition to the Loan Markets Association, the GLP is also administered by the Asia Pacific Loan Market Association and the Loan Syndications & Trading Association

information provided is complete, accurate or up to date; (2) that they have provided Sustainalytics with all relevant information and (3) that any provided material information has been duly disclosed in a timely manner. Sustainalytics also reviewed relevant public documents and non-public information.

This document contains Sustainalytics' opinion of the Framework and should be read in conjunction with that Framework.

Any update of the present Second-Party Opinion will be conducted according to the agreed engagement conditions between Sustainalytics and Verizon.

Sustainalytics' Second-Party Opinion, while reflecting on the alignment of the Framework with market standards, is no guarantee of alignment nor warrants any alignment with future versions of relevant market standards. Furthermore, Sustainalytics' Second-Party Opinion addresses the anticipated impacts of eligible projects expected to be financed with bond and loan proceeds but does not measure the actual impact. The measurement and reporting of the impact achieved through projects financed under the Framework is the responsibility of the Framework owner.

In addition, the Second-Party Opinion opines on the intended allocation of proceeds but does not guarantee the realised allocation of the bond and loan proceeds towards eligible activities.

No information provided by Sustainalytics under the present Second-Party Opinion shall be considered as being a statement, representation, warrant or argument either in favour or against, the truthfulness, reliability or completeness of any facts or statements and related surrounding circumstances that Verizon has made available to Sustainalytics for the purpose of this Second-Party Opinion.

# Sustainalytics' Opinion

## Section 1: Sustainalytics' Opinion on the Verizon Green Financing Framework

Sustainalytics is of the opinion that the Verizon Green Financing Framework is credible and impactful, and aligns with the four core components of the GBP and GLP. Sustainalytics highlights the following elements of the Framework:

- Use of Proceeds:
  - The five use of proceeds categories – Renewable Energy, Energy Efficiency, Green Buildings, Sustainable Water Management, and Biodiversity and Conservation – are aligned with those recognized by the GBP and GLP.
  - The Framework specifies that eligible renewable energy technologies include solar and wind energy.
    - Expenditures may include those in the construction and operation of renewable energy facilities, of which Verizon has been directly involved in the installation of over 20 MW of onsite renewable energy systems and has committed to adding a further 24 MW by 2025.
    - The Framework also defines power purchase agreements ("PPAs") and virtual PPAs ("vPPAs")[8] for renewable energy as eligible uses of proceeds. PPAs and vPPAs will be directly tied to specific renewable energy generation projects, rather than the purchase of "generic" green energy from a utility, and the Framework further specifies that PPAs will be "long-term" and entered into prior to commercial operations or, in the case of re-powering projects, re-commencement of commercial operations. Sustainalytics considers that (i) by including PPAs and vPPAs in its Framework Verizon is supporting the overall development of the renewable energy market, (ii) by selecting long-term pre-construction agreements that Verizon is further enabling the development of these assets and (iii) the distributed energy demands of Verizon's network make vPPAs well-suited to meet its renewable energy and carbon neutral commitments.
  - Within the energy efficiency category, Verizon has included projects related to the "deployment of 5G wireless technologies that allow for real-time response to energy demand". By enabling high-speed network connectivity, Verizon's solutions have the potential to support significant energy savings by end users across many industrial sectors. Sustainalytics views positively this use of proceeds, and is of the opinion that it will provide net-positive environmental impacts. For further information, refer to Section 3: Impact of Use of Proceeds.
    - Sustainalytics also notes that there are limitations to this use of proceeds, related to (i) the energy demands on the network, and (ii) the wide range of end user technologies that it supports.
  - The Framework specifies that eligible green buildings are those that have received Gold or higher certification from LEED, or an ENERGY STAR score of 85 or higher. Sustainalytics considers these rating schemes to be credible and the levels selected to be in line with market practice (see Appendix 2 for a summary of the schemes). The criteria also include buildings that are carbon net-zero, or upgrades to buildings that are expected to improve energy efficiency by at least 30%. Sustainalytics is of the opinion that these levels of performance are in line with market practice.
  - The Framework defines leasing of eligible green buildings, on a capitalized basis, as eligible use of proceeds. While Verizon does own green buildings, the Framework also allows for the inclusion of the certification of green buildings for facilities not owned by Verizon. By signing long-term leases Verizon is enabling the construction of these assets. Additionally, Verizon has confirmed to Sustainalytics that leasing of buildings includes the operation and management of the buildings. Sustainalytics considers that by including capitalized leases in its Framework,

[8] A virtual PPA is a contractual arrangement between a generator and an energy buyer in which the renewable power is not "physically" delivered to the off-taker. Generally, the renewable energy generator delivers energy to the grid as "null" power with the off-taking company drawing an equivalent amount of grid power from their local utility. The buyer pays a settlement to the energy producer to make up the difference between the agreed-upon contractual price of the PPA and the wholesale price obtained by the energy producer selling the null power. The associated RECs also accrue to the buyer. As this structure supports the financing of renewable energy projects, Sustainalytics considers it to be equivalent to a typical or physical PPA.

Verizon is supporting the overall development of the green building markets, which delivers indirect environmental benefits.
  - The Framework allows for inclusion of equipment which results in energy and/or water savings, including, but not limited to, legacy network technology replacements and upgrades, HVAC and lighting equipment, and plumbing fixtures and irrigation systems. Although no quantitative thresholds for eligibility are specified, Verizon has stated that it intends to include only projects which provide benefits consistent with its publicly stated goals for energy efficiency and water management, such as a 15% corporate water savings. Sustainalytics encourages Verizon to ensure that only projects which deliver quantifiable environmental benefits be prioritized.
- Project Evaluation and Selection:
  - Verizon's Sustainability and Treasury teams will be responsible for determining if potential investments are in conformance with the eligibility criteria of the Framework, and the Issuer intends to allocate an amount equal to the net proceeds from any Green Financing Instrument(s) to these eligible green investments.
  - Based on the clear delegation of responsibility, Sustainalytics considers this to be in line with market practice.
- Management of Proceeds:
  - Verizon intends to allocate an amount equal to the net proceeds of a green bond or other Green Financing Instrument to finance or refinance eligible green investments, and will track these allocations using its internal recording system. Pending full allocation, an amount equal to the unallocated net proceeds will be managed in accordance with Verizon's normal liquidity activities. Verizon has stated its intention to allocate the majority of the proceeds within three years of issuance.
  - Based on the presence of a system to track allocations and the disclosure of intended temporary management approach, Sustainalytics considers this to be in line with market practice.
- Reporting:
  - Verizon intends, on an annual basis, until an amount equal to the net proceeds is fully allocated, to produce and make available on its website a Green Financing Report, which will provide allocation and impact reporting.
    - The allocation reporting will include the total amounts allocated to each category and the balance of any unallocated proceeds
    - The impact reporting will include quantitative environmental impacts, where feasible. The Framework specifies a list of sample metrics which may be used to report the impacts of each category. Additionally, Verizon notes that it intends to continue to develop a methodology to quantify the impacts of its 5G investments.
  - For each Green Financing Instrument, Verizon intends to disclose the categories of the Framework which are intended to receive allocations.
  - Based on the commitments described above, Sustainalytics considers Verizon's reporting commitments to be in line with market practice and highlights in particular the ongoing commitment to develop appropriate impact metrics.

**Alignment with Green Bond Principles 2018 and Green Loan Principles 2020**

Sustainalytics has determined that the Verizon Green Financing Framework aligns to the four core components of the GBP and GLP. For detailed information please refer to Appendix 5: Green Bond/Green Bond Programme External Review Form.

## Section 2: Sustainability Performance of Verizon

**Contribution of the Framework to Verizon's sustainability strategy and targets**

The principles which underlie Verizon's sustainability approach are laid out in the Company's Credo, which states the Company's commitment to integrity, respect, performance excellence, and accountability.[9] Verizon's approach to sustainability is centered on addressing the key environmental and social issues associated with its core operations. The Company has performed a materiality assessment to prioritize ESG topics that are relevant to both its business and society, and although Verizon's sustainability strategy seeks

[9] Verizon, "Verizon Credo," https://www.verizon.com/about/sites/default/files/Verizon-Credo.pdf

to address all material issues identified, some of the most material include Access to connectivity, Climate change mitigation, Network, mobile, and data security and Sustainable product innovation.[10]

As it relates to environmental impact, Verizon identified a number of key areas on which it tracks its progress and sets targets for progress, such as emissions and carbon intensity, network resiliency, renewable energy, buildings & data centers, fleet operations, e-waste, paper waste, water conservation, and reforestation. Sustainalytics notes that these areas align with the use of proceeds categories of the Framework, and highlights the following key points of Verizon's strategy and results:[11]

- Verizon has set quantitative and time-bound targets for its environmental performance. The Company intends to reduce its carbon intensity of overall operations by 50% by 2025 from a 2016 baseline and become carbon neutral (Scope 1 & 2) by 2035. Additionally, science-based emissions targets will be developed by 2021. Verizon recently announced that the company had achieved its carbon intensity reduction goal six years early, achieving a 53% reduction in 2019.
- Verizon has contracted for 384MW of renewable energy capacity, in addition to installing 20MW of onsite renewables and committing to a further 24MW onsite by 2025. A target has been established of generating or procuring 50% of total annual energy consumption from renewables by this date.
- 357 facilities have LEED certification, and 278 properties have received Energy Star certification. Verizon is committed to achieving Energy Star certification at all eligible properties, and in 2019 was recognized with an Energy Star Partner of the Year award for the 7th consecutive time.
- In addition to improvements within its own operations, Verizon has committed to support carbon reductions by its network users, and has calculated that in 2019 it enabled the avoidance of 8.8 million tonnes of $CO_2e$.
- The Company achieved a 9% reduction in water usage over the period 2016-2019, and in 2019, 54% of paper purchases contained recycled fiber and 43.3 million pounds of e-waste were recycled.

Based on the policy statements and quantitative time-bound targets, Sustainalytics views Verizon's sustainability strategy positively, and is of the opinion that the eligible green projects defined by the Framework will contribute to the Company's overall sustainability approach and that Verizon is well-positioned to issue green bonds.

**Well positioned to address common environmental and social risks associated with the projects**

Sustainalytics views the eligible green investments contemplated by the Framework to have overall positive environmental benefits. Nevertheless, all major projects may have associated environmental and social risks. In particular, infrastructure projects such as renewable energy and green buildings may face risks such as air, water, and soil pollution, biodiversity impacts, worker health and safety, and community support, while network solutions such as "smart city" technologies may face risks related to data and privacy as well as supply chain risks.

Verizon has policies and procedures in place which will help mitigate the aforementioned risks, including:

- Identification of key risks in relation to its business activities, including those related to sustainable operations and privacy & data use, and has implemented compliance processes and programs, which are overseen by the Audit Committee of Verizon's Board of Directors.[12] Within its Taskforce on Climate-related Financial Disclosures (TCFD) reporting, Verizon has identified activities which it is taking to mitigate climate risks and pursue a transition to a low-carbon economy.[13]
- A Customer Advisory Board, composed of independent business-sector and public interest advocates that advise the Company on matters that may impact stakeholders.[14] Verizon has also published a Broadband Commitment which states how Verizon will address important consumer-facing issues such as access and informed choice.[15]
- A Code of Conduct, which is considered part of mandatory training for all employees and states that, in addition to complying with all relevant laws and regulations, Verizon employees must maintain an inclusive, fair and healthy work environment, protect the Company's assets and reputation, and maintain integrity and fairness in the marketplace. Channels for inquiries and whistleblowers have been put in place.[16] Furthermore, a specific zero-tolerance anti-corruption policy is in force.[17]

[10] Verizon, "Our ESG Strategy," https://www.verizon.com/about/sites/default/files/esg-report/2019/approach/our-esg-strategy.html
[11] Verizon, "2019 ESG Report", https://www.verizon.com/about/sites/default/files/esg-report/2019/Verizon-2019-ESG-Report.pdf
[12] Verizon, "How we Govern", https://www.verizon.com/about/sites/default/files/esg-report/2019/governance/how-we-govern.html
[13] Verizon, "Verizon TCFD Report", https://www.verizon.com/about/sites/default/files/Verizon-TCFD-Report.pdf
[14] Verizon, "Governance – How we Operate", https://www.verizon.com/about/sites/default/files/esg-report/2019/governance/how-we-operate.html
[15] Verizon, "Verizon Broadband Commitment", https://www.verizon.com/about/sites/default/files/Verizon_Broadband_Commitment.pdf
[16] Verizon, "Ethics and Compliance", https://www.verizon.com/about/sites/default/files/esg-report/2019/governance/ethics-and-compliance.html
[17] Verizon, "Anti-corruption", https://www.verizon.com/about/sites/default/files/esg-report/2019/governance/anti-corruption.html

- Several policies which apply to Verizon's suppliers and supply chain, include a Supplier Code of Conduct,[18] a Conflict Minerals Policy,[19] and a Human Rights statement.[20]

Based on the policies and procedures in place, Sustainalytics considers Verizon well-positioned to mitigate the environmental and social risks associated with the projects funded by the net proceeds of any Green Financing Instrument.

## Section 3: Impact of Use of Proceeds

All five use of proceeds categories are aligned with those recognized by the GBP and GLP. Sustainalytics has focused below on two where the impact is specifically relevant for Verizon.

**The impact of network technologies to deliver global energy efficiency improvements**

According to the International Energy Association ("IEA"), in 2017 world electricity demand rose by 3.1% while innovations in energy efficiency slowed down significantly.[21] According to the IEA Bridge Scenario, increasing energy efficiency, for industry, buildings, and transport is a critical action that must be taken to combat greenhouse gas ("GHG") emissions, and could contribute to approximately 48% of global emissions reductions by 2030.[22]

Verizon's existing network solutions currently enable customers in numerous sectors to operate with increased energy efficiency; the Company has worked with the Carbon Trust to quantify the benefits accrued by end users, measured in $CO_2e$ avoided. In 2019, 8.8 million metric tons of $CO_2e$ emissions were avoided across six industrial sectors, with the largest benefits accrued through telecommuting, smart meters and demand response units for power grids, and transportation telematics. These avoided emissions are equivalent to 1.99 times Verizon's overall scope 1 & 2 emissions, indicating that their solutions have resulted in more energy savings than is required to deliver the services.[23]

Verizon's Framework contemplates the inclusion of the "deployment of 5G wireless technologies that allow for real-time response to energy demand". The upgrade to a next-generation 5G network will enable a transition to more network-connected devices, by supporting an ultrafast hyperconnected network that facilitates the rapid flow and analysis of data between connected devices, including personal devices, machinery, buildings, infrastructure and a range of other connectable items, to enable and optimize the delivery of services, including new services. This advancement can lead to energy savings across industries. Examples include, but are not limited to, smart metering, smart lighting, smart parking and other aspects of smart cities such as real-time traffic data for transit systems and first responders, the sharing economy, including bike and electric vehicle sharing, industry automation, and smart logistics. Recent studies have indicated that the carbon emissions abatement that can already be attributed to mobile communication technologies stands at 180 million tons of $CO_2e$ each year in the United States and Europe, 70% of which is attributable to the machine-to-machine communications[24] that next-generation networks and devices will further enable and enhance. Refer to Appendix 3 for further discussion of the potential applications and GHG abatement mechanisms of various technologies enabled by 5G deployments.

Given the need for energy efficiency across a diversity of industrial sectors and the potential for next-generation technologies such as 5G-connected applications to provide energy efficiency improvements, and considering Verizon's status among the world leaders in 5G development,[25] Sustainalytics views Verizon's projects in these areas as impactful.

Environmental limitations in deployment of 5G technology
Sustainalytics recognizes that 5G technologies as described in Verizon's Framework carry two risks/limitations in terms of impact:

[18] Verizon, "Supplier Code of Conduct", https://www.verizon.com/about/our-company/supplier-diversity/supplier-code-of-conduct
[19] Verizon, "Conflict Minerals Policy", https://www.verizon.com/about/our-company/company-policies/conflict-mineral
[20] Verizon, "Human Rights Policy", https://www.verizon.com/about/our-company/company-policies/human-rights-verizon
[21] IEA, "Global Energy Outlook", https://www.iea.org/publications/freepublications/publication/GECO2017.pdf
[22] IEA, "Meeting climate change goals through energy efficiency", https://www.iea.org/publications/freepublications/publication/MeetingClimateChangeGoalsEnergyEfficiencyInsightsBrief.pdf
[23] Verizon, "Carbon abatement: Solutions for a more sustainable world", https://www.verizon.com/about/sites/default/files/esg-report/2019/environmental/carbon-abatement.html
[24] GeSI Mobile Carbon Impact
[25] IEEE, "The Race to 5G", https://spectrum.ieee.org/static/the-race-to-5g

i. Large telecom networks are energy-intensive to operate, and the deployment of 5G will impose even greater electricity demands. While the overall network emissions from the telecommunications industry may increase as a result of 5G deployment and increased network traffic, the ratio of direct energy savings from mobile technologies to network energy use is currently estimated at 5:1 in Europe and North America.[26] Verizon projects that by 2022 their networks and connected solutions will result in emissions savings at a ratio of more than 2:1 compared to the emissions from their operations.[27] Sustainalytics considers that these net-positive ratios are indicative of 5G's potential environmental benefits.
ii. As 5G enables end users to deploy a wide range of solutions, the technologies have a broad impact, and can drive energy efficiency gains in a variety of industries. This does not exclude the possibility of application in fossil fuel-based industries. Sustainalytics understands that Verizon cannot control the use and application of its network technologies.

Despite these limitations, Sustainalytics is of the opinion that the deployment of 5G will provide, overall, net positive environmental impacts.

**Importance of renewable energy to power telecommunications services**

The telecommunications sector is by its very nature energy-intensive; it is estimated that worldwide the sector contributes to approximately 10% of total energy consumption.[28] Within traditional telecom service providers, the largest single energy demand is electricity to run network base stations, with telephone exchanges, core networks, and data centers also making up significant loads.[29] According to the US Department of Energy, the data centers that form the hubs of modern networks consume 10–50 times more energy per unit of floor space, on average, than commercial office buildings, and collectively make up approximately 2% of the country's total electricity consumption. In 2014, US data centers consumed 70 billion kWh of electrical energy, and this amount is projected to continue to increase to 73 billion kWh by 2020, even if the ongoing trend toward increasingly efficient equipment continues.[30] In this context, using renewable energy to power these networks will provide significant impact in reducing carbon emissions.

The operation of a wireless wide area network ("WAN") requires broadly distributed telecommunications infrastructure, including towers and base stations, all of which must have consistent access to electricity to ensure connectivity. In this context, it is challenging to match energy loads precisely to renewable energy generation, due to the variable nature of renewables coupled with potential geographic discrepancies between sources and demands. In this context, Sustainalytics recognizes that the use of vPPAs can play an impactful role by supporting the production of clean energy in an amount equivalent to the energy requirements of the network. In the long-term, it is noted that additional innovations, potentially including energy storage, will be required to fully decarbonize the energy required by the telecommunications sector.

**Alignment with/contribution to SDGs**

The Sustainable Development Goals ("SDGs") were set in September 2015 and form an agenda for achieving sustainable development by the year 2030. This green bond advances the following SDG goal(s) and target(s):

| Use of Proceeds Category | SDG | SDG target |
|---|---|---|
| Renewable Energy | 7. Affordable and Clean Energy | 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix |
| Energy Efficiency | 8. Decent Work and Economic Growth | 8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programs on sustainable consumption and production, with developed countries taking the lead. |

[26] GeSI Mobile Carbon Impact
[27] Verizon, "Carbon abatement: Solutions for a more sustainable world", https://www.verizon.com/about/sites/default/files/esg-report/2019/environmental/carbon-abatement.html
[28] Ibrahim et al, "Energy Consumption Assessment of Mobile Cellular Networks", http://www.ajer.org/papers/Vol-7-issue-3/K070396101.pdf
[29] Lange et al, "Analysis of the energy consumption in telecom operator networks", https://link.springer.com/article/10.1007/s11107-015-0492-4
[30] Berkeley National Laboratory, "United States Data Center Energy Usage Report", http://eta-publications.lbl.gov/sites/default/files/lbnl-1005775_v2.pdf

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|---|---|---|
| | 9. Industry, Innovation and Infrastructure | 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities |
| Green Buildings | 11. Sustainable Cities and Communities | 11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries |
| Sustainable Water Management | 6. Clean Water and Sanitation | 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity |
| Biodiversity and Conservation | 15. Life on Land | 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements |

## Conclusion

Verizon has developed the Verizon Green Financing Framework, under which it may issue green bonds and other Green Financing Instruments. Eligible green investments include renewable energy, energy efficiency, green buildings, sustainable water management, and biodiversity and conservation, all of which will deliver environmental benefits. Sustainalytics highlights in particular Verizon's intention to finance renewable energy vPPAs and its deployment of 5G technologies which will deliver significant energy savings to end users, providing net-positive environmental benefits despite increased loads on Verizon's own network.

The use of proceeds categories specified in the Framework are aligned with those of the Green Bond Principles 2018 and Green Loan Principles 2020; Verizon has described a process by which proceeds will be tracked, allocated, and managed, and commitments have been made for reporting on the allocation of an amount equal to the net proceeds. Furthermore, Sustainalytics believes that the investments funded by any Green Financing Instruments will contribute to the advancement of the UN Sustainable Development Goals, in particular 6, 7, 8, 9, 11, and 15.

Based on the above, Sustainalytics is confident that Verizon is well-positioned to issue Green Financing Instruments should it decide to do so, and that the Verizon Green Financing Framework is robust, transparent, and in alignment with the Green Bond Principles 2018 and Green Loan Principles 2020.

# Appendices

## Appendix 1: Green Bond / Green Bond Programme - External Review Form

## Section 1. Basic Information

| | |
|---|---|
| **Issuer name:** | Verizon Communications Inc. |
| **Green Bond ISIN or Issuer Green Bond Framework Name, if applicable:** | Verizon Green Financing Framework |
| **Review provider's name:** | Sustainalytics |
| **Completion date of this form:** | September 2, 2020 |
| **Publication date of review publication:** | |

## Section 2. Review overview

**SCOPE OF REVIEW**

The following may be used or adapted, where appropriate, to summarise the scope of the review.

The review assessed the following elements and confirmed their alignment with the GBP:

| | | | |
|---|---|---|---|
| ☒ | Use of Proceeds | ☒ | Process for Project Evaluation and Selection |
| ☒ | Management of Proceeds | ☒ | Reporting |

**ROLE(S) OF REVIEW PROVIDER**

| | | | |
|---|---|---|---|
| ☒ | Consultancy (incl. 2nd opinion) | ☐ | Certification |
| ☐ | Verification | ☐ | Rating |
| ☐ | Other *(please specify)*: | | |

Note: In case of multiple reviews / different providers, please provide separate forms for each review.

**EXECUTIVE SUMMARY OF REVIEW and/or LINK TO FULL REVIEW *(if applicable)***

| |
|---|
| Please refer to Evaluation Summary above. |

## Section 3. Detailed review

Reviewers are encouraged to provide the information below to the extent possible and use the comment section to explain the scope of their review.

**1. USE OF PROCEEDS**

Overall comment on section *(if applicable)*:

The eligible categories for the use of proceeds – Renewable Energy, Energy Efficiency, Green Buildings, Sustainable Water Management, Biodiversity and Conservation – are aligned with those recognized by both the Green Bond Principles 2018 and the Green Loan Principles 2020. Sustainalytics considers that Verizon's investments in these eligible categories will lead to positive environmental impacts and advance the UN Sustainable Development Goals ("SDGs"), specifically SDGs 6, 7, 8, 9, 11, & 15.

**Use of proceeds categories as per GBP:**

| | | | |
|---|---|---|---|
| ☒ | Renewable energy | ☒ | Energy efficiency |
| ☐ | Pollution prevention and control | ☒ | Environmentally sustainable management of living natural resources and land use |
| ☐ | Terrestrial and aquatic biodiversity conservation | ☐ | Clean transportation |
| ☒ | Sustainable water and wastewater management | ☐ | Climate change adaptation |
| ☐ | Eco-efficient and/or circular economy adapted products, production technologies and processes | ☒ | Green buildings |
| ☐ | Unknown at issuance but currently expected to conform with GBP categories, or other eligible areas not yet stated in GBP | ☐ | Other *(please specify)*: |

If applicable please specify the environmental taxonomy, if other than GBP:

**2. PROCESS FOR PROJECT EVALUATION AND SELECTION**

Overall comment on section (if applicable):

Verizon's Sustainability and Treasury teams will be responsible for determining if potential investments are in conformance with the eligibility criteria of the Use of Proceeds. This is in line with market practice.

**Evaluation and selection**

| | | | |
|---|---|---|---|
| ☒ | Credentials on the issuer's environmental sustainability objectives | ☒ | Documented process to determine that projects fit within defined categories |
| ☒ | Defined and transparent criteria for projects eligible for Green Bond proceeds | ☒ | Documented process to identify and manage potential ESG risks associated with the project |
| ☐ | Summary criteria for project evaluation and selection publicly available | ☐ | Other *(please specify):* |

**Information on Responsibilities and Accountability**

☒ Evaluation / Selection criteria subject to external advice or verification

☐ In-house assessment

☐ Other (please specify):

**3. MANAGEMENT OF PROCEEDS**

Overall comment on section *(if applicable)*:

Verizon will track allocations using its internal recording system. Pending full allocation, proceeds will be managed in line with its liquidity policy. Verizon has stated its intention to allocate the majority of the net proceeds within three years of issuance. This is in line with market practice.

**Tracking of proceeds:**

☒ Green Bond proceeds segregated or tracked by the issuer in an appropriate manner

☒ Disclosure of intended types of temporary investment instruments for unallocated proceeds

☐ Other *(please specify)*:

**Additional disclosure:**

☐ Allocations to future investments only

☒ Allocations to both existing and future investments

☐ Allocation to individual disbursements

☒ Allocation to a portfolio of disbursements

☒ Disclosure of portfolio balance of unallocated proceeds

☐ Other *(please specify)*:

**4. REPORTING**

Overall comment on section (if applicable):

Verizon intends to produce a Green Financing Report annually until full allocation. This report will detail the amounts allocated to each category and provide relevant quantitative impact metrics, where feasible. This is in line with market practice.

**Use of proceeds reporting:**

☐ Project-by-project

☒ On a project portfolio basis

☐ Linkage to individual bond(s)

☐ Other *(please specify):*

**Information reported:**

☒ Allocated amounts
☐ Green Bond financed share of total investment
☐ Other *(please specify):*

**Frequency:**

☒ Annual
☐ Semi-annual
☐ Other (please specify):

**Impact reporting:**

☐ Project-by-project
☒ On a project portfolio basis
☐ Linkage to individual bond(s)
☐ Other (please specify):

**Information reported (expected or ex-post):**

☒ GHG Emissions / Savings
☒ Energy Savings
☒ Decrease in water use
☒ Other ESG indicators (please specify): Refer to Framework for full list of potential impact metrics

**Frequency**

☒ Annual
☐ Semi-annual
☐ Other (please specify):

**Means of Disclosure**

☐ Information published in financial report
☐ Information published in sustainability report
☒ Information published in ad hoc documents
☐ Other (please specify):
☐ Reporting reviewed (if yes, please specify which parts of the reporting are subject to external review):

Where appropriate, please specify name and date of publication in the useful links section.

**USEFUL LINKS** (e.g. to review provider methodology or credentials, to issuer's documentation, etc.)

**SPECIFY OTHER EXTERNAL REVIEWS AVAILABLE, IF APPROPRIATE**

**Type(s) of Review provided:**

☐ Consultancy (incl. 2nd opinion)
☐ Certification
☐ Verification / Audit
☐ Rating

☐ Other *(please specify):*

**Review provider(s):** **Date of publication:**

**ABOUT ROLE(S) OF INDEPENDENT REVIEW PROVIDERS AS DEFINED BY THE GBP**

i. Second-Party Opinion: An institution with environmental expertise, that is independent from the issuer may issue a Second-Party Opinion. The institution should be independent from the issuer's adviser for its Green Bond framework, or appropriate procedures, such as information barriers, will have been implemented within the institution to ensure the independence of the Second-Party Opinion. It normally entails an assessment of the alignment with the Green Bond Principles. In particular, it can include an assessment of the issuer's overarching objectives, strategy, policy and/or processes relating to environmental sustainability, and an evaluation of the environmental features of the type of projects intended for the Use of Proceeds.

ii. Verification: An issuer can obtain independent verification against a designated set of criteria, typically pertaining to business processes and/or environmental criteria. Verification may focus on alignment with internal or external standards or claims made by the issuer. Also, evaluation of the environmentally sustainable features of underlying assets may be termed verification and may reference external criteria. Assurance or attestation regarding an issuer's internal tracking method for use of proceeds, allocation of funds from Green Bond proceeds, statement of environmental impact or alignment of reporting with the GBP, may also be termed verification.

iii. Certification: An issuer can have its Green Bond or associated Green Bond framework or Use of Proceeds certified against a recognised external green standard or label. A standard or label defines specific criteria, and alignment with such criteria is normally tested by qualified, accredited third parties, which may verify consistency with the certification criteria.

iv. Green Bond Scoring/Rating: An issuer can have its Green Bond, associated Green Bond framework or a key feature such as Use of Proceeds evaluated or assessed by qualified third parties, such as specialised research providers or rating agencies, according to an established scoring/rating methodology. The output may include a focus on environmental performance data, the process relative to the GBP, or another benchmark, such as a 2-degree climate change scenario. Such scoring/rating is distinct from credit ratings, which may nonetheless reflect material environmental risks.

## Appendix 2: Comparison of Green Building Certification Schemes

| | LEED | ENERGY STAR |
|---|---|---|
| Background | Leadership in Energy and Environmental Design (LEED) is a US Certification System for residential and commercial buildings used worldwide. LEED was developed by the non-profit U.S. Green Building Council (USGBC) and covers the design, construction, maintenance and operation of buildings. | ENERGY STAR is a U.S Environmental Protection Agency voluntary program that provides independently certified energy efficiency ratings for products, homes, buildings, and industrial plants. Certification is given on an annual basis, so a building must maintain its high performance to be certified year to year. |
| Certification levels | • Certified<br>• Silver<br>• Gold<br>• Platinum | • 1-100 score, 75 is minimum for certification |
| Areas of assessment | • Energy and atmosphere<br>• Sustainable Sites<br>• Location and Transportation<br>• Materials and resources<br>• Water efficiency<br>• Indoor environmental quality<br>• Innovation in Design<br>• Regional Priority | • Energy use |
| Requirements | Minimum requirements independent of level of certification; point-based scoring system weighted by category to determine certification level.<br><br>The rating system is adjusted to apply to specific sectors, such as: New Construction, Major Renovation, Core and Shell Development, Schools-/Retail-/Healthcare New Construction and Major Renovations, and Existing Buildings: Operation and Maintenance. | 1-100 score based on energy use, as calculated through the Portfolio Manager tool. Raw score is adjusted based on location, operating conditions, and other factors. The numerical score indicates performance better than at least that percentage of similar buildings nationwide. |
| Qualitative Considerations | Widely accepted within the industry, both in North America and internationally, and considered a guarantee of strong performance. | Accounts only for energy use, not other measures of environmental performance. Is a key component of other green building certification systems. |
| Performance display |  |  |

## Appendix 3: Selected 5G-Supported Technologies

5G is the next generation of wide area network (WAN) technology, building upon and replacing contemporary 4G/LTE networks. Compared to current networks, 5G is expected to provide higher data throughput speed, reduced latency, advanced management and operations support systems, high-motion ability, and universal applications support.[31] It is anticipated that 5G, which is expected to be widely deployed within the next several years, will provide the speeds and bandwidth to support vast new networks of connected devices, the Internet of Things (IoT).[32] Some observers have argued that to realize all the potential benefits of large-scale IoT deployments, 5G networks are necessary.[33] In this context, 5G can be seen as supporting further gains from existing network deployments which are already providing environmental benefits, as well as enabling next-generation technologies which are currently unfeasible.

| Technology/ Sector | Benefits of existing network technologies | Examples of additional benefits provided by 5G | GHG Abatement Mechanism for 5G |
|---|---|---|---|
| Transportation/ Smart Cities | Telematics, optimized routing, GPS location services, dispatching, smart parking meters | Self-driving cars, car-to-vehicle-to-everything (C-V2X) communications,[34] first responder support, improved transit priority. | Fewer and more efficient vehicle miles driven, improved public transit performance, improved public safety |
| Power Grids | Smart meters | Additional network grid and end user sensors to provide real-time information and two-way communication.[35] | More efficient energy use, better integration of renewable electricity |
| Health Care | Remote patient monitoring, electronic health records | High-speed and low latency networks enable robotics-assisted remote surgery and transmission of real-time high-resolution imaging for consultations and examinations.[36] | Less travel by both patients and doctors resulting in fuel savings, improved surgery techniques result in energy savings from shorter procedures |
| Manufacturing | Automation, computerization | Low latency micro-sensors and factory-scale networks can improve monitoring, control, and data collection for complex industrial processes.[37] | More efficient industrial processes result in emissions savings, better quality control results in better environmental performance of end products |

[31] https://www.networkworld.com/article/3203489/lan-wan/what-is-5g-wireless-networking-benefits-standards-availability-versus-lte.html
[32] https://spectrum.ieee.org/tech-talk/computing/networks/5g-taking-stock
[33] https://www.networkworld.com/article/3268668/internet-of-things/5g-to-become-the-catalyst-for-innovation-in-iot.html
[34] C-V2X allows vehicles to communicate with one another as well as with other parts of the road environment such as traffic lights, toll booths, pedestrians, etc. https://www.technologyreview.com/s/611883/how-5g-connectivity-and-new-technology-could-pave-the-way-for-self-driving-cars/
[35] These technologies can help grid reliability by adapting instantaneously to spikes or outages, as well as enabling end user energy savings. One study projected 12% household savings from a 5G enabled smart grid. https://www.engerati.com/transmission-and-distribution/article/communications-networks-technologies/5g-%E2%80%93-driver-next
[36] https://www.iotevolutionhealth.com/topics/iotevolutionhealth/articles/436795-how-5g-could-help-transform-health-care.htm
[37] A case study of the application of 5G technology to manufactured bladed disks (BLISKs), a key component of jet engines, suggested savings of 360 million metric tons of $CO_2e$ globally was possible, along with creating higher-quality engines which would reduce emissions by a further 2%. https://www.ericsson.com/en/trends-and-insights/consumerlab/consumer-insights/reports/5g-business-value-to-industry-blisk

# Disclaimer

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Sustainalytics, a Morningstar Company, is a leading ESG research, ratings and data firm that supports investors around the world with the development and implementation of responsible investment strategies. The firm works with hundreds of the world's leading asset managers and pension funds who incorporate ESG and corporate governance information and assessments into their investment processes. The world's foremost issuers, from multinational corporations to financial institutions to governments, also rely on Sustainalytics for credible second-party opinions on green, social and sustainable bond frameworks. In 2020, Climate Bonds Initiative named Sustainalytics the "Largest Approved Verifier for Certified Climate Bonds" for the third consecutive year. The firm was also recognized by Environmental Finance as the "Largest External Reviewer" in 2020 for the second consecutive year. For more information, visit www.sustainalytics.com.