

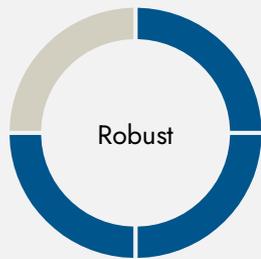
SECOND PARTY OPINION

on the sustainability of Merck’s Sustainability Financing Framework

V.E considers that Merck’s Framework is aligned with the four core components of ICMA’s Social Bond Principles 2021 (“SBP”) and Green Bond Principles 2021 (“GBP”)

Framework

Contribution to Sustainability:



- Advanced
- Limited
- Robust
- Weak

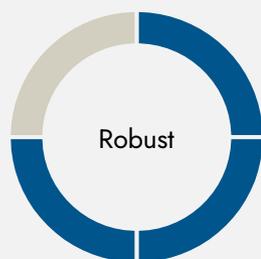


Characteristics of the Framework

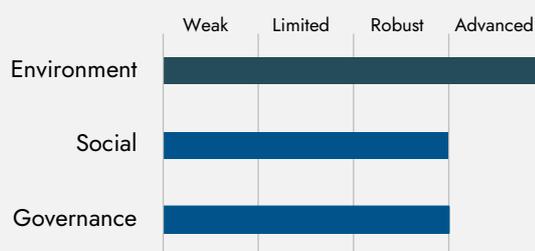
Green/Social Project Categories	⇒ 2 Social Categories ⇒ 5 Green Categories
Project locations	Americas, Europe, Asia and Africa
Target population	Defined
Existence of framework	Yes
Share of refinancing	Disclosed to investors pre-issuance
Look back period	36 months

Issuer

ESG Performance as of September 2021



- Advanced
- Limited
- Robust
- Weak



Controversial Activities

The Issuer appears to not be involved in any of the 17 controversial activities screened under our methodology:

- Alcohol
- Animal welfare
- Cannabis
- Chemicals of concern
- Civilian firearms
- Fossil fuels industry
- Coal
- Gambling
- Genetic engineering
- High interest rate lending
- Human embryonic stem cells
- Military
- Nuclear power
- Pornography
- Reproductive medicine
- Tar sands and oil shale
- Tobacco

ESG Controversies

Number of controversies	4
Frequency	Occasional
Severity	High
Responsiveness	Reactive

Coherence

Coherent
Partially coherent
Not coherent

V.E considers that the contemplated Framework is coherent with Merck’s strategic sustainability priorities and sector issues and that it contributes to achieving the Issuer’s sustainability commitments.

Key findings

V.E considers that Merck's Sustainability Financing Framework is aligned with the four core components of the SBP and GBP.

Use of Proceeds – aligned with SBP and GBP

- The Eligible Categories are clearly defined, the Issuer has communicated the nature of the expenditures, the eligibility criteria, the target populations for social categories and the location of Eligible Projects/Programs.
- The Environmental and Social objectives are clearly defined. These are relevant for all the Eligible Categories and coherent with sustainability objectives defined in international objectives.
- The Expected Environmental and Social Benefits are clear. These are considered relevant, measurable, and will be quantified for all the Eligible Categories/Programs in the reporting.
- The Issuer has committed to transparently verbally communicate to investors the estimated share of refinancing for each bond issuance. The look-back period for refinanced Eligible Projects will be equal to or less than 36 months from the issuance date, in line with market practices.

Evaluation and Selection - aligned with SBP and GBP

- The process for Project Evaluation and Selection has been clearly defined by the Issuer, and it is considered structured. The roles and responsibilities are clear and include relevant internal expertise. The Process will be publicly disclosed in the herewith SPO.
- Eligibility criteria (selection) for project selection have been clearly defined by the Issuer for a majority of Eligible Categories.
- The process applied to identify and manage potentially material E&S risks associated with the projects is publicly disclosed (in the herewith SPO). The Process is considered robust: it combines monitoring, identification and corrective measures for all projects (see detailed analysis on pages 29-31).

Management of Proceeds - aligned with SBP and GBP and best practices identified by VE

- The Process for the Management and Allocation of Proceeds is clearly defined and publicly available in this SPO.
- The allocation period will be 24 months or less.
- Net proceeds of the Sustainability Financing Instruments will be appropriately tracked by the Issuer and attested in a formal internal process.
- Information on the intended types of temporary placement for the balance of the unallocated net proceeds is publicly disclosed.
- The Issuer has committed that, as long as the Sustainability Financing Instrument is outstanding, the balance of the tracked net proceeds will be periodically adjusted to match allocations to Eligible Projects made during that period.
- The Issuer has provided information on the procedure that will be applied in case of project divestment or postponement. It has committed to reallocating divested proceeds to projects compliant with the Sustainability Financing Framework within 24 months.



Reporting - aligned with SBP and GBP

- The Issuer has committed to reports on the Use of Proceeds annually, until full allocation and on a timely basis in case of material developments. The report will be publicly available until the Sustainability Financing Instruments' maturity.
- The reporting will cover relevant information related to the allocation of Sustainability Financing Instrument proceeds and to the expected sustainable benefits of the categories.
- The reporting methodology and assumptions used to report on the environmental and social benefits of the Eligible Categories will be publicly disclosed.
- An external auditor will verify the tracking and allocation of funds to Eligible Categories. Indicators used to report on the environmental and social benefits of the eligible projects will be verified internally by the Issuer.

Contact

Sustainable Finance Team | VESustainablefinance@vigeo-eiris.com

SCOPE

V.E was commissioned to provide an independent Second Party Opinion (“SPO”) on the sustainability credentials and management of the Sustainability Financings¹ (the “Instruments”) to be issued by “Merck & Co., Inc. (“Merck” or the “Issuer”)” in compliance with the Sustainability Financing Framework (the “Framework”) created to govern their issuances.

Our opinion is established according to V.E’s Environmental, Social and Governance (“ESG”) exclusive assessment methodology and to the latest version of the voluntary guidelines of ICMA’s Social Bond Principles (“SBP”) and Green Bond Principles (“GBP”) – both edited in June 2021 (referred together as the “SBP & GBP”).

Our opinion is built on the review of the following components:

- Framework: we assessed the Framework, including the coherence between the Framework and the Issuer’s environmental and social commitments, the Instruments’ potential contribution to sustainability and its alignment with the four core components of the SBP & GBP 2021.
- Issuer: we assessed the Issuer’s ESG performance, its management of potential stakeholder-related ESG controversies and its involvement in controversial activities².

Our sources of information are multichannel, combining data (i) gathered from public sources, press content providers and stakeholders, (ii) from V.E’s exclusive ESG rating database, and (iii) information provided from the Issuer through documents.

We carried out our due diligence assessment from September 9th to November 9th, 2021. We consider that we were provided access to all documents and interviewees we solicited. For this purpose, we made reasonable efforts to verify the accuracy of all data used as part of the assessment.

Type of External Reviews supporting this Framework

<input checked="" type="checkbox"/>	Pre-issuance Second Party Opinion	<input type="checkbox"/>	Independent verification of impact reporting
<input checked="" type="checkbox"/>	Independent verification of funds allocation	<input type="checkbox"/>	Climate Bond Initiative Certification

¹ The “Sustainability Financing” is to be considered as the Instrument to be potentially issued, subject to the discretion of the Issuer. The name “Sustainability Financings” has been decided by the Issuer: it does not imply any opinion from V.E.

² The 17 controversial activities screened by V.E are: Alcohol, Animal welfare, Cannabis, Chemicals of concern, Civilian firearms, Coal, Fossil Fuels industry, Unconventional oil and gas, Gambling, Genetic engineering, Human embryonic stem cells, High interest rate lending, Military, Nuclear Power, Pornography, Reproductive Medicine and Tobacco.

COHERENCE

Coherent
Partially coherent
Not coherent

V.E considers that the contemplated Framework is coherent with Merck's strategic sustainability priorities and sector issues and that it contributes to achieving the Issuer's sustainability commitments.

The pharmaceutical sector's main challenges include pollution and energy use from its manufacturing process and product safety and improvement of social conditions through equal distribution of medical services.

Approximately 100,000 tonnes of pharmaceutical products are consumed globally every year. Active Pharmaceutical Ingredients (APIs) and other chemical ingredients are released into the environment during their manufacture, use, and disposal.³ In the OECD countries, pharmaceutical consumption has rapidly grown over the last decade, and this trend is expected to continue at a rate of 6.5% per year by 2022.⁴ Management of waste that results from the manufacturing process is critical as, for example, discharge of antibiotics into the environment can promote not only adverse environmental effect but also the natural development of antibiotic-resistant pathogens that are harder to treat. Furthermore, wastes that are not properly treated can seriously affect local community by contaminating water and food resources.

Country-level policies are being established to control the environmental consequences of pharmaceutical operations. For example, United States' EPA finalized regulations for managing hazardous waste by pharmaceuticals and the EU established its "Strategic Approach to Pharmaceuticals in the Environment".⁵ This approach by the EU allows water quality improvement in the pharmaceutical life cycle in the EU where they established actions to identify, share good practices, cooperate at the international level, and improve understanding of the risks.

European Federation of Pharmaceutical Industries and Associations has launched an initiative supported by three pillars that identified key areas of focus for the pharmaceutical industry in order to reduce its environmental impact.

1. Identification of the potential environmental risks of existing and new active pharmaceutical ingredients (API) through intelligent and targeted assessment strategies;
2. Manufacturing effluents management: the compilation of best industry practices, enabling manufacturers to minimise risks to the environment;
3. Refinement of the existing environmental risk assessment (ERA) process for medicinal products to ensure that they remain up-to-date and relevant.

In terms of access to medicine and treatment, the OECD explains the concerns regarding the pharmaceutical industry's unequal distribution of its products as well as high prices and underscores the importance of allowing access to all at an affordable price. The OECD has provided key recommendations for policymakers to consider to improve the current system, including ensuring access to medicines in countries with different levels of development, supporting a system with transparent and well-established rules as well as promoting of better dialogue among stakeholders.⁶ In the US, the federal agency, ODPHP (Office of Disease Prevention and Health Promotion), has set a target to reduce the proportion of Americans who cannot get prescription medicines when they need them from 3.4% baseline in 2017 to 3% in 2030.⁷

³ <https://www.oecd-ilibrary.org/sites/6a617955-en/index.html?itemId=/content/component/6a617955-en>

⁴ <https://www.unep.org/resources/report/global-chemicals-outlook-ii-legacies-innovative-solutions>

⁵ <https://www.epa.gov/rcra/medical-waste>

<https://op.europa.eu/en/publication-detail/-/publication/b74925bf-2f9c-11eb-b27b-01aa75ed71a1>

<https://www.epa.gov/hwgenerators/management-hazardous-waste-pharmaceuticals>

⁶ <https://www.oecd.org/health/pharmaceutical-innovation-and-access-to-medicines-9789264307391-en.htm>

⁷ [Reduce the proportion of people who can't get prescription medicines when they need them — AHS-06 - Healthy People 2030 | health.gov](https://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance)

Merck's business strategy incorporates sustainability in its commitments and actions. The Issuer has a formalised commitment to support the principles of the Paris Climate Agreement⁸. This statement acknowledges the need to address climate change, water scarcity and public health risks through public policy. In this climate change policy, Merck specifically focuses on reducing the impact of greenhouse gas (GHG) emissions and utilizing renewable energy. These commitments are complemented by their environmental sustainability goals:

- Reduce their operational GHG emissions (i.e., Scopes 1 & 2) by 46% by 2030, from a 2019 baseline
- Achieve carbon neutrality across their operations by 2025 (Scopes 1 & 2 emissions)
- Source 100% of their purchased electricity from renewables by 2025
- Work with their suppliers to achieve a 30% reduction in Scope 3 emissions by 2030, from a 2019 baseline
- By 2025, at least 90% of their strategic suppliers with the highest environmental impacts will set their own GHG emission and water use reduction targets
- For waste management, by 2025, no more than 20% of their global operational waste will be sent to landfills and incinerators (without energy recovery), and at least 50% of their sites will send zero waste to landfills
- For water use management, by 2025, Merck will maintain global water use at/or below 2015 levels⁹

In terms of social responsibility, Merck has set accessibility at the forefront of its global strategy. The Issuer has disclosed its "Access to Health Guiding Principles", in which key performance indicators are detailed.¹⁰ They have set a target to reach 30 million people in low- and middle-income countries and U.S. underserved populations with their social investments by 2025.¹¹ Merck's action plan to address antimicrobial resistance is of particular value.¹² The Issuer has committed to delivering antibiotics to low and middle-income countries with a higher rate of infectious diseases and a lack of access to needed antibiotics.¹³

⁸ [Merck's Climate Change Public Policy Statement](#)

⁹ [Environmental, Social & Governance \(ESG\) Progress Report 2020/2021 \(merck.com\)](#)

¹⁰ [Merck-Access-to-Health-Principles_Update-2021.pdf](#)

¹¹ [Environmental, Social & Governance \(ESG\) Progress Report 2020/2021 \(merck.com\)](#)

¹² [Addressing a Global Public Health Threat \(merck.com\)](#)

¹³ [Delivering-on-our-Commitments.pdf \(merck.com\)](#)

FRAMEWORK

The Issuer has described the main characteristics of the Sustainability Financings within a formalized Framework that covers the four core components of the GBP and SBP 2021 (the last updated version was provided to V.E on November 5th, 2021). The Issuer has committed to making this document publicly accessible on Merck's website¹⁴, in line with good market practices.

Alignment with the Social Bond Principles and Green Bond Principles

Use of Proceeds



The net proceeds of the Sustainability Financing Instruments will exclusively finance or refinance, in part or in full, projects falling under two Social Project Categories and five Green Project Categories ("Eligible Categories"), as indicated in Table 1.

- The Eligible Categories are clearly defined, the Issuer has communicated the nature of the expenditures, the eligibility criteria, the target populations for social categories and the location of Eligible Projects/Programs.
- The Environmental and Social objectives are clearly defined. These are relevant for all the Eligible Categories and coherent with sustainability objectives defined in international objectives.
- The Expected Environmental and Social Benefits are clear. These are considered relevant, measurable, and will be quantified for all the Eligible Categories/Programs in the reporting.
- The Issuer has committed to transparently verbally communicate to investors the estimated share of refinancing for each bond issuance. The look-back period for refinanced Eligible Projects will be equal to or less than 36 months from the issuance date, in line with market practices.

¹⁴ <https://www.merck.com/investor-relations/>

Table 1. V.E’ analysis of Eligible Categories, Sustainability Objectives and Expected Benefits as presented in the Issuer’s Framework.

- Nature of expenditures: Capex, Opex, Public Investments and R&D
- Location of Eligible Projects/Assets: Worldwide – Americas, Europe, Africa, and Asia

ELIGIBLE CATEGORIES	DESCRIPTION	SUSTAINABILITY OBJECTIVES AND BENEFITS	V.E’S ANALYSIS
<p>Access to Essential Services - Healthcare</p>	<p>Expenditures in medicines & vaccines, programs, systems, facilities or equipment for or that enhance access to public, not-for-profit, free or subsidized essential products or services to the stated target population:</p> <p><u>Affordability and Addressing Barriers to Health</u></p> <p>a) Increasing healthy pregnancies and safer childbirth by helping to end preventable maternal deaths through quality maternity care through Merck for Mothers¹⁵ programs & initiatives. Examples include:</p> <ul style="list-style-type: none"> - MOMs (Maternal Outcomes Matter)¹⁶ <p><u>Target population:</u> Pregnant women and women of childbearing age in Low- and Middle-Income countries.</p> <ul style="list-style-type: none"> - Safer Childbirth Cities initiative¹⁷ <p><u>Target population:</u> Pregnant women and women of childbearing age from underserved and racial/ethnic minority populations in the United States.</p> <p>b) Product donation, medical outreach, disaster & emergency relief, or patient assistance programs. Examples include:</p>	<p><u>Improve access to healthcare services</u></p> <p>Expand healthcare accessibility, quality & affordability to underserved target populations</p>	<p>The Eligible Category is clearly defined. The Issuer has communicated the nature of the expenditures, the eligibility criteria and the location of Eligible Projects/Programs.</p> <p>The Issuer reported the following in internal documentation:</p> <ul style="list-style-type: none"> - MOMs (Maternal Outcomes Matter) aims to stimulate, advance, and scale innovations that contribute to a healthy pregnancy and safe childbirth. These programs directly and indirectly contribute to maternal health: health infrastructure, health service delivery, training for health providers etc. - Safer Childbirth Cities initiative aims to increase access to care for women in U.S. cities with a high burden of maternal mortality and morbidity. This program supports community-based organizations to reverse the US maternal health trends and directly tackle racial inequities in maternal health outcomes. - Regarding MSD Medical Outreach Program (MMOP), only products with over a year until final expiry will be donated. - Improving access to care to people with Non-Communicable Diseases includes: <ul style="list-style-type: none"> o Alliance to Advance Patient Centered Cancer Care which increases access to care (integration of primary care with cancer care, patient engagement, psychosocial services) for underserved populations in communities in the U.S.

¹⁵ [Merck for Mothers](#)

¹⁶ https://www.merckformothers.com/docs/Merck_MfM_Factsheet_MOMsinitiative.pdf

¹⁷ <http://www.saferchildbirthcities.com/>

	<p>- <u>MECTIZAN Donation Program</u>¹⁸</p> <p><u>Target population:</u> People living in remote communities in Africa, Latin America and Yemen, infected by river blindness (onchocerciasis)</p> <p>- MSD Medical Outreach Program (MMOP)¹⁹</p> <p><u>Target Population:</u> (i) Those who need humanitarian assistance in low- and middle-income countries that do not have access to the needed medication or (ii) those who need assistance following a natural disaster, acute emergency, or protracted socioeconomic crisis where access to the medication has been cut-off or severely limited.</p> <p>c) Contributions to the Merck Foundation²⁰, to the extent the Foundation uses such contributions to strengthen health systems and improve population health outcomes. Examples include:</p> <p>i. Improving access to care for people living with non-communicable diseases²¹</p> <p>ii. Promoting equity in HIV/AIDS care</p> <p><u>Target population:</u> People in low- & middle-income countries (as defined by the World Bank), vulnerable and underserved people in high-income countries, as defined by the Department of Health and Human Services, such as U.S Black/African American, Latino/Hispanic, and Indigenous peoples²², people without insurance, or unable to pay for medication, people affected by natural disasters and people</p>		<ul style="list-style-type: none"> o Reducing Disparities in Diabetes Care (Bridging the Gap) initiative funds programs to improve access to high-quality diabetes care for people living with type 2 diabetes in underserved communities across the U.S. o ECHO (Extension for Community Healthcare Outcomes) programs in India and Vietnam provides ongoing training and skills-building for health care practitioners treating tuberculosis, HIV, hepatitis C, cancer, diabetes, and mental health conditions. o Alzheimer-increase access to care through program funding²⁷ <p>- HIV/AIDS care covers access to care for people of color living with HIV.²⁸</p> <p>The target population is defined for all the Eligible Projects/Programs. Of note, beyond the examples provided in the framework, challenges remain to ensure financial accessibility to the most vulnerable population under any program of this category.</p> <p>The Social Objective is clearly defined and set in coherence with sustainability objectives defined in international standards.</p> <p>The Expected Social Benefit is clear, relevant, measurable, and the results will be quantified for all the Eligible Projects/Programs in the reporting.</p>
--	--	--	--

¹⁸ <https://www.msd.com/stories/mectizan/>

<https://mectizan.org/>

¹⁹ <https://msdresponsibility.com/access-to-health/affordability/medical-outreach-program/>

²⁰ <https://www.merck.com/company-overview/responsibility/philanthropy/>

²¹ <https://www.merck.com/wp-content/uploads/sites/5/2020/11/ImprovingAccessstoCareforNCDsInfographic.pdf>

²² The U.S Department of Health and Human Services references race & ethnic groups in the U.S. and an equivalent standard will be used internationally where available.

²⁷ <https://www.alz.org/about>

²⁸ <https://www.merck.com/company-overview/responsibility/philanthropy/promoting-equity-in-hiv-aids-care/>

	<p>affected by global health and/or socioeconomic crises, such as the COVID-19 pandemic</p> <p>d) Infectious Diseases: Research and development on products that treat diseases that disproportionately impact the target population. Examples include:</p> <ul style="list-style-type: none"> - Antimicrobial resistance (AMR)²³ - Neglected diseases and emerging infectious diseases, as defined by the G-FINDER project²⁴ - Sexual and reproductive health issues of HPV and HPV-related cervical cancer, as defined by the G-FINDER project²⁵ <p><u>Target population:</u> People in low- & middle-income countries, as defined by the World Bank, vulnerable and underserved people in high-income countries, as defined by the U.S Department of Health and Human Services²⁶, such as Black/African American, Latino/Hispanic, and Indigenous peoples.</p>		
<p>Socioeconomic Advancement and Empowerment</p>	<p>Expenditures which seek to expand access and benefit to the stated target population, including:</p> <p>a) Sourcing from third party certified Minority and Women-Owned Business Enterprise (MWBE) suppliers, which are also small or medium enterprises and qualify for Merck’s supplier diversity program, which provides mentoring</p>	<p><u>Empowerment of traditionally marginalized groups</u></p> <p>Increase inclusion of marginalized suppliers, employees and patients</p>	<p>The Eligible Category is clearly defined. The Issuer has communicated the nature of the expenditures, the eligibility criteria and the location of Eligible Projects/Programs.</p> <p>The Issuer reported the following in internal documentation:</p> <ul style="list-style-type: none"> - Approximately 12% of procurement spend is with small/diverse suppliers. - Specific programs to be funded are Woman’s leadership program, Diverse leadership program and EBRGs (Employee Business Resource Groups) and the purpose of these programs is to strengthen the target population’s leadership skills and the ability to navigate within the organization as well as to increase recruitment of the target population.

²³ <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>

²⁴ [R&D needs for global health - Policy Cures Research](#)

²⁵ [G-FINDER - Home \(policycuresresearch.org\)](http://policycuresresearch.org)

²⁶ https://www.hhs.gov/guidance/sites/default/files/hhs-guidance-documents/006_Serving_Vulnerable_and_Underserved_Populations.pdf



	<p>support, scholarships and other external educational opportunities for suppliers.²⁹</p> <p><u>Target population:</u> Women, LGBTQ+, Underrepresented ethnic groups.</p> <p>b) Health literacy programs, which serve people of all ages, races, incomes and education levels, however some population groups in the U.S. are at higher risk of having low health literacy.</p> <p><u>Target population:</u> Elderly, people with less than a high school education, people living in poverty, racial and ethnic minorities, people with limited English proficiency.</p> <p>c) Expenditures to fund employee diversity and inclusion initiatives, including employee development and up skilling programs.</p> <p><u>Target population:</u> Women, LGBTQ+, Underrepresented ethnic groups.</p>		<p>The target population is defined for all the Eligible Projects/Programs.</p> <p>The Social Objective is clearly defined and set in coherence with sustainability objectives defined in international standards.</p> <p>The Expected Social Benefit is clear, relevant, measurable, and the results will be quantified for all the Eligible Projects/Programs in the reporting.</p>
--	---	--	---

²⁹ SME is defined as <https://www.sba.gov/federal-contracting/contracting-guide/size-standards>. For Medium Enterprises, Merck follows the definition by the National Minority Supplier Development Council for Class 2: annual sales of \$1 to \$10 million; and Class 3: \$10 to \$50 million in sales.

Renewable Energy	<p>Expenditures dedicated to the generation, distribution of energy from renewable sources, including:</p> <ul style="list-style-type: none"> - Acquisition or development of new onsite or offsite solar and wind generating capacity; - Investments in energy storage (i.e. Batteries); - Purchases of renewable energy or energy storage capacity under long-term (greater than 5 years) Power Purchase Agreements (PPAs) and Virtual Power Purchase Agreements (VPPAs) in all cases entered into prior to the commencement, or in the case of rehabilitated projects, the re-commencement, of commercial operation of the project. 	<p><u>Climate Change Mitigation</u></p> <p>Increase and promotion of renewable energy generation</p> <p>Avoidance of GHG emissions</p>	<p>The Eligible Category is clearly defined. The Issuer has communicated the nature of the expenditures, the eligibility criteria and the location of the Eligible Projects.</p> <p>The Issuer reported in the internal documentation that PPA and VVPA contracts would only include solar and wind energies.</p> <p>An area for improvement consists in clarifying the proportion of proceeds allocated to PPA vs on-site to understand the amount of new installation of renewable energy. However, the Issuer reports in internal documentation that they target 100% of purchased electricity sources to be renewable by 2025 and of which 90% will be offsite (i.e. VPPAs).</p> <p>Of note, V.E lacks visibility on the fact that the construction and/or operations of the renewable energy purchased is financed through other green instruments. Therefore, V.E cannot ensure the avoidance of a potential double-counting of environmental benefits with another green financial instrument (following the Green Bond Principles).</p> <p>The Environmental Objective is clearly defined and set in coherence with sustainability objectives defined in international standards.</p> <p>The Expected Environmental Benefits are clear, relevant, measurable, and will be quantified for all the Eligible Projects in the reporting.</p>
Energy Efficiency	<p>Expenditures in new or upgraded technologies, products, or systems which increase or are expected to increase energy efficiency in operations, such as laboratories and manufacturing facilities, with 30% estimated energy savings, including:</p> <ul style="list-style-type: none"> - Energy efficient heating, ventilation, air conditioning, refrigeration, lighting, roofing, or electrical equipment, including retrofits which may be EPA Energy Star certified products; - Energy monitoring, control solutions and energy assessments, including but not limited to smart meters and control automation devices. 	<p><u>Climate Change Mitigation</u></p> <p>Energy savings</p> <p>Avoidance of GHG emissions</p>	<p>The Eligible Category is clearly defined. The Issuer has communicated the nature of the expenditures, the eligibility criteria and the location of the Eligible Projects.</p> <p>The Issuer reported the following in internal documentation:</p> <ul style="list-style-type: none"> - Type of heating will include best in class heating, ventilation, and air conditioning (HVAC) technology and electric boilers. Furthermore, Merck will use refrigerants with the lowest GWP where feasible and ensure its compliance with the EU or US guidelines; - Lighting will be the most efficient type available, including LED. <p>The Environmental Objective is clearly defined and set in coherence with sustainability objectives defined in international standards.</p> <p>The Expected Environmental Benefits are clear, relevant, measurable, and will be quantified for all the Eligible Projects in the reporting.</p>

<p>Green Buildings</p>	<p>Expenditures, including design, development, construction, materials, equipment and certification costs, in new or existing buildings or facilities that:</p> <ul style="list-style-type: none"> - Meet or intend to meet certification according to third-party verified green building standards, such as LEED Gold or Platinum standard or equivalent recognized building standard; - Have been refurbished and as a result achieve a minimum 30% improvement in energy use or carbon emissions. 	<p><u>Climate Change Mitigation</u></p> <p>Energy savings Avoidance of GHG emissions</p>	<p>The Eligible Category is clearly defined. The Issuer has communicated the nature of the expenditures, the eligibility criteria and the location of the Eligible Projects.</p> <p>The Environmental Objective is clearly defined and set in coherence with sustainability objectives defined in international standards.</p> <p>The Expected Environmental Benefits are clear, relevant, measurable, and will be quantified for all the Eligible Projects in the reporting.</p>
<p>Sustainable Water and Wastewater Management</p>	<p>Expenditures in facilities, technologies, systems, programs or equipment that improve water quality, water efficiency in operations, such as laboratories and manufacturing facilities, including:</p> <ul style="list-style-type: none"> - Wastewater treatment, recycling, and harvesting³⁰; - Reducing, recycling, or reusing water. 	<p><u>Sustainable water and wastewater management</u></p> <p>Water savings Increase of water collection, treatment and recycling</p>	<p>The Eligible Category is clearly defined. The Issuer has communicated the nature of the expenditures, the eligibility criteria and the location of the Eligible Projects.</p> <p>The Issuer reported the following in internal documentation:</p> <ul style="list-style-type: none"> - Wastewater treatment will only include onsite wastewater treatment facilities for its own effluent and projects for non-product contact cooling and heating. Eligible Projects will not include treatment of sewage sludge and will have no net GHG emission or negative net GHG emission. - Recycling and reusing water will include reverse osmosis technology for the purification of water. <p>The Environmental Objectives are clearly defined and set in coherence with sustainability objectives defined in international standards.</p> <p>The Expected Environmental Benefits are clear, relevant, measurable, and will be quantified for all the Eligible Projects in the reporting.</p>

³⁰ The Issuer report wastewater projects will pass an environmental impact assessment.

<p>Pollution Prevention & Control</p>	<p>Expenditures in facilities, technologies, systems, programs or equipment used to reduce and manage emissions to air or water, or waste generated from operations, such as laboratories and manufacturing facilities, including:</p> <ul style="list-style-type: none"> - Collection, sorting, treatment, reduction, recycling or reuse of emissions, waste or hazardous waste; - Salvage, use, reuse or recycling of waste products; - Waste treatment projects which divert waste and/or hazardous waste away from landfills. 	<p><u>Pollution prevention and control</u></p> <p>Waste reduction</p> <p>Increase waste collection, treatment and recycling/reuse</p> <p><u>Climate change Mitigation</u></p> <p>Avoidance of GHG emissions</p>	<p>The Eligible Category is clearly defined. The Issuer has communicated the nature of the expenditures, the eligibility criteria and the location of the Eligible Projects.</p> <p>The Issuer reported the following in internal documentation:</p> <ul style="list-style-type: none"> - Waste includes general plant operating waste, contaminated and non-contaminated production materials, plastics, glass, solvents, contaminated PPE³¹, municipal waste. - Waste treatment will not include the production of energy from waste but will only cover the collection and sorting of waste destined for waste to energy facilities. In addition, recyclables will not be sent to waste to energy facilities. <p>The Environmental Objectives are clearly defined and set in coherence with sustainability objectives defined in international standards.</p> <p>The Expected Environmental Benefit are clear, relevant, measurable, and will be quantified for all the Eligible Projects in the reporting.</p>
---	--	---	---

³¹ Personal Protective Equipment

SDG Contribution

The Eligible Categories are likely to contribute to eight of the United Nations' Sustainable Development Goals ("SDGs"), namely:

ELIGIBLE CATEGORY	SDG	SDG TARGETS
Access to Essential Services- Healthcare		3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable medicines and vaccines for all.
Sustainable Water and Wastewater Management		6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
Renewable Energy		7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.
Energy Efficiency Green Buildings		7.3 By 2030, double the global rate of improvement in energy efficiency.
Green Buildings		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.
Access to Essential Services – Healthcare Socioeconomic Advancement		10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.
Green Buildings		11.3 Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.
Pollution Prevention & Control		11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
Pollution Prevention & Control		12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse
Renewable Energy Energy Efficiency		13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

Evaluation and Selection of Eligible Projects



- The process for Project Evaluation and Selection has been clearly defined by the Issuer, and it is considered structured. The roles and responsibilities are clear and include relevant internal expertise. The Process will be publicly disclosed in the herewith SPO.
- Eligibility criteria (selection) for project selection have been clearly defined by the Issuer for a majority of Eligible Categories.
- The process applied to identify and manage potentially material E&S risks associated with the projects is publicly disclosed (in the herewith SPO). The Process is considered robust: it combines monitoring, identification and corrective measures for all projects (see detailed analysis on pages 29-31).

Process for Project Evaluation and Selection

- For the purpose of the Sustainability Financing Instruments, a Sustainability Financing Committee (“the Committee”) has been created. This Committee is composed of representatives of the following teams:
 - Treasury
 - Accounting
 - Social Business Innovation
 - Environmental Sustainability
 - Legal
 - Investor Relations
- The Committee is responsible for:
 - Evaluating and selecting projects that meet the listed eligibility criteria in the Use of Proceeds section of this Framework;
 - Ongoing monitoring of Eligible Projects;
 - Ensuring all Eligible Projects are aligned with Merck’s policies, resources and guidelines³²;
 - Development of the Framework, management of proceeds and associated reporting commitments.
- The traceability and verification of the selection and evaluation of the projects are ensured throughout the process:
 - The Sustainable Finance Committee will conduct reviews semi-annually on the eligibility criteria of the selected projects throughout the life of the Sustainability Financing. Projects that are not compliant will be removed and replaced with a compliant project within 24 months.
 - The Sustainable Finance Committee will conduct reviews semi-annually on potential ESG controversy faced by the selected projects throughout the life of the Sustainability Financing. In case a controversy

³² <https://www.merck.com/company-overview/responsibility/>

is identified, appropriate steps to resolution will be identified, and the respective governing body will ensure that the controversy is resolved in a timely manner.

- Meetings and related decisions will be documented in meeting minutes or via written consent.

Eligibility Criteria

The process relies on explicit eligibility criteria (selection) relevant to the environmental and social objectives defined for the Eligible Categories.

- The selection criteria are based on the definitions of the Eligible Categories defined in Table 1 in the Use of Proceeds section.
- The Issuer has not defined any exclusion criteria under this Framework.

BEST PRACTICES

⇒ The Issuer reports that it will monitor potential ESG controversies associated with the projects throughout the life of the Sustainability Financing and has provided details on frequency, content and procedures in case of controversy on a project.

Management of Proceeds



- The Process for the Management and Allocation of Proceeds is clearly defined and publicly available in the herewith SPO.
- The allocation period will be 24 months or less.
- Net proceeds of the Sustainability Financing Instruments will be tracked by the Issuer in an appropriate manner and attested in a formal internal process.
- Information on the intended types of temporary placement for the balance of the unallocated net proceeds is publicly disclosed.
- The Issuer has committed that, as long as the Sustainability Financing Instruments is outstanding, the balance of the tracked net proceeds will be periodically adjusted to match allocations to Eligible Projects made during that period.
- The Issuer has provided information on the procedure that will be applied in case of project divestment or postponement, and it has committed to reallocate divested proceeds to projects that are compliant with the Sustainability Financing Framework within 24 months.

Management Process

- Proceeds will be held in Merck's general Treasury accounts and monitored by Merck's Sustainability Financing Committee.
- Proceeds will be monitored throughout the life of the Sustainability Financing Instruments and periodically adjusted by the Sustainable Finance Committee on a semi-annual basis. This Committee will ensure proceeds are fully allocated throughout the life of the Sustainability Financing Instruments.
- As long as the Sustainability Financing Instrument remains outstanding, internal records will show the amount of the net proceeds from the issuance allocated to Eligible Projects, as well as the amount of net proceeds pending allocation.
- Unallocated proceeds will be managed in accordance with Merck's normal liquidity practices, which include short-term investments that are invested in highly liquid and highly rated instruments, including Money Market Funds (MMFs) and Treasuries. Payment of principal and interest on each Sustainability Financing Instrument will be made from Merck's general funds and will not be directly linked to the performance of any Eligible Projects.

BEST PRACTICES

- ⇒ The allocation period is 24 months or less.
- ⇒ The Issuer has committed not to invest temporarily unallocated net proceeds in GHG intensive activities or controversial activities.
- ⇒ The Issuer has provided information on the procedure that will be applied in case of project divestment or postponement, and it has committed to reallocate divested proceeds to projects that are compliant with the Sustainability Financing Framework within 24 months.

Monitoring & Reporting



- The Issuer has committed to reports on the Use of Proceeds annually, until full allocation and on a timely basis in case of material developments. The report will be publicly available until the Sustainability Financing Instruments' maturity.
- The reporting will cover relevant information related to the allocation of Sustainability Financing Instruments proceeds and to the expected sustainable benefits of the categories.
- The reporting methodology and assumptions used to report on the environmental and social benefits of the Eligible Categories will be publicly disclosed.
- An external auditor will verify the tracking and allocation of funds to Eligible Categories. Indicators used to report on the environmental and social benefits of the eligible projects will be verified internally by the Issuer.

Indicators

The Issuer has committed to transparently communicate at Eligible Program level, on:

- Allocation of proceeds: The indicators selected by the Issuer to report on the allocation of proceeds are clear and relevant.

REPORTING INDICATORS

- ⇒ When feasible, the list of Eligible Projects (re)financed, including a brief description
- ⇒ The aggregated amount of (re)allocated net proceeds to Eligible Projects
- ⇒ The balance of the unallocated proceeds
- ⇒ The proportion of financing vs refinancing (%)

Environmental and Social benefits: The indicators selected by the Issuer to report on the environmental and social benefits are clear and relevant. The Issuer commits to provide qualitative case studies on the Eligible Projects/Programs.

ELIGIBLE CATEGORIES	ENVIRONMENTAL AND SOCIAL BENEFITS INDICATORS	
	OUTPUTS AND OUTCOMES	IMPACT INDICATORS
Access to Essential Services – Healthcare	<ul style="list-style-type: none"> - People reached through Merck for Mothers - People reached globally through product donations, patient assistance programs and partnerships - People reached through investments in partnerships and programs that support health care capacity-building and address underlying barriers to access to health 	
Socioeconomic Advancement and Empowerment	<ul style="list-style-type: none"> - Suppliers in the target population participating in Merck’s capacity-building opportunities - Reviews for patient-facing information conducted by non-profit vendors, applying evidence-based health literacy best practices - Employees participating in Employee Business Resource Groups (EBRGs) that are aimed to serve members of the target population 	
Renewable Energy	<ul style="list-style-type: none"> - Annual renewable energy generation in MWh/GWh (electricity) and MMBtu (other energy) 	<ul style="list-style-type: none"> - Annual GHG emissions avoided in tonnes of CO₂ equivalent
Energy Efficiency		<ul style="list-style-type: none"> - Annual energy savings in MWh/GWh (electricity) and MMBtu (other energy savings) - Annual GHG emissions avoided in tonnes of CO₂ equivalent
Green Buildings	<ul style="list-style-type: none"> - Total floor space of green real estate (m²) - Green Building certifications and level obtained 	<ul style="list-style-type: none"> - Annual energy savings in MWh/GWh (electricity) and MMBtu (other energy savings) - Annual GHG emissions avoided in tonnes of CO₂ equivalent
Sustainable Water and Wastewater Management		<ul style="list-style-type: none"> - Annual absolute (gross) amount of wastewater treated, reused or avoided before and after the project and as a % total water reduced³³
Pollution Prevention & Control	<ul style="list-style-type: none"> - % of waste diverted from landfill and incineration without energy recovery - % of sites zero-waste-to-landfill 	

³³ Absolute reduction vs. 2015 baseline, for further information please refer to Merck’s 2020/2021 ESG Progress Report.

An area for improvement includes committing to an external verification of the indicators used to report on the environmental and social benefits of the Eligible Categories.

BEST PRACTICES

- ⇒ The Issuer report will be publicly available.
- ⇒ The reporting methodology and assumptions used to report on the environmental and social benefits of the eligible projects will be disclosed publicly.

Contribution to sustainability

Expected Impacts

The potential positive impact of the eligible projects on environmental and social objectives is considered to be robust.

ELIGIBLE CATEGORY	EXPECTED IMPACT	ANALYSIS
Access to Essential Services	ROBUST	<p>The Eligible Projects/Programs will bring overall positive impacts to the countries in which Merck operates, including countries in Africa, Latin America, Eastern Mediterranean, Asia, and South Pacific. In this category, the Issuer seeks to contribute through donation and distribution of medical products and services, pharmaceuticals and vaccines for humanitarian assistance, and to improve maternal health. Projects in this category include:</p> <p><u>MOMS</u>: Merck for Mothers launched the MOMS (Maternal Outcome Matter) initiative, a partnership with the US Development Finance Corporation (DFC) to stimulate innovation that contributes to a healthy pregnancy and safe childbirth - laying the foundation for lifelong good health for women, children and communities. The MOMS initiative aims to deploy up to USD 50 million over the next several years in debt and grant capital to improve maternal health in regions of the world where they are high rates of women dying from complications of pregnancy and childbirth. Today, sub-Saharan Africa and South Asia account for 85% of global maternal deaths. According to UNICEF, Sub-Saharan Africans suffer from the highest maternal mortality ratio - 533 maternal deaths per 100,000 live births.</p> <p><u>Safer Childbirth Cities</u> is a U.S. based program targeted at reducing the high maternal mortality rate.³⁴ Specifically, it aims to reduce the rate disparity between white women and communities of colour (e.g., African and Native Americans). Merck has leveraged community-based partnerships to implement strategic action plans. One such partnership is with an Atlanta based organization, Black Mamas Matter Alliance, where they promote Black women-led initiatives to reduce the U.S. maternal mortality gap.³⁵ The Issuer also partners with the Association of Maternal & Child Health Programs to develop solutions based on their Chasing Zero Maternal and Infant Deaths strategic plan.³⁶ These targeted programs are to address and reduce the 60% U.S. maternal deaths that the CDC states can be prevented.³⁷</p> <p><u>MECTIZAN</u> is a treatment donated by Merck for the elimination of river blindness (onchocerciasis) and lymphatic filariasis, two parasitic diseases that plague remote communities in Africa, Latin America, Eastern Mediterranean, Asia, and the South Pacific. Since the program's inception, Merck has donated more than 4 billion MECTIZAN treatments. In November 2017, in support of new WHO guidelines, Merck announced an expansion of the Mectizan Donation Program to reach up to an additional 100 million people per year through 2025 to reach people in 49 countries in Africa, Latin America, the Eastern Mediterranean, Asia, and South Pacific. More than 1.3 billion people are at risk, and 30% of those infected live in Africa.</p> <p><u>Cancer</u>: African American men have a prostate cancer death rate that is more than twice that of white men. Hispanic children are 20% more likely to develop leukaemia than non-Hispanic white children. In the US, the cancer-attributable annualized average medical costs in the initial, continuing, and non-cancer end-of-life phases were \$41,800, \$5,300, and \$23,500 per patient, respectively. The national cost of cancer care in the U.S was \$157 billion in 2010 dollars. The estimated number of annual cancer related deaths is 9M.</p> <p>The Merck Foundation is supporting the Alliance to Advance Patient-Centred Cancer Care (the Alliance) with a \$15 million, five-year (2017-2021) commitment that is supporting programs</p>

³⁴ [Home | Safer Childbirth Cities](#)

³⁵ [Our Work - Black Mamas Matter Alliance](#)

³⁶ [Mission, Strategic Plan & By-Laws \(amchp.org\)](#)

³⁷ [Pregnancy-Related Deaths in the United States | CDC](#)



		<p>that will provide early detection patient-centred cancer care and psychosocial support services for underserved populations. Gravity of the problem as well as its concentrated occurrence amongst the minority community, renders this project important.</p> <p><u>HIV:</u> The Merck Foundation is supporting HIV Care Connect in the U.S., with a commitment of \$7 million over five years (2019–2023) to reduce disparities in HIV care in the South Eastern communities that have disproportionately high rates of HIV. There are approximately 1.2 million Americans with HIV, and 37,968 new HIV was diagnosed in 2018. According to the CDC, it costs \$501,000 lifetime to treat one person with HIV infection.</p> <p>Providing access to health care and medication to the underserved population is part of the pharmaceutical company’s important responsibility. However, providing equal distribution to the most vulnerable population remains a challenge.</p> <p>Of note, V.E. does not have transparency on the specific types of treatment or medications used for projects included under non-communicable diseases and MMOP, therefore unable to comment on its efficacy.</p> <p>Overall, V.E considers the social impact from the projects to be robust as all aforementioned illnesses/ diseases are in dire need of access to better care and medication.</p>
<p>Socioeconomic Advancement and Empowerment</p>	<p>ROBUST</p>	<p>The Eligible Projects/Programs will bring overall positive impacts to the countries in which Merck operates through sourcing of women and minority-owned SME suppliers, funding of employee diversity and inclusion programs and health literacy programs.</p> <p><u>SME:</u> Approximately 12% of procurement spend is with small/diverse suppliers. Merck reports continuing to provide maximum practicable opportunities to small and diverse suppliers in their procurement practices to drive meaningful socio-economic advancements.</p> <p><u>Health literacy:</u> Merck has nine FDA approved health literate patient labels which were developed with input from patients across a range of health literacy levels. Health literacy efforts include the development of proactive clinical safety risk-management strategies for clinical trials, detailed product packaging according to requests from regulatory authorities, informed consent, diversity in trials. This project serves the elderly, people with less than high school education, people living in poverty, racial and ethnic minorities, as well as those with limited English proficiency. Health literacy is influenced by poverty, education, race/ethnicity, age, and disability and adults living below the poverty level have lower health literacy than adults living above the poverty level.³⁸ Although we acknowledge the social benefit of targeting the vulnerable population, it should be noted that health literacy program are normally seen as business as usual for pharmaceutical companies whose primary responsibility lies in conveying detailed and precise information about the treatment and medication they provide.</p> <p><u>Diversity and inclusion:</u> These programs (Woman’s Leadership Program, Diverse Leadership program and EBRGs (Employee Business Resource Groups) are designed to help Merck’s internal employees as well as diversity in recruitment as part of the overarching Company’s Diversity and Inclusion goals These programs cover internal diversity and inclusion measures, some of which will demonstrate long term impact while others might result in short term impact only. While these different measures all contribute to a diversity and inclusion objective, due to the variety of measures, ranging from awareness events to long-term training and empowerment projects, the social impact observed may result in short, medium or long term. An area of improvement for this sub-category is to focus on measures and programmes that can deliver long-term impact or even empowerment.</p>

³⁸ <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health/interventions-resources/health-literacy>

Renewable Energy	ROBUST	<p>Renewable energy is playing an increasingly important role in the United States (US) energy system. In 2018, renewables accounted for 17% of electricity generation, after an unprecedented growth of wind and solar across the United States, driven by lower costs and state policies such as renewable portfolio standards.³⁹ Of note, Scope 2 emissions represent less than 5% of the total Scope 1, Scope 2 and Scope 3 emissions of the Issuer. Furthermore, the global pharmaceutical sector emitted approximately 52 megatons of carbon dioxide equivalent in 2015. In addition, according to the International Energy Agency, the United States' electricity mix is powered at around 63% by fossil fuels.</p> <p>The Eligible Projects will bring overall positive impacts to the countries in which Merck operates through acquisition or development of renewable energy, investment in energy storage as well as investment in long term PPA and promoting the renewable energy market through VPPA. No lock-in effect is expected for wind and solar energy. Merck currently sources 38% of its purchased electricity from renewable energy and targets 100% by 2025.</p>
Energy Efficiency	ADVANCED	<p>According to the U.S Department of Energy Office of Scientific and Technical Information, improving energy efficiency should be a strategic goal for any plant manager or manufacturing professional working in the drug industry today. Not only can energy efficiency reduce overall manufacturing costs, it usually reduces environmental emissions, establishing a strong foundation for a corporate greenhouse-gas-management program. For most pharmaceutical manufacturing plants, Heating, Ventilation and Air Conditioning (HVAC) is typically the largest consumer of energy.⁴⁰ The distribution of energy used in the pharmaceutical industry is on average 65% by HVAC systems, 25% used by plug loads and processes (such as microscopes, incubators, or sterilizers), and 10% of energy is consumed with lighting the facilities. The Eligible Projects will bring overall positive impacts to the countries in which Merck operates by investing in products or systems such as LED and HVAC, which increase energy efficiency in operations, such as laboratories and manufacturing facilities. Such products are mostly EPA Energy Star certified. Merck ensured the use of refrigerants with the lowest GWP, where feasible, as well as its compliance with the EU or US regulations. Furthermore, Merck commits to 30% estimated energy savings for this category. Such a target will contribute to Merck's target to achieve carbon neutrality across its operations by 2025 (Scopes 1 & 2 emissions).</p>
Green Buildings	ADVANCED	<p>According to the United Nations Environment Program Global Status Report 2017, buildings and construction together account for 36% of global final energy use and 39% of energy-related carbon dioxide (CO₂) emissions when upstream power generation is included. According to the U.S. Energy Information Administration, the real estate sector accounts for 39% of the U.S. energy consumption in 2019, of which the residential sector accounts for 21%. In that context, reduction of CO₂ emissions and energy savings in buildings is a key environmental issue. The Eligible Projects will bring overall positive impacts to the countries in which Merck operates by construction or refurbishment of buildings that are either LEED-certified or a minimum 30% improvement in energy use or carbon emissions. The category includes renovation and construction projects. Construction however has an absolute effect on energy consumption and on land use and therefore has a less positive impact compared with renovation. Both renovation and construction projects are in line with one of the most stringent international standards available for the sector.</p> <p>For refurbishments, although an overall 30% energy reduction is set, the environmental impact is hard to assess due to the lack of clarity on the baseline figure.</p>

³⁹ [Energy Policies of IEA Countries: United States 2019 Review \(windows.net\)](#)

⁴⁰ [Improving Energy Efficiency in Pharmaceutical Manufacturing Operations – Part I: Motors, Drives and Compressed Air Systems \(Journal Article\) | OSTI.GOV](#)

Sustainable Water and Wastewater Management	ROBUST	<p>Water is extensively used as a raw material or starting material in the production, processing and formulation of active pharmaceutical ingredients (APIs).⁵² Responsible use of water and management of waste is critical for the pharmaceutical industry due to the negative impact of the waste they deposit. Pollution caused by pharmaceutical plants affects organisms living nearby due to water and soil contamination with chemical substances, including antibiotics that can cause antimicrobial resistance. According to WHO, antimicrobial resistance is one of the top ten threats to global health in 2019 and is predicted to cost 10 million lives a year by 2050.⁵³ Of note, OECD reports the limitations of wastewater treatment plants for removal of pharmaceuticals in the water and that upgrading wastewater treatment with new technologies will not solely solve the problem.⁵⁴ The Eligible Projects will bring overall positive impacts to the countries in which Merck operates by investing in systems and programs that improve water quality and water efficiency for the manufacturing facilities. However, V.E lacks visibility on the specific technology used and whether the eligible projects will align with the best available technologies to contribute to the claimed environmental objective or having a potentially negative impact in a relevant increase of GHG emissions in the new processes.</p>
Pollution Prevention & Control	ROBUST	<p>Waste management is critical for the pharmaceutical industry due to the negative impact on the organisms living nearby. Pharmaceutical wastes include hazardous, biomedical. Therefore, careful sorting and treatment is critical as pharmaceutical waste from manufacturing facilities is one of the top three ways in which pharmaceuticals enter our environment.⁵⁵ Although the Food and Drug Administration and the European Medicines Agency strictly regulate drug supply chains in terms of drug safety, environmental standards are not thoroughly regulated and lacks proper oversight. This highlights the dire need for the pharmaceutical industry to step up and proactively reduce its waste output.⁵⁶ The Eligible Projects will bring overall positive impacts to the countries in which Merck operates by investing in facilities and technologies that are expected to lower emissions and waste from their manufacturing facilities. Considering that waste management remains a material topic for the pharmaceutical industry, this type of project is likely to bring a positive environmental impact. However, specific technologies incorporated as well as waste reduction targets, at project level, should be provided to demonstrate better transparency and magnitude on its benefits.</p>
OVERALL ASSESSMENT	ROBUST	

ESG Risks Identification and Management systems in place at project level

The identification and management of the environmental and social risks associated with the Eligible Categories are considered robust⁴¹.

	ELIGIBLE CATEGORIES						
	Renewable Energy	Energy Efficiency	Green Buildings	Sustainable Water And Wastewater Management	Pollution Prevention & Control	Access To Essential Services - Healthcare	Socio Economic Advancement And Empowerment
Environmental Management System	X	X	X	X	X	X	
Eco-design	X	X	X	X	X	X	
Energy Efficiency and GHG emission	X	X	X	X	X	X	
Water	X	X	X	X	X	X	
Waste Management	X		X	X	X	X	
Fundamental Human and Labor Rights	X	X	X	X	X	X	X
Product Safety						X	
Health & Safety	X	X	X	X	X	X	X
Community Involvement						X	
Integration of environmental and social factors in supply chain	X	X	X	X	X	X	X
Business Ethics	X	X	X	X	X	X	X
OVERALL ASSESSMENT	ROBUST						

⁴¹ The "X" indicates the E&S risks that have been activated for each Eligible Category.

Environmental Management System

Merck's Environmental, Health and Safety (EHS) system is aligned with the requirements of the ISO but are not certified under the Environmental (ISO 14001) or Safety (ISO 45001) frameworks at the global level. 11 European sites have maintained and/or achieved their certification of ISO 50001:2018 for energy management to comply with the EU Energy Efficiency Directive audit requirements. Furthermore, Merck is also certified in the Responsible Care Management System Technical Specification (RCMS)⁴².

The EHS Management System follows the classic "Plan, Do, Check, Act" model and is implemented through a set of interwoven business processes that span the company, including:

- Goals, objectives and metrics that are based on a review of company performance, EHS programs, applicable regulations and other external factors;
- Standards, Guidelines and Tools, which detail the program implementation expectations for all sites and operating organizations;
- Governance committees, from the executive-level EHS Council through site compliance committees, that review performance and progress against objectives;
- Corrective actions and continuous improvement initiatives to resolve EHS issues surfaced during performance reviews, assessments, audits or routine surveillance of the regulatory landscape.

All of Merck's sites are required to comply with applicable local, state and national environmental regulatory requirements and industry standards. They are also required to meet internal corporate environmental standards for Waste Prevention and Management, Water Management and Air Quality Management.

Eco design

Merck reports implementing an internal Sustainable Design Methodology required for all capital projects. The Issuer reports that "Design for Environment" is also adopted as a guideline to design new product packages that are better for the environment by minimizing package sizes and using more environmentally friendly materials. The EPS⁴³ (Eco-Pharmaco-Stewardship initiative) considers Merck's environmental impacts of medicine throughout its entire life cycle. Also, the Issuer reports that 100% of the packaging for their new human health products are reviewed for environmental impact and improvement. Furthermore, Merck reports implementing a simplified life-cycle assessment (LCA) tool, which allows them to distinguish products with the least environmental impacts generated by the materials used in their packaging. Of note, V.E had no access to the above-mentioned documents.

Energy Efficiency and GHG emissions

Merck's Energy Management Standard requires responsible and efficient energy management and prioritises the reduction of energy demand as well as emissions reduction of CO₂, NO_x, SO_x and VOCs from their operations. Merck's climate strategy is overseen globally by its Environmental Sustainability Center of Excellence (CoE). The Issuer's Energy CoE has created an "Energy Road Map" to help all facilities to reduce energy demand and associated GHG emissions. All new facilities are required to comply with the Energy Design Guide and Energy Conservation Planner, which evaluates energy efficiency against the energy scorecard. The Energy CoE tracks energy use in all the sites and identifies energy projects to fund in order to reduce energy use across the company. The Issuer has also implemented a Low Carbon Transition Playbook (LCTP), which includes a gap assessment for sites to evaluate their energy programs and creates short- and long-term plans to reduce sites' carbon intensity and build toward a carbon-neutral future.

Lastly, Merck reports that they recently signed three virtual power purchase agreements (VPPAs) for utility-scale energy projects in Texas and Spain. These projects will address approximately 35% of the Issuer's Scope 2 emissions by collectively adding 145 megawatts (MW) of solar and wind energy to the grid. These agreements follow a 2018 U.S.

⁴² The Responsible Care Management System Technical Specification identifies a set of required elements for management systems, designed to help companies assess impacts, set performance goals, develop internal processes to drive performance and share progress with the public.

⁴³ Eco-Pharmaco-Stewardship (EPS) (efpia.eu)

wind VPPA, which has added 60 MW of new renewable energy capacity while providing the Issuer with the associated renewable energy credits.

Water Management

Merck endorses the UN CEO Water Mandate⁴⁴, a public commitment to adopt and implement a comprehensive approach to water management. Merck is a member of the Antimicrobial Resistance (AMR) Industry Alliance⁴⁵ and signatory to the Industry Roadmap for Progress on Combating AMR⁴⁶, Closed-loop cooling systems, which reduce freshwater use. The Issuer reports that water-use-reduction initiatives include consideration of water use in process design, cooling-system optimization, prompt repairs and maintenance of steam distribution systems and traps, recovery and reuse of steam condensate and “reject water”, process-water purification system optimization and avoiding the use of water in mechanical seals, such as those in pumps. Environmental Quality Criteria (EQCs) is used to confirm that wastewaters discharged do not contain levels of residual products that present a risk to human health or the environment. The Issuer also reports that EQC, along with industry-accepted risk-assessment methods, are incorporated to establish procedures for managing and controlling active pharmaceutical ingredients (APIs) in their wastewater. API-treatment technology such as advanced oxidation is provided to avoid wastewater discharges and to meet both regulatory requirements and internal standards. More than half of Merck’s facilities are required to implement an internal EQC program that evaluates potential human health and environmental impacts of APIs in waterbodies where wastewater is discharged. Reverse osmosis’ “reject water” is reused for non-potable and non-process applications such as cooling-tower feed water and fire water. Of note, V.E had no access to the Environmental Quality Criteria (EQCs).

Waste Management

Waste management is overseen globally by the Waste and Dangerous Goods Center of Excellence (CoE), and the Waste Management Standard requires the facilities to comply with the applicable generation, management and disposal regulations and standards. Merck reports making extensive efforts to avoid the use of hazardous materials and reuse or recycling of materials to prevent the generation of waste. They also partner with third-party Integrated Facility Management (IFM) partners to manage site waste and work toward the corporate waste goals. V.E had no access to the Waste Management Standard.

As a member of the Global Antimicrobial Action Plan⁴⁷, policy on the Responsible Disposal of Medicine, AMR Industry Alliance and signatory to the Industry Roadmap for Progress on Combating Antimicrobial Resistance, Merck is committed to reducing the environmental impacts from the production of antibiotics. Merck reports that operations of third-party suppliers are assessed for good practice in controlling releases of antibiotics into the environment. A mechanism is being developed with other stakeholders to transparently demonstrate that science-driven, risk-based targets for discharge concentrations are established. Furthermore, heavily regulated or high-risk waste streams that need to be neutralized, treated or destroyed, use only approved waste disposal facilities. The Issuer reports that audits are routinely conducted at these facilities to verify the acceptability of their systems and practices.

Green & Sustainable Science program is followed to design new processes using fewer solvents and other hazardous materials as well as reuse and recycle. Solvents play a key role in the manufacturing process, and their efficiency and control of emissions, effluents and waste are carefully considered. Merck reports that water-based methods are effective as solvents and incorporated where possible for cleaning of manufacturing equipment.

In terms of chemical management, procedures, systems, and processes are in place to manage the approval, procurement, inventory, receipt, transfer, storage, use and disposal of chemicals at all of their sites. Solvents that leave the sites as hazardous waste are managed at offsite facilities that are on Merck’s list of approved waste management sites.

⁴⁴ [CEO Water Mandate | Sign the Commitment to Water Stewardship](#)

⁴⁵ [Home - AMR Industry Alliance](#)

⁴⁶ [Roadmap-for-Progress-on-AMR-FINAL.pdf \(ifpma.org\)](#)

⁴⁷ [Global action plan on antimicrobial resistance \(who.int\)](#)

Fundamental Human and Labor Rights

Merck is a signatory of the United Nations Global Compact and recognises multiple international human rights principles, including the United Nations Universal Declaration of Human Rights, International Covenant on Economic, Social and Cultural Rights, International Covenant on Civil and Political Rights, Organization for Economic Cooperation and Development Guidelines for Multinational Enterprises and the core labour standards set out by the International Labor Organization. Furthermore, Pharmaceutical Supply Chain Initiative's (PSCI's), Pharmaceutical Industry Principles for Responsible Supply Chain Management is adhered to in order to set the standard for ethics, labour, health, safety and the environment for the industry. The Issuer reports that labour and human rights risks are considered as part of third-party risk management activities that exist beyond Tier 2 suppliers.

Merck reports that all investigational studies in human subjects are conducted in a manner consistent with laws, regulations and guidelines for the protection of human subjects, including those issued by the International Council for Harmonisation Good Clinical Practice (ICH GCP). In addition, the Issuer reports that audits are consistently carried out, and audit-related corrective measures are tracked to completion.

Product Safety

Merck reports that its quality strategy prioritizes sustained quality and compliance through a digitally enabled Quality Management System (QMS), oversight and periodic review of quality performance, and a Quality Management Maturity (QMM). Medicines and vaccines are tested before they are approved for marketing and governed by a comprehensive regulatory scheme. The safety of products is assured through nonclinical and clinical trials prior to regulatory approval. Compliance with the safety policies is continuously monitored following approval of drugs, vaccines, or devices. In case of any issues, Merck's Global Clinical Safety and Pharmacovigilance (GCS&PV) manages a global system for the collection, review and reporting of Adverse Experience⁴⁸ (AE) and assesses product safety.

Furthermore, Merck screens all active pharmaceutical ingredients for environmental, health and safety (EHS) compliance in addition to quality, supply and technical competence requirements. Based on the screening results, certain external manufacturers are subject to a more detailed onsite assessment conducted by a multidisciplinary team, which may include Merck's Quality, Global Safety and the Environment, Global Technical Operations and GSMG representatives. Higher-risk external manufacturers are subject to more frequent onsite assessments.

In terms of safety information for the clients, Merck reports that sales representatives must provide truthful, non-misleading information in their interactions with the medical and scientific community, and their compliance program is consistent with applicable laws and regulations and is aligned with the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA)⁴⁹, Code of Pharmaceutical Marketing Practices⁵⁰, as well as with regional and country industry codes, such as the Pharmaceutical Research and Manufacturers of America (PhRMA)⁵¹, Code and the Compliance Program Guidance for Pharmaceutical Manufacturers, U.S. Department of Health and Human Services.

To respond to increasing requests for on-demand information, Merck offers health care providers resources and product information on company websites and other digital company platforms in certain countries. This allows their employees to be aware and acquire knowledge to comply with applicable laws and regulations.

⁴⁸ Adverse Experience is defined as any unfavorable and unintended change in the structure, function, or chemistry of the body temporally associated with any use of a Product or of a derivative thereof, whether or not the adverse experience is considered to be related to the use of the Product, including but not limited to any of the following: an unexpected side effect, injury, toxicity or sensitivity reaction, which may include an experience of unexpected incidence and severity; an adverse experience occurring in the course of the use of a drug product in professional practice; an adverse experience occurring in clinical studies; an adverse experience occurring from drug overdose, whether accidental or intentional; an adverse experience occurring from drug abuse; an adverse experience occurring from drug withdrawal; and any significant failure of expected pharmacological action.

⁴⁹ [Home - IFPMA](#)

⁵⁰ [IFPMA Code of Pharmaceutical Marketing Practices \(iapco.org\)](#)

⁵¹ [PhRMA Org | PhRMA](#)

Health and Safety

Merck is certified on the Responsible Care Management System Technical Specification RC101.04.20 (recertified December 4, 2019) and reports complying with the International Labour Office (ILO) Code of Practice on Recording and Notification of Occupational Accidents and Diseases (the Code).

Merck reports comply with all the applicable country, regional, state, provincial and local safety and environmental laws and their own policy Environmental, Health and Safety (EHS) performance. Merck partners with Pharmaceutical Supply Chain Initiative (PSCI)⁵² and the Pharmaceutical Environmental Group (PEG) to benchmark, engage and share environmental sustainability best practices with peers and suppliers. External manufacturers of active pharmaceutical ingredients and finished products are screened for environmental, health and safety (EHS) compliance as well, according to the Issuer.

Merck reports that EHS audits are also performed throughout the year, corrective actions and continuous improvement initiatives are established to resolve EHS concerns, and training are provided to ensure compliance. Incidents and near-miss events are investigated to identify root causes and corrective and preventive actions and carried out to prevent recurrences.

Community Involvement

Merck contributes to the economy of local communities directly and indirectly by providing employment, training, support for local suppliers, local research and development (R&D). Merck reported that the protection of the environment, maintaining safe operations, and respecting human rights are priorities. Neighbour of Choice (NOC) grant program⁵³ supports the work of local non-profit organizations dedicated to promoting the wellbeing of community residents and is managed by "ESG Strategy & Engagement team (formerly the Office of Corporate Responsibility)". As a member of numerous industry and trade groups, Merck participates in discussions with the government to help improve policies related to their work.

Merck also participates in PhRMA's Medicine Assistance Tool (MAT)⁵⁴, which provides a search engine for the community and aims to help patients, caregivers, and health care providers get free or nearly free brand name medicines through a single website.

Integration of environmental and social factors in supply chain

As a signatory to the 10 Principles of the United Nations Global Compact, Merck supports the PSCI and participates in the Pharmaceutical PSCI's principles.

Suppliers are identified, qualified and managed based on the Global Sourcing & Procurement and Supplier Management function. It follows a sourcing management process in which environmental sustainability, economic inclusion and supplier diversity principles are integrated throughout each stage.

The GREEN Supplier program is designed to evaluate its suppliers' environmental sustainability programs and provides environmental metrics, environmental certificates and assurance that they can meet Merck's GREEN Supplier requirements⁵⁵. Business Partner Code of Conduct, along with the company's Supplier Performance Expectations, are communicated to existing and potential third-party suppliers and are included in requests for information, proposals, quotes, and its purchase order terms and conditions.

To evaluate the risks for labour and human rights in the supply chain and to address potential risks, all new suppliers are required to fill out the Supplier Self-Assessment Questionnaire SAQ, which requires suppliers to answer a series of labour and human rights questions covering a range of subjects, including freely chosen employment, child labour,

⁵² [PSCI \(pscinitiative.org\)](https://pscinitiative.org)

⁵³ [Neighbor of Choice Program Guidelines \(merck.com\)](https://www.merck.com/neighbor-of-choice-program-guidelines)

⁵⁴ [Medicine Assistance Tool](https://www.merck.com/medication-assistance-tool)

⁵⁵ <https://www.merck.com/wp-content/uploads/sites/5/2021/09/Merck-ESG-Report.pdf>

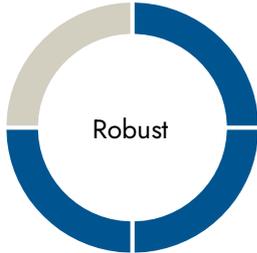
employment practices, employee disclosures, fair treatment, wages, benefits and working hours. Of note, V.E had no access to the above-mentioned documents.

Merck reports that audits are carried out in countries identified as high risk for potential human rights violations, and they are tracked to ensure corrective and preventative actions to completion.

Business ethics

Merck has implemented a global ethics and compliance program that is consistent with the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA) Code of Practice requirements, as well as with other applicable regional or country industry codes of conduct, including those issued by the Pharmaceutical Research and Manufacturers of America (PhRMA) and the European Federation of Pharmaceutical Industries and Associations (EFPIA). Merck's business ethics are overseen by the Board of Directors and senior management, including the Chief Ethics and Compliance Officer and members of the Corporate Compliance Committee and Office of Global Investigations. Employees are aware of and trained on the Code of Conduct and company policies. The prevention of anti-competitive practices is also ensured through strict adherence to the code of conduct, and all sales and marketing employees are required to be certified periodically on sales and marketing practices. The Office of Ethics and the Office of Global Investigations are responsible for oversight of the global processes for managing investigations into potential ethics and compliance concerns to ensure consistent and timely resolution of potential concerns and implementation of remediation actions.

ISSUER



Merck & Company is a global health care company that delivers health solutions through its prescription medicines, vaccines, biologic therapies and animal health products. In June 2021, the Company completed the Spin-Off of products from its women’s health, biosimilars and established brands businesses into a new, independent, publicly-traded Company named Organon & Co. (Organon).

Level of ESG performance

Merck’s ESG performance was assessed through a complete process of rating and benchmarking.

As of September 2021, Merck displays an overall robust ESG performance, ranking 1st in V.E’s Pharmaceuticals & Biotechnology North America sector, which covers 59 companies. The Issuer’s performance is considered advanced in the Environment pillar and robust in the Social and Governance pillars.

DOMAIN	COMMENTS	OPINION
Environment	<p><u>Merck’s performance on the Environment pillar is considered advanced.</u></p> <p>Merck discloses a formalised commitment to environmental protection, covering all its responsibilities, and reports on specific targets regarding water use, energy use and GHG emissions. The Issuer has also allocated means to the prior commitments, including water risk assessments, closed-loop cooling systems to reduce freshwater use and on-site wastewater treatment in several production and research facilities.</p>	Advanced
	<p>Regarding energy use, the Issuer has implemented building optimizations (all new laboratories, offices and major renovations are built following cost-effective and energy-efficient practices and are designed to meet Energy Efficient Design (EED) Management, Leadership in Energy and Environmental Design (LEED), or a comparable country standard (e.g., BREEAM, EXEED, HQE, etc.). Offices and laboratories are expected to achieve LEED Gold certification at a minimum. In addition, some of the company’s buildings are reported to have the certification of ISO50001:2018 for energy management.</p>	Robust
	<p>On the topic of pollution prevention and control, Merck has a commitment to prevent accidental pollution throughout the life cycle of its products. In addition, it has put in place comprehensive measures including pollution control audits, training, risk assessments and risk prevention procedures. Coupled with this, Merck commits to reducing atmospheric emissions and has installed monitoring and cleaning systems to mitigate this risk. Merck is committed to following the 3R’s (‘Replacement, Reduction and Refinement’) for its laboratory animal-based research, and its animal research programs and facilities are accredited by the Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC).</p>	Limited
	<p>In addition, the Issuer supports the development of environmentally sound programs that promote the proper disposal of unused medicines in accordance with regional requirements and reports on R&D and environmental risk assessments related to the impact of used and not-used medicines on the environment.</p>	Weak

Social	<p><u>Merck's performance on the Social pillar is considered robust.</u></p> <p>Merck discloses commitments regarding labour relations, career management, and health and safety. The Issuer has committed to combat counterfeit products and report implemented measures to ensure product safety during drug production, including training, internal audits of production processes, a Global Clinical Safety and Pharmacovigilance function is in charge of the global system for the collection, review and reporting of Adverse Experience reports received worldwide, and for the continuous assessment of product safety. The issuer also has a global quality system in compliance with regulations and Good Manufacturing Practices (cGMPs) and conducts risk assessments on nanomaterials used in the products.</p> <p>On the issue of Information to Customers, the Issuer reports a formalised commitment to adequately inform customers about its drugs and has set up a comprehensive system to ensure customers are informed properly, including recourse to third parties (the Issuer reports to submit new U.S.-based Direct-to-consumer (DTC) advertising campaigns to the FDA for its review).</p> <p>In addition, the Issuer reports on at least basic measures to support these commitments. The Issuer also reports on KPIs linked to career management and health and safety, indicating an overall improving trend from 2016 to 2020.</p> <p>Merck reportedly implemented measures to ensure the respect of informed consent during clinical trials and respect of patient's data privacy. Merck also commits to informed consent and other human rights when conducting genetic activities.</p> <p>Merck discloses formalised commitments to promote access to medicines and address the societal impacts of products. The Issuer reports on extensive measures to promote the sustainable development of health care systems and several measures in place to support access to medicines, covering some infectious and non-infectious diseases, as well as R&D programmes to address WHO priority infectious and neglected diseases. Furthermore, the Company reports on KPIs regarding all the issues under review, which show mixed trends.</p>	Advanced
		Robust
		Limited
		Weak
Governance	<p><u>Merck's performance on the Governance pillar is considered robust.</u></p> <p>Merck publishes formalised commitment to preventing corruption and anti-competitive practices in its Code of Conduct and Merck's Ethical Operating Standards Handbook. The Issuer refers to international standards in its corruption commitment: IFPMA, PhRMA, and EFPIA. Yet, Merck remains silent regarding KPIs linked to corruption and anti-competitive practices. While the Issuer has issued a formalised commitment to ensure transparency and integrity of lobbying practices, they have only some measures to allocated to implement this policy. There is also insufficient information regarding the involvement of employees in ensuring transparency and integrity of lobbying practices.</p> <p>The roles of Chairman and CEO are separated, 62% of Board members are considered independent, and 46% of Board members are women. The Issuer's Audit Committee is reported to have a comprehensive role, and some CSR risks appear to be covered by the internal controls system. However, major restrictions have been identified to convene an EGM, and not all significant items are put to a shareholder vote.</p> <p>Finally, Merck discloses the rules guiding the allocation of its short-term and long-term incentives. Still, the Company's CSR performance does not seem considered in determining variable remuneration of senior executives.</p>	Advanced
		Robust
		Limited
		Weak

Management of ESG Controversies

As of October 2021, Merck faces four stakeholders related ESG controversy, linked to two of the six domains we analyse:

- Business Behaviour, in the criteria of "Product safety," "Information to customers," & "Prevention of anti-competitive practices;"
- Community Involvement, in the criteria of "Promotion of the sustainable development of healthcare systems" & "Access to medicines and societal impacts of products."

Frequency: The controversies faced are considered "occasional"⁵⁶, in line with the sector.

Severity: The severity of the cases, based on the analysis of the impact on both the Issuer and its stakeholders, is considered "high"⁵⁷, in line with the sector.

Responsiveness: Merck is considered overall "reactive"⁵⁸, in line with the sector.

Involvement in Controversial Activities

The Issuer appears not to be involved in any of the 17 controversial activities screened under our methodology, namely: Alcohol, Animal welfare, Cannabis, Chemicals of concern, Civilian firearms, Coal, Fossil Fuels industry, Unconventional oil and gas, Gambling, Genetic engineering, Human embryonic stem cells, High interest rate lending, Military, Nuclear Power, Pornography, Reproductive Medicine and Tobacco.

The controversial activities research provides screening of companies to identify involvement in business activities that are subject to philosophical or moral beliefs. The information does not suggest any approval or disapproval on their content from V.E.

⁵⁶ VE scale of assessment: Isolated / Occasional / Frequent / Persistent.

⁵⁷ VE scale of assessment: Minor / Significant / High / Critical.

⁵⁸ VE scale of assessment: Non-communicative / Reactive / Remediative / Proactive.

METHODOLOGY

In V.E's view, Environmental, Social and Governance (ESG) factors are intertwined and complementary. As such they cannot be separated in the assessment of ESG management in any organisation, activity or transaction. In this sense, V.E provides an opinion on the Issuer's ESG performance as an organisation, and on the processes and commitments applicable to the intended issuance.

Our Second Party Opinions (SPOs) are subject to internal quality control at three levels (Analyst, Project Manager and Quality Reviewer). If necessary, this process is complemented by a final review and validation by the Expertise Committee and Supervisor. A right of complaint and recourse is guaranteed to all companies under our review, following three levels: first, the team in contact with the company; then the Executive Director in charge of Methods, Innovation & Quality; and finally, V.E's Scientific Council.

COHERENCE

Scale of assessment: not coherent, partially coherent, coherent

This section analyses whether the activity to be financed through the selected instrument is coherent with the Issuer's sustainability priorities and strategy, and whether it responds to the main sustainability issues of the sector where the Issuer operates.

FRAMEWORK

Alignment with the Social and Green Bond Principles

Scale of assessment: Not aligned, Partially aligned, Aligned, Best Practices

The Framework has been evaluated by V.E according to the ICMA's Social Bond Principles - June 2021 ("SBP"), and Green Bond Principles - June 2021 ("GBP") and on our methodology based on international standards and sector guidelines applicable in terms of ESG management and assessment.

Use of proceeds

The definition of the Eligible Projects and their sustainable objectives and benefits are a core element of Green/Social/Sustainable Bonds and Loans standards. V.E evaluates the clarity of the definition of the Eligible Categories, as well as the definition and the relevance of the primary sustainability objectives. We evaluate the descriptions of the expected benefits in terms of relevance, measurability and quantification. In addition, we map the potential contribution of Eligible Projects to the United Nations Sustainable Development Goals' targets.

Process for evaluation and selection

The evaluation and selection process is assessed by V.E on its transparency, governance and relevance. The eligibility criteria are assessed on their clarity, relevance and coverage vs. the intended objectives of the Eligible Projects.

Management of proceeds

The process and rules for the management and the allocation of proceeds are assessed by V.E on their transparency, traceability and verification.

Reporting

The monitoring and reporting process and commitments defined by the Issuer are assessed by V.E on their transparency, exhaustiveness and relevance, covering the reporting of both proceeds' allocation and sustainable benefits (output, impact indicators).

Contribution to sustainability

Scale of assessment: Weak, Limited, Robust, Advanced

V.E's assessment of activities' contribution to sustainability encompasses both the evaluation of their expected positive impacts on environmental and/or social objectives, as well the management of the associated potential negative impacts and externalities.

Expected positive impact of the activities on environmental and/or social objectives

The expected positive impact of activities on environmental and/or social objectives to be financed by the Issuer or Borrower is assessed on the basis of:

- i) the relevance of the activity to respond to an important environmental objective for the sector of the activity; or to respond to an important social need at country level;⁵⁹
- ii) the scope of the impact: the extent to which the expected impacts are reaching relevant stakeholders (i.e. the issuer, its value chain, local and global stakeholders); or targeting those populations most in need;
- iii) the magnitude and durability of the potential impact of the proposed activity on the environmental and/or social objectives (capacity to not just reduce, but to prevent/avoid negative impact; or to provide a structural/long-term improvement);
- iv) only for environmental objectives, the extent to which the activity is adopting the best available option.

ESG risk management for eligible activities

The identification and management of the potential ESG risks associated with the eligible projects/activities are analysed on the basis of V.E's ESG assessment methodology, international standards and sector guidelines applicable in terms of ESG management and assessment.

ISSUER

Issuer's ESG performance

Scale of assessment of ESG performance: Weak, Limited, Robust, Advanced

NB: The Issuer's level of ESG performance (i.e. commitments, processes, results of the Issuer related to ESG issues), has been assessed through a complete process of rating and benchmarking developed by V.E.

The Issuer's ESG performance has been assessed by V.E on the basis of its:

- **Leadership**: relevance of the commitments (content, visibility and ownership).
- **Implementation**: coherence of the implementation (process, means, control/reporting).
- **Results**: indicators, stakeholders' feedbacks and controversies.

The analysis of the issuer's sustainability performance is derived from V.E's Sovereign Sustainability Rating, a proprietary rating framework which provides scores, data and information about the Environmental, Social and Governance (ESG) performance of countries. The rating framework is anchored in globally recognised standards and country statistics, and is organised within three equally weighted pillars, 17 factors (sub-domains), 56 criteria and 172 indicators, which are divided between:

- a) **Engagement indicators** that measure the level of commitment of a country towards sustainability norms and standards endorsed by globally recognised treaties and conventions (e.g. UN treaties, ILO conventions, OECD standards), and
- b) **Results indicators** that measure the actions undertaken, or the results achieved, by a country across a wide range of ESG factors.

The 172 indicators have been chosen due to their universal applicability and relevance in reflecting the country's level of sustainability in the areas they measure. For each indicator, we source country data and information from authoritative sources available in the public domain, which offer comparable data and statistics for a wide coverage of countries and have regular data updates (e.g. United Nations

⁵⁹ The importance of a specific social need at country level is assessed on the basis of the country performance on the priority SDG that the project is targeting using data from Sachs, J., Schmidt-Traub, G., Kroll, C., Lafortune, G., Fuller, G., Woelm, F. 2020. The Sustainable Development Goals and COVID-19. Sustainable Development Report 2020. Cambridge: Cambridge University Press. or TO ADAPT CITATION TO THE SPECIFIC REPORT YOU ARE USING

agencies, the World Bank, the OECD, the World Resources Institute, Coface, the Freedom House, Amnesty International and Transparency International).

The indicators included in our rating framework are also mapped against the Sustainable Development Goals (SDGs), the global blueprint set up in 2015 by the United Nations (UN) and agreed upon by the UN member states as part of the Agenda 2030 for a fairer, greener and more sustainable future. V.E's Sovereign Sustainability Rating provides the assessment of the ESG performance and sustainable development needs of countries, which goes beyond the scope of the Green/Social/Sustainability/Sustainability-linked bond/loan.

Management of stakeholder-related ESG controversies

V.E defines a controversy as public information or contradictory opinions from reliable⁶⁰ sources that incriminate or make allegations against an issuer regarding how it handles ESG issues as defined in V.E ESG framework. Each controversy may relate to several facts or events, to their conflicting interpretations, legal procedures or non-proven claims.

V.E reviewed information provided by the Issuer, press content providers and stakeholders (partnership with Factiva Dow Jones: access to the content of 28,500 publications worldwide from reference financial newspapers to sector-focused magazines, local publications or Non-Government Organizations). Information gathered from these sources is considered as long as it is public, documented and traceable.

V.E provides an opinion on companies' controversies risks mitigation based on the analysis of 3 factors:

- **Frequency:** reflects for each ESG challenge the number of controversies that the Issuer has faced. At corporate level, this factor reflects on the overall number of controversies that the Issuer has faced and the scope of ESG issues impacted (scale: Isolated, Occasional, Frequent, Persistent).
- **Severity:** the more a controversy is related to stakeholders' fundamental interests, proves actual corporate responsibility in its occurrence, and have caused adverse impacts for stakeholders and the company, the higher its severity is. Severity assigned at the corporate level will reflect the highest severity of all cases faced by the company (scale: Minor, Significant, High, Critical).
- **Responsiveness:** ability demonstrated by an Issuer to dialogue with its stakeholders in a risk management perspective and based on explanatory, preventative, remediating or corrective measures. At corporate level, this factor will reflect the overall responsiveness of the company for all cases faced (scale: Proactive, Remediate, Reactive, Non- Communicative).

The impact of a controversy on a company's reputation reduces with time, depending on the severity of the event and the company's responsiveness to this event. Conventionally, V.E's controversy database covers any controversy with Minor or Significant severity during 24 months after the last event registered and during 48 months for High and Critical controversies.

Involvement in controversial activities

17 controversial activities have been analysed following 30 parameters to screen the company's involvement in any of them. The company's level of involvement (Major, Minor, No) in a controversial activity is based on:

- An estimation of the revenues derived from controversial products or services.
- The specific nature of the controversial products or services provided by the company.

V.E'S ASSESSMENT SCALES

Scale of assessment of Issuer's ESG performance or strategy and financial instrument's Contribution to sustainability

Scale of assessment of financial instrument's alignment with Green and/or Social Bond and Loan Principles

⁶⁰ 'Reliable' means that there are sufficient details to substantiate claims made, with due attention paid to the political dimension of news and the danger of misinformation. V.E draws on investigative journalism, the business press, NGO and trade union reports which focus on corporate behavior relating to ESG issues. It is neither possible nor advisable to create a prescriptive fixed list of sources as new, valid sources arise all the time and it is necessary to investigate these as and when they are retrieved in order to comprehensively cover evolving issues and media.

Advanced	Advanced commitment; strong evidence of command over the issues dedicated to achieving the sustainability objective. An advanced expected impact combined with an advanced to robust level of E&S risk management & using innovative methods to anticipate new risks.	Best Practices	The Instrument's practices go beyond the core practices of the ICMA's Green and/or Social Bond Principles and/or of the Loan Market Association's Green Loan Principles by adopting recommended and best practices.
Robust	Convincing commitment; significant and consistent evidence of command over the issues. A robust expected impact combined with an advance to robust level of assurance of E&S risk management or an advanced expected impact combined with a limited level of assurance of E&S risk management.	Aligned	The Instrument has adopted all the core practices of the ICMA's Green and/or Social Bond Principles and/or of the Loan Market Association's Green Loan Principles.
Limited	Commitment to the objective of sustainability has been initiated or partially achieved; fragmentary evidence of command over the issues. A limited expected impact combined with an advanced to limited level of assurance of E&S risk management; or a robust expected impact combined with a limited to weak level of assurance of E&S risk management; or an advance expected impact combined with a weak level of assurance of E&S risk management.	Partially Aligned	The Instrument has adopted a majority of the core practices of the ICMA's Green and/or Social Bond Principles and/or of the Loan Market Association's Green Loan Principles, but not all of them.
Weak	Commitment to social/environmental responsibility is non-tangible; no evidence of command over the issues. A weak expected impact combined with an advanced to weak level of assurance of E&S risk management or a limited expected impact with a weak level of assurance of E&S risk management.	Not Aligned	The Instrument has adopted only a minority of the core practices of the ICMA's Green and/or Social Bond Principles and/or of the Loan Market Association's Green Loan Principles.

Statement on V.E' s independence and conflict-of-interest policy

Transparency on the relation between V.E and the Issuer: V.E has not carried out any audit mission or consultancy activity for Merck. No established relation (financial or commercial) exists between V.E and Merck. V.E's conflict of interest policy is covered by its Code of Conduct, which can be found at <http://vigeo-eiris.com/wp-content/uploads/2018/07/Code-of-Conduct-Vigeo-Eiris-EN.pdf>.

This opinion aims at providing an independent opinion on the sustainability credentials and management of the Bonds, based on the information which has been made available to V.E. V.E has neither interviewed stakeholders out of the Issuer's employees, nor performed an on-site audit nor other test to check the accuracy of the information provided by the Issuer. The accuracy, comprehensiveness and trustworthiness of the information collected are a responsibility of the Issuer. The Issuer is fully responsible for attesting the compliance with its commitments defined in its policies, for their implementation and their monitoring. The opinion delivered by V.E neither focuses on the financial performance of the Bond/Loan, nor on the effective allocation of its proceeds. V.E is not liable for the induced consequences when third parties use this opinion either to make investments decisions or to make any kind of business transaction. Restriction on distribution and use of this opinion: The deliverables remain the property of V.E. The draft version of the Second Party Opinion by V.E is for information purpose only and shall not be disclosed by the client. V.E grants the Issuer all rights to use the final version of the Second Party Opinion delivered for external use via any media that the Issuer shall determine in a worldwide perimeter. The Issuer has the right to communicate to the outside only the Second Party Opinion complete and without any modification, that is to say without making selection, withdrawal or addition, without altering it in any way, either in substance or in the form and shall only be used in the frame of the contemplated concerned bond (s) issuance. The Issuer acknowledges and agrees that V.E reserves the right to publish the final version of the Second Party Opinion on V.E' website and on V.E' internal and external communication supporting documents.

DISCLAIMER

© 2021 Vigeo SAS and/or its licensors and subsidiaries (collectively, "V.E"). All rights reserved.

V.E provides its customers with data, information, research, analyses, reports, quantitative model-based scores, assessments and/or other opinions (collectively, "Research") with respect to the environmental, social and/or governance ("ESG") attributes and/or performance of individual issuers or with respect to sectors, activities, regions, stakeholders, states or specific themes.

V.E'S RESEARCH DOES NOT ADDRESS NON-ESG FACTORS AND/OR RISKS, INCLUDING BUT NOT LIMITED TO: CREDIT RISK, LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. V.E'S ASSESSMENTS AND OTHER OPINIONS INCLUDED IN V.E'S RESEARCH ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. V.E'S RESEARCH: (i) DOES NOT CONSTITUTE OR PROVIDE CREDIT RATINGS OR INVESTMENT OR FINANCIAL ADVICE; (ii) IS NOT AND DOES NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES; AND (iii) DOES NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. V.E ISSUES ITS RESEARCH WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

V.E'S RESEARCH IS NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE V.E'S RESEARCH WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER. V.E'S RESEARCH IS NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT V.E'S PRIOR WRITTEN CONSENT.

ALL INFORMATION CONTAINED HEREIN IS OBTAINED BY V.E FROM SOURCES BELIEVED BY IT TO BE ACCURATE AND RELIABLE. BECAUSE OF THE POSSIBILITY OF HUMAN OR MECHANICAL ERROR AS WELL AS OTHER FACTORS, HOWEVER, ALL INFORMATION CONTAINED HEREIN IS PROVIDED "AS IS" WITHOUT WARRANTY, EXPRESS OR IMPLIED, OF ANY KIND, INCLUDING AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. V.E IS NOT AN AUDITOR AND CANNOT IN EVERY INSTANCE INDEPENDENTLY VERIFY OR VALIDATE INFORMATION IT RECEIVES.

To the extent permitted by law, V.E and its directors, officers, employees, agents, representatives, licensors and suppliers (together, "V.E Parties") disclaim liability to any person or entity for any (a) indirect, special, consequential, or incidental losses or damages, and (b) direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded); on the part of, or any contingency within or beyond the control of any V.E Party, arising from or in connection with the information contained herein or the use of or inability to use any such information.

Additional terms For PRC only: Any Second Party Opinion, Climate Bond Initiative (CBI) Verification Report or other opinion issued by V.E: (1) does not constitute a PRC Green Bond Assessment as defined under any relevant PRC laws or regulations; (2) cannot be included in any registration statement, offering circular, prospectus or any other documents submitted to the PRC regulatory authorities or otherwise used to satisfy any PRC regulatory disclosure requirement; and (3) cannot be used within the PRC for any regulatory purpose or for any other purpose which is not permitted under relevant PRC laws or regulations. For the purposes of this disclaimer, "PRC" refers to the mainland of the People's Republic of China, excluding Hong Kong, Macau and Taiwan.

Additional terms for Hong Kong only: Any Second Party Opinion or other opinion that falls within the definition of "advising on securities" under the Hong Kong Securities and Futures Ordinance ("SFO") is issued by Vigeo Eiris Hong Kong Limited, a company licensed by the Hong Kong Securities and Futures Commission to carry out the regulated activity of advising on securities in Hong Kong. This Second Party Opinion or other opinion that falls within the definition of "advising on securities" under the SFO is intended for distribution only to "professional investors" as defined in the SFO and the Hong Kong Securities and Futures (Professional Investors) Rules. This Second Party Opinion or other opinion must not be distributed to or used by persons who are not professional investors.