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ESG: Helping you with the Environmental agenda

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PRI Principles for Responsible Investment

Presenting today

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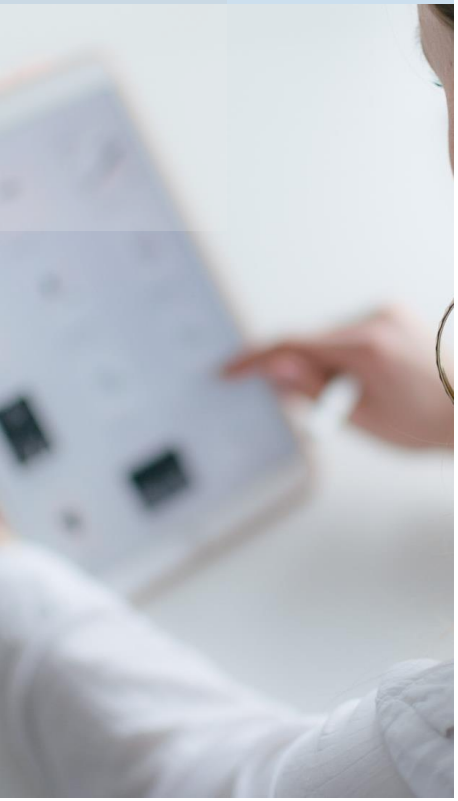
We have three objectives for today's webinar

1. Make the case for the "E" in ESG
2. Introduce a structured approach to the "E"
3. Share resources to help you advance the environmental agenda at your company

Agenda



1.	Why the “E” in ESG matters	20 min
2.	Your phased approach to tackling “E”	20 min
3.	Resource library	5 min
4.	Q&A	15 min

01

Why the “E” in ESG matters

Healthcare is lagging behind other sectors on environmental issues…

- In 2016, **only 33%** of the **S&P 500-listed healthcare** companies reported on their environmental protection efforts **vs 82%** companies from **other sectors**[1]
- In 2021, **53%** of health care companies **lacked** a dedicated **ESG officer** and did **not** yet **quantify** their environmental **impact**[2]
- In 2022, only **~20%** in MSCI's **healthcare** sector coverage has an **emissions-reduction target**[3]

> Healthcare is **wholly unprepared** for the **net-zero transition** […]. There is a real opportunity for the healthcare sector to increase their efforts towards decarbonization
>
> – **Julia Giguere-Morello**, Vice President, MSCI[3]

Big challenge for healthcare companies when **regulators** will require **standardized** emissions and carbon-risk **disclosure**, as the **SEC** is planning to do

Source: 1 Senay, Emily & Landrigan, Philip. (2018). Assessment of Environmental Sustainability and Corporate Social Responsibility Reporting by Large Health Care Organizations. JAMA Network Open. 1. e180975. 10.1001/jamanetworkopen.2018.0975; 2. Healthcare firms lagging in addressing the E in ESG, Law.com corporate counsel, accessed on June 16, 2022; 3. Healthcare scores poorly for ESG but is a vital sector, Esgclarity.com, accessed on June 21, 2022

..while having a big and growing environmental footprint around the world and in the US

World and US

- Global healthcare accounts **4.4%** of greenhouse gas emissions (GHGs), equivalent to the **annual** GHGs from **514 coal-fired** power plants[1]
- US health sector is **top GHG emitter** in both absolute and per capita terms[2]
- In the US, the healthcare sector contributes **8.5%** of the **total** domestic **GHGs**, having **risen 6%** from 2010 to 2018[4]

Impacts

- **Droughts**
- **Unrest** and **migration** caused by **food scarcity**
- **Economic Impact**
- Increased **health effects**

Paris Climate Agreement

- **Legally binding** international treaty
- Aims to limit global warming in 21st century to well below 2 °C, preferably to 1.5 °C **(3.6 °F),** compared to pre-industrial levels by reducing **GHGs by 45%** by **2030** and **reach net zero by 2050**[3]
- Joined by **193 Parties** to date
- Basis of rapidly developing **market regulations** in the **US** and the **EU**

Greenhouse Gas Definition

- Any gas that absorbs infrared radiation emitted from Earth's surface and reradiates it back to Earth's surface, thus contributing to the greenhouse effect
- Carbon dioxide (CO_2), methane and nitrous oxide are the leading greenhouse gases[5]

Source: 1. Health Care's Climate Footprint: How the Health Sector contributes to the Global Climate Crisis and Opportunities for Action, Health Care Without Harm & ARUP, 2019; 2. Global Road Map for Health Care Decarbonization, Arup and Health Care Without Harm, 2021; 3. For a livable climate: Net-zero Commitments must be backed by credible action, United Nations Climate Action, accessed on June 28, 2022; 4. Health Care Pollution, Eckelman, Dec 2020 ; 5. Britannica, accessed on June 21, 2022

SEC-proposed rule requires disclosure of climate-related risks, emissions and net-zero transition plans

In **March 2022**, SEC issued proposed "**Rules to Enhance and Standardize Climate-Related Disclosures for Investors**"[1][2]

Required Disclosures

Climate Change Risks

- **Governance** of climate-related risks (physical and transition) and relevant **risk management** processes *(more details later in the presentation)*
- **Material impact** (realized or likely to occur) of climate-related risks identified on the business (including strategy and outlook) and financial statement (FS)
- Impact of climate events on assumptions included in the FS

GHG Emissions

- **Scope 1 and 2** with **limited assurance** for accelerated filers, moving to **reasonable assurance** after two years *(more details later in the presentation)*
- **Scope 3, if material** or part of goals/targets under a phased transition
- Reporting in **absolute terms** and **intensity**: per unit of revenue and product manufactured
- Disclosure of **calculation methods** and which GHGs included (e.g. CO_2, nitrous oxide, methane) and type of source

Transition Plans

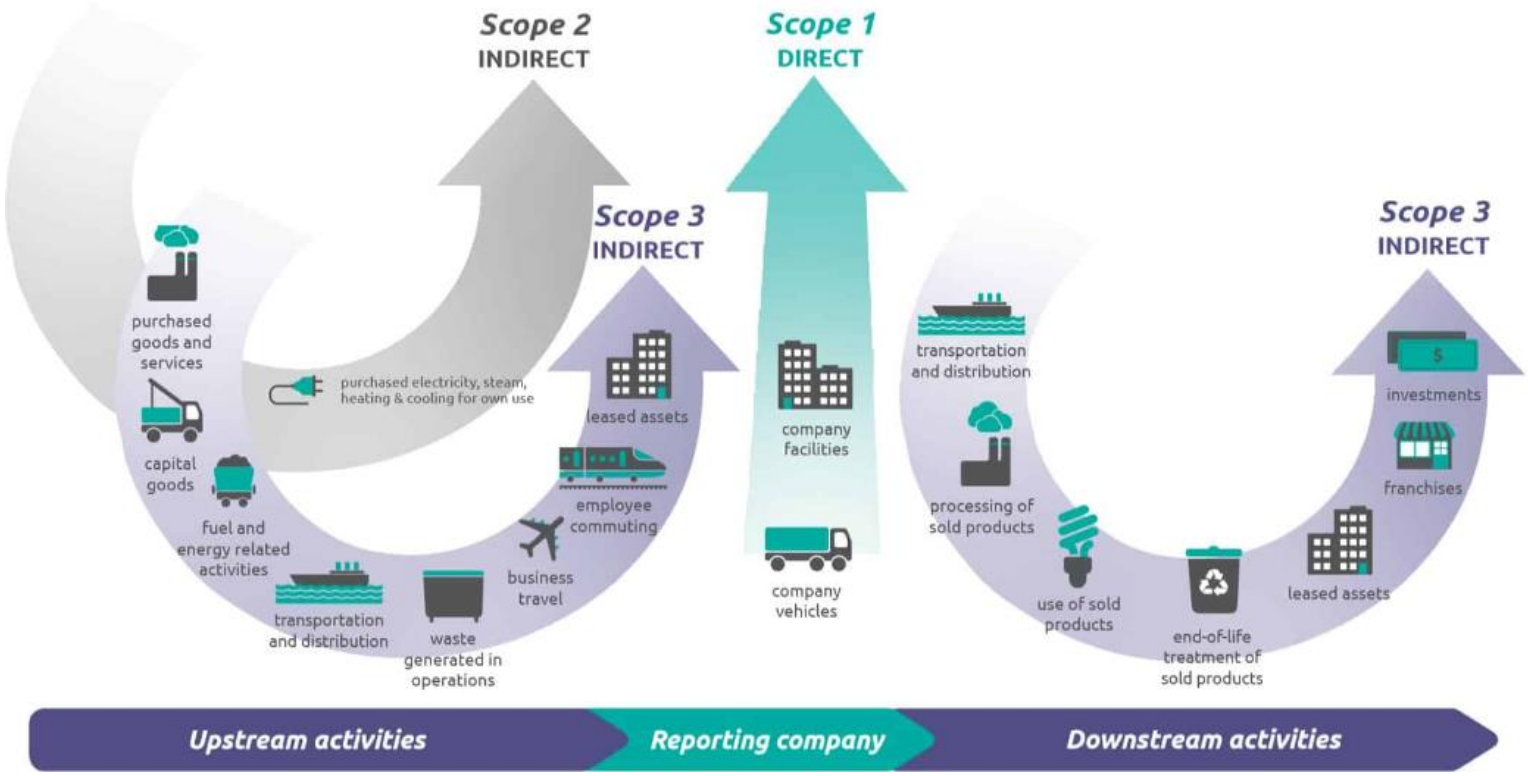
- **GHGs targets** around emission reductions and energy use
- **Transition plans**

Applicability

- Publicly-listed companies: **US 10-K filers** as well as foreign private issuers who **file 20-F** forms with the SEC
- **Large companies** to disclose most of this information as of **fiscal year 2023**, so filing year 2024; **smaller companies** as of **fiscal year 2024**
- For Scope 3 emissions, the SEC to provide an additional year beyond those deadlines
- Effective date not yet determined. **SEC aims for December 2022**

Source: 1. SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors, SEC Press Release, March 21, 2022, accessed on June 28, 2022;
2. Understanding the SEC's proposed climate risk disclosure rule, McKinsey & Company, accessed on June 22, 2022

Let us demystify GHG Emissions Scope 1, 2 and 3…



- Purchased goods and services
- Capital goods
- Fuel- and energy-related activities (not included in Scope 1 or Scope 2)
- Upstream transportation and distribution
- Waste generated in operations
- Business travel
- Employee commuting
- Upstream leased assets

- Downstream transportation and distribution
- Processing of sold products
- Use of sold products
- End-of-life treatment of sold products
- Downstream leased assets
- Franchises
- Investments

Definitions

- **Scope 1**: **Direct GHG emissions** from the use of **fossil fuels** from sources that are **owned** or **controlled by the company**, e.g. emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.
- **Scope 2: Indirect emissions** from the generation of **purchased electricity produced from fossil fuels**, **heating** and the **cooling** of office buildings
- **Scope 3: Other indirect GHG emissions** are a consequence of an organisation's activities, but occur **from sources not owned or controlled by the organisation**. They include the entire **value chain**, both upstream and downstream activities

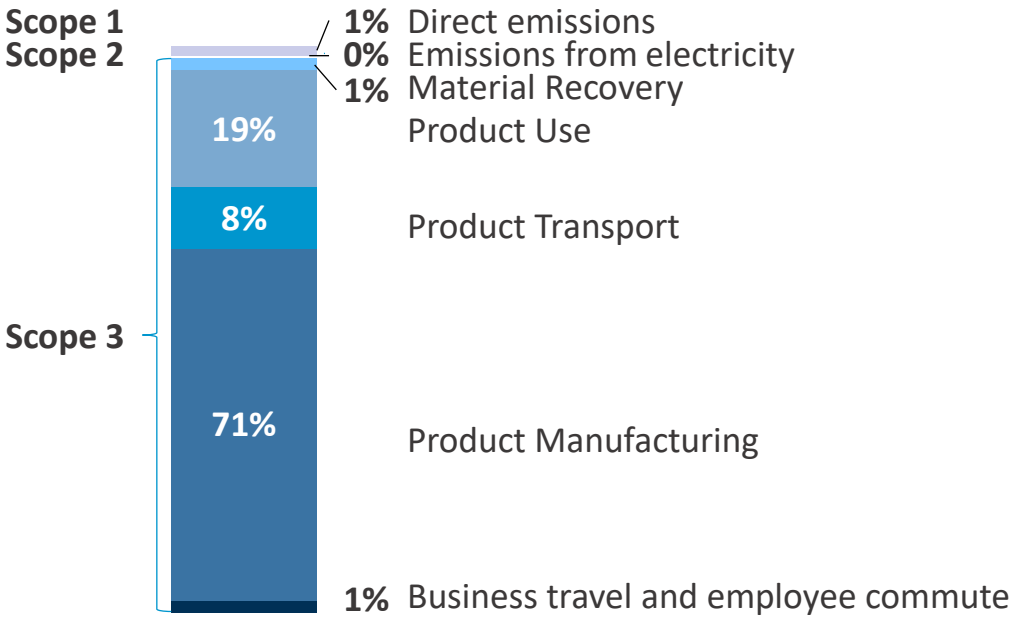
Source: Technical Guidance for Calculating Scope 3 Emissions, 2013, GHG Protocol, accessed on June 28, 2022

… by looking at the iPhone's life-cycle analysis and Apple's 2020 reported GHG emissions

iPhone's Life Cycle

1. **Material extraction**, i.e. mining
2. **Product manufacturing:**
   - Processing of these commodities: aluminium (significant portion), glass (screen) and lithium (battery)
   - Production of screens, speakers, batteries
   - iPhone assembly
3. **Packaging** & **transportation** to the stores and warehouses
4. **Device usage:**
   - ~3-4 years
   - Includes electricity used to charge the device
5. **End of life**
6. **Recycling** and **disposal**

Apple's 2020 reported GHG emissions



- **Scope 3 emissions** account for **99%** of all emissions, with the **device manufacturing** process alone accounting for **71% of emissions**
- **1 iPhone** generates 77kg of CO_2, which equals **8.7 gallons** (32l) of **petrol**
- Apple aims to use **fewer materials** in general and more **recycled** materials. This is both **a financial** and environmental opportunity

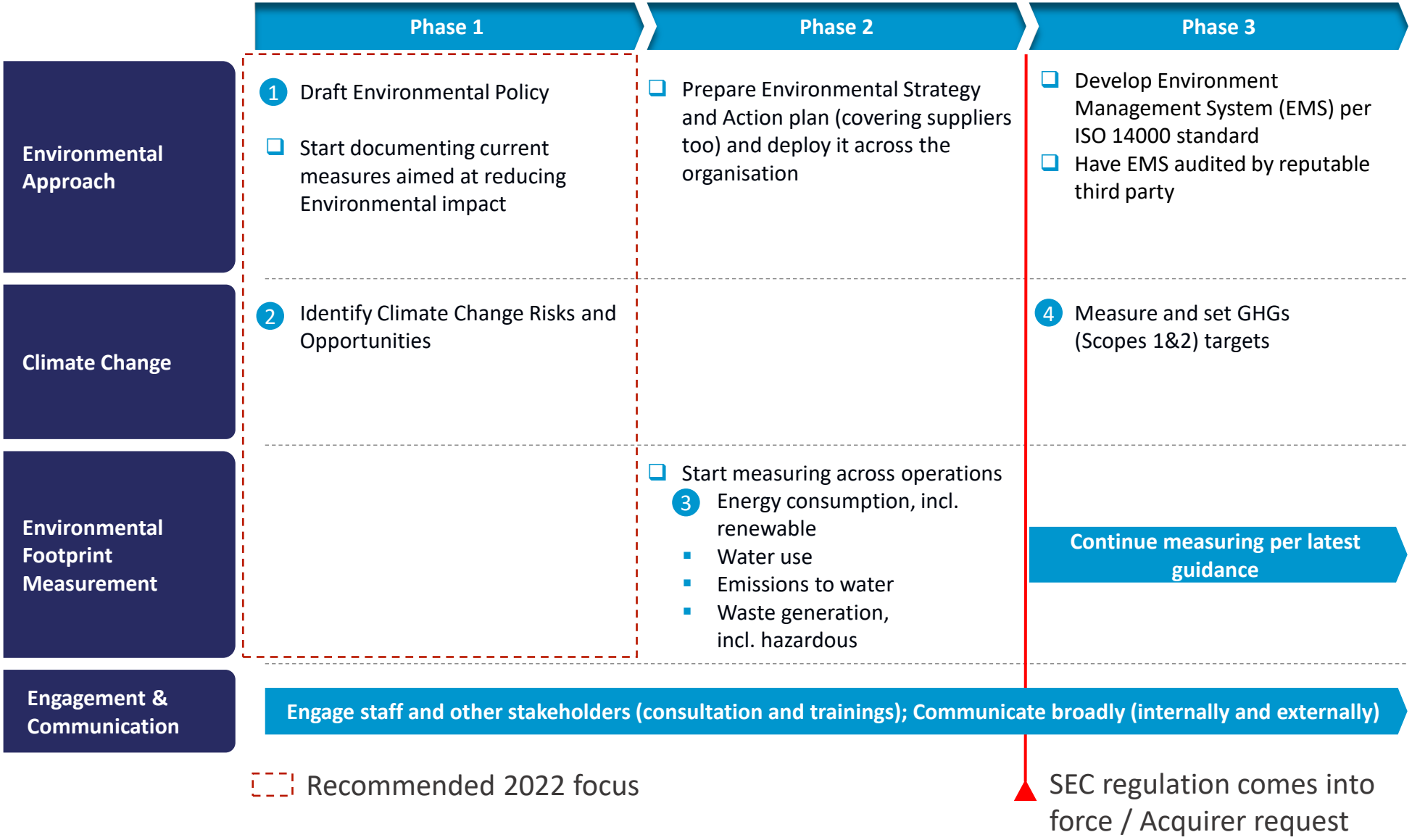
Source: Apple's 2021 Environmental Progress Report

02

Your phased approach to tackling “E”

There is a three-phased approach to helping you comply with the upcoming SEC regulation

x Details on following slides



1 Your Environmental Policy

Topics to cover

Purpose & Commitment

- Your company's commitment to the three environmental UN SDGs goals and to net zero by 2050 in accordance with the Paris Agreement, while complying with environmental regulations

Scope & Governance

- To whom (and to which entities) the policy applies
- Your Board of Director's, CEO and ESG Committee's responsibility for this document, which will be reviewed on a regular basis

Objectives and steps

- Policy objectives could include:
  - Understand the company's environmental footprint
  - Documenting the impact of climate change on the business
  - Identify and commit to a concrete set of measures to reduce this impact
- Concrete potential steps to consider:
  - Measure environmental impact
  - Develop Environmental Strategy with clear goals and KPIs aligned with the Paris Agreement and measures to implement the strategy
  - Monitor on a regular basis environmental performance

Awareness

- Share policy broadly, to internal and external stakeholders (staff, suppliers, investors, customers, etc.)
- Engage in regular communication with staff and suppliers about how to reduce environmental impact of own operations

Next steps

- Review and **adapt the template** to your company's needs
- **Create** an **ESG Committee** to streamline the organisation's environmental governance, including roles, responsibilities and reporting lines
- Have the **management and the board approve** and **sign** the Environmental Policy
- **Communicate** the Policy to all stakeholders

2 Climate Change Strategy and Risks Guidance

Where to start

- Identify and analyze **physical risks**, such as rising temperatures, heavy rainfall, which are most material for your company
- Identify and analyze **transition risks**, such as regulatory risks, technology risks, and policy changes which are likely to affect your company's operations

Next steps

- Establish a **framework for analyzing how climate risks could materially affect the business** using the Task Force on Climate-related Financial Disclosures' (TCFD) recommendations
- Estimate the **potential financial impact of these risks**, e.g. the extent to which increased flooding could disrupt supply chains and cause revenue loss
- Demonstrate how these **risks are integrated into the organisation's financial planning process** and how they can be **mitigated**. This could be done by using **climate scenario analysis** which demonstrates how physical and transition risks affect the business under different climate scenarios

Source: TCFD 2017 Report, accessed on May 16, 2022

2 Sonova's reporting of climate-related risks and opportunities

sonova
HEAR THE WORLD

- Swiss hearing aid manufacturer
- Publicly listed, $19 bn market capitalization
- Accounts for 24% of global market in terms of sales

TCFD Physical Risks

Potential risk	Potential threat	Country
Heatwaves and extreme temperatures	The frequency and duration of heatwaves are projected to increased significantly, especially in the south and east of the US. Heatwaves may cause higher cooling costs and increase heat stress conditions for employees and customers. As elderly people are the most common demographic that experiences hearing loss and are also most affected by heat stress during heatwaves, they may not come to the stores, thereby affecting sales.	United States, United Kingdom, Germany, Canada
Wildfires	Average and maximum temperatures during wildfire season are projected to increase significantly, which leads to an increased risk in wildfires that may affect our production sites in California.	United States
Heavy precipitation and flooding	Heavy precipitation is expected to increase substantially in the Ho Chi Minh City region, which may cause supply chain and operational interruptions in our operation center due to flash and sustained flooding.	Vietnam
Sea-level rise and coastal flooding	As our operation center in Vietnam is located far inland, the projected sea-level rise and coastal flooding is expected to pose no substantial risk.	Vietnam

TCFD Transition Risks

TCFD Opportunities

Country	Carbon pricing schemes	Net zero retrofit requirements	Scope 3 reduction	Increases in airfares	Energy savings due to net zero retrofits
Canada	Not relevant	Low	Not relevant	Not relevant	Low
China	Not relevant	Low	High	Not relevant	Medium
Germany	Low	Low	Low	High	Low
Switzerland	Low	Low	Not relevant	High	High
United Kingdom	Low	Low	Not relevant	High	Low
United States	Not relevant	Low	Not relevant	Not relevant	High
Vietnam	Not relevant	Low	Not relevant	Not relevant	Low

Source: Sonova's 2021/2022 ESG Report, accessed on June 22, 2022

3 Measuring your energy consumption

Where to start

- Designate **responsible employees or the ESG committee** to collect, analyze and monitor environmental footprint data
- Utilize utility bills, invoices, meter readings or similar to **identify, aggregate and track quantities** in company databases. Fuel and electricity will likely be your company's primary sources of energy consumption
- Define the scope. Recommendation: start with **Head Office**
- Regularly **measure and track energy** consumption (electricity and heating) of company sites across three dimensions as per GRI 302-1, SASB standard 130a.1:
  i. Total energy consumed
  ii. Percentage grid electricity
  iii. Percentage renewable
- To calculate the annual consumption, you could also take a **sample** of 1-3 months/year and **extrapolate** to the rest of the year, by documenting clearly your assumptions in the model
- Use **Excel templates** to report the consumed energy

Next steps

- Establish a **formal energy program**, including **quantitative targets** for **reducing (i) and (ii)**
- Where possible, **grow** the proportion of energy sourced from **renewable sources** – increasing (iii). For example, consider installing renewable energy – such as rooftop solar panels – at sites used by the company
- Explore opportunities to adopt **green building certifications** from the US Green Building Council certification for your office to become more sustainable and resource efficient

3 Sonova's total energy consumption reporting

In 2021, the total energy consumption of the Sonova Group from heating (fuel oil, natural gas, biogas, district heating), electricity, and vehicle fuels (diesel, gasoline, liquefied petroleum gas, liquefied natural gas, ethanol) amounted to 100,035 megawatt-hours (MWh). Of this total, 47,988 MWh (48%) can be attributed to the Wholesale business and 52,047 MWh (52%) to the Audiological Care business. The Wholesale business accounts for a higher proportion of electricity consumption because of the air conditioning systems necessary in operation centers in China, Vietnam, and the US. On the other hand, the Audiological Care business accounts for a higher proportion of heating because of a stronger presence in Europe, where cold winters make heating more relevant. Compared to the previous year, total energy consumption reduced by 1%. This is due to the lower total distances covered by a more efficient car fleet. Despite the strong growth of the business, our energy consumption from heating and electricity remained stable. This development is also reflected in our energy intensity figure, which reduced by 24% from 39 MWh to 29.7 MWh per million CHF revenue compared to 2020.

Energy consumption
✓ PwC CH
MWh

	2021	
	Audiological Care	Wholesale
Total [1,2]	**52,047**	**47,988**
Heating	24,299	7,015
Electricity	20,461	31,639
Vehicle fuels	7,288	9,334

[1] Includes extrapolation, where only partial data is available.
[2] 2019 + 2020 values restated due to methodological improvements. Impact on Scope 1+2 MWh around 6%. Main difference originat from the change to lower heating extrapolation values for Audiological Care Group companies.

Energy intensity
✓ PwC CH
MWh relative to million CHF revenue

	2021
Total energy consumption (Scope 1 & 2)	100,035
Revenues	3,364
Energy intensity	**29.7**

[1] 2019 + 2020 values restated due to methodological improvements. Impact on Scope 1+2 MWh around 6%. Energy intensity changed from 41.1 to 38.9 in 2019 and from 41.1 to 39.0 in 2020.

Source: Sonova's 2021/2022 ESG Report, accessed on June 22, 2022

3 Sonova's renewable energy consumption reporting

Sonova is committed to increase the share of renewable energy in its total energy consumption. In 2021, 54% came from renewable sources, surpassing our previously stated goal of a 20% renewable energy share by 2022. On-site photovoltaic panels have been installed at our operation center in Vietnam, and multiple operations have moved to sourcing bundled renewable electricity certificates, while the remaining renewable electricity was procured through unbundled renewable electricity certificates. In 2021, 53,678 MWh of energy came from renewable sources, representing an increase in the renewable energy share of total energy consumption from 19% to 54%, compared to 2020. A total of 945 MWh of renewable electricity was generated by on-site photovoltaic panels at our operation centers in China and Vietnam and our Wireless Competence Center in Switzerland (an increase of 66% over 2020). There are several projects planned for 2022/23 to build further photovoltaic panels across our locations.

Renewable energy
✓ PwC CH
MWh

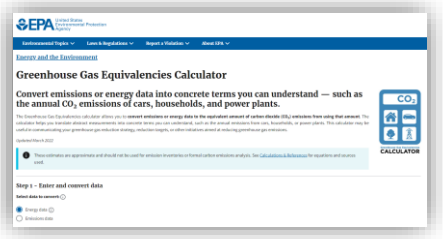
	2021
Total energy consumption	**100,035**
Non-renewable energy consumption	46,357
Renewable energy consumption	53,678
Share of renewable energy	54%

[1] 2019 + 2020 values restated due to methodological improvements. Due to the lower consumption of non-renewable energy, our share of renewable electricity increased from 18% to 19% in 2020. 2019 remained unchanged at 13%.

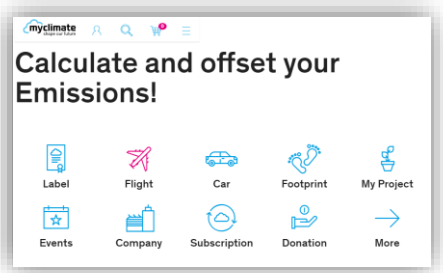
Source: Sonova's 2021/2022 ESG Report, accessed on June 22, 2022

4 Calculating your GHGs emissions

GHG emissions calculators



US EPA



My Climate

Sonova's GHG emissions reporting

GHG emissions – Scope 1 – 3
✓ PwC CH
t CO_2e

	2021
Total Scope 1 – 3 [1]	**159,436**
Scope 1 [2]	10,291
Scope 2 [3]	232 [4]
Scope 3 [5]	148,914

1) Includes extrapolation, where only partial data is available.
2) 2019 + 2020 values restated due to methodological improvements and inclusion of refrigerants. Impact on Scope 1 emissions around 13%.
3) 2019 + 2020 values restated due to methodological improvements. Impact on Scope 2 emissions <1%.
4) Sonova sourced 100% renewable electricity across its sites. Remaining Scope 2 emissions derive from district heating and electricity from EVs.
5) 2019 + 2020 values restated as total Scope 3 screening was conducted in 2021/22, including all applicable Scope 3 categories for 2019 – 2021. In previous years, only categories 4 and 9 (transportation and distribution), category 6 (business-related air travel) and category 7 (employee commuting) were measured and disclosed.

Scope 3 GHG emissions
✓ PwC CH
t CO_2e

	2021
Total Scope 3	**148,914**
Category 1: Purchased goods and services	71,327
Category 2: Capital goods [1]	2,119
Category 3: Fuel- and energy-related activities (not included in Scope 1 + 2)	7,453
Categories 4 & 9: Upstream & downstream transportation and distribution [2]	35,968
Category 5: Waste generated in operations	915
Category 6: Business travel [2]	4,421
Category 7: Employee commuting [3]	21,841
Category 10: Processing of sold products	236
Category 11: Use of sold products	2,769
Category 12: End-of-life of sold products	1,615
Category 15: Investments	250

1) Category 2 currently only includes GHG emissions related to IT equipment.
2) 2019 + 2020 values restated due to methodological improvements. Non-CO2 emissions related to aviation were taken into account with a radiative forcing multiplier of 1.9. In previously reported figures, only direct climate change effects were taken into account.
3) 2019 + 2020 values restated due to methodological improvements. Previous 16,296t CO2e in 2020 and 21,558t CO2e in 2019.

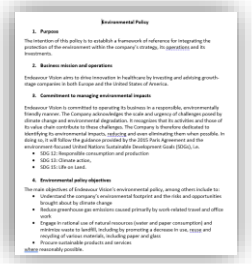
Source: Sonova's 2021/2022 ESG Report, accessed on June 22, 2022

03

Resource Library

Resources at your disposal

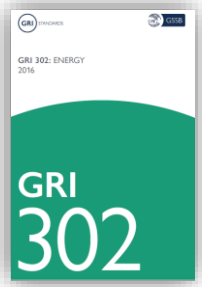
Templates



Environmental Policy

Excel to capture your energy consumption and GHGs over time

Further reading



GRI 302-306 Reporting Standards

Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)

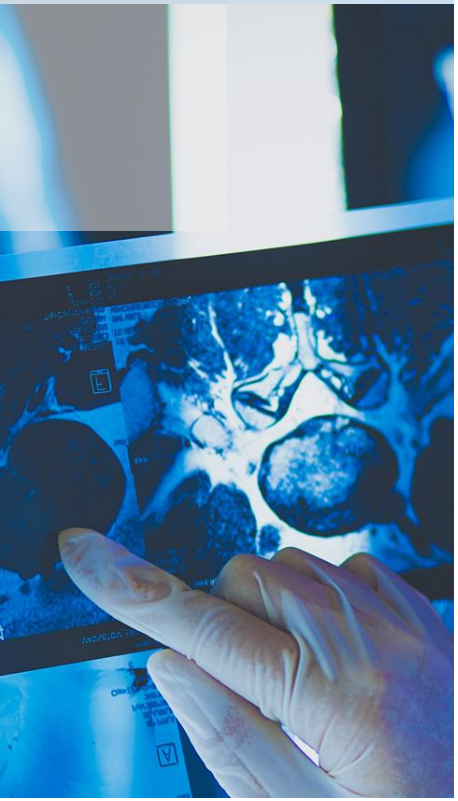
WWF UK's Sustainable Office Guide

Working 9 to 5 on Climate Change: An Office Guide

04

Q&A

Thank YOU



APPENDIX

1. Definitions
2. Environmental Statistics
3. TCFD Climate Change Risks and Opportunities

01

Definitions

Defining key terms from the ESG Questionnaire

1. Renewable energy

- Often referred to as clean energy, comes from natural sources that cannot run out and are therefore deemed sustainable, e.g. solar power, wind, biomass energy, and hydropower

2. Hazardous waste

- Waste that is dangerous or could have a harmful effect on human health or the environment

3. Biodiversity assessment

- Assessing whether the organisation has any sites close to a protected areas or areas of large biodiversity (large variety of plant and animal life)

4. Carbon footprint

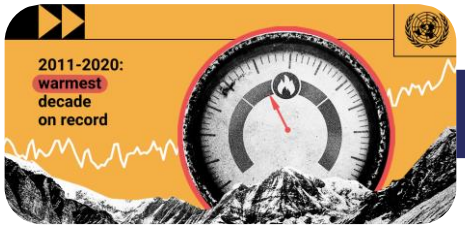
- The total amount of greenhouse gases, including carbon dioxide (CO_2) and methane that are generated by human activity

02

Environmental Statistics

The triple planetary crisis has already a big impact on human health

World battling triple planetary crises[1]



Climate Change

- **Average** global **temperature** in **2021 1.1°C above** the pre-industrial (1850-1900) levels[2]
- The **most recent seven years**, 2015 to 2021, are the **seven warmest years on record**[2]

Biodiversity Loss

- A **major species extinction** is ongoing and it will compromise planetary integrity and Earth's capacity to meet human needs[3]
- **71 % of terrestrial habitats** have seen a **decrease** in **vegetation**[3]

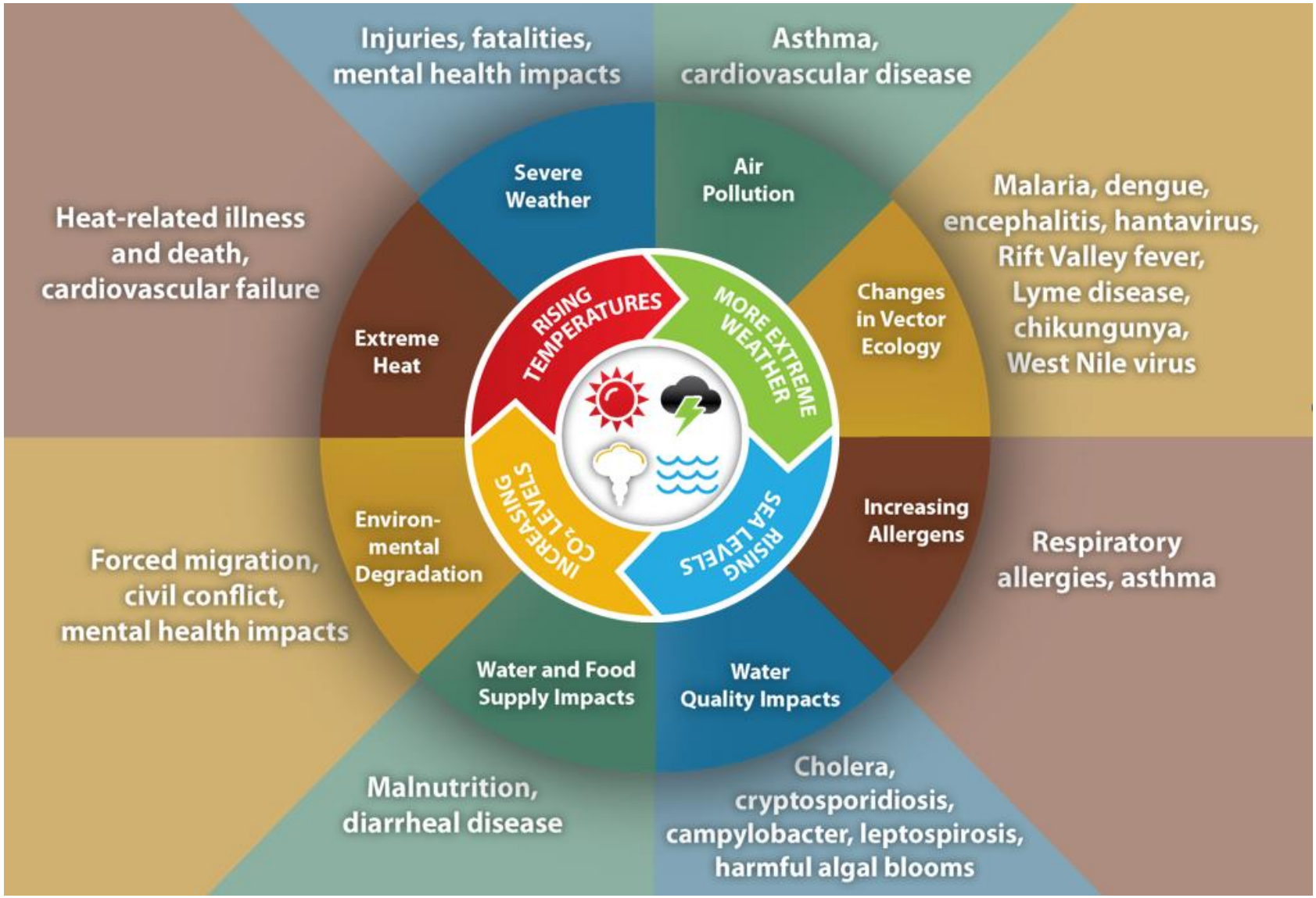
Pollution & Waste

- **90% of people worldwide** breathe **air** that contains levels of **pollutants** that exceed **WHO guidelines**[4]
- **<20% of global waste** is **recycled** each year[5]

WHO: Environmental stressors are responsible for **23% of all global deaths**, ~14 mln deaths per year[6]

Source: 1. What is the triple planetary crisis, UNFCCC, April 2022, accessed on June 21, 2022; 2. Four key climate change indicators break records in 2021, WMO, May 2022, accessed on June 21, 2022; 3. Biodiversity Infographic, Global Environment Outlook 6, UNEP, March 2019, accessed on June 21, 2022; 4. 9 out of 10 people worldwide breathe polluted air but more countries are taking action, WHO, May 2018, accessed on June 28, 2022; 5. Global waste facts, Globalcitizen.org, December 2021, accessed on June 21, 2022; 6. Public health and environment, WHO, accessed on June 21, 2022

CDC's estimates substantive consequences of climate change on human health in the future



Source: Climate and Health, CDC, accessed on June 28, 2022

Doing what is right for the environment is also good for your business

Greater access to capital

- Up to **$5 trillion annually** will be invested in **sustainability** by 2025—the **largest capital reallocation** in history[1]
- **Investors are required to report** on the **environmental performance** of their **portfolio companies**, to comply with European regulation, i.e. Sustainability Finance Disclosure Regulation (SFDR, in force since March 2021)
- Investors in other jurisdictions, incl. the US, are following the European lead

Compliance with Regulations and avoid fines

- **Rapidly evolving legislation mandating disclosures** of companies' environmental impacts:
  - **EU**: Corporate Sustainability Reporting Directive (CSRD, 2021) according to which all EU companies will have to abide by its sustainability reporting standards—large companies from fiscal year 2023, and small and medium-sized companies from 2026[2]
  - **US**: SEC-proposed rule related to climate disclosures (March, 2022), potentially applicable as early as December 2022 *(see next slide)*
- **Litigation and fines** for companies in breach of environmental regulations, tarnishing reputation

Moral obligation

- Current generation has a **duty towards future generations** to preserve a **livable planet** by ensuring the sustainable functioning of the planet's ecosystems[3]
- Risk of **losing customers** and **employees** if company perceived as **brown**, i.e. not fulfilling this obligation

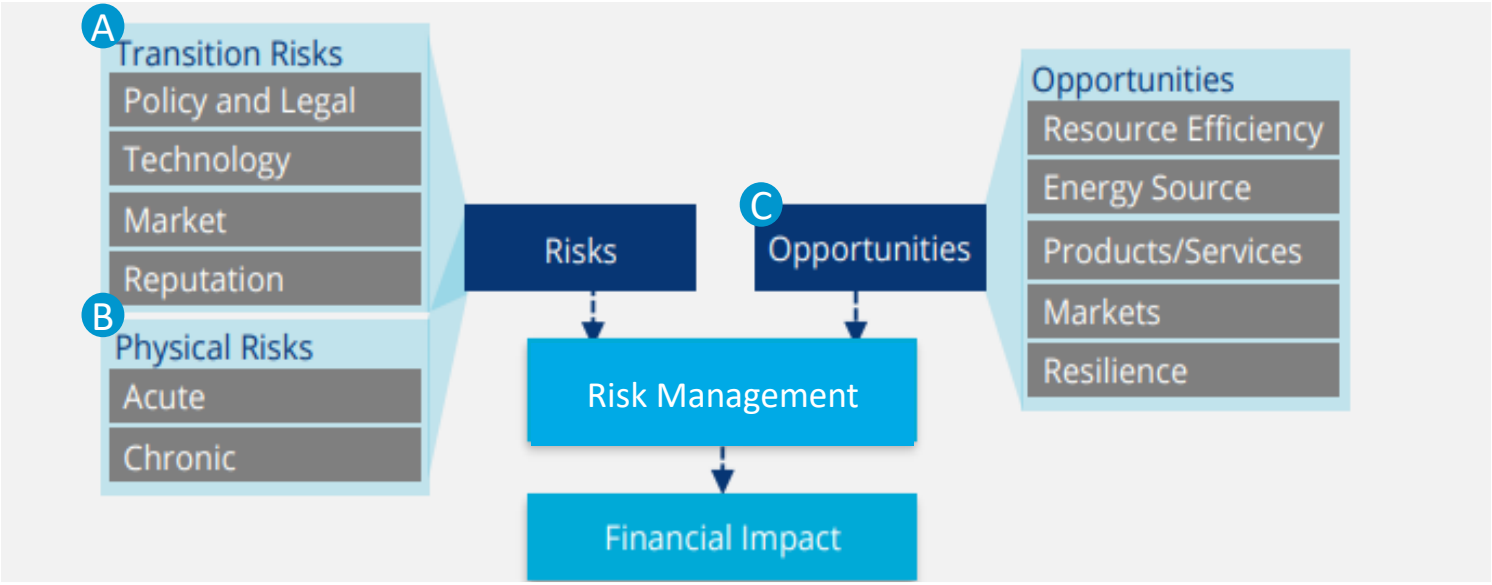
Source: 1 Understanding the SEC's proposed climate risk disclosure rule, McKinsey & Company, June 2022, accessed on June 22, 2022; 2 How the EU's new sustainability directive will be a game changer, EY, July 2021, accessed June 3, 2022; 3 A brighter tomorrow: climate change and intergenerational justice, UNICEF, accessed on June 21, 2022

03

TCFD Climate Change Risks and Opportunities

2 TCFD provides guidance on climate-related risks, opportunities and financial impact

- In 2017, the Task Force on Climate-related Financial Disclosures (TCFD) released climate-related financial disclosure **recommendations** designed to help companies provide better information to **support informed capital allocation**
- These **voluntary disclosures** require companies to report on their **governance** around **climate-related risks** and **opportunities**, its **impacts** on the organisation's **business** and **strategy**, and **how** these risks are **managed**
- TCFD recommendations have been **adopted by 2,600+ institutions** with combined market **capitalizations** of **>$25 trillion**, including **1,069 financial** institutions, responsible for **assets of $194 trillion**
- TCFD recommendations are the **basis** for **SEC's proposed rule** and for **international accounting standard** for climate risk disclosure



Source: TCFD 2017 Report, accessed on May 16, 2022; TCFD 2021 Annual Report accessed on June 22, 2022

A TCFD's Climate Change Transition Risks

Climate-Related Risks[32]	Potential Financial Impacts
Policy and Legal	
– Increased pricing of GHG emissions – Enhanced emissions-reporting obligations – Mandates on and regulation of existing products and services – Exposure to litigation	– Increased operating costs (e.g., higher compliance costs, increased insurance premiums) – Write-offs, asset impairment, and early retirement of existing assets due to policy changes – Increased costs and/or reduced demand for products and services resulting from fines and judgments
Technology	
– Substitution of existing products and services with lower emissions options – Unsuccessful investment in new technologies – Costs to transition to lower emissions technology	– Write-offs and early retirement of existing assets – Reduced demand for products and services – Research and development (R&D) expenditures in new and alternative technologies – Capital investments in technology development – Costs to adopt/deploy new practices and processes
Market	
– Changing customer behavior – Uncertainty in market signals – Increased cost of raw materials	– Reduced demand for goods and services due to shift in consumer preferences – Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g., waste treatment) – Abrupt and unexpected shifts in energy costs – Change in revenue mix and sources, resulting in decreased revenues – Re-pricing of assets (e.g., fossil fuel reserves, land valuations, securities valuations)
Reputation	
– Shifts in consumer preferences – Stigmatization of sector – Increased stakeholder concern or negative stakeholder feedback	– Reduced revenue from decreased demand for goods/services – Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions) – Reduced revenue from negative impacts on workforce management and planning (e.g., employee attraction and retention) – Reduction in capital availability

Source: TCFD 2017 Report, accessed on May 16, 2(

B TCFD's Climate Change Physical Risks

Climate-Related Risks[32]	Potential Financial Impacts
Acute – Increased severity of extreme weather events such as cyclones and floods Chronic – Changes in precipitation patterns and extreme variability in weather patterns – Rising mean temperatures – Rising sea levels	– Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions) – Reduced revenue and higher costs from negative impacts on workforce (e.g., health, safety, absenteeism) – Write-offs and early retirement of existing assets (e.g., damage to property and assets in "high-risk" locations) – Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel plants) – Increased capital costs (e.g., damage to facilities) – Reduced revenues from lower sales/output – Increased insurance premiums and potential for reduced availability of insurance on assets in "high-risk" locations

Source: TCFD 2017 Report, accessed on May 16, 2022

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Example of Climate Change-Related Physical and Transition Risks

Not exhaustive

	Physical risks		Transition-related risks			
	Acute	**Chronic**	**Policy and legal**	**Technology**	**Market**	**Reputation**
Potential risks	Increased risk of potential extreme weather events, e.g. floods, hurricanes	Changes in precipitation and extreme variability in weather patterns Rising mean temperatures Rising sea levels	Enhanced emissions-reporting obligations Exposure to litigation	Substitution of existing products and services with lower emissions options	Difficulty to find reputable long-term investors or potential acquirers	Stigmatization of industry Changes in stakeholder expectations
Possible financial implications	Increased capital costs (e.g. damage to facilities, retrofitting) Reduced revenue and higher costs from negative impacts on workforce (e.g. health, safety, absenteeism)		Increased operating costs (e.g. higher compliance costs, increased insurance premiums) Increased costs and/or reduced demand for services resulting from fines and judgements	Costs to adopt/deploy new practices and processes	Abrupt and unexpected shifts in energy costs Capital and potentially liquidity constraints	Reduced access to capital Reduced revenue from negative impacts on workforce management and planning (e.g. employee attraction and retention)

Source: TCFD 2017 Report, accessed on May 16, 2022

C TCFD's Climate Change Opportunities

Type	Climate-Related Opportunities[33]	Potential Financial Impacts
Resource Efficiency	– Use of more efficient modes of transport – Use of more efficient production and distribution processes – Use of recycling – Move to more efficient buildings – Reduced water usage and consumption	– Reduced operating costs (e.g., through efficiency gains and cost reductions) – Increased production capacity, resulting in increased revenues – Increased value of fixed assets (e.g., highly rated energy-efficient buildings) – Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs
Energy Source	– Use of lower-emission sources of energy – Use of supportive policy incentives – Use of new technologies – Participation in carbon market – Shift toward decentralized energy generation	– Reduced operational costs (e.g., through use of lowest cost abatement) – Reduced exposure to future fossil fuel price increases – Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon – Returns on investment in low-emission technology – Increased capital availability (e.g., as more investors favor lower-emissions producers) – Reputational benefits resulting in increased demand for goods/services
Products and Services	– Development and/or expansion of low emission goods and services – Development of climate adaptation and insurance risk solutions – Development of new products or services through R&D and innovation – Ability to diversify business activities – Shift in consumer preferences	– Increased revenue through demand for lower emissions products and services – Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services) – Better competitive position to reflect shifting consumer preferences, resulting in increased revenues
Markets	– Access to new markets – Use of public-sector incentives – Access to new assets and locations needing insurance coverage	– Increased revenues through access to new and emerging markets (e.g., partnerships with governments, development banks) – Increased diversification of financial assets (e.g., green bonds and infrastructure)
Resilience	– Participation in renewable energy programs and adoption of energy-efficiency measures – Resource substitutes/diversification	– Increased market valuation through resilience planning (e.g., infrastructure, land, buildings) – Increased reliability of supply chain and ability to operate under various conditions – Increased revenue through new products and services related to ensuring resiliency

Source: TCFD 2017 Report, accessed on May 16, 2022

C Example of Climate Change-Related Opportunities

Not exhaustive

	Resource efficiency	Energy Source	Services	Markets	Resilience
Potential opportunities	Use of more efficient modes of transport Recycling Move to more efficient buildings Reduced water usage and consumption	Use of lower-emission sources of energy Use of supportive policy incentives Use of new technologies Participation in carbon market Shift toward decentralized energy generation	Expansion of low emissions services	Access to new markets	Participation in renewable energy programs and adoption of energy-efficiency measures
Possible financial implications	Reduced operating costs (e.g., through efficiency gains and cost reductions) Increased value of fixed assets (e.g., highly rated energy efficient buildings) Benefits to workforce management and planning (e.g., improved health and safety, employee satisfaction) resulting in lower costs	Reduced operational costs (e.g., through use of lowest cost abatement) Reduced exposure to future fossil fuel price increases Reduced exposure to GHG emissions and therefore less sensitivity to changes in cost of carbon Increased capital availability (e.g., as more investors favor lower-emissions healthcare companies) Reputational benefits resulting in increased demand for services	Increased access to capital as investors favor lower-emissions healthcare companies	Increased access to capital through new access to new and emerging markets	Increased ability to operate under various conditions

Source: TCFD 2017 Report, accessed on May 16, 2022