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THE BLUE PLANEUSTAINABILITY TOWARDS KNOWLEDGE SHARING

Article 1: Carbon Accounting and Sustainable Finance: The New Way Forward

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CARBON ACCOUNTING AND SUSTAINABLE FINANCE: THE NEW WAY FORWARD

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Human induced Climate Change

Palaeontological evidence suggests that about 66 million years ago a catastrophic asteroid impacted on earth, in the Yucatan Peninsula on the Gulf of Mexico, leading to more than a decade long global climate change and environmental disaster. This catastrophic event resulted in mass

extinction of plants and animals, including dinosaurs.

Let's travel hypothetically to the distant future and may be in a mythical alien planet. Now think of an intelligent being from another habitable planet reading an article or two that intelligent beings are discussing – "Why Homosapiens became extinct on the Blue Planet or on the Planet Earth?". The answer is that they may read or Earth's climate has gone through many rollercoaster peaks and declines.

However, about 7,000 to 5,000 years ago, the climate stabilized and over the past 7,000 years the temperature only changed by 0.5 degree centigrade.

centigrade. Because of this incredibly stable Earth's temperature and climatic conditions, human civilisations were able to blossom.

Scientific evidence shows that between 8,000 to 6,000 years ago, greenhouse gas levels remained stable or declined.

However, greenhouse gases began to rise slowly over the last 6,000 years as humans began clearing forests, land and started burning fuels. It is believed that early human activities reversed the greenhouse gas decline and stopped the eventuality of another ice age. In that respect, human-induced climate change started much earlier than we currently

discuss – "Homo sapiens were themselves responsible for destruction of their own and other species of their time".

Earth's climate has gone through many roller-coaster peaks and declines. However, about 7,000 to 5,000 years ago, the climate stabilized and over the past 7,000 years the believe.

Economic development, energy

consumption and carbon emissions have a direct nexus. Historically, human activities were fuelled by biomass, such as fallen woods from trees. In addition to that, we have also used animal fat, and plant oils. These biomasses were extremely inefficient fuels as most of the embodied energy was lost in the combustion process. As a result, the intensity of economic activities and wealth creation were also limited. However, there was enough available biomass to support the level of economic activities of those times

Between 1850 -1900, the industrial revolution was primarily fuelled by biomass, followed by expansion of global and local transport systems between 1900-1950, with the help of fossil fuels such as coal and oil and these fossil fuels advanced the process of industrialisation.

However, an unprecedented appetite for fossil fuel started about 1950 as globally,

we have started adopting high consumption based, Western style living standards, which have been further exacerbated since 2000 by rapid ndustrialisation in China and other emerging economies. An estimate highlights that we have released over 600 billion tonnes of trapped carbon

into the atmosphere due to burning these fossil fuels.

With ever increasing concentrations of anthropogenic greenhouse gases (Carbon dioxide, Methane, Nitrous oxide,

Hydrofluorocarbons, Sulphur hexafluoride, and Nitrogen Trifluoride) in the atmosphere, the global average temperature increased by 1 degree Celsius in 2015 above

pre-industrial temperatures (as recorded between 1880-1899). In this context, the Paris Agreement in 2015, urged community to limit the global warming to well below 2 degrees Celsius, preferably to 1.5 degree Celsius, compared with pre-industrial levels.

The current rise in the global average temperature by 1 degree Celsius above pre-industrial levels is already similar to or warmer than the previous peak temperature of the earlier Holocene epoch which was around 8,000 to 7,000 years ago. Hence, further concentrations of greenhouse gases in the atmosphere will only further exacerbate 8,000 to 7,000 years ago. Hence, further concentrations of greenhouse gases in the atmosphere will only further exacerbate the existential threat to mankind and other life on earth.

Carbon Accounting - A step to combat Climate Change

The Paris Agreement is the first legally binding international treaty, to limit emission of greenhouse gases and to combat climate change. Under this

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first legally binding

to submit.

international treaty, to

agreement, countries need to submit their **nationally determined contributions (NDCs)** – a plan for climate action by 2020 and by 2024 counties need to establish an enhanced transparency framework (ETF) to report transparently on actions taken to advance climate change mitigation processes, on adaption

measures and on support provided or received in relation to climate change.

The individual country's ETF will be collated to track a global stocktake on the progress towards

Sustainable Development Goal-13 on Climate Action is also an important global commitment. In addition, the Task Force on Climate-related Financial Disclosures (TCFD) also recommended to improve and increase reporting of climate-related financial information. These three formal institutional pressures created a global obligation and commitment to measure our greenhouse gas emission and to account for how much we are releasing previously trapped carbon into the atmosphere.

Over the decades fossil fuel-based energy consumption leads to economic growth, facilitates rapid transportation, and improves the social conditions of mankind. conditions of mankind. However, at the same time, consumption of nonrenewable fossil fuel-based energy also leads to greenhouse gas emissions, which results in significant adverse impacts on the environment, human life, destroyed infrastructure, and economic growth. Ironically, we need even more energy to recover from the adverse impacts, to rebuilt destroyed infrastructures and to reinstate economic growth. Carbon emission is one of the most destructive outcomes in the total greenhouse gas emissions.

Hence there is a direct nexus between economic growth, fossil fuel-based energy consumption and carbon emission. Studies have overwhelmingly confirmed that this nexus can be both unidirectional (higher economic growth leads to increase in carbon emission) as well as bidirectional increase (or decrease) in economic growth cause increases (or decreases) in carbon emissions.

The main reasons for this unidirectional relationship are: a) a higher proportion of dependency on non-renewable fossil fuels in the total energy mix, b) fossil fuel-based oil dependency for transportation, and c) higher energy demands for rapid industrialisation, urbanisation, and farming. Hence, because of this concerningly unidirectional relationship between energy consumption and carbon emissions, there is a need to account for the amount of emissions we are emitting in the process of our economic activities.

However, the magnitude may differ from country to country. For example, developing countries require higher cheaper cost fossil fuel-based energy, instead of renewable sources. In the case of developed countries, the situation can be different, counties might be taking policy action actively to combat climate change by shifting to alternative renewable energy, and Germany is a good example of that

The evidence suggests higher energy consumption is necessary for economic growthbut at the cost of environmental degradation, therefore intervention is required in the form carbon taxes, carbon capture installations, reductions in the consumption of fossil fuels in the energy mix, and by shifting to energy efficient and environmental-friendly technologies. These steps will reduce energy consumption, reduce the cost of production, leading to a green economy wherein governments can maintain economic growth with a less negative impact on the environment. In this process of transition and in the process of monitoring the level of emissions, carbon accounting is essential.

Counting Greenhouse Gases (GHG) Emissions

Carbon emissions can be both direct and indirect. Emissions that are produced from sources within the reporting organisation's boundary or as a result of an organisation's activities are called **Direct Emissions**. For example: emissions due to the heating of a boiler, energy generation, transportation of materials, manufacturing, on-site landfill, methane release from coal mines, and gas leaks from joints and seals. On the other hand, if emission happen because of a reporting organisation's demand for goods and services or due to both upstream and downstream value chain activities, those are called **Indirect** emissions.

Hence, indirect emissions are all embedded emission in goods and services or in the value chain of the reporting entity. For example: the consumption of electricity, upstream emissions due to extraction and production of fossil fuels, downstream emissionvs during

Figure-1: Types of Emissions



transportation of an organisation's product o customers, and emissions from contracted/outsourced activities.

In the next step it is important to understand the proportion of ownership of emissions in the value chain. In this regards the **scope of emissions explains who 'owns' emissions** and the level of control in the process of emissions.

The GHG Protocol categorised emissions into three levels. **Scope-1** emissions are the direct emissions of the reporting entity and are fully owned or controlled by the reporting organisation (examples: company owned vehicles or emissions due to fuel consumption in the company's factory). **Scope-2** emissions are the indirect upstream emissions especially those to purchase and consumption of electricity. **Scope-3** emissions are all the indirect upstream and downstream emissions in the value chain that are not included in scope-2. Accounting for Scope 1, 2 and 3 emissions is governed by **the Greenhouse Gas Protocol (GHG Protocol). The GHG Protocol** is a multi-stakeholder-based standard for greenhouse gas accounting and reporting. The GHG Protocol was launched in 1998 as an initiative of the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) and, since then, a number of standards, guidelines, and protocols were published, such as the GHG Protocol Corporate Accounting and Reporting Standard, and the GHG Protocol Scope 3 Standard.

Understanding Emission Factors

In order to identify and calculate GHG emissions, an organisation needs to know the extent of its activity and emissions factors. An emission factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. These factors are usually expressed as the weight of the pollutant divided by a unit weight, volume, distance, or the duration of the activity emitting the pollutant (e.g., kilograms of particulate emitted per megagram of coal burned).

Hence, emissions factors are an activity-based value, and provide estimated average emission rates of a given pollutant for a given source, relative to units of activity.

To estimate GHG emissions per unit of specific activities an organisation needs to use an emission factor.

The general equation for emissions estimation is: $E = A \times EF \times (1-ER/100)$

where:

- E = emissions;
- A = activity rate;
- EF = emission factor, and
- ER = overall emission reduction efficiency,

Emissions are expressed in CO2 equivalents, and this make it easier to compare the effects of different GHGs and to denominate carbon offset credits in units of CO2-equivalent emission reductions.

Human economic activities produce various kinds of greenhouse gases (GHGs) with different levels of Global Warming Potential (GWP). Greenhouse gases (GHGs) keep the earth warm by absorbing energy and by slowing down the rate of energy escapes to space. The greenhouse gases act as insulating blanket. Each of the greenhouse gases has different ability to absorb infrared energy and how long they stay in the atmosphere.

The GWP value of a particular GHG, denotes physical characteristic of a GHG, and its level of impact on the greenhouse effect.

Table-1: Global Warming Potentials

| Green House Gases | Global Warming Potential |
|---|---|
| Carbon dioxide | 1 |
| Methane | 28 |
| Nitrous oxide | 265 |
| Perfluoro methane (tetrafluoromethane) | 6,630 |
| Perfluoro methane (hexafluoroethane) | 11,100 |
| Hydrofluorocar- bons (HFCs) | Dependent on HFC type (HFC-23 => 12,400 Highest range) |
| Sulphur hexafluoride | 23,500 |

The GWP values is a common unit of measurement and allows to compare the global warming impact of different gases.

The value tells us how much energy the emission of 1 ton of a GHG will absorb over 100 years, relative to the emission of 1 ton of Carbon dioxide on an equal basis. Hence, it is expressed as CO2 equivalent. When the quality of greenhouse gas is multiplied by GWP, gives us the CO2 equivalent.

For example:

- I tonnes methane x 28 = 28 tonne CO2 equivalent.

The table shows a small amount methene, nitrous oxide, sulphur hexafluoride, hydrofluorocarbon and perfluoro methane have much more capacity to create greenhouse effects in the atmosphere. The larger the GWP of a particular GHG, more it has capacity to warm-up the earth.

Road to Carbon Neutrality

The process of carbon neutrality include emission reduction actions and buying carbon offsets to eliminate the residual emissions.

Figure-2: Steps to ZERO EMISSION



The first steps to achieve carbon neutrality includes adopting strategies for both internal and supply chain emissions reductions.

The internal emissions reduction strategies include:

- *^ø* Inventory of GHG emissions.
- Implementation of internal mitigation strategies aligning with global goals to reduce CO2 emissions in half by 2030 and to achieve net-zero emissions by 2050. Steps include:
 - investing in low-carbon capital projects,
 - shifting to lower-emitting equipment, materials, and fuels,
 - investing in energy efficiency measures, and renewable onsitepower.

Emission reduction strategies for the supply chain, include:

- Ø Estimate supply chain emissions,
- Estimate emissions embedded in the products,
- Implement mitigation strategies such as:
 - Choosing low GHG emitting suppliers.
 - Incentivising suppliers to reduce GHG emissions.
 - Re-designing products and services to reduce the GHG footprint.

The final step in the emissions reduction initiative is to purchase carbon offset credits to eliminate any residual emissions from the direct (scope-1) and indirect (scope-2 & 3) sources.

Understanding Carbon Offsets

A carbon offset or carbon offset credit, as

called interchangeably, refers to reductions in GHG emissions or increases in carbon storage – which are happening elsewhere, and the benefits are passed on to other organisations through a transferable instrument certified by governments or independent certification bodies. Carbon offsets arise out of projects, which involve:

- Switching to renewable energy
- development from conventional power generation, thus ending fossil-fuel emissions,
- Capture of highly potent GHGs like methane, N2O, or HFCs,
- Ø Avoiding deforestation.

Carbon offset programs are governed by international agencies (such as the United Nation's Clean Development Mechanism (CDM) Executive Board, which oversees carbon offsets under the Kyoto Protocol) or governmental regulatory bodies or independent non-governmental organisations (NGOs). Carbon offset programs can have both environmental and social benefits and have three functions:

- Ø Develop standards and criteria to set the quality of carbon offset credits.
- Review offsets projects against standards with the help of third-party verifiers
- Maintain registry systems to keep records of issues, transfers and retirement of offset credits.

The Kyoto Protocol has established project-based offset mechanisms:

- the Clean Development Mechanism (CDM), and
- ø Joint Implementation (JI).

The Clean Development Mechanism (CDM)

is part of the United Nations Framework Convention on Climate Change (UNFCCC). It offers the opportunity to purchase carbon credits from offset projects in low or middle-income nations to both public and private sectors of high-income countries.

The CDM advances the sustainable development agenda in the host country. CDM projects generated emissions credits called **Certified Emission Reductions (CERs)**, which are then bought and traded.

Joint Implementation operates in

developed countries and tradable units from JI projects are called Emissions Reductions Units (ERUs).

Criteria for a high-quality Carbon Offset

The carbon offset scheme can be considered as high-quality only if the following characteristics are there, such as: Additionality: In the context of emission reduction projects, additionality of a project means that the only way the project exists, because of the funding from carbon credits. In other words, emission reductions or removals from a mitigation activity are additional if the mitigation activity wouldy not have taken place in the absence of the added incentive created by the carbon credits.

- Permanent or permanence: Sequestration projects need to ensure that emissions are kept out of the atmosphere for a reasonable length of time. The longer the guarantee, the higher the relative quality of the offset credits.
- Ø Not claimed by another entity
- Not associated with significant social or environmental harms

Road to address the Paris Agreement

Post the Paris Agreement, countries, regions, cities, and companies across the world are obligated to invest in technology and capacity building to meet carbon neutral targets and zero-carbon solutions.

In the race to limit global warming below or up to 1.5 degree centigrade, **Carbon Capture and Storage (CCS)** can play a vital role. The Carbon Capture and Storage technology prevents the release of carbon dioxide (CO2) into the atmosphere by capturing CO2 produced during the industrial production process, compressing it for transportation and then injecting it in carefully selected secure and deep geological sites for permanent storage. The technology has been in use in industrial settings. to purify natural gas, hydrogen, and other gases, since 1930.

However, in 1972 the technology was used commercially for the first time for carbon capture and storage purposes. As of 2019 there were only 19 large scale CCS projects in operation; however, the number is expected to grow to more than 2000 largescale CCS plants across the globe. It is expected that in addition to shifting to bioenergy or biofuel for energy production, CCS technology will be some of the most effective technology to combat the climate change challenge.

Hence, we need to mobilise enormous sums technologies. A conservative estimate shows that by transitioning to a low carbon economy, we can gain about US\$ 26 trillion in direct economic benefit globally by 2030. For example, in 2017 itself about US\$280 billion was invested in renewable energy projects.

Recognising new investment opportunities in climate-related projects, capital markets across the world are bullish about this sector and more than 160 financial firms, with a value of US\$86 trillion in assets, have shown commitment to accept the TCFD's recommendations.

The biggest challenge to address the Paris Agreement goals is that, we need to increase production of renewable energy at least by nine-fold, for which we need to accelerate the development of clean energy infrastructure as well as we need significant amounts of land for onshore wind and large-scale solar installations. Nonetheless, globally we are fortunate enough to have enough altered land in the form of agriculture, infrastructure, and other development activities, which can be used for dual purposes or can be reused for renewable energy development purposes. At present, it is estimated that we have more than 600 million hectares of land available globally, or approximately 17 times more land, than we require for renewable energy infrastructure. This land bank includes both the highest greenhouse emitting countries and others.

In the process of developing clean energy infrastructure, it is important to ensure we do not commit the same mistakes, undermining the environmental and social impact of land use, as we have committed during the development of the fossil fuel sector. We must look for low-impact pathways for renewable energy infrastructure build-up.

A report published by The Nature Conservancy, prescribed six pathways to a green energy build-up:

- Identify and approve low-environmental impact zones for renewable energy development.
- Develop renewable energy plants and transmission where there will be low impact for wildlife and habitats.
- Develop science-based guidelines andstandards for green energy plant developers, and lenders on how to identify or what constitutes low impact project siting and design.
- Incentivise development of renewable energy projects in brownfield (former closed mine sites, former industrial sites, already contaminated unusable and degraded lands) over greenfield sites.
- To make buying low-impact renewable energy a corporate commitment to address their sustainability goals (social equity, environmental consideration, and financial profit) for both climate and nature.

- Incorporate environmental and social performance standards into financial
- institutions' lending criteria to ensure renewable energy investments are undertaken low-impact zones and avoidimpacts to nature and communities.

Hence, to combat climate change, both for adaptation and mitigation, we not only require green technology and infrastructure we also need new financial instruments in the form of sustainable finance.

Sustainable Finance: To Finance the Future

Sustainable Development Goals (SDGs) and the Paris Agreement are the two urgent major alobal commitments of our time that we need to address by 2030 and beyond. Therefore, to speed up the transition towards a sustainable economy, we need both technology and finance. An estimate of the United Nations Environment Programme Finance Initiative (UNEP FI) mentions that globally

we need to invest about US \$ 5 to 7 trillion a year.

As a result, banks, insurers, and investors across the globe have pledged to integrate sustainability into their operations. It is estimated that the global market for sustainable finance has grown many folds from USD 11.3 billion in 2013 to USD 183 billion in 2018. Hence, sustainable finance will play a vital role, alongside sustainable technology, in accelerate the transition towards a sustainable global economy.

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Hence, sustainable finance will play a vital role, alongside sustainable technology, in accelerate the transition towards a sustainable global economy.

What is Sustainable Finance?

Sustainable finance embeds sustainability values and factors (environmental, social, and governance) in financial decision making (risk-management and lending decisions), so that financing activities and projects are economically, socially, and environmentally sustainable. In other words, sustainable finance represents an alignment of sustainability with financial systems.

The genesis of sustainable finance can be traced back to the 1980's-1990's Corporate Social Responsibility (CSR) movement. However, CSR is considered to

> be as a philanthropic activity of corporates, it is not integrated into a company's business model. With the growing stakeholder, institutional and regularity pressures, sustainability aspects have gradually been integrated within business practices and embracing sustainability is now seen as a factor for competitive advantage.

> In 1992, the United Nations Environment Programme

Finance Initiative (UNEP FI) was set up and in the same year the Convention on Biological Diversity was organised. Since the 2000's many international frameworks have been published, such as the Equator Principles (2003), Principles of Responsible Investment (2006), Principles for Sustainable Insurance (2012), UNEP Inquiry into a Sustainable Financial System (2014), Addis Ababa Action Agenda (2015), Sustainable Development Goals (SDGs) & the Paris Agreement on Climate Change (2015).



Figure-3: The Anatomy of Sustainable Finance

Following publication of these frameworks, the attracted attention of policy makers and regulators has been drawn towards development of sustainable finance markets. For example, some of the initiatives are:.

- Issue of Climate Awareness Bond by the European Union in 2007,
- Issue of the first Green Bond in 2008 by the World Bank,
- Task Force on Climate-related Disclosures (TCFD) in 2015,
- Ø The Chinese Green Bond Project
- ⌀ catalogue in 2015,
- French Energy Transition Law and Article 173 in 2015,
- The Network for Greening for Financial Systems (NGFS) in 2017,
- The EU Action Plan on Sustainable Finance in 2018,
- The Principle for Responsible Banking in 2019,
- EU Taxonomy for Sustainable Activities (2020),
- Ø Finance for Biodiversity Pledge (2020)

The Need for Sustainable Finance and key elements of Sustainable Finance

The finance sector has an important catalytic role in addressing economic, social, and environmental challenges. It can influence future business decision process, business operation, and can motivate investors to embed holistic sustainability values in new investments.

The Finance sector encourages potential borrowers to present their social and environmental risks and impact assessments before approving their loan proposals. Sustainable finance will reduce the risk of loss, strengthen brand reputations, support transition to a low carbon economy, meet stakeholders' and regulators' expectations and facilitate advancing sustainable development goals.

Sustainable finance provides desired financial returns in addition to positive social and environmental outcomes, where both traditional finance and investment (primary focus on financial performance), and ethical or philanthropic donation operates at sub-optimal level (only focuses on social and environmental performance).

Four key elements of Sustainable Finance:

- 1. Finance-focuses on expected returns and associated risks.
- Governance-focuses on system, processes, and oversights that ensure an organisation, and its products, deliver on their financial, social, and environmental goals.
- 3. Social focuses on the positive social impact of investments.
- 4. Environmental-focuses on green investment, such as investment in climate change mitigation, investmentsin adaptation to the physical impacts of climate change, and investments in biodiversity conservation.

Four key frameworks for Sustainable Finance Systems

Over the decades, several initiatives have been undertaken to develop systems and markets for sustainable finance. The Principles for Responsible Investment (PRI), Principles for Sustainable Insurance (PSI), Equator Principles (EI), and Principles for Responsible Banking are four fundamental pillars of the sustainable finance ecosystem.

Principles for Responsible Investment (PRI):

The PRI is a framework for the institutional investment industry, which includes both insurance and non-insurance institutions (e.g. insurance companies, pension funds, government reserve funds, foundations, endowments, depository organisations, and investment management companies).

The six Principles for Responsible Investment are to:

1. incorporate ESG issues into investment analysis and decision-making processes.

- 1. be active owners and incorporate ESG issues into our ownership policies and practices.
- 2. seek appropriate disclosure on ESG issues by the entities in which we invest.
- 3. promote acceptance and implementation of the Principles wit in the investment industry.
- 4. work together to enhance our
- 5. effectiveness in implementing the To advance sustainable investment policies and regulations in any jurisdictions, policymakers need to define five areas in their policy documents:
- 1. Corporate ESG Disclosures- define the issuer's obligation to publish relevant corporate strategies, operations, and performance on key ESG issues so that investors get material ESG performance information on investee's investment proposal, before making investmentdecisions and lending engagement. The prescribed regulatory guidelines on corporate ESG disclosures need to be aligned with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).
- 2. Stewardship- set out clearly the longterm value of economic, social and environmental assets on which returns, and clients' and beneficiaries' interests, depend.
- 3. Investor ESG Regulations- creating demand for better ESG disclosures so that disclosing and incorporating ESG information in decision-making becomes a fiduciary duty and obligation of the asset owners and investment manager.
- 4. Taxonomies-creating a common language between investors, issuers, project promoters and policy makers so that investors can assess whether 1) a particular economic activity is environmentally and socially sustainable (e.g., what constitutes green or sustainable activities or projects or of helps to measure the level of sustainability of investments), whether projects follow robust

Figure-4: Four Governing Frameworks for Sustainable Finance System

| Priciples for Responsible Investment (PRI) | Priciples for Sustainable Insurance (PSI) | Equator Principales (El) | Priciples for Responsible Banking (PRB) |
|--|---|---|---|
| provides priniciples to incorporate environmental, social and governance (ESG) factors into investment and ownership decision- making process | aims to integrate all activities in the insurance value chain and to identifying, assessing, managing, and monitoring all insurable risks and oppotunities through the prism of environmental, social and governce perspective | objective to provide benchmark to financial industry for determining, assessing, and managing social and environmental risk in project financing | objective to aligning banking activities with UNs' Sustainable Development Goals (SDGs) and the social goals set by the paris Agreement expects banking practice must be responsible and to give due consideration to the environment, society and economy factors while making investment decision and extend loan |

- . ESG standards and have the potential to navigate the transition to a low-carbon, inclusive sustainable economy.
- 5. National Sustainable Strategies- prescribing a framework so that the financial sector transits towards or supports goals of sustainable and inclusive growth, by aligning economic and financial goals with the Paris Agreement and the SDGs

Principles for Sustainable Insurance (PSI):

The growing environmental, social and governance challenges changed global risk landscape and led to the launch of PSI in 2012 via the United Nations Environment Programme Finance.

Sustainable insurance aims to integrate all activities in the insurance value chain and to identify, assess, manage, and monitor all insurable risks and opportunities through the prism of the environmental, social and governance perspectives. The PSI Principles are a framework for the insurance industry.

Four Principles of PSI:

1. To embed environmental, social and governance issues in decision-making that is relevant to business (including: company strategy, risk management and underwriting, product and

- . servicedevelopment, chain management, sales and marketing, and investment.
- To work together with insurance clients and business partners to raise awareness of environmental, social and governance issues, manage risk and develop solutions (this includes client suppliers, insurers, reinsurers, and intermediaries).
- 3. To work together with governments, regulators and other key stakeholders to promote widespread action across society on environmental, social and governance issues.
- 4. To demonstrate accountability and transparency by regularly and publicly disclosing insurance companies progress in implementing the Principles.

Equator Principles (EI): In 2003 the Equator Principles Financial Institutions (EPFIs) adopted the Equator Principles (EI) with the objective of providing benchmarks to the financial industry for determining, assessing, and managing social and environmental risks in project financing. Often large and complex capital-intensive projects encounter social and environmental issues and application of El in a project ensures development of internal social,

environmental policies, procedures, and standards so that negative impacts on the ecosystem and community can be avoided. The El principles apply to financial

products relating to all industry sectors such as project finance advisory services, project finance, project-related corporate loans, bridge loans, project-related refinance, and project-related acquisition finance. Equator Principles apply to any projects whose capital cost is US\$10 million or more.

Ten Principles of Equator Principles

- 1. Review & Categorisation Review and categorise projects into three categories A, B & C, based on the magnitude of potential impacts and risks, in accordance with the environmental and social screening criteria of the International Finance Corporation (IFC).
- . Category A Projects with potentially significant adverse social or environmenimpacts that are diverse, irreversible, or unprecedented.
- . Category B Projects with potentially limited adverse social or environmental impacts that are few, generally site-specific, largely reversible, and readily ad dressed through mitigation measures; and
- . Category C Projects with minimal social or environmental impacts.
- 2. E&S Assessment where the borrower must conduct a Social and Environmental Assessment of the project and also needs to propose mitigation and management measures relevant and appropriate to the nature and scale of the proposed project

- 3. Applicable E&S Standards- need to apply IFC Performance Standards as well as Industry Specific EHS Guidelines.
- 4. E&S Management System & EP Action Plan- establish a Social and Environmental Management System that addresses the management of impacts, risks, and corrective actions required to comply with the applicable host country's social and environmental laws and regulations.
- 5. Stakeholder Engagement- borrower or third-party expert must consult with project affected communities in a structured and culturally appropriate manner, and the project must adequately incorporate any affected communities' concerns.
- 6. Grievance Mechanism- The borrower must inform any affected communities about the mechanism in the course of its community engagement process and ensure that the mechanism addresses concerns promptly and transparently, in a culturally appropriate manner, and is readily accessible to all segments of the affected communities
- 7. Independent Review- an independent social or environmental expert not directly associated with the borrower will review the Assessment
- 8. Covenants- An important strength of the Principles is the incorporation of covenants linked to compliance. Where a borrower is not in compliance with its social and environmental covenants, EPFIs will work with the borrower to bring it back into compliance to the extent feasible, and if the borrower fails to re-establish compliance within an agreed grace period, EPFIs reserve the right toexercise remedies, as they consider appropriate.

- 9. Independent Monitoring & Reporting- require appointment of an independent environmental and/ or social expert, or require that the borrower retain qualified and experienced external experts to verify its monitoring information which would be shared with EPFIs
- **10. Reporting & Transparency-** commits to report publicly at least annually about its Equator Principles implementation processes and experience, considering appropriate confidentiality considerations.

Principles for Responsible Banking (PRB): Banking systems can have both direct and indirect impacts on environmental and social issues. Banks may not have a direct impact for their own operations, but their profitability can be impacted due to the project they lend or select to lend. As a result, the bank's core business of lending capital, and risk assessment and pricing of risk, and recovery of money are exposed to environmental and social issues. Hence, the banking industry is becoming more aware of the environmental issues. The banking industry also recognises that they are laggard when it comes to their own human resource policies, as the banking industry has traditionally under-represented minorities, notably woman and ethnic minorities.

Keeping these factors in consideration, in 2019, UNEP FI launched the Principles for Responsible in 2019, UNEP FI launched the Principles for Responsible Banking with the objective of aligning banking activities with the UNs' Sustainable Development Goals (SDGs) and the social goals set by the Paris Agreement. Under the PRB framework, signatory banks are required to contribute towards social goals and report on positive and negative impacts on society and the environment through the banking business.

PRB expects banking practice must be responsible and give due consideration to the environment, society and economic factors while making investment decisions and extending loans.

Principle 1 Alignment: Align business strategies to individual needs and social goals set in the SDGs and the Paris Agreement and contribute to them.

Principle 2 Impact & Target setting:

Evaluate the increase in positive impacts and the decrease in negative impacts caused by banking operations, and set and publish targets for that purpose

Principle 3 Clients & Customers: Work with customers to encourage sustainable practices and enable economic activity that has a common prosperity for current and future generations

Principle 4 Stakeholders: Actively work with relevant stakeholders to further promote the objectives of the principles

Principle 5 Governance & Culture: Carry out commitments to these rules through effective governance and corporate culture as a responsible bank.

Principle 6 Transparency & Accountability: Appropriately review the implementation of these principles to remain transparent and accountable for positive and negative impacts.

Sustainable Finance Product Categories

- 1. Sustainable Bonds (Green Bonds, Social Bonds, and Sustainability Bonds).
- 2. Sustainable Loans.

3. Sustainability Equity and Index Funds.

Sustainable Bonds are a tradable debt instrument with specific risk, interest, and maturity. Sustainable bonds are mainly categorised as green, social and

sustainability bonds. In addition, there are further subcategories: Blue Bonds (focusing on marine conservation) and transition bonds (to finance transition to low carbon transition).

Sustainable Loans are provided by banks and borrowers and are supposed to be used to fund green projects as specified and defined in the Green Loan Framework of the lender.

Sustainable Equity: Investors choose specific companies whose practices,

processes, and products align with

invertors' sustainability goals or investors interested in sustainability-related issues choose to invest in green or sustainability funds. **Index funds** are a portfolio of securities that allow investors to invest in sustainable, green, or socially responsible companies.

Sustainable Bonds are the essential f inancial instrument for transitioning to a sustainable global economy. Issues of sustainable bonds are governed by the Green Bond Principles (GBP), Social Bond Principles (SBP), Sustainability Bond Guidelines (SBG), and the Sustainability-Linked Bond Principles (SLBP).





Collectively, these frameworks are called the '**Principles**'. As of 2020, the total value of sustainable bonds issuance is USD 594 billion and 97% of all sustainable bond issued globally are aligned with GBP, SBP, SBG and SLBP.

Green Bonds are any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance projects with clear environmental benefits, and which are aligned with the Core Components of the GBP. Eligible Green Project categories include renewable energy, energy efficiency, pollution prevention and control, environmentally sustainable management of living natural resources and land use, terrestrial and aquatic biodiversity conservation, clean transportation, sustainable water and wastewater management, climate change adaptation, the circular economy and/or eco-efficient projects, and Green buildings.

Social Bonds finance projects that directly aim to address or mitigate a specific social issue and/or seek to achieve positive social outcomes, especially but not exclusively for a target population(s) and are aligned with the Core Components of the SBP. Social Project categories include providing and/ or promoting affordable basic infrastructure, access to essential services, affordable housing, employment generation, food security, or socioeconomic advancement and empowerment.

Sustainability Bonds are any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance a combination of Green and Social Projects and which are aligned with the Core Components of the GBP and SBP.

Sustainability-Linked Bonds are any type of bond instrument for which the financial and/or structural

characteristics (i.e. coupon, maturity, or repayment amount) can vary depending on whether the issuer achieves predefined Sustainability/Environmental and/or Social and/or Governance (ESG) objectives within a predefined timeline, and which are aligned with the Core Components on the SLBP.

It is possible to combine a "use of proceeds" approach with a Sustainability-Linked Bond approach, if an issuer chooses to earmark the proceeds of their sustainability-linked bond to specific projects, and where these are eligible green and/or social projects, by aligning their bonds simultaneously with all the Core Components of the GBP/SBP/SLBP

Green, Social, Sustainability and

Sustainability-Linked Bonds are regulated instruments subject to the same capital market and financial regulation as other listed fixed income securities. Subject to any applicable law or regulation, all types of issuers in the debt capital markets can issue a Green, Social, Sustainability or Sustainability-Linked Bond as long as it is aligned with the Core Components of the GBP/ SBP/SLBP.

Sustainable Bonds ((Green Bond Principles (GBP), Social Bond Principles (SBP), Sustainability Bond Guidelines (SBG)) Principles and concepts.

Use of Proceeds – Utilisation of the proceeds of the bond for eligible Green or Social Projects, which should be appropriately described in the legal documentation of the security. All or a proportion of the proceeds are or may be used for refinancing. In short, in a legal document it is clearly states `use of proceeds' are utilised for the purpose of green or social benefits.

Process for Project Evaluation and Selection

the issuer of a Green or Social Bond should clearly communicate to investors:

- The environmental or social sustainability objectives of the Projects
- The process by which the issuer determines how the projects fit within the eligible Green or Social Project categories and
- Complementary information on the processes by which the issue identifies and manages perceived social and environmental risks associated with the relevant Project(s)

Management of Proceeds - The net

proceeds of the Green or Social Bond, or an amount equal to these net proceeds, should be credited to a sub-account, moved to a sub-portfolio or otherwise tracked by the issuer in an appropriate manner, and

attested to by the issuer in a formal internal process linked to the issuer's lending and investment operations for eligible Green or Social Projects.

So long as the Green or Social Bond is outstanding, the balance of the tracked net proceeds should be periodically adjusted to match allocations to eligi-

ble Green or Social Projects made during that period. The issuer should make known to investors the intended types of temporary placement for the balance of unallocated net proceeds.

Reporting – Issuers should make, and keep, readily available, up to date information on the use of proceeds to be renewed annually until full allocation, and on a timely basis in case of material developments. The annual report should include a list of the projects to which Green or Social Bond proceeds have been allocated, as well as a brief description of the projects, the amounts allocated, and their expected impact.

In 2016, Europe had the highest proportion of investment in sustainable investment, followed by the USA, Canada, Australasia, and Japan. In 2020 the USA overtook the rest of the regions, followed by Europe, Japan, Canada, Australasia.

Investors' Strategies and Approaches for Sustainable Finance

Sustainable finance products or sustainable assets promise to provide long-term sustainable returns after taking into consid eration environmental, social and governance factors. At the same time, investors in sustainable assets expect that the companies in which they are investing will be agents of social change, will have strong corporate governance, will improve environmental and social performance, and will ensure the financial implications of sustainability-related issues are taken care-off.

Hence, investing in sustainable finance

requires strategy. Investment decision making is itself a complex process. Therefore, the question of what the decision-making process should be taken to select and reject an asset as a sustainable asset or how investors can consider social and environmental issues in the process of

their investment decision-making.

There are four sustainable finance investor strategies and three additional approaches to sustainable finance investment decision-making.

Four Investors' Strategies for Sustainable Finance:

Exclusionary or Negative screening:

Investor excludes or rejects certain investments or funds (these can be from specific sectors, companies, countries or issues) from portfolios based on values and norms or moral principles. The process can exclude products and services such as gambling, adult entertainment, weapons, and tobacco. or company practices that involves animal testing, violation of human rights, and corruption.

Best-in-class investment: Selecting those sectors, companies, countries, that lead their peer groups in respect of sustainability performance or have positive ESG performance.

Norms-based investment: Excluding

investment in companies or government debts thar fail to abide by standards set by the UN Global Compact, the Kyoto Protocol or the UN Declaration of Human Rights or International Labour Organisation.

Thematic Investment: Investing in

companies or assets that are contributing and advancing sustainable solutions such as green technologies, sustainable agriculture, green buildings, and gender equity diversity).

Additional approaches are ESG integration:

Systematic and explicit inclusion of environmental, social and governance factors into financial analysis by investment managers. The process focuses on assessing the potential positive and negative financial impacts of ESG issues and incorporating these data in valuing and assessing a company or asset.

Governance impact and active ownership:

Investors or shareholders actively engage with senior management to highlight specific sustainability issues and to encourage companies to improve their sustainability issues and policies.

Impact investment: The Global Impact Investing Network defines impact investment as "investments made into companies, organisations and funds with the intention to generate social and environmental impact alongside a financial return". In other words, providing capital to those companies or projects that have clear social or environmental goals or intentions for community wellbeing of traditionally underserved individuals or communities or targeted lending activities (also called **Community Investing**).

In 2020, ESG integration was the most adopted strategy across the world to select and invest in sustainable assets, followed by negative or exclusionary screening, corporate engagement and shareholder action, norms-based screening, positive and best in class screening, sustainability themed investing and impact investing.

In the USA, ESG integration and negative or exclusive screening were the most popular adopted strategies in 2020. In Europe, negative or exclusive screening and corporate engagement and shareholder action were the most popular adopted strategies during the same period.

Sustainable Investment's Facts & Figure

Over the years sustainable investment in the economy has grown manyfold. As of 2020, the value of global sustainable investment stands at \$35.3 trillion, and it has grown by approximately 55% between 2016 and 2020.

In 2016, Europe had the highest proportion of investment in sustainable investment, followed by the USA, Canada, Australasia, and Japan. In 2020 the USA overtook the rest of the regions, followed by Europe, Japan, Canada, Australasia.

On overall, the USA and Europe constituted 80% of global sustainable investing assets between 2018-2020.



Figure-7: Growth of Sustainable Investment







Figure-9: Sustainable Investment in 2020 by Region (by percentage)

Aligning with this growing trend, the proportion of sustainable investment in the total category of **'Assets Under Management' (AMU)** grew by 54 % between 2016 and 2020

Figure-10: Proportion of Sustainable Investments in "Asset Under Management" (AMU) category (by percentage)



The global trend suggests sustainable debt instruments (Green, Sustainability, Social, Sustainability-linked bonds, and transitions) are used to invest in renewable energy, carbon neutrality, solar, environmental, water, green innovation, sustainable awareness, SDGs, positive impact, socially responsible investing, affordable housing, education, gender equality, SDG housing, youth, employment, blue transitions, green transitions, and low-carbon transitions health care, SDG housing, youth, employment, blue transitions, green transitions, and low-carbon transitions.

| GREEN | SUSTAINABILITY | SOCIAL | SUSTAINABILITY-LINKED BOND | TRANSITION |
|-------------------------|--------------------------------|---------------------|--------------------------------|-----------------------|
| Blue | SDG | Affordable Housing | Sustainability-linked | Blue Transition |
| Environmental & Climate | Sustainability Awamess | Education | ESG-linked | Green Trasition |
| Carbon Neutral | ESG | Gender Equality | SDG-linked | Low-carbon Transition |
| Renewable Energy | Socially Responsible Investing | Healthcare | Social Impact-linked | |
| Renewable Energy | Positive Impact | SDG Housing | Social & Sustainability linked | |
| Water | | Town Revitalisation | | |
| | | Youth & Employment | | |

Table-2 Components of Sustainable Debt Instruments

As of 2021 Green bonds are the biggest sustainable debt instrument in terms of financial value and they account for about 43% of the total USD 3.75 trillion sustainable debt market, followed by social, sustainability, sustainability-linked bonds, and transition bonds. Green bonds are also the major debt instrument in terms of the number of issuers, number of instruments, number of countries of issue and in terms of the number of currencies issued.

| | GREEN | SUSTAINABILITY | SOCIAL | SUSTAINABILITY-LINKED BOND | TRANSITION | TOTAL |
|-------------------------------------|-------|----------------|--------|----------------------------|------------|-------|
| Total size of market US in Trillion | 1.6 | 0.520 | 0.538 | 0.135 | 0.96 | 3.753 |
| Number of issuers | 2045 | 425 | 861 | 225 18 | | 3571 |
| Number of instruments | 9886 | 2323 | 3471 | 317 32 | | 16029 |
| Number of countries issued | 80 | 51 | 44 | 37 | 12 | 224 |
| Number of currencies | 47 | 38 | 33 | 16 | 7 | 141 |

Table-3 Size of Sustainable Debt Instruments in 2021

The Longitudinal trend between 2015-2021 suggests that most green bonds are generated from Europe. Supranational and Latin America are major issuers of sustainability debts, whereas Europe are major sources of Social Bonds, 88% of Non-financial corporates issues Sustainability Linked bonds, and lastly Europe and Asia-Pacific are major issues of transition bonds.

Most of the sustainable debt instruments are issued in Euro or USD with a maturity tenor of 5 to 10 years. USA and China are the issuers of green bonds, while France is the major issuing country for social bonds, and Italy leads in issuing sustainability-linked bonds. The Chilian government is the only sovereign country in the world that issues green, social and sustainability linked sustainable debt.

Over the decades, sustainable finance has grown steadily, however development of sustainable taxonomies in each jurisdiction is essential to provide clarity and guidance to the financial markets in which economic activities and investment assets can be termed sustainable investment and to avoid camouflage or greenwashing. In this context, the EU, Russia, China, and ASE-AN countries have a sustainable taxonomy.

The UK and South Africa have draft taxonomies, while Canada, India, Brazil, New Zealand, and Chile are in the process of development of such taxonomies. Lastly Australia, and Mexico are at the discussion stage of such development. Many countries are experiencing major food and energy crises due to high inflation following the Russian invasion in of Ukraine and, at the same time, the conflict has also triggered a surge in demand for coal. Both the pandemic and conflict have also prompted communities to shift towards sustainability and renewal energy. For example: the Ukraine conflict is also acting as

Table-4 Characteristics of Sustainable Debt Markets (2015-2021)

| | GREEN | SUSTAINABILITY | SOCIAL | SUSTAINABILITY-LINKED BOND | TRANSITION |
|--|--------------------------------------|------------------------------|------------------------|---|-----------------------|
| Major issuer | Europe, Asia-PAcific & North America | Supranational, Latin America | Europe & Supranational | Europe (Italy), Asia-Pacific | Europe & Asia-Pacific |
| Purpose of use | Energy, Buildings, Transport | N/A | N/A | Consumer Discretionary, Utilities & Industrials | N/A |
| Tenor of maturity (mostly) | 5 to 10 years | 5 to 10 years | 5 to 10 years | 5 to 10 years | N/A |
| Issueing Currencies (mostly) | Euro, USD | USD, Euro & Pound | Euro & USD | Euro & USD | N/A |
| Size of bond in term of value (mostly) | USD 170 to 250 million | USD 1 billion | USD 500m to 1bn | USD 500m to 1bn | N/A |

Conclusion

Today's world is at the crossroads of challenges and opportunities. We are more than half-way into the implementation of the 2030 Sustainable Development Goals. In addition, we are also committed to comply with the Paris Agreement by 2030. However, as the world economy has been hit by two back-to-back events, such as the global pandemic and the Russia-Ukraine military conflict, the global effort for advancing sustainable development, including determination to fight back against climate change, has also faced a setback. a catalyst for Europe to rapidly shift away from fossil fuels.

In this global context, interlinking the social, environmental, and economic dimensions of development has become paramount and the need for sustainable finance is even more necessary than before to support greener, inclusive, and resilient economic development.

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