RAIN Alliance Sustainability Workgroup

Sustainability Glossary

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Terms and Definitions	Source
3 E's of sustainability: These are Economy, Ecology and Equity. To achieve sustainable development the three E's of sustainability need to be in balance between each other. Thus sustainability is achieved when an individual's or an organization's actions are helping to develop the economy, promoting social equity, and protecting the integrity of the environment for future generations.	Rain White Paper: Defining Sustainability for RAIN RFID Importance, Challenges, and Potential
3 P's of sustainability These are People, Profit, and Planet. Those are the 3 principles upon which sustainability is built and sustainable development achieved. The three Ps are used to assess the sustainability of an organization, product, or service.	Rain White Paper: Defining Sustainability for RAIN RFID Importance, Challenges, and Potential
Bio products or bio-based products are materials derived from biological sources, excluding fossilized or geological materials. They include plant-based, animal-based, and microbial-derived substances. Bio-based products offer sustainability benefits, such as reduced CO2 emissions and lower toxicity, compared to traditional materials. They are increasingly used in various industries, from everyday items to advanced technologies.	European Commission: Internal Market, Industry, Entrepreneurship and SMEs
Biodegradation is the breakdown of organic matter by microorganisms, such as bacteria and fungi.[] It is generally assumed to be a natural process, which differentiates it from composting. Composting is a human-driven process in which biodegradation occurs under a specific set of circumstances.	Rain White Paper: Defining Sustainability for RAIN RFID Importance, Challenges, and Potential
Carbon footprint: A term used popularly to refer to the overall quantity of CO2 and other greenhouse gas emissions caused directly and indirectly by a product or an activity, or associated with the activities of an individual or an organisation. Alternatively an analysis focusing on the life-cycle climate-change impacts of a product or service. Therefore, results are typically presented as a single indicator in equivalent kilograms of carbon dioxide (kg CO_2 e.g.). No mandatory EU rules exist for calculating carbon footprints. Guidance is included in the ISO 14067 standard.	European ECA
Circular economy: A **CE** aims to keep materials and products in use for as long as possible, minimizing waste and maximizing resource efficiency. It involves restorative or regenerative industrial processes and economic activities, redesigning materials and products to be less resource-intensive, and repurposing waste as a resource. Embraced within sustainable materials management, the circular economy approach seeks to reduce negative lifecycle impacts, decouple material use from economic growth, and address climate change. By transitioning to a circular economy, we can protect the environment, improve economics, and promote social justice by reducing environmental and health impacts on underserved communities.	EPA: United Nations Environmental Protection Agency's website
Climate Change: According to the United Nations, Climate change refers to long-term shifts in	United Nations'

temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas.	website
Climate Disclosure Project: CDP is a not-for-profit charity that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts. The world's economy looks to CDP as the gold standard of environmental reporting with the richest and most comprehensive dataset on corporate and city action.	CDP's website
Climate Risk: it encompasses two main categories: transition risks and physical risks. Transition risks involve challenges associated with the shift to a lower-carbon economy, including policy and legal uncertainties, technological disruptions, market fluctuations, and reputational concerns. On the other hand, physical risks stem from the direct impacts of climate change, such as extreme weather events and long-term shifts in climate patterns, leading to asset damage, supply chain disruptions, and increased operational costs.	EPA: United Nations Environmental Protection Agency's website
Compostable refers to a material, often plastic, that can break down into biomass, organic and inorganic compounds, CO2, and water under specific composting conditions. These conditions may include either home composting or industrial composting facilities. In home composting, the material should undergo 90% degradation by microorganisms and oxygen within 12 months at ambient temperature. Industrial compostable materials, which adhere to the EN13432 standard, must biodegrade by at least 90% within 6 months in industrial facilities at temperatures of 50–60°C, in the presence of oxygen and microorganisms. It's important to verify with local authorities whether compostable materials can be disposed of in food waste collection systems.	Royal Society of Chemistry's brochure: Compostable and Biodegradable plastics
Corporate Social Responsibility (CSR): The continuing commitment by businesses to behave ethically and contribute to economic development while improving the quality of life of the workplace as well as the local community and society at large.	EPA Glossary for Sustainability
Cost Benefit Analysis (CBA): An estimate of the total equivalent money value of the benefits and costs to the community of projects. A CBA is used to establish whether a given project is worthwhile.	EPA Glossary for Sustainability
Cradle-to-cradle Manufacturing: An approach to the design of products that seeks to be essentially waste-free. All materials used are designated as either technical nutrients, which are non-toxic synthetic materials that are reused in continuous cycles, or biological nutrients, which can be disposed of into natural environments to decompose into the soil.	EPA Glossary for Sustainability
Cumulative Energy Requirements Analysis: A process to quantify the primary energy requirement for products and services from a lifecycle perspective.	EPA Glossary for Sustainability
Decarbonisation is the removal or reduction of all human-made carbon emissions into the atmosphere. It is achieved through cross-cutting measures to reduce or eliminate carbon emissions from an organization's or individual's activities. Decarbonisation differs from climate neutrality because it seeks to reduce absolute carbon emissions and intensity.	PlanA Glossary
Developed-to-be-recyclable refers to packaging that is recyclable and has proven to be recyclable in practice and at scale. Whether or not it's able to be recycled in practice depends very much on the local recycling infrastructure. May lead to greenwashing.	EPA Glossary for Sustainability
Digital Product Passport The DPP was defined by the European Commission as a "product-specific data set," which would structure the disclosure requirements of products. It can provide information on the origin, composition, repair, and disassembly options of a product as well as how the various components can be recycled. All this information brings a new level of transparency that not only improves communication between different actors in the value chain (e.g. producers and recyclers), but also boosts consumer consciousness and empowers better decision making. This important disclosure mechanism would enable upscaling of circular economy strategies and inform consumers and stakeholders of the sustainability characteristics of a product. Packaging will be included in DPPs.	Generation Climate Europe
Eco-Friendly (also environmentally friendly, nature friendly, and green) are terms that refer to objects that people buy (called *goods*), services, laws, and rules that either do not harm the	The United Nations'

environment or do very little harm to it. However, these terms do not have standard definitions and be intentionally used for misleading purposes and be easily misunderstood.	website
Eco-label: A visual communication tool that indicates environmentally preferable products, services, or companies that meet specific standards. Different types of eco-labels include pass-fail; tiered; multi-attribute; and single attribute.	EPA Glossary for Sustainability
Ecological Footprint: The total amount of land, food, water, and other resources used by, or the total ecological impact of, a person or organization's subsistence; usually measured in acres or hectares of productive land.	EPA Glossary for Sustainability
Ecosystem is a dynamic ecological community encompassing both living and nonliving elements within a specific area. These components interact in complex ways, forming a cohesive unit where biological, physical, and chemical factors coalesce. Integral to ecosystems is the delicate balance maintained among their members, essential for their sustainability and vitality. External factors, including human intervention and natural disturbances, can disrupt this equilibrium, posing threats to the ecosystem's health and stability.	National Ocean services' website
End of Life (EOL) refers to the life cycle stage describing the last portion of a product's useful life. This can either be disposal, reuse or recycling.	Earthshift Global
Environmental attribute: The characteristics or elements of products or services that determine the type of extent of their short- and long-term impacts on the environment and/or human health. Environmental attributes include, for example, biodegradability, recyclability, volatile organic compound (VOC) emissions, energy efficiency, water efficiency, indoor air emissions, hazardous waste, and carcinogenicity.	EPA Glossary for Sustainability
Environmental Impact Assessment (EIA): The process of identifying and evaluating the consequences of one economic activity on the environment and, when appropriate, mitigating those consequences. An EIA is used as an aid to public decision-making on larger projects.	EPA Glossary for Sustainability
Environmental Product Declaration (EPD): A declaration of a product's performance with regard to different environmental parameters during the product's life cycle. An EPD requires the gathering of quantified environmental data for a product with pre-set categories of parameters (raw material, energy use, etc.). Also includes additional product and company information.	EPA Glossary for Sustainability
Environmental Risk Assessment (ERA): The examination of technology-related risks that threaten ecosystems, animals and people.	EPA Glossary for Sustainability
Environmental Sustainability is one of the three sustainability pursuits intended to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations. The other two are economic and sociopolitical sustainability.	EPA Glossary for Sustainability
Environmentally Preferable Products: Products or services that have a lesser or reduced effect on human health and the environment as compared to competing products or services that serve the same purpose. This comparison involves the impacts of a product or service's raw materials, manufacturing, packaging, distribution, use, reuse, operation, maintenance, and disposal.	EPA Glossary for Sustainability
GHG Emissions. The quantities of GHG emitted by industrial and other human activities may be measured and regulated to address global warming.	US EPA GHG
GHG Removals include natural processes such as photosynthesis, and active human activities such as carbon dioxide capture and sequestration. Net atmospheric neutrality will be achieved when removals match emissions. A return to cooler climates requires removals to be much greater than emissions.	EPA GHG
Global Commitment, The. This is an initiative from EMF & UN Environment Programme that unites businesses and governments around the world to create a plastic system that works. Represented among the hundreds of signatories are producers, brands, retailers, investors, recyclers, governments, nongovernmental organisation, and others.	EMF Global Commitment

Green Design: The design of products, services, buildings, or experiences that are sensitive to environmental issues and achieve greater efficiency and effectiveness in terms of energy and materials use.	EPA Glossary for Sustainability
Green/Sustainable Procurement: A process for buying products with a reduced environmental impact compared to similar products.	EPA Glossary for Sustainability
Green House Gases (GHG) are gases that trap heat in the atmosphere. They include carbon dioxide, methane, nitrous oxide and a number of fluorinated gases. Each has a measured global warming potential (GWP) which relates it potential effect to its mass.	US EPA GHG
Greenwashing involves the deceptive practice of misleading the public about a company's environmental efforts, creating a false perception of environmental responsibility. It obstructs genuine efforts to address climate change by promoting misleading solutions that divert attention from real action. Tactics of greenwashing include vague or exaggerated claims, misleading labels, and emphasizing minor improvements while ignoring broader environmental impacts.	The United Nations' website
Harmonization: A process whereby national or regional standards and requirements are aligned, including product and manufacturing standards and conformance assessment requirements. Harmonization does not necessarily require that standards be identical in each jurisdiction, but rather that they be consistent or compatible.	EPA Glossary for Sustainability
Harmonized Standards: Standards approved by different standardizing bodies that establish interchangeability of products, processes, and services, or mutual understanding of test results or information provided according to these standards.	EPA Glossary for Sustainability
Internet of things (IoT) describes physical objects (or groups of such objects) with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the Internet or other communications networks. RAIN RFID is the most common connection between the "thing" and the "internet".	RAIN IOT
Inventory Analysis. A major business function that RAIN technology excels with. It is available from many RAIN Alliance members	RAIN Alliance
Life Cycle Analysis (LCA), as defined by ISO 14040, evaluates the environmental impacts of a product system throughout its lifecycle by analyzing inputs, outputs, and potential environmental effects. It encompasses four main phases: goal and scope, inventory analysis, impact assessment, and interpretation. In the goal and scope phase, the study's aims and methodological choices are defined. The inventory analysis involves data collection and quantification of inputs and outputs. Impact assessment associates inventory results with environmental impact categories, while interpretation interprets these results and addresses uncertainty. Further, the Life Cycle Impact Assessment (LCIA) phase within LCA involves classification, characterisation, normalisation, and weighting steps to evaluate the environmental performance of a product, enabling comparison and interpretation of results.	European commission's website: European Platform on LCA | EPLCA
Life Cycle Assessment: Compilation and evaluation of the inputs, outputs, and the potential environmental impacts of a product system throughout its life cycle. The comprehensive examination of a product or service's environmental aspects and potential impacts throughout its lifetime, including raw material extraction, transportation, manufacturing, use, and disposal.	EPA Glossary for Sustainability
Life Cycle Cost: All costs associated with the defined life cycle of a product, including capital costs, installation costs, operating costs, maintenance costs, and disposal costs. This definition does not include external costs (i.e., those not borne directly by the entity that owns and operates a product/service, such as environmental costs to society at large).	EPA Glossary for Sustainability
Life Cycle: Consecutive and interlinked stages of a product system, from raw material acquisition or generation of natural resources to final disposal. Life cycle stages include raw material extraction, manufacturing/production, transportation, use, and disposal/recycling.	EPA Glossary for Sustainability
Material Input per Unit Service (MIPS): The weighted cradle to-grave material inputs of a good, as defined per units of services obtainable. This concept can be used to measure the eco-efficiency of a product or service. The calculation takes into account materials required to produce a product or	EPA Glossary for Sustainability

service. The total material input (MI) is divided by the number of service units (S). For example, in the case of a passenger car, the number of service units is the total number of passenger-miles during the whole life span of the vehicle. The lower the material input per mile, the more eco-efficient the vehicle.	
Near-infrared (NIR) optical sorting is a technology that enables plastic packaging to be mechanically separated by polymer type into different plastic recycling streams. Although not perfect it improves process speed and greatly reduces costs. One element of designing packaging to be recyclable is to facilitate better sorting by, for example NIR or other automated processes.	The Association of Plastic Recyclers' document: Near Infrared (NIR) Sorting in the Plastics Recycling Proces
Net Carbon Emitter Term used to describe a process, factory, business, locality or natural region that is a net emitter of carbon (as CO2 or CH4) to the atmosphere than it captures. Some forests are becoming net emitters. Clearly the accuracy depends upon the ability to monitor all related flows, so prone to error from assumptions.	Oceanic and Atmospheric Research's website
Net Carbon Sink term used to describe a process, factory, business, locality or natural region that captures more carbon (as CO2 or CH4) from the atmosphere than it emits. Some farmlands are being transformed from net emitter to net carbon sinks through sustainable practices. It is also a goal for climate responsible municipalizes and businesses. It is very challenging to be comprehensive, especially for localities or regions.	Food and Agriculture Organization of the United Nations' website
Net Zero Economy refers to the balance between the amount of greenhouse gas produced and the amount removed from the atmosphere for a business sector, region or country. There is a global initiative to have the Energy Sector be Net Zero by 2050.	The United Nations' website
Pollution Prevention: Practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other resources, or protection of natural resources by conservation, including: Reduction in the amount of any hazardous substance, pollutant, or contaminant into the environment prior to recycling, treatment, or disposal. Reduction in hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.	EPA Glossary for Sustainability
Post-consumer recycled (PCR) plastic: Materials that have served their purpose (have been used by the consumer) and subsequently been recycled to produce a new product.	Assoc. Plastic Recyclers
Product Carbon Footprint Carbon footprint for a defined product or item. See Carbon Footprint	European ECA's special report: How do the EU institutions and bodies calculate, reduce and offset their greenhouse gas emissions?
Product Stewardship: A product-centered approach to environmental protection that calls on those in the product life cycle (e.g. manufacturers, retailers, users, and disposers) to share responsibility for reducing the environmental impacts of products. Most effective when managed by the manufacturer for high impact products.	EPA Glossary for Sustainability
RAIN The RAIN Alliance is a global collection of companies and organizations which develop RAIN technology solutions addressing applications across many vertical markets	RAIN ALLIANCE

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Recyclable means that instead of being discarded a product or material can be collected and transformed in a reusable form. Common examples encountered with RFID are packaging, tyres, textiles, and clothing. Packaging in particular has design standards that facilitate recycling, i.e. packaging with the right attributes for successful collection, sorting, and recycling in the real world. However, being actually recycled is very dependent on local and regional factors such as pickup or drop off, and the type of material. In many US regions less than 20% of collected post-consumer plastic may be reused. RAIN tags functional at or near end of life are facilitating recycle and will improve recover rates.	EPA's website: Recycling Basics and Benefits
Recycling streams refer to the categories that materials are sorted into to prepare for sale into the market. In terms of packaging, common streams are aluminium, paper, polyolefins (PO) for flexible plastics and PET for rigid plastics.	EPA's website
Recycling: The process of converting waste into a reusable material or return a material to a previous state in a cyclic process.	EPA Glossary Sustainability
Responsibly Sourced Materials. Raw materials sourced from socially and environmentally responsible suppliers, as confirmed by certification schemes, such as ASI (Aluminium Stewardship Initiative) or FSC® (Forest Stewardship Council).	Committee on Sustainability Assessment's website
Reusable Packaging that is refilled or used again for its original purpose.	Reusable Packaging Association's website
Science Based Targets Initiative (SBTI) is an organisation that has developed a guidance which sets a path for the financial sector to effectively collect and manage a variety of data points and address data gaps, while creating internal structures that enable the implementation of science-based targets by businesses worldwide, in their efforts to combat global warming and other ecological calamities.	Science-based Targets Org
Science-based targets provide a clearly-defined pathway for companies and financial institutions to reduce (GHG) emissions, helping prevent the worst impacts of climate change and future-proof business growth. Targets are considered 'science-based' if they are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement – limiting global warming to 1.5°C above pre-industrial levels.	Science Based Targets Org
See first entry	
Single-stream recycling A system in which all materials to be recycled are collected in one mixed container, instead of being pre-sorted. It tends to encourage more items to be put out for recycling, but adds cost to the process and can negatively impact the quality of the recycled materials.	EPA Glossary for Sustainability
Supply Chain Traceability refers to the ability to track and trace the movement of products, components, or ingredients through all stages of production, processing, and distribution within a supply chain. It involves documenting and verifying every step of the journey, from raw materials sourcing to final delivery to the end consumer. This practice enhances transparency, accountability, and visibility within supply chains, enabling companies to identify potential issues such as quality control problems, ethical concerns, or environmental impacts.	European commission's website
Supply Chain Transparency involves openly sharing detailed information about the processes and components involved in a supply chain, both internally and externally. It encompasses data collection, risk assessment, and communication with stakeholders to ensure adherence to regulations, mitigate risks, and foster trust. As demands for ethical sourcing and environmental responsibility rise, transparency becomes increasingly critical for businesses. Despite challenges like competitive pressures and data accuracy, embracing transparency offers benefits such as regulatory compliance, risk mitigation, enhanced reputation, and improved operational efficiency.	Harvard Business Review's article

Sustainability Accounting Standards Board (SASB) is a non-profit organization, founded in 2011 by Jean Rogers to develop sustainability accounting standards. Investors, lenders, insurance underwriters, and other providers of financial capital are increasingly attuned to the impact of environmental, social, and governance (ESG) factors on the financial performance of companies, driving the need for standardized reporting of ESG data.	SASB
Sustainability Stewardship Evaluation Tools like Amcor's ASSET can be used to generate life-cycle data that enables users to compare different materials options. ASSET is specifically for packaging, so of value to many RAIN tag users. It compares the performance of a brand's current packaging with the proposed packaging, looking at everything from non-renewable primary energy demand and carbon footprint to water consumption and weight.	Amcor ASSET
Sustainability strategy is the integration of economic, environmental, and social aims into a firm's goals, activities, and planning, with the aim of creating long-term value for the firm, its stakeholders, and the wider society.	Major Sustainability's website (Penn State University)
Sustainability: A concept based in the principle that humans depend on the natural environment for survival and well-being, and that humans and nature can exist in productive harmony. Sustainability is the conditions that ensure that human impact on the environment is sufficiently mitigated in pursuit of the protection of natural resources and of future generations' access to water, material, resources, and social and economic requirements.	EPA Glossary for Sustainability
Sustainable Development encompasses environmental (or ecological) sustainability, economic sustainability, and sociopolitical sustainability developments	UN Sustainable Development
Sustainable Development Goals (SDGs). The 17 SDGs are a call for action by all countries – poor, rich and middle-income – to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.	UN Sustainable Development
Task Force on Climate-related Financial Disclosures (TCFD) was created by The Financial Stability Board to improve and increase reporting of climate-related financial information.	TCFD
Triple Bottom Line: A phrase describing a company's improved top line financial performance over the long term due to sustainable business practices, including less capital investment and increased revenues. The triple bottom line refers to environmental, social, and economic sustainability. (See 3Ps)	EPA Glossary for Sustainability
Waste Hierarchy ranks waste management options according to what is best for the environment. It gives top priority to preventing waste in the first place. When waste is created, it gives priority to preparing it for re-use, then recycling, then recovery, and last of all disposal (e.g. landfill).	UK Govt Publication
Zero Waste: A system-wide approach that seeks to maximize recycling, minimize waste, reduce consumption, and ensure that products are designed to be reused, repaired, or recycled back into the environment or marketplace.	EPA Glossary for Sustainability

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ABOUT RAIN RFID ALLIANCE

The RAIN RFID Alliance is an organization supporting the universal adoption of RAIN UHF RFID technology. A wireless technology that connects billions of everyday items to the internet, enabling businesses and consumers to identify, locate, authenticate, and engage each item. The technology is based on the EPC Gen2 UHF RFID specification, incorporated into the ISO/IEC 18000-63 standard.

Join the RAIN RFID Alliance to enable connectivity for your business and consumers: identify, locate, authenticate, and engage items in our everyday world. For more information, visit www.RAINRFID.org.

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If you are interested in learning more about the RAIN RFID Alliance, contact us at info@rainrfid.org.