May 2025

The Food Value Chain Criteria

Climate Bonds Standard and Certification Scheme

Final Criteria Document

Revision	Date	Summary of changes
0.1	13/02/2025	Draft for public consultation
	30/05/2025	Final Document for Publication

List of acronyms and definitions

Acronyms

AHRI	Air-conditioning, Heating and Refrigeration Institute
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
CBS	Climate Bonds Standard
CBSB	Climate Bonds Standard Board
CO_2	Carbon dioxide
CO_2eq	Carbon dioxide equivalent
EU	European Union
FSC	Forest Stewardship Council
FVC	Food Value Chain
GAFSP	Global Agriculture and Food Security Program
GHG	Greenhouse gas
GWP	Global warming potential
HFC	Hydrofluorocarbon
IFC	International Finance Corporation
IPPC	Intergovernmental Panel on Climate Change
ISCC	International Sustainability and Carbon Certification
ISO	International Standards Organisation
IWG	Industry working group
KPI	Key performance indicator
LCA	Life-cycle assessment
LED	Light-emitting diode
PEFC	Program for Endorsement of Forest
RSB	Round Table for Sustainable Biomaterials
RTRS	Round Table of Responsible Soy Association
SBTi	Science Based Targets initiative
SFI	Sustainable Forestry Initiative
SLB	Sustainability-linked bond
SLD	Sustainability-linked debt
TWG	Technical working group
UoP	Use of proceeds

Definitions

Adaptation and resilience (A&R) criteria: Rules or principles for evaluating and preventing physical climate risk, as well as assessing and reducing the vulnerability of an asset or entities to the effects of climate changes. These rules generally guarantee that the activities do no significant harm to other assets within their system boundaries covering the area affected by the activity.

Applicant: The term or name for any potential bond issuer or non-financial corporate entity that might seek Certification under the Food Value Chain Criteria.

Certified entity: The entity or part thereof which is being certified under the Climate Bonds Standard. Currently, Entity Certification is limited to non-financial entities or segregated segments thereof, for which Climate Bonds has Climate Bonds Standard Sector Criteria for Entity Certification. Entities are not eligible for Certification under the Food Value Chain Criteria.

Circular CO_2: Carbon dioxide that has been captured or removed from the atmosphere and made available for new uses.

Climate Bond Certification: allows the applicant to use the Climate Bond Certification mark in relation to that bond. Climate Bond Certification is provided once the independent CBSB is satisfied the bond complies with the CBS.

Climate Bonds Initiative (Climate Bonds): An investor-focused not-for-profit organisation, promoting large-scale investments that will deliver a global low-carbon and climate resilient economy. Climate Bonds seeks to develop mechanisms to better align the interests of investors, industry, and government to catalyse investments at a speed and scale sufficient to avoid dangerous climate change.

Climate Bonds Standard (CBS): A screening tool for investors and governments that allows them to identify green bonds, the proceeds of which are being used to deliver climate change solutions. This may be through climate mitigation impact and/or climate adaptation or resilience. The CBS is made up of two parts: the parent standard (CBS v4.2) and a suite of sector-specific eligibility Criteria. The parent standard covers the Certification process and pre-and post-issuance requirements for all Certified bonds, regardless of the nature of the capital projects. The Sector Criteria detail specific requirements for assets identified as falling under that specific sector. The latest version of the CBS is published on the Climate Bonds website.

Climate Bonds Standard Board (CBSB): A board of independent members that collectively represents USD34tn of assets under management. The CBSB is responsible for authorising (i) revisions to the CBS, including the adoption of additional Sector Criteria; (ii) approved verifiers; and (iii) applications for Certification of a bond under the CBS. The CBSB is constituted, appointed, and supported in line with the governance arrangements and processes as published on the Climate Bonds website.

Climate change: A change in global or regional climate patterns attributed to the increased levels of CO_2 in the atmosphere, produced mainly by the combustion of fossil fuels.

Climate goals: Objectives that aim to reduce GHG emissions to limit the global temperature increase to 1.5°C above pre-industrial levels.

Climate mitigation performance targets: The performance targets that define the measurable climate mitigation performance to be achieved.

Climate adaptation and resilience: Measures or assessments related to protecting communities or ecosystems from the effects of climate change. Adaptation refers to protection, while resilience is the ability to adapt and recover from the impacts of climate change.

Climate targets: Limits established by scientists and policymakers in plans to combat climate change.

CO_2 equivalent: A unit to measure the effect of all greenhouse gases according to their global warming potential that expresses the warming effect of each greenhouse gas over a set period of time (usually 100 years) in comparison to CO_2. Thus, an amount of a GHG can be expressed by the quantity of CO_2 that will have the equivalent warming effect over 100 years.

Compostable packaging/compostable plastic: Packaging that undergoes degradation by biological processes during composting to yield CO_2, water, inorganic compounds and biomass at a rate consistent with other known compostable materials and leave no visible, distinguishable or toxic residue (as defined in in ISO 17088).

Critical interdependencies: The asset or activity's boundaries and interdependencies with surrounding infrastructure systems. Interdependencies are specific to local context but are often connected to wider systems through complex

relationships that depend on factors 'outside the asset fence' that could cause cascading failures or contribute to collateral system benefits.

Decarbonisation pathways: Transformation processes, strategies, or indications to be implemented in the energy sector aiming to reduce emissions and the use of fossil fuels. They involve measures such as shifting the energy mix, increasing energy efficiency, utilising the circular economy, or managing demand for energy.

Decarbonise: Move away from energy systems that produce carbon dioxide and other greenhouse gas emissions and remove the amount of carbon gaseous compounds in the atmosphere.

Developing countries/emerging economies: As defined by the UN, where developing countries are characterised by a low level of income, structural impediments to growth, and a need for special measures to address these problems.

Emission intensity: Volume of emissions per unit of a representative factor in the assessed sector, which for example for food freight transport is measured as ton per Kilometre tkm, representing the transport of 1t of goods by a given transport mode over a distance of 1km. So the emissions intensity is the grams of CO_2 eq per ton of food transported over one kilometre: (g CO2eq per t-km).

Food value chain: Activities that occur at post-production level (beyond the farm gate) to bring food and beverage products to consumers and to dispose of the related waste. This includes activities such as transport, processing, packaging, storage and distribution, retail, food preparation by hospitality and food service providers, and waste disposal. It also includes actions taken by actors in the food value chain to influence household-level consumption patterns which are one of the main drivers of rising emissions, provided the emissions reductions can be credibly measured.

Global warming potential (GWP): An index measuring how much infrared thermal radiation a ton of a greenhouse gas would absorb over a given time frame after it has been emitted to the atmosphere, compared to a ton of CO_2 (which has the reference value 1).

Green bond: A bond where the proceeds are allocated to environmental projects or expenditures. The term generally refers to bonds that have been marketed as green. In theory, green bond proceeds could be used for a wide variety of environmental projects or expenditures, but in practice they have generally been earmarked for climate change projects.

Industry working group (IWG): A group of key organisations that are potential applicants, verifiers, and investors convened by Climate Bonds. The IWG provides feedback on the draft Sector Criteria developed by the technical working group (TWG) before they are released for public consultation.

Investment period: The interval between the bond's issue and its maturity date; otherwise known as the bond tenor.

Life-cycle analysis/ Life-cycle assessment (LCA): A methodology for assessing or accounting for environmental emissions associated with all the stages of the life cycle of a product or process, from the initial design phase to disposal or recycling.

Low-carbon fuels: Fuels such as hydrogen, green ammonia, and waste biomass made without the use of fossil fuels.

Low-carbon technologies: Technologies referred to as innovative technical solutions that are characterised by a low-emission intensity, compared to state-of-the-art alternatives. Considered best-in-class technologies with a focus on environmental impact, examples of electricity utility low-carbon technologies would be solar, wind, marine, bioenergy, hydropower, geothermal, and nuclear.

Low-value plastics: Any plastic where the costs of collecting and processing the plastic waste are higher than the revenue generated from sales of the recovered plastic.

Mitigation criteria: Rules and principles containing thresholds, benchmarks, and milestones for sector activities whose objective is the reduction of the harmful effects of greenhouse gases emissions.

Net-zero emissions: A situation where global greenhouse gas emissions from human activity are in balance with emissions reductions. To achieve this situation, human-caused emissions should be reduced as close to zero as possible.

Paris Agreement: A legally binding international treaty on climate change adopted by 196 parties. Its overarching goal is to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

Pathways: Science-based trajectories for different sectors indicating the way to achieve targets related to relevant indicators.

Scope of emissions: Scope 1, 2 and 3 are terms devised by the GHG Protocol to categorise the different sources of carbon emissions an organisation creates in its own operations, and in its wider value chain.

Standards criteria: Established principles to evaluate processes, assets, or entities aiming to achieve benchmarks, targets, or goals.

Sustainability-linked debt (SLD): Any debt instrument for which the financial and structural characteristics can vary depending on whether the issuer achieves predefined sustainability/ESG objectives. Such objectives are measured through predefined key performance indicators (KPIs) and assessed against predefined performance targets. Proceeds of SLD are intended to be used for general purposes.

Technical working group (TWG): A group of recognised experts from academia, international agencies, industry, and NGOs convened by Climate Bonds. The TWG develops the Sector Criteria, which are detailed technical criteria for the eligibility of projects and assets as well as guidance on the tracking of eligibility status during the term of the bond. Their draft recommendations are refined through engagement with finance industry experts in convened industry working groups (IWG) and through public consultation. Final approval of Sector Criteria is given by the CBSB.

Use-of-proceeds (UoP) bond: A bond the proceeds of which are ring-fenced for specific assets and activities. Green bonds, blue bonds, and transition bonds are examples of UoP bonds.

Waste biomass: The biodegradable fraction of products, waste, and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin.

Whole-life carbon assessment: See Life Cycle Assessment (above).

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Acknowledgements

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1 Introduction

1.1 The Climate Bonds Standard

Investor demand for climate bonds is strong and is expected to increase in line with the delivery of quality products into the market. However, investor concerns about the credibility of green labelling are also growing. Standards, assurance and Certification will be essential to improve confidence and transparency, which in turn will enable further strong growth in the market.

The Climate Bonds Standard (CBS) and Certification Scheme is an easy-to-use screening tool that provides a clear signal to investors and intermediaries on the climate integrity of Certified Climate Bonds.

A core element of the Standard is a suite of sector-specific eligibility Criteria. Each sector-specific Criteria sets climate change benchmarks for that sector that are used to screen assets, capital projects, and entities, so that only those that have climate integrity, either through their contribution to climate mitigation, and/or to adaptation and resilience to climate change, will be Certified.

These sector-specific Criteria are determined through a multi-stakeholder engagement process, involving a TWG and IWG, convened and managed by Climate Bonds, and are subject to public consultation. Finally, they are reviewed and approved by the Climate Bonds Standard Board (CBSB).

The second key part of the CBS is the overarching CBS, which documents the common management of proceeds and reporting requirements that all Certified Climate Bonds must meet, in addition to meeting the sector-specific Criteria available from the Climate Bonds website www.climatebonds.net. https://www.climatebonds.net.

1.2 Environmental scope of the Criteria

Certification requirements address:

- climate change mitigation; and
- climate adaptation and resilience; and
- other environmental impacts where applicable.

1.3 What can be Certified

The Criteria will enable certification of assets and use of proceeds (UoP) financing climate mitigation measures and climate adaptation and resilience measures in the food value chain, subject to meeting the eligibility Criteria set out in this document.

Eligible assets and UoP include:

- Capital expenditures to implement an asset or project, and/or increase the value and/or lifetime of the assets or projects.
- Related operating and supporting expenditures for eligible projects or physical assets including relevant installation and routine maintenance expenditure and upgrades undertaken to maintain the value and/or lifetime of the asset.

Eligible assets and UoP will need to demonstrate a measurable contribution to climate mitigation, adaptation or resilience in at least one of the following areas:

1. Energy use.
2. Freight transport
3. Buildings, storage and facilities.
4. Green cold chain.
5. Packaging.
6. Food loss and waste reduction.
7. Sustainable sourcing,
8. Shifting consumption patterns.

Recognising that some actors in food value chains also process, handle, and/or sell non-food products, at least 90% of the bond value must be used for assets and activities related specifically to food and beverage value chains to be eligible for Certification under the Food Value Chain Criteria.

1.4 Documents supporting these Criteria

Food value chain-specific information to support applicants and verifiers is available from the Climate Bonds website as follows:

• Food Value Chain Background Paper that details why the Criteria were chosen.

• Food Value Chain Frequently Asked Questions (FAQs).

• Food Value Chain public consultation feedback and responses summary.

In addition, the following cross-cutting information to support applicants and verifiers is available as follows:

• The Climate Bonds Standard (CBS) v4.2 contains the requirements of the overarching CBS.

For more information on Climate Bonds and the Climate Bonds Standard and Certification Scheme, see www.climatebonds.net.

1.5 Revisions to these Criteria

These Criteria will be reviewed on a regular basis, at which point the TWG will take stock of bonds raised and developments in improved methodologies and data that can increase the climate integrity of future issuances. As a result, the Criteria are likely to be refined over time, as more information becomes available. Certification will not be withdrawn retroactively from bonds certified under earlier versions of the Criteria.

2 Scope of the Criteria

The Food Value Chain Criteria cover a wide range of levers that actors across Food Value Chains can use to reduce their carbon emissions. These actions may be accounted for in corporate GHG inventories as scope 1, 2 or 3 emissions depending on the position of the issuer in the supply chain. As the range of mitigation levers is very wide, issuers are not expected or required to include all topics covered by the Food Value Chain Criteria in a certified bond. However, any investments in any single topic area must comply with all applicable requirements.

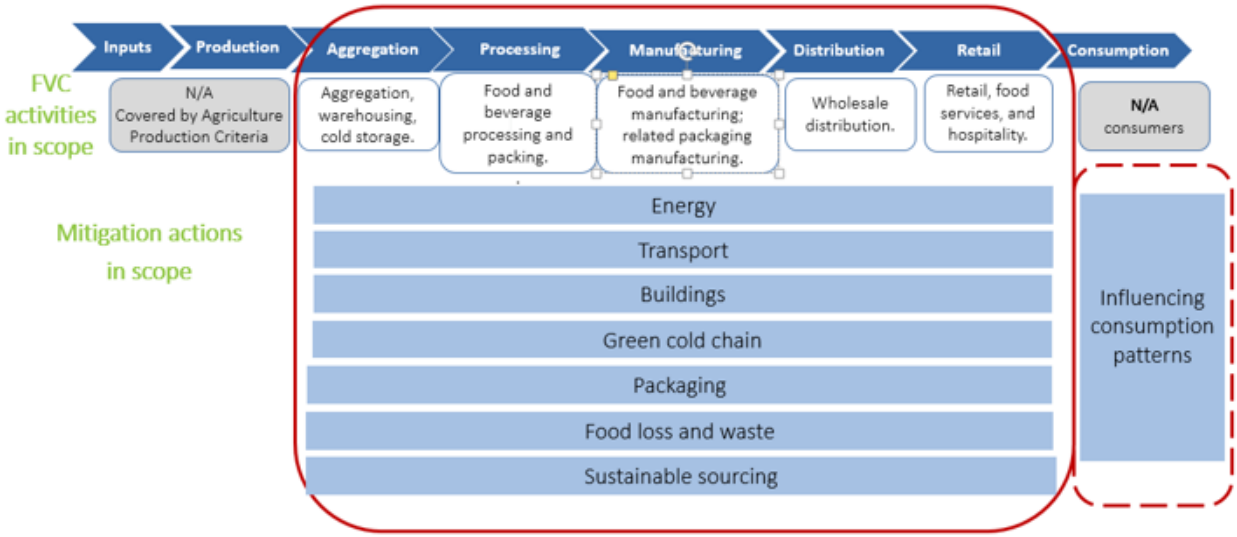
2.1 Food value chain boundaries and activities in scope

The Food Value Chain Criteria cover investments in all activities that occur at post-production level (beyond the farm gate) to bring food and beverage products to consumers and to dispose of the related waste.

This covers actors across food and beverage value chains involved in post-harvest aggregation including storage and transport, processing and manufacturing, and distribution and retail including food preparation by hospitality and food service providers; and waste disposal of food and related packaging within the food value chain before products reach household level.

The Food Value Chain Criteria cover a range of activities targeting the largest sources of emissions at post-production level in the agrifood sector. These activities cut across the food value chain and can be applied by any actors in scope of the Criteria. The Criteria also include actions taken by actors in the food value chain to influence household level consumption patterns which are one of the main drivers of rising emissions, provided the emissions reductions can be credibly measured. See Figure 1 (below).

Figure 1: Food Value Chain Criteria boundaries and activities in scope



The food value chain includes post-production activities for food and beverage products derived from the following:

- Agriculture (crops including agroforestry]) livestock farming, fisheries, and alternative protein production, which are covered by other Climate Bonds Criteria.
- Other production systems which are not covered by other Climate Bonds Criteria including wild harvest; controlled environment agriculture such as greenhouse, vertical farming or hydroponics, aquaculture or fish farming, lab-based food production.

The Criteria do not cover:

- Pre-production activities related to farm input manufacturing or energy use in production.
- Post-production activities related to non-food products derived from agriculture, livestock, fisheries or alternative protein production which are used in other sectors including textiles, pharmaceuticals, cosmetics, industry or construction, etc.
- Post-production activities occurring at household level such as food preparation and storage or waste disposal.

The Criteria will enable certification of assets and UoP bonds financing climate mitigation measures in the food value chain, which also meet the overarching CBS. At present Certification of entities and sustainability-linked debt (SLD) is not eligible under the Food Value Chain Criteria. Eligible assets and UoP relating to climate mitigation, adaptation and resilience in the food value chain include:

- Capital expenditures to implement an asset or project, and/or increase the value and/or lifetime of the assets or projects.
- Related operating and supporting expenditures for eligible projects or physical assets including relevant installation and routine maintenance expenditure and upgrades undertaken to maintain the value and/or lifetime of the asset.

Eligible assets and UoP will need to demonstrate a measurable contribution to climate mitigation in at least one of the following areas within the food value chain:

1. Energy use.
2. Freight transport.
3. Buildings, storage and facilities.
4. Green cold chain.
5. Packaging.
6. Food loss and waste reduction.
7. Sustainable sourcing.
8. Shifting consumption patterns

Recognising that some actors in food value chains also process, handle and/or sell non-food products, to be eligible for Certification under the Food Value Chain Criteria at least 90% of the bond value must be used for assets and activities related specifically to food and beverage value chains.

For the avoidance of doubt, activities, assets, or projects where the climate benefits are unclear or have an unclear time horizon are not eligible, for example:

- Research and development programmes where climate benefits are unclear.
- Environmental or social projects with unclear climate benefits.
- General behavioural change training.
- Any project with an unclear time horizon for climate benefits.
- Expenditure relating to general corporate purposes.

For new projects that have not started operations when applying for Certification (e.g., new facilities or the introduction of new technologies), applicants must demonstrate that the design of the project meets criteria for low-carbon actions set out below. Where new projects relate to upgrading existing assets, technologies or processes, applicants must present a plan with quantification of intended emissions reduction potential and a verified baseline. Once the project is Certified and operations start, the information presented is evaluated on a yearly basis over the term of the bond. If the annual evaluation identifies that the project does not meet the Criteria, the Certification is revoked.

Table 1: Overview of food value chain activities in scope

	Included	Excluded
Certification	✓ Assets and UoP bonds financing climate mitigation and adaptation measures.	X Entities (agrifood companies operating at post-production level) and SLD issued by those entities (may be considered in the future).
Activities in scope	✓ Investments at post-production level related to food and beverage transport, processing and manufacturing, packaging, storage and distribution, retail, food service provision and waste disposal, and food loss along the value chain by various actors. ✓ Investments in actions to influence household consumption patterns provided the emissions reductions can be credibly measured.	X Pre-production activities related to farm input manufacturing or energy use in production. X Post-production activities related to non-food products. X Household level actions such as food preparation and storage.
Investment use	✓ Capital expenditures to implement an asset or project, and/or increase the value and/or lifetime of the assets or projects. ✓ Related operating and supporting expenditures for eligible projects or physical assets including relevant installation and routine maintenance expenditure and upgrades undertaken to maintain the value and/or lifetime of the asset.	X Research and development with unclear climate benefits. X Environmental or social projects with unclear climate benefits. X General behavioural-change training. X Any project with an unclear time horizon for climate benefits. X Expenditure relating to general corporate purposes
Materiality	✓ At least 90% of the bond value must be used for assets and activities related to food and beverage value chains.	X >10% bond value for non-food products.

2.2 Alignment with other Climate Bonds Sector Criteria

The critical areas of focus for investments in climate mitigation and adaptation in food value chains cut across multiple value chain stages and emissions sources. For this reason, some relevant intervention areas are already covered in existing Climate Bonds Criteria which must be used to guide investments in these areas. The possible overlaps, and appropriate Sector Criteria to be used are clarified in Table 2 below.

Table 1: Assets and UoP partially covered by other Climate Bonds Sector Criteria.

Potential assets and UoP	Sector Criteria
Renewable energy generation using bioenergy	Bioenergy Criteria
Renewable energy generation using geo-thermal sources	Geothermal Energy Criteria
Freight transport by road	Land Transport Criteria
Freight transport by ship	Shipping Criteria
Production of hydrogen as a feedstock for fuel or packaging	Hydrogen Criteria
New buildings and building retrofits	Buildings Criteria
Recycling, composting, and anaerobic digestion	Waste Management Criteria
Sustainable sourcing: qualitative proxies for Certification against the Climate Bonds Agriculture Production Criteria	Agriculture Production Criteria
Production and promotion of plant-based alternatives to high emissions animal proteins	Alternative Proteins Criteria

3 Food value chain mitigation criteria

These Criteria cover emissions mitigation actions in the eight topic areas driving the most significant emissions in food value chains. Eligible assets and UoP must:

- meet the relevant requirements set out in the mitigation criteria for each topic set out in Section 3 (below).
- comply with the relevant climate adaptation and resilience criteria set out in Section 4.
- implement relevant environmental and social safeguards set out in Section 5.

The Food Value Chain mitigation criteria are structured to focus on the eight main drivers of emissions in food value chains beyond the farm gate. However, these emissions drivers are closely interconnected and the levers for climate mitigation are often relevant and applicable at multiple stages of the value chain. For example, reductions in emissions from energy use also play a significant role in reducing emissions in other topic areas such as cold chains and packaging production. Similarly optimising demand management, which is a key intervention to reduce sourcing-related emissions, also plays an important role in reducing emissions from transport, storage and cold chain, and food loss and waste. For this reason, rather than replicate these measures under each heading, each section of the mitigation criteria begins with a list of eligible assets and UoPs that are defined in other topic sections. The main assets and use of proceeds which are covered in other parts of the document are set out in Table 3 below.

Table 2: Assets and UoP partially covered by other sections within the Food Value Chain Criteria.

Covered under other FVC Criteria								Mitigation measures in the Food Value Chain criteria	
3.8 Shifting Consumption patterns	3.7 Sustainable Sourcing	3.6 Food Loss and Waste	3.5 Packaging	3.4 Green Cold Chain	3.3 Buildings	3.2 Transport	3.1 Energy	Eligible assets and use of proceeds	Criteria
	✓							Optimised demand management and sourcing	**Transport**
				✓			□	Low GWP refrigerants and leakage management in cold	**Buildings**
							✓	Use of renewable energy and energy efficiency	**Green Cold Chain**
						✓		Reduced fuel use from refrigerated transport	
	✓							Optimisation of procurement, storage, transport and demand	
					✓			Improved storage and warehousing facilities	**Reducing Food Loss and Waste**
				✓				Improved cooling and refrigeration:	
			✓					Improved packaging to extend product life	
	✓							Optimising demand management and sourcing	

3.1 Precondition: deforestation- and conversion-free sourcing

All assets and/or UoP that involve sourcing biomass or are directly related to sourcing of agricultural products must fulfil this requirement and provide evidence of compliance as a precondition for Certification. The eligibility Criteria follow the Agrifood Deforestation- and Conversion-Free (DCF) Sourcing Criteria.

Table 3: Eligible assets and UoP precondition: deforestation- and conversion-free sourcing.

Precondition	Eligible assets and UoP	Demonstration of compliance
Deforestation- and conversion-free sourcing: MANDATORY	All relevant assets and UoP Certified under the Food Value Chain Criteria must comply with Agrifood Deforestation- and Conversion-Free Sourcing Criteria which covers purchasing, processing, trading, distributing or selling any agrifood commodities, products, and derived ingredients or packaging, whose production, after 31 December 2020, has been linked to conversion of any natural	Sourcing must be deforestation- and conversion-free using Climate Bonds Agrifood Deforestation- and Conversion-Free (DCF) Sourcing Criteria or certification by an accepted proxy that aligns with the following requirements of the Criteria: 1. Cut-off date of 31 December 2020 for deforestation and conversion of natural ecosystems in the supply chain. 2. Risk classification of origin. 3. Traceability. 4. Due diligence. 5. Monitoring and reporting.

	ecosystem to another land use, including: - deforestation, including forest degradation; - peatland drainage, development or peat burning. This is particularly relevant for assets and UoP related to: • sourcing of agricultural products; • sourcing of wood or bio-based building materials; • sourcing of biomaterials for packaging; • sourcing of biomaterials for insulation and passive cooling; • sourcing of biomaterials for transport fuel; • sourcing of biomaterials for energy production (covered by Bioenergy Criteria).	6. Verification. 7. Use of third-party certification. 8. Human rights requirements.

3.2 Energy-related mitigation criteria

Table 5 below sets out the decarbonisation measures eligible for Certification due to their climate mitigation potential, and any associated eligibility Criteria specific to those investments.

Table 4: Eligible assets and UoP for energy-related mitigation measures.

Route for Certification (Climate objective)	Eligible assets and UoP	Demonstration of compliance
Adoption of renewable energy for electricity generation: Substituting fossil fuel-based electricity generation through procurement or onsite generation of renewable energy.	Power generation from Wind or Solar.	Automatically eligible.
	Power generation from geo-thermal sources.	Eligible as per the Climate Bonds Geothermal Energy Criteria: Criteria 1. Geothermal energy generation facilities with direct emissions of less that 100gCO_2/kwh. OR Criteria 2. Geothermal projects with mitigation technologies that will render the non-condensable gas releases to the atmosphere negligible.
	Power generation from sustainably sourced biomass.	Only secondary organic streams are eligible. Wood and other dedicated crops are not eligible. The bioenergy complies with the Climate Bonds Bioenergy Criteria: Section 3.2.1 Requirement 1: Meet the established GHG emissions threshold and conversion efficiency percentage;

		• Lifecycle emissions threshold for biofuel/biomass produced/used (primary energy) 16.0gCO_2e/MJ. • Energy efficiency threshold- 80%. Section 3.2.2 Requirement 2: Reducing the risk of indirect land use: • Option A – Feedstocks used are certified under one of the following, pre-approved best practice standards: RSB, RTRS, FSC, ISCC Plus, Climate Bonds Agriculture Production Criteria. • Option B – Feedstocks are certified under a standard or a similar scheme where issuer can prove the standard has sufficient requirements and thus is robust. Agriculture Criteria Certification of all source feedstocks must be maintained for the full term of the bond.
	EXCLUDED: • Power Purchase Agreements (PPA).	
Decarbonising thermal energy Substitute fossil-fuel based thermal energy with renewable heat sources and heat recovery systems.	Electrification of heating systems and boilers using renewable energy.	Automatically eligible.
	Solar thermal heating and drying.	Automatically eligible.
	Geothermal heat pumps.	Automatically eligible.
	Renewable heat sources from sustainably sourced biomass, organic waste or biogas.	Only secondary organic streams are eligible. Wood and other dedicated crops are not eligible. The bioenergy complies with the Climate Bonds Bioenergy Criteria: Section 3.2.1 Requirement 1: Meet the established GHG emissions threshold and conversion efficiency percentage for heating/cooling, and co-generation combined heat and power (CHP) facilities using biofuel/biomass; • Lifecycle emissions threshold for biofuel/ biomass produced/used (primary energy) 16.0gCO_2e/MJ, • Energy efficiency threshold - 80%. Section 3.2.2 Requirement 2: Reducing the risk of indirect land use impact.
	Combined heat and power (CHP) systems combining:	Automatically eligible with renewable energy use.

	• renewable electrical energy; • thermal energy, e.g., steam, used for process heating; • absorption chiller, providing cooling.	
Energy efficiency Reducing energy consumption by improving energy efficiency.	Energy management, monitoring, and control systems to improve energy efficiency such as: • smart sensors to control temperature, lighting density; • automation of heating, ventilation and air conditioning (HVAC) systems; • occupancy/motion sensors.	Identify and measure expected improvement of at least 30% over a verified baseline.
	Energy efficient equipment and technologies such as: • high efficiency lamps and ballasts; • optimised LED lights; • energy efficient fans, pumps, mixers, lighter weight conveyors etc., and; • advanced insulation on equipment and piping.	Energy-efficient equipment must operate within the top 25% of energy efficiency rates for relevant equipment available in-country. OR Identify and measure expected improvement of at least 3O% over a verified baseline (where no relevant energy ratings are available).
	Thermal management and heat recovery systems such as: • heat pumps, heat exchangers, and storage tanks to use waste heat for heat generation, steam generation, space heating, water heating, air drying, cooling etc.; • higher efficiency heat supply equipment e.g., boilers, optimisers, burners, pre-heat feed water etc.; improved chilling and refrigeration equipment e.g., compressors for chilling device etc., and; • heating, ventilation and air conditioning (HVAC) equipment optimisation including higher efficiency fans, variable speed vans, etc.	Energy-efficient equipment must operate within the top 25% of energy efficiency rates for relevant equipment available in-country. OR Identify and measure expected improvement of at least 3O% over a verified baseline (where no relevant energy ratings are available).
	Optimisation of processes for energy efficiency such as: • change from batch to continuous processes, • process controls requiring lower temperature, • changing chiller condensation temperature to decrease thermal losses,	Identify and measure expected improvement of at least 3O% over a verified baseline.

	• scheduling process timing, • optimising configuration of processing lines, • improving equipment controls and maintenance.	

3.3 Transport-related mitigation criteria

Table 6 below sets out eligible assets and UoP to reduce freight transportation related emissions across the food value chain. Use of airfreight is not eligible.

Other relevant mitigation actions are covered in the following section of this document including:

- optimisation of demand management and sourcing; **3.8 Sourcing-related mitigation criteria.**

Table 5: Eligible assets and UoP for transport-related mitigation measures.

Route for Certification (Climate objective)	Eligible assets and UoP	Demonstration of compliance
Logistics optimisation Strategy to reduce fuel per ton-kilometre across all modes of freight transport.	Improve freight transport systems and processes such as: • network optimisation including development of localised logistics hubs to reduce distance travelled and optimise assets/footprint; • route optimisation to reduce distance and time travelled and empty loads; • load optimisation, increasing size of average payload; • scheduling optimisation to maximise efficiency and reduce empty loads.	Identify and measure expected improvement in efficiency (fuel per ton-kilometre) with related emissions savings against a verified baseline. AND Must meet emissions thresholds for freight activity by year of issuance set out in the EU Taxonomy and the Climate Bonds Land Transport Criteria: Up to 2026: 25 (g CO_2eq per t-km) 2030: 21 (g CO_2eq per t-km) 2050: 18 (g CO_2eq per t-km)
	Shifting from high emissions transport (air, road transport based on fossil fuels) to shipping.	Identify and measure expected emissions savings against a verified baseline. AND Must meet requirements in the Climate Bonds Shipping Criteria.
	Shifting from high emissions transport (air, road transport based on fossil fuels) to rail.	Identify and measure expected emissions savings against a verified baseline. AND Must meet section 3.7 Requirements for railway networks and freight rail rolling stock in the Climate Bonds Land Transport Criteria.
ROAD TRANSPORT		
Electrification of fleets	In-scope vehicles:	Automatically eligible.

Zero tailpipe emissions fleets Shift fleets away from use of fossil fuels.	• battery electric vehicles (BEV), • fuel-cell electric vehicles (FCEV) – hydrogen, • zero tail-pipe emissions. **EXCLUDED:** • liquid natural gas, • drop-in fuels based on fossil fuel sources or biomass.	All zero direct emissions transport along with key components and dedicated supporting infrastructure are eligible for Certification under the Climate Bonds Land Transport Criteria.
	Infrastructure supporting electric vehicles e.g., charging stations.	Automatically eligible.
	Hybrid vehicles: **EXCLUDED** for developed countries.	Hybrid vehicles are eligible in emerging economies with a sunset date adjusted for availability of relevant technology and infrastructure.
Electric or solar mobile refrigeration Reducing emissions from refrigeration units used for freight transport.	Electric or solar mobile refrigeration units powered by electric vehicles.	Automatically eligible.
	Electric or solar mobile refrigeration (powered separately from the vehicle diesel motor).	Electric mobile refrigeration units are eligible with a sunset date for the shift to fully electric vehicles in line with net zero by 2050.
Low-carbon fuels Switching to advanced fuels that reduce emissions.	Adoption of low-carbon fuels of non-fossil origin sustainably sourced from municipal or organic waste, or renewables. **EXCLUDED:** • biofuels such as biodiesel.	Automatically eligible. For fuel mixes, written commitment and measurable progress towards elimination of fossil fuel component: • by 2040 in developed countries, • by 2050 in developing economies.
	Low-carbon hydrogen-based fuel.	Must comply with Hydrogen Criteria.
	Using CO_2 as a feedstock.	CO_2 must be captured from industrial processes or directly from the atmosphere.
Fuel efficiency improvement Greater fuel efficiency to reduce fuel per ton-kilometre in road freight transport.	Fuel efficiency measures for road freight vehicles, for example: • efficiently designed vehicles and engine improvements to reduce idling; • improved tyre technology to reduce rolling resistance; • improved vehicle maintenance; • driver training and incentives to reduce running speeds and idling; • monitoring and auditing data on fuel use, routes & speed.	Identify contribution of fuel efficiency measures in supporting the transition away from fossil fuel use. AND Identify and measure expected improvement in efficiency (fuel per ton-kilometre) with related emissions savings against a verified baseline. AND Show progress to meeting emissions intensity thresholds for freight activity by year of issue set out in the EU Taxonomy and the Climate Bonds Bonds Land Transport Criteria: Up to 2026: 25 (g CO_2eq per t-km)

		2030: 21 (g CO_2eq per t-km) 2050: 18 (g CO_2eq per t-km)
SEA TRANSPORT (SHIPPING)		
Low-carbon fuels	Use low-carbon fuels in new build and retrofitted zero-emission vessels. EXCLUDED: • liquefied natural gas, • biofuels.	Use of low-carbon fuels in new build and retrofitted zero-emission vessels eligible under the Climate Bonds Shipping Criteria subject to the following conditions: • reduce well-to-wake GHG emissions by at least 80% vs. fossil fuel oil, • chosen fuel is sufficiently scalable to decarbonise the entire shipping industry, • can be used safely in time.

3.4 Buildings-related mitigation criteria

Table 7 below sets out the eligible projects and activities related to buildings including storage, processing and manufacturing, packaging, storage, transport, and retail facilities.

Other relevant mitigation actions are covered in the following section of this document including:

- low GWP refrigerants and refrigerant leakage management in cold storage facilities; **3.5 Green cold chain related mitigation criteria.**

Table 6: Eligible assets and UoP for buildings-related mitigation measures.

Route for Certification (Climate objective)	Eligible assets and UoP	Demonstration of compliance
NEW BUILDINGS		
Adopt green building principles for processing, manufacturing, packaging, storage and distribution facilities for food and beverages	Eligible facilities include, for example: • post-harvest storage, • food processing facilities, • manufacturing facilities, • packaging facilities and bottling plants, • warehouses and storage facilities, • distribution centres and logistics hubs. EXCLUDED: • commercial offices.	Meet requirements for new buildings set out in the Climate Bonds Buildings Criteria, particularly: 1. No fossil fuels are used for heating, hot water, cooking, or on-site electricity generation. 2. The building provides necessary infrastructure to support electric mobility where on-site car parking is provided. 3. Shift to all electric buildings (electrification). 4. Reporting on whole life carbon assessment. In emerging economies where the use of fossil fuels in the energy mix cannot be avoided, the building must be net-zero ready and net zero by 2050. Emergency power back-ups using fossil fuels are allowed. AND Demonstrate green certification of buildings using Climate Bonds approved proxies: • LEED (Global), Gold rating or above; • Energy star (USA), 75 or above;

		• Living building challenge (Global), Certified; • Green star (Australia), Net-zero compliance.
Adopt green building principles for retail, supermarket, and food service premises	Eligible facilities include for example: • supermarkets, • retail premises, • hospitality and food service facilities. **EXCLUDED:** • commercial offices.	Meet requirements for new buildings set out in the Climate Bonds Buildings Criteria (see above). AND EITHER Demonstrate green certification of buildings using Climate Bonds approved proxies. OR Meet Low-Carbon Buildings Criteria threshold where available (see emissions intensity calculator on the Climate Bonds website).
RENOVATION / RETROFITTING OF EXISTING BUILDINGS		
Adopt green building principles for processing, manufacturing, packaging, storage and distribution facilities for food and beverages	Eligible facilities include, for example: • post-harvest storage, • food processing facilities, • manufacturing facilities • packaging facilities and bottling plants, • warehouses and storage facilities, • distribution centres and logistics hubs. **EXCLUDED:** • commercial offices.	Meet requirements for renovations and retrofits set out in the Climate Bonds Buildings Criteria, particularly: • renovated/retrofitted part of the building must be fully electrified and net-zero ready or net zero by 2050. Note: emergency power back-ups using fossil fuels shall be allowed. AND EITHER Demonstrate green certification of building renovation/retrofit using Climate Bonds approved proxies. OR Renovation/retrofit achieves at least 30% emissions improvement from a verified baseline. AND Non renovated/retrofitted parts of the building must phase out fossil fuel dependency by 2040 irrespective of the location.
Adopt green building principles for retail/ supermarket premises	Eligible facilities include, for example: • supermarkets, • retail premises, • hospitality and food service facilities. **EXCLUDED:** • commercial offices.	Meet requirements for renovations and retrofits set out in the Climate Bonds Buildings Criteria (see above). AND EITHER Demonstrates green certification of buildings using Climate Bonds approved proxies. OR

		Meet Low-Carbon Buildings Criteria threshold where available (see emissions intensity calculator on the Climate Bonds website).

3.5 Green cold chain-related mitigation criteria

Electricity use and transport are key drivers of cold-chain related emissions. For this reason, several actions to mitigate cold-chain emissions have already been covered in previous sections of this document. These include:

- sustainable sourcing of biomaterials for insulation **3.1 Preconditions;**
- reducing energy emission by shifting to renewable energy use and energy efficiency of cooling and refrigeration equipment **3.2 Energy-related mitigation criteria;**
- reducing fuel emissions from refrigerated transport by electrifying vehicles, shifting to low-emissions fuels and electrifying mobile refrigeration units **3.3 Transport-related mitigation criteria;**
- reducing buildings-related emissions through green building practices for cold-storage facilities **3.4 Buildings-related mitigation criteria.**

Other relevant mitigation actions are covered in the following section of this document including:

- optimisation of demand management and sourcing **3.8 Sourcing-related mitigation criteria.**

Table 8 below sets out further eligible projects and activities for mitigation through development of green cold chains.

Table 7: Eligible assets and UoP for green cold chain-related mitigation measures.

Route for Certification (Climate objective)	Eligible assets and UoP	Demonstration of compliance
Development of green cold chain	Shift to low GWP refrigerants including natural, higher performance refrigerants (GWP < 5) such as propane, hydrogen or green ammonia.[1] **EXCLUDED:** Ammonia if produced from fossil fuels.	Refrigerant meets the threshold for refrigerants with GWP <150 (defined in new EU Regulation on fluorinated greenhouse gases (EU) 2024/573). AND Provides full life-cycle assessments for refrigerants including safety (flammability, toxicity) and environmental pollution as well as emissions. AND Show systems to measure, monitor, and minimise refrigerant leakages. AND Demonstrate compliance with safety requirements for handling of refrigerants including national laws and international standards such as ASHRAE/, ANSI Standard 34-2019 and Standard 15-2019 or ISO, ISO 817:2014.
	Minimise refrigerant leakage during installation, charging, servicing and normal operations such as gas leakage management	Show systems to measure, monitor, and minimise refrigerant leakages.

[1] The IPCC assessment report released in August 2023, indicates the recalculated global warming potentials (GWPs) for many substances, https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/ and https://iifiir.org/en/news/update-on-the-global-regulation-on-refrigerants

	systems and Improved maintenance and inspections.	New equipment: demonstrate that equipment operates at or above the industry average for leakage rates for relevant equipment type. Existing equipment: demonstrate progress in reducing leakage rates and related emissions against a verified baseline. Measurement and reporting of leakage rates and emissions must use accepted methods e.g., Canadian Government Federal Offset protocol.
	Safe end-of-life recovery and recycling of refrigerants.	Recovery and recycling equipment must meet accepted safety standards set out in the AHRI standard 740.
	Disposal of high GWP refrigerants through reclamation or destruction in an authorised reclamation or destruction facility.	Reclamation or destruction certification and chain of custody records from an authorised facility.
Passive cooling systems and technologies Avoid emissions from refrigeration using alternative cooling solutions.	Infrastructure, equipment, technologies and processes using insulation materials to protect temperature of products against unwanted external or outer temperatures; including biomaterials, plastics, and industrial insulation materials.	Evidence of sustainable sourcing of insulation materials, particularly the precondition for DCF sourcing. Evidence of sustainable disposal of insulation materials including: • prioritising reuse and recycling of materials before disposal in landfill; • appropriate measures to avoid the release of harmful substances into air, water or soil during disposal. Evidence of compliance with safety standards for insulation materials to avoid risks to human health and the environment such as no PFAs; including food quality and safety standards, which were in direct contact with food.

3.6 Packaging-related mitigation criteria

Table 9 below sets out the eligible assets and UoP related to mitigating emissions from packaging production, use, and waste management across food value chains. Several actions to mitigate emissions from packaging production have already been covered in previous sections of this document. These include:

- sustainable sourcing of biomaterials for packaging **3.1 Preconditions;**
- reducing energy emission by shifting to renewable-energy use and energy efficiency of cooling and refrigeration equipment **3.2 Energy-related mitigation criteria;**
- reducing buildings-related emissions through green buildings practices for packaging production and packing facilities **3.4 Buildings-related mitigation criteria.**

The packaging-related mitigation criteria reflect the mitigation hierarchy principles to prevent and reduce the amount of packaging and the use of carbon-intensive packaging materials, and reuse and recycle packaging to lower emissions. They also include actions to reduce emissions from waste management of packaging.

Table 8: Eligible assets and UoP for packaging-related mitigation measures.

Route for Certification (Climate objective)	Eligible assets and UoP	Demonstration of compliance
Reduce packaging and packaging waste Reduce emissions from packaging production and waste management.	Actions to reduce the use of packaging, for example: • reduction or simplification of layers of packaging; • shift to bulk packaging from individual item packaging; • eliminate unnecessary packaging; • reduce production and use of non-recyclable, reusable, or compostable packaging i.e., – single use plastics, – multilayer packaging, and – low-value plastics (any plastic where the costs of collecting and processing the plastic waste are higher than the revenue generated from sales of the recovered plastic); • development and implementation of extended producer responsibility (EPR) systems and recovery supply chains for packaging waste management.	Packaging waste or waste-reduction management plan. Demonstrate reduction of packaging and related emissions against a verified baseline.
Use of low-carbon feedstocks in packaging Avoid use of virgin fossil-fuel-based polymers in packaging.	Use of low-carbon hydrogen as a feedstock in packaging.	Life-cycle analysis based on a recognised sustainable packaging framework, and report on progress achieved in reducing life-cycle GHG emissions. AND Packaging must be 100% recyclable, reusable or compostable. AND Meet criteria for using hydrogen as a feedstock in the Hydrogen Criteria.
	Use of carbon as a feedstock in packaging.	Life-cycle analysis based on a recognised sustainable packaging framework, and report on progress achieved in reducing lifecycle GHG emissions. AND Packaging must be 100% recyclable, reusable or compostable. AND

		CO_2 must be captured from industrial processes or directly from the atmosphere.
	Use of sustainably sourced biomaterials for packaging feedstocks, materials and products, for example: • production of bio-based renewable feedstocks for packaging, • production of bioplastics.	Must comply with 3.1 Pre-condition for Agrifood DCF Sourcing Criteria or certification by an accepted proxy, such as: • Forest Stewardship Council (FSC) • SFI Sustainable Forestry Initiative • PEFC (Program for Endorsement of Forest Certification). Optional: demonstrate certified sustainable biomass by a recognised certification. • Option A – Feedstocks used are certified under one of the following, pre-approved best practice standards: RSB, RTRS, FSC, ISCC Plus, Climate Bonds Agriculture Production Criteria. • Option B – Feedstocks are certified under a standard or a similar scheme where issuer can prove the standard has sufficient requirements and thus is robust. Certification of all source feedstocks must be maintained for the full term of the bond standards for these Criteria.
Increase use and content of recycled plastic feedstocks in packaging Reduce use of virgin fossil-fuel-based polymers in packaging.	Production and use of packaging with increased content from recycled plastic feedstocks generated by: • mechanical recycling, • chemical recycling.	Life-cycle analysis based on a recognised sustainable packaging framework and report on progress achieved in reducing life-cycle GHG emissions. Acceptable sustainable packaging frameworks include: • WBCSD SPHERE The Packaging sustainability framework; • Consumer Goods Forum, Global Protocol on Packaging Sustainability 2.0; • Sustainable Packaging Coalition definition of sustainable packaging; • Walmart Sustainable Packaging Playbook: A Guidebook for Suppliers to Improve Packaging Sustainability; • Australian Packaging Covenant Sustainable Packaging Guidelines. AND The LCA of the recycled plastic should be below the LCA of virgin plastic (for chemical recycling). AND

		Packaging should shift to 100% recyclable, reusable or compostable during the term of the bond. Reporting on recycled content use must use: EITHER Content recovered from post-consumer plastic waste must be calculated per packaging type and format as an average per manufacturing plant and year in line with EU Packaging and Packaging Waste Regulation (PPWR) 2024. OR Evidence of recycled content by a credible certification may be used e.g., Recycled Content Certification.
Increase recyclability and recycling of packaging Increase availability of circular feedstocks to reduce use of virgin fossil-fuel based feedstocks, increase reuse of packaging waste to replace other virgin inputs for secondary products and energy, and reduce packaging emissions from landfill.	Development and use of packaging designed for collection and recycling including for example: • reduction or simplification of multilayer packaging to improve recyclability, • packaging composition aligned with available recycling infrastructure, • labelling and consumer communication to recycling i.e., material composition, sorting instructions.	Lifecycle analysis based on a recognised sustainable packaging framework and report on progress achieved in reducing lifecycle GHG emissions. AND Packaging must be 100% recyclable, reusable or compostable.
	Systems and Infrastructure to support recycling of packaging into secondary raw materials including for example: • collection, sorting, storage and bulking facilities, dedicated to eligible waste processing, • mechanical recycling, • chemical recycling • processing into other secondary raw materials, • technologies to support recycling or repurposing of multi-layer packaging.	Comply with recycling criteria in the Climate Bonds Waste Management Criteria including: • Collection containers must be made from 100% recycled and recyclable materials.
	Systems and infrastructure to support recycling of residual packaging waste for energy including:	Comply with energy from waste criteria in the Climate Bonds Waste Management Criteria.

	• facilities which produce power and/or heat/cooling by the thermal processing of residual waste, including rejects from recycling/ composting or anaerobic digestion; • refuse derived fuel (RDF) production; • solid recovered fuel (SRF) production.	
Reuse and refill packaging solutions Reduce emissions from packaging production and waste management.	Development and use of packaging, infrastructure, equipment and technology designed to support reuse and refill solutions including for example: • packaging composition and design; • collection, sorting and cleaning facilities; • return logistics systems; • filling lines, tracking and labelling systems; • consumer information, labelling, reuse guidelines.	Life-cycle analysis based on a recognised sustainable packaging framework, and report on progress achieved in reducing lifecycle GHG emissions. AND Packaging must be 100% recyclable (or compostable) at end of life.
Compostable packaging Reduce emissions from landfill, waste burning, and industrial composting.	Development and use of compostable packaging as defined in *ISO 17088*: *Packaging that undergoes degradation by biological processes during composting to yield CO_2, water, inorganic compounds, and biomass at a rate consistent with other known compostable materials and leaves no visible, distinguishable or toxic residue.*	Life-cycle analysis based on a recognised sustainable packaging framework and report on progress achieved in reducing life-cycle GHG emissions. AND Packaging complies with the definition for compostable packaging from the following frameworks: • ISO 17088, Plastics — Organic recycling — Specifications for compostable plastics, 2021-04 (defined as 'compostable in municipal and industrial composting facilities'). • ASTM D6400-21, Standard Specification for Labelling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities (US norm). • European Standard EN 13432 Packaging. Requirements for packaging recoverable through composting and biodegradation. (European norm). AND Evidence that: EITHER

		Compostable packaging is destined for use in markets with appropriate industrial composting capacity. OR Development and use of compostable packaging is accompanied by investment in relevant composting facilities. OR Compostable packaging is designed fully decompose without the need for specialised industrial composting infrastructure (biodegradable). OR Verification by a credible certification scheme, such as: • Compostability label from European Bioplastics, • OK compost.
Improved waste management for packaging waste. Reduce emissions from landfill, waste burning, and industrial composting.	Implementation of extended producer responsibility (EPR) systems to manage packaging waste.	Packaging waste or waste reduction management plan.
	Infrastructure for composting of compostable packaging.	Comply with criteria for composting in the Climate Bonds Waste Management Criteria.
	Infrastructure for anaerobic digestion of compostable or bio-based packaging.	Comply with criteria for anaerobic digestion in the Climate Bonds Waste Management Criteria.

3.7 Food and loss waste-related mitigation criteria

Food loss and waste is a driver of carbon emissions that cuts across all activities in food value chains. A number of actions that can reduce food loss and waste and therefore mitigate related emissions have already been addressed in the sections above. These include:

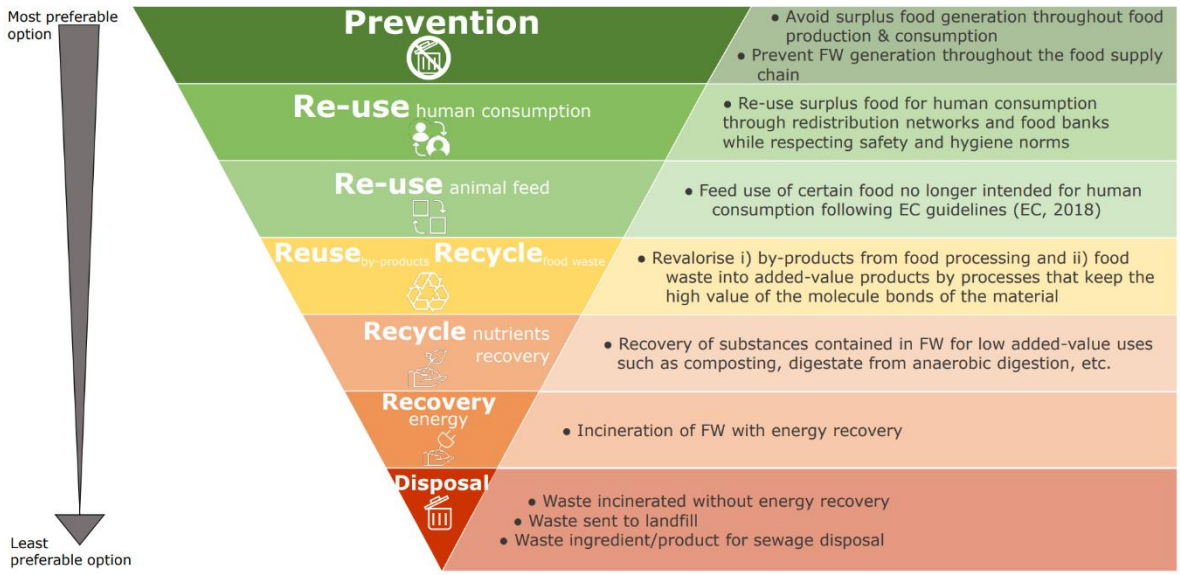
- improved storage and warehousing facilities **3.3 Buildings-related mitigation criteria,**
- improved cooling and refrigeration **3.4 Green Cold Chain-related mitigation criteria,**
- improved packaging to extend product life **3.5 Packaging-related mitigation criteria.**

Other actions are addressed in subsequent sections of this document. These include:

- optimising demand management and sourcing to reduce over-purchasing, storage time, transport time and distance **3.7 Sourcing-related mitigation criteria,**
- informing and incentivising consumers to reduce food loss and waste at household level **3.8 Influencing consumption patterns.**

Actions to address food loss and waste should respect the accepted mitigation hierarchy for the circular economy as it applies to food loss and waste shown in Figure 2 below.

Figure 2: Circular economy mitigation hierarchy applied to food loss and waste.



Source: Brief on food waste in the European Union, European Commission Joint Research Centre, 2020

Table 10 below sets out further eligible assets and UoP related to mitigating emissions from reducing food loss and waste across food value chains aligned with the mitigation hierarchy above.

Table 9: Eligible assets and UoP for food loss and waste-related mitigation measures

Route for Certification (Climate objective)	Eligible assets and UoP	Demonstration of compliance
Prevent food loss and waste Improved handling and storage.	Infrastructure and equipment to improve storage and handling to reduce food loss and waste including, for example: • improved silos and storage infrastructure; • improved storage bags and containers that protect against temperature variations, humidity, and pests (e.g., hermetic grain storage bags, reusable plastic crates, protective crate liners); • improved temperature management systems; • improved handling and preservation techniques.	Measurements and reporting of food loss and waste and related emissions using an accepted methodology, demonstrating reduction against a verified baseline. Accepted methodologies for food loss and waste measurement: • EU Common Methodology for measuring food waste. • Food Loss + Waste Protocol: Food Loss and Waste Accounting and Reporting Standard. Food loss and waste emissions measurement: • Food Loss + Waste protocol. Connecting Food Loss and Waste to Greenhouse Gas Emissions: Guidance for Companies; GAFSP food loss climate impact tool focused on emerging markets.
Prevent food loss and waste Optimising products and production processes to reduce waste.	Infrastructure, equipment, systems and processes to optimise products and production to reduce food loss and waste including, for example:	Measurement and reporting of food loss and waste and related emissions reduction (as above).

	• improve forecasting and planning processes to reduce oversupply and minimise storage times and travel distances; • optimise operations to identify, track, and reduce waste, optimise storage conditions, minimise processing and manufacturing errors, manage product line changeovers, etc.; • improve product formulation and product/portion sizes that reduce waste by consumers; • amend product standards to reduce waste from aesthetic criteria; • standardise date labelling.	
Prevent food loss and waste Improve packaging to extend product life.	Development and use of improved packaging to extend product life including for example: • resealable, easy to empty packaging; • smart packaging to detect deterioration; • edible coatings.	Measurement and reporting of food loss and waste, and related emissions reduction (as above) demonstrating that expected food waste-avoided emissions are higher than packaging-related emissions. AND Packaging must be reusable, recyclable or compostable (see **3.5 Packaging-related mitigation measures**). AND Life-cycle analysis based on a recognised sustainable packaging framework.
Prevent food loss and waste Consumer engagement to reduce food loss and waste at household level.	Activities to raise consumer awareness and support behaviour change including: • standardise date labelling and information to avoid waste; • consumer education and information on how to minimise waste such as choice architecture systems, decision-support apps (carbon footprint calculator, etc.); • redesign promotional strategies to avoid incentivising over-purchasing; • behavioural marketing strategies to encourage consumers to avoid waste easier for consumers e.g.,	Set measurable targets for emissions reduction against a verified baseline.

	• retail layout, product placement and display, in-store signage.	
Reuse for human consumption Reuse of unused food for new food products or consumers.	Reuse of unused food for consumption including for example: • reprocessing or repackaging of unused food into new food products; • processing of surplus production into long shelf-life products (e.g., tomatoes to puree or paste); • establishing secondary markets for imperfect or surplus produce; • systems, equipment, and infrastructure to support donation of unused/rejected but edible food including collection, storage, handling, matching, and logistics.	Measurement and reporting of food loss and waste and related emissions reduction (as above).
Reuse for non-food uses Use of food waste to produce products not intended for human consumption.	Value addition from food waste to produce products such as: • animal feed, • biotextiles (e.g., bioleather), • biochar, • bio-based packaging, • bioplastics.	Must use unavoidable and worthless by-products and residues of agricultural and agrifood industries with no potential value for food. AND Measurement and reporting of food loss and waste and related emissions reduction (as above*).* AND For bioplastics and biobased packaging must **meet FVC packaging criteria.**
Recycle for nutrient recovery Increase composting and anaerobic digestion.	Waste management facilities and processes for composting including infrastructure for collection, sorting, and transport of food waste.	Zero measurable methane emissions. AND Must meet relevant criteria for composting facilities in Waste Management Criteria (currently under revision).
	Waste management facilities and processes for anaerobic digestion including Infrastructure for collection, sorting, and transport of food waste.	Must meet the thresholds for total methane emissions and the requirements for anaerobic digestion facilities in the Waste Management Criteria once it has been updated in 2025.
Recycle for energy recovery Process food waste for energy generation.	Generation of electricity or biogas for heating/cooling, and co-generation from anaerobic digestion of food waste.	Must use unavoidable and worthless by-products and residues of agricultural and agrifood industries with no potential value for food. AND The bioenergy complies with the Climate Bonds Bioenergy Criteria, Section 3.2.1

		Requirement 1. Meet the established GHG emissions threshold and conversion efficiency percentage for heating/cooling, and co-generation combined heat and power (CHP) facilities using biofuel/biomass: • life-cycle emissions threshold for biofuel/ biomass produced/used (primary energy) 16.0gCO2e/MJ, • energy efficiency threshold 80%.

3.8 Sustainable sourcing-related mitigation criteria

Table 11 below sets out eligible assets and UoP related to mitigating upstream emissions in food value chains through shifts in sourcing practices:

- actions related to sourcing of agricultural products must comply with Climate Bonds requirements for DCF sourcing **3.1 Preconditions Deforestation- and Conversion-Free Sourcing.**

Table 10: Eligible assets and UoP for sustainable sourcing-related mitigation measures.

Route for Certification (Climate objective)	Eligible assets and UoP	Demonstration of Compliance
Sustainable sourcing Support emissions reduction from agricultural production and increased carbon sequestration.	Sourcing sustainability certified products including for example: • traceability systems, • data collection and monitoring systems, • infrastructure and processes to segregate certified and non-certified products, • supplier engagement, training and support to achieve sustainability certification. **EXCLUDED:** • investment at farm level to support sustainability practices (Certified under the Agriculture Production Criteria).	Set measurable targets for emissions reduction from optimised sourcing practices against a verified baseline. AND Certification covering agricultural production must: • Comply with requirements of Climate Bonds Agrifood DCF Sourcing Criteria. AND • Comply with section 3.1.1 in the in the Agriculture Production Criteria which defines qualitative proxies that can be used for UoP or Asset Certification at production level. These cover the following production systems under certain conditions including a commitment to full GHG accounting by 2030: • organic farming (certified, plant-based or mixed production system), • agroecology principles and practices (plant-based or mixed production system) applied in production unit(s), • improved production systems for vulnerable contexts to increase productivity and efficiency sustainably (i.e., for small-scale producers including investments for capacity building in climate mitigation practices).

Demand management and optimised sourcing processes Support emissions reduction from unnecessary food production, transport, and storage.	• Optimise sourcing processes including demand management, inventory management systems and supplier contracting to better match forecasting and ordering. • Increase local and seasonal sourcing.	Set measurable targets for emissions reduction from optimised sourcing practices and measure progress against a verified baseline. AND Must not increase food loss and waste. Food loss and waste and related emissions must be measured and reported using an accepted methodology as defined in **3.6 Food Loss and waste-related mitigation criteria.**

3.9 Shifting consumption patterns-related mitigation criteria

Table 12 below sets out eligible assets and UoP related to mitigating downstream emissions in food value chains through actions to shift consumption patterns and consumer behaviour.

Table 11: Eligible assets and UoP for shifting consumption patterns -related mitigation measures.

Route for Certification (Climate objective)	Eligible assets and UoP	Demonstration of compliance
Optimise product offering to reduce consumption of high emissions foods and over-consumption.	Diversification of product offerings to shift consumption from high emissions food, particularly animal-based protein, including: • increased share of available products with low emissions alternatives, • increased proportion of locally sourced, organic or sustainability certified products. • developing product range to increase offering of plant-based alternatives to animal-based products, • adjustments to product formulation, menu composition, product serving sizes, etc.	Set measurable targets for emissions reduction and measure progress against a verified baseline. AND Must not increase food loss and waste. Food loss and waste and related emissions must be measured and reported using an accepted methodology as defined in **3.6 Food loss and waste-related mitigation criteria**. AND Developing product range to increase offering of plant-based alternatives to animal-based products must meet the requirements set out in the Climate Bonds Alternative Proteins Criteria.
Consumer engagement to reduce consumption of high -emissions foods and over-consumption.	Activities to raise consumer awareness and support behavioural change including: • product/menu labelling of lower-emissions or sustainably certified food choices e.g., eco-labelling, carbon-footprint labelling, true-cost labelling;	Set measurable targets for emissions reduction and measure progress against a verified baseline. AND Must not increase food loss and waste. Food Loss and waste and related emissions must be measured and reported using an accepted methodology as defined in the **section 3.6 Food Loss and Waste-related mitigation criteria**.

	• consumer education and information such as choice; • architecture systems, decision-support apps (carbon footprint calculator etc.); • redesign of promotional strategies to avoid incentivising over-purchasing; • behavioural marketing strategies to make shifting consumption patterns easier for consumers e.g., retail layout, product placement and display, in-store signage.	

3.10 Research and development projects

Research and development (R&D) may be needed to support climate mitigation in any of the eligible topic areas outlined in the Food Value Chain Criteria (above). Applicants should check eligible R&D expenditure details under the latest CBS v4.2.

Eligible R&D expenditure covers any early or later stage expenditure relating to the research, applied research, and experimental development of solutions, processes, technologies, business models, and other products dedicated to the substantial reduction, avoidance or removal of GHG emissions for which the ability to substantially reduce, remove or avoid GHG emissions has been demonstrated in a relevant environment, corresponding to at least technology readiness level (TRL) 6. This includes expenditure through TRL 1-5. In addition, funds or subsidy schemes incentivising early-stage R&D (TRL1 to TRL5) may be considered eligible if aiming to bring the solution, product or technology to TRL6 (see box below).

Technology Readiness Levels (TRL) and R&D eligibility

TRL 1-5: Funds or subsidy schemes incentivising early-stage R&D (TRL1 to TRL5) may be considered eligible if aiming to bring the solution, product or technology to TRL6.

TRL 6-7: TRL6 or above must be demonstrated as follows:
TRL6 requires that the technology is fine-tuned to a variety of operating conditions, the process is reliable, and the performances match the expectations, interoperability with other connected technologies is demonstrated, the manufacturing approach is clearly defined and that all environmental, regulatory and socio-economic issues are addressed. Where the researched, developed or innovated technology, product or other solution is at TRL6 or TRL7, life- cycle GHG emissions are evaluated in simplified form by the entity carrying out the research.

TRL 8: Where the researched, developed or innovated technology, product or other solution is at TRL8 or higher, life- cycle GHG emissions are calculated using Recommendation 2013/179/EU or, alternatively, using ISO 14067:2018 or ISO 14064- 1:2018 and are verified by an independent third party.

4 Adaptation and resilience criteria

The aim of the adaptation and resilience (A&R) criteria is to ensure that the eligible assets and activities are resilient and adapted to climate change. The checklist is a tool to verify that the applicant has implemented a thorough risk assessment of physical climate hazards, taken appropriate measures to address and mitigate them; ensuring no harm to the resilience of system, and that ongoing monitoring and evaluation is conducted to adjust measures as necessary. Details on the specific steps and demonstration of compliance are given in Table 13 below.

Table 12: Adaptation and resilience safeguard requirements and demonstration of compliance for any type of issuer.

	Steps for A&R safeguard	Demonstration of compliance
1.	Identify boundaries and interdependencies.	The applicant must define the boundaries of the investment and associated assets and activities, as well as the internal and external interdependencies between the broader system affected by those assets and activities. These boundaries and interdependencies are important for scoping risk and benefit assessments, and ensuring the asset or activity being invested in is fit-for-purpose and does no harm to the system of which it is part. See checklist in Table 4.
2.	Assessment of the physical climate hazards.	The applicant must demonstrate that a risk assessment has been undertaken of the physical climate hazards to which the assets and activities will be exposed and vulnerable over their operating life. The applicant must follow best-practice standards or similar schemes to carry out the risk assessments, where the applicant can demonstrate the standard has sufficient requirements and thus is robust. See checklist in Table 4.
3.	Measures taken: a) Address and mitigate hazards. b) Ensure no harm to the resilience of system.	The applicant must also demonstrate that measures have or will be taken to: i. address and mitigate those identified physical climate hazards to a level so that the assets and activities are 'fit for purpose' in the face of coming climate change over their operational life; and ii. ensure that the assets and activities do no harm to the resilience of the defined system they operate within, considering the boundaries and critical interdependencies identified in 1. See checklist in Table 4.
4.	Ongoing monitoring and evaluation to adjust measures as necessary.	The applicant is required to demonstrate that there will be ongoing monitoring and evaluation of the relevance of the risks and resilience measures, and related project adjustments as needed. See checklist in Table 4.

Eligible assets and UoP in the food value chain must satisfy the relevant requirements in the checklist detailed below in Table 14. All elements of the checklist must be addressed, and appropriate evidence provided that these requirements are being met or are not applicable in respect of the specific project linked to Certification. It is expected that the applicant's evidence will encompass a range of assessment and impact reports and associated data, including but not limited to those reports required to meet national and local licensing and approval processes. This might include development consent orders, planning regulations adhered to, environmental impact assessments, vulnerability

assessments and associated adaptation plans. It is the applicant's responsibility to provide the relevant information to the verifier, which must include this information in the scope of verification.

Table 13: Adaptation and resilience checklist for the food value chain.

No.	Adaptation and resilience checklist for the food value chain
1.	**Clear boundaries and critical interdependencies between the asset or project and the system it operates within are identified.**
1.1	Boundaries of the assets and activities are defined using the following: 1. A listing of all assets and activities associated with the bond UoP. 2. A map of their location. 3. Identification of the expected operational life of the activity, asset or project.
1.2	Critical interdependencies between the measure(s) and the system within which it/they operate(s) are identified, which should consider the potential for adverse impacts arising from, but not limited to: • relationships of the asset/activity to nearby flood zones; • relationships of the asset/activity to surrounding water bodies and water courses including the effects of water use or pollution on other water users; • relationship of the asset/activity to air quality including pollution, fire, and dust; • relationships of the asset/project to living environment including land-based pollution, plastics, and leakage; • reduction in biodiversity or high conservation value (HVC) habitat or reduction in pollinating insects and birds; • appropriation of land or economic assets from nearby vulnerable groups; • relationships of the asset/activity to safe working conditions affected by changing weather patterns and extreme weather events; • relationship of the asset/activity with sustainable land use, productivity, and producer income as climate change impacts production and sourcing; • relationship of the asset/activity with health and nutrition including access to healthy food for all, including in the case of supply disruptions due to the effects of climate change.
2.	**An assessment has been undertaken to identify the key physical climate hazards to which the measure will be exposed/vulnerable to over its operating life.**
2.1	Key physical climate risks and their indicators are identified in line with the following guidelines. • Risks are identified based on: A. a range of climate hazards, and B. information about risks in the current local context, including reference to any previously identified relevant hazard zones, e.g., flood zones. It is essential that the climate risks being assessed and addressed cover those that are of greatest relevance to the asset/activity. The physical characteristics of climate change that must be considered in the risk assessment include the following. • Temperature rise: o impact on commodity production areas and productivity, disruption to supply, and reduced resilience of suppliers; o impact on safe working hours and conditions across the supply chain; and, o impact on refrigeration and cold chain systems, leading to higher demand for energy and cooling and increased risk spoilage of temperature-sensitive food products. • Precipitation, flooding, storms, and extreme weather events: o disruption to supply chains road, rail, and port access, delaying raw materials and finished goods, and impacting availability of food products to consumers; o impact on agricultural production affecting availability of raw materials and security of supply; o contamination of food products and their production and storage environments;

	o impact on the availability of solar or wind energy; and, o increased risk of damage to infrastructure and equipment, and the release of toxic, flammable, volatile, and reactive chemicals such as refrigerants. • Drier seasons: o potential increased use of or reliance on mains water for dust suppression and cleaning; and, o impact on agricultural production affecting availability of raw materials and security of supply. • Drought and water availability: o reduced water availability may impact operations and hygiene requirements; and, o competition for water resources in drought-affected areas may increase operational costs and lead to conflict with local communities. • Sea-level rise and coastal risks (if applicable): o facilities near coastlines may face inundation, saline intrusion, or infrastructure damage from storm surges; and, o access to ports for raw material imports or finished product exports may be disrupted. • Increased soil erosion: o erosion may damage facility foundations or impact agricultural suppliers upstream. • Increased incidence of pests and diseases: o facilities and supply chains may suffer increased disruption from pests such as locust invasion due to climate variability; and, o the location and frequency of pest/vector borne diseases such as malaria, dengue fever, West Nile virus, and Lyme disease may increase, especially where water bodies are present.
3.	The measures that have or will be taken to address those risks mitigate them to a level such that the asset/project is suitable to climate change conditions over its operational life.
3.1	Evaluate the adequacy of measures implemented to mitigate risks, ensuring the facility's resilience to climate hazards. • Temperature resilience: o equipment and infrastructure are designed to maintain operational efficiency across the range of temperatures projected for the facility's location; o cooling and refrigeration systems are upgraded or optimised to function effectively under extreme heat conditions; and, o employee working conditions are supported by resilience measures (e.g., cooling in workspaces, heat-resistant materials, adjusted working hours). • Flood risk management: o facility layout incorporates site drainage systems capable of managing increased rainfall or storm water runoff; o key assets (e.g., electrical systems, storage areas) are elevated above projected flood levels; and, o flood defences (e.g., levees, barriers) are installed to protect vulnerable areas. • Water availability and drought management: o alternative water sources (e.g., rainwater harvesting, recycled water systems) are established to mitigate risks of water shortages; o water storage capacity is increased to ensure consistent supply during drought periods; and, o operations and cleaning processes are adapted to minimise water use. • Sea-level rise and coastal resilience: o coastal facilities include flood-resistant structures or are relocated away from vulnerable zones; o storm surge protection measures are in place for critical infrastructure; and, o saline intrusion mitigation is implemented for water supply and surrounding agricultural areas. • Wind and extreme weather protection:

	○ facility buildings and lightweight structures are reinforced to withstand high wind speeds and extreme weather events; and, ○ back-up power systems (e.g., generators, batteries) are installed to mitigate energy disruptions from wind damage to grids. • Soil stability and erosion control: ○ foundations are strengthened to ensure stability under conditions of increased soil erosion; and ○ vegetative cover or retaining walls are used to reduce erosion risks around the facility. • Resilience to pests and diseases: ○ pest control measures are implemented at facilities and across supply chains; and, ○ measures are taken to eradicate disease vectors from facilities and nearby water bodies, and to protect workers and the local population from infection. The list provided above is not exhaustive and applicants should fully assess the mitigation measures that are relevant to the climate risks and impacts identified in the risk assessment.
3.2	Risk reduction measures must be tolerant to a range of climate hazards and not lock-in conditions that could result in maladaptation.
4.	**The assets/activities do no harm to the climate resilience of the defined system they operate within, as indicated by the boundaries of and critical interdependencies with that system as identified in item 1 in this checklist.**
	The assets/activities themselves do not pose significant risk of harm to the system they are located within or the natural, social, or financial assets of others according to the principle of best available evidence during the investment period, considering the boundaries and critical interdependencies as defined in item 1 in this checklist. Harm is defined as an adverse effect on any of the items identified as critical interdependencies in item 1 in this checklist.
5.	**The applicant is required to demonstrate that there will be ongoing monitoring and evaluation of the relevance of the risks and resilience measures and related adjustments to those measures will be taken as needed.**
5.1	Indicators for risks identified under item 2 in this checklist are provided.
5.2	Indicators for risk mitigation measures identified under item 3 in this checklist are provided.
5.3	Indicators for 'no harm' to relevant system assets identified under item 4 in this checklist are provided.
5.4	Applicants have a viable plan to annually monitor (a) climate risks linked to the asset or activity, (b) climate resilience performance, (c) appropriateness of climate resilience measure(s) and to adjust as necessary to address evolving climate risks.

5 Environmental and social safeguards for food value chain activities

This section describes the safeguards required for eligible food value chain assets and UoP to ensure that they are resilient to the impacts of climate change and that they identify and minimise potential negative environmental and social impacts.

5.1 Environmental safeguards

A thorough environmental impact assessment (EIA) for the asset and activities must be carried out consistent with local regulations and verified by an independent third-party expert. The risks identified in that assessment must be addressed by implementing appropriate mitigation measures.

Table 14: Environmental safeguards checklist for the food value chain.

No.	Environmental safeguards checklist for the food value chain
1.	**Clear boundaries and critical interdependencies between the asset or project and the system it operates within are identified.**
1.1	Boundaries of the assets and activities are defined using the following: 1. A listing of all assets and activities associated with the bond UoP. 2. A map of their location. 3. Identification of the expected operational life of the activity, asset or project.
1.2	Critical interdependencies between the measure(s) and the system within which it/they operate(s) are identified. Identification of these interdependencies should consider the potential for adverse impacts arising from, but not limited to: • relationships of the asset/activity to surrounding water bodies and water courses including the effects of water use or pollution on other water users; • relationship of the asset/activity to air quality including pollution, fire, and dust; • relationships of the asset/project to living environment including land-based pollution, plastics, leakage; and, • reduction in biodiversity or HCV habitat or reduction in pollinating insects and birds.
2.	**A risk assessment has been undertaken to identify the risk of negative impacts on the environment.**
2.1	The applicant must demonstrate that an environmental risk assessment or environmental impact assessment has been undertaken for the relevant assets and activities for the full period of operating life. The applicant must follow best-practice standards or similar schemes to carry out the risk assessments, where the applicant can demonstrate the standard has sufficient requirements and thus is robust. Risk assessment must cover at least the following elements. • Impact on land, water, and air pollution, and biodiversity from handling and disposal of refrigerants, particularly those with high flammability and toxicity: ○ Impact on land, air, and water pollution, and biodiversity from the use of insulation materials for heating, cooling, and food processing and preservation. • Impact on land, air, and water pollution, and biodiversity from the use of packaging materials particularly non-recyclable, non-compostable plastics or multilayer packaging including eco-toxicity, micro-plastics, and leaching.
3.	**The measures that have or will be taken to address those risks mitigate them to a level such that the asset/project effectively mitigates the risk of negative environmental impacts over its operational life.**

3.1	The following are examples of risk management activities that bond issuers might consider, or that might be adopted as part of regulations (e.g., codes and standards). This list is not exhaustive, and bond issuers should fully assess the mitigation measures that are relevant to the environmental impacts identified in the risk assessment. Measures depend on the specific and local conditions of an asset. They may include the following: • Strengthened environmental monitoring. • Demonstrated compliance with relevant regulations and international standards for the safe handling and disposal of refrigerants, insulation, and packaging materials. • Demonstrated compliance with relevant regulations and international standards for sustainable packaging. • Reduction/phase-out of the use of harmful substances (e.g., PFAS) in packaging materials.
4.	**The applicant is required to demonstrate that there will be ongoing monitoring and evaluation of the relevance of the risks and resilience measures and related adjustments to those measures will be taken as needed**.
4.1	Indicators for risks identified under item 2 in this checklist are provided.
4.2	Indicators for risk mitigation measures identified under item 3 in this checklist are provided.
4.3	Applicants have a viable plan to annually monitor and periodically evaluate the occurrence of risks and the effectiveness of mitigation measures.
4.4	Applicants can demonstrate that activities have been adjusted as necessary to address issues identified by monitoring and evaluation.

5.2 Social safeguards

A thorough social impact assessment for the asset and activities must be carried out consistent with local regulations and verified by an independent third-party expert. The risks identified in that assessment must be addressed by implementing appropriate mitigation measures.

Table 15: Social safeguards checklist for the food value chain.

No.	Social safeguards checklist for the food value chain
1.	**Clear boundaries and critical interdependencies between the asset or project and the system it operates within are identified**.
1.1	Boundaries of the assets and activities are defined using the following: 1. A listing of all assets and activities associated with the bond UoP. 2. A map of their location. 3. Identification of the expected operational life of the activity, asset or project.
1.2	Critical interdependencies between the measure(s) and the system within which it/they operate(s) are identified. Identification of these interdependencies should consider the potential for adverse impacts arising from, but not limited to: • relationships of the asset/activity to safe working conditions and respect of human rights and labour rights; • relationship of the asset/activity with sustainable land use, productivity, and producer income as climate change impacts production and sourcing; • potential for the appropriation of land or economic assets and natural resources from nearby vulnerable groups;

	• relationship of the asset/activity to the use of harmful substances with a potential negative effect on human health, such as refrigerants, insulation, or packaging materials with high toxicity or flammability; and, • relationship of the asset/activity with health and nutrition including access to healthy food for all.
2.	**A risk assessment has been undertaken to identify the risk of negative impacts on the social groups including own workforce, producers, workers in the supply chain, consumers, local communities, and indigenous peoples**.
2.1	The applicant must demonstrate that a social impact assessment has been undertaken for the relevant assets and activities for the full period of operating life. The applicant must follow best-practice standards or similar schemes to carry out the risk assessments, where the applicant can demonstrate the standard has sufficient requirements and thus is robust. Risk assessment must cover at least the following elements: • Risk of human rights or labour rights violations in own operations or in the supply chain (including forced labour, child labour, infringements of the rights of local communities and indigenous peoples). • Impact on the health and safety of workers, consumers, and local communities from handling and disposal of refrigerants, particularly those with high flammability and toxicity. • Impact of land and water pollution on human health from the use of insulation materials for heating, cooling, and food processing and preservation. • Impact of human health from the use of packaging materials particularly non-recyclable, non-compostable plastics. • Impact on human health and food inequality from product formulation and offerings including recognised dangers of obesity and other health problems from ultra-processed foods, and lack of access to affordable nutritious food for low-income and vulnerable population groups. • Impact on producers, workers, and local communities regarding income, employment, and access to nutrition from shifts in sourcing.
3.	**The measures that have or will be taken to address those risks mitigate them to a level such that the asset/project is suitable to climate change conditions over its operational life**.
3.1	The following are examples of risk management activities that bond issuers might consider, or that might be adopted as part of regulations (e.g., codes and standards). This list is not exhaustive, and bond issuers should fully assess the mitigation measures that are relevant to the environmental impacts identified in the risk assessment. Measures depend on the specific and local conditions of an asset and may include the following: • Identification of stakeholder groups likely to be impacted including own staff, producers and workers in supply chains, informal sector waste management workers, local communities and consumers, including particularly vulnerable or excluded groups. • Engagement of affected stakeholders such as labour unions, community groups, civil society, and local governments to ensure that transition plans are equitable and inclusive. • Demonstrated compliance with United Nations Guiding Principles on Business and Human Rights, OECD Guidelines for Multinational Enterprises, ILO Declaration on the Fundamental Principles and Rights at Work or other relevant national legislation. • Develop and document evidence of effective grievance mechanisms with appropriate mitigation and remediation mechanisms involving affected stakeholders. • Demonstrated compliance with relevant health and safety regulations and international standards for the safe handling and disposal of refrigerants, insulation, and packaging materials. • Demonstrated compliance with relevant health and safety regulations and international standards for food safety and quality. • Reduction/phase-out of the use of harmful substances (e.g., PFAS) in packaging materials. • Commitment and strategy to promote healthy nutrition and reduce food inequality. • Strategies for supplier support to ensure the cost and burden of transition is not passed solely to workers of producers and local communities in supply chains e.g., finance and training to support

	transition to sustainable practices, or to support income diversification and local infrastructure development.
4.	**The applicant is required to demonstrate that there will be ongoing monitoring and evaluation of the relevance of the risks and resilience measures and related adjustments to those measures will be taken as needed.**
4.1	Indicators for risks identified under item 2 in this checklist are provided.
4.2	Indicators for risk mitigation measures identified under item 3 in this checklist are provided.
4.3	Applicants have a viable plan to annually monitor and periodically evaluate the occurrence of risks and the effectiveness of mitigation measures.
4.4	Applicants can demonstrate that activities have been adjusted as necessary to address issued identified by monitoring and evaluation.

6. Appendix A

TWG and IWG members

Climate Bonds Coordinator			
Aishwarya Sankar Sustainability Analyst	Climate Bonds Initiative		
External Technical Lead Advisor:			
Ruth Rennie Consultant	Rennie Sustainability Consulting		
TWG Members			
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Isabel Nepstad CEO	Bella Terra	**Liyuan Wei** School of Physics	University of Sydney
Joe Robertson Executive Director	Citizens' Climate International	**Dr. Christopher Martius** Team leader, Climate change, energy and low-carbon development	University Centre for International Forestry Research (CIFOR)
Saloni Shah Green Economy specialist, Agribusiness	European Bank for Reconstruction and development	**DING Shanshan (Helen)** Green Supply Chain and Finance Director	Institute of Public and Environmental Affairs (IPE)
Matthew Unerman Food sustainability manager	Independent consultant	**Liuba Marchionne** Sustainable Food Systems Advisor	Independent consultant

Dr. Jan Broeze Researcher, Data and Informatics and Supply chain design	Wageningen University and research	**Brijpal Singh Choudhary** Food systems specialist	Independent consultant
Claire McConnell (she/her/hers) Policy Advisor, Food and Agriculture	International Institute for Sustainable Development (IISD)	**Steffany Bermudez** Policy Advisor, Food and Agriculture	International Institute for Sustainable Development (IISD)

IWG Members	
David Shaw	Artemis eco
Marjolein Hanssen	Rabobank, Europe
Nicolas Diaz	Global methane hub
Daisy Nicholls	Impact
Andrew Van Haght	OFI (olam food ingredients)
Laurence bahk	EBRD
Julie Loyson	Agri 3
Jasper Dix	Agri 3
Taciano Custodio	Rabobank, South America