ICIS General Program Instructions for Carbon Footprint

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General

The ICIS Carbon Footprint Documentation is a comprehensive resource developed to support organizations in accurately measuring, reporting, and reducing their greenhouse gas (GHG) emissions. Aligned with the International Climate Intelligence System (ICIS) framework and rooted in ISO 14025 Environmental Product Declaration (EPD) standards, this guide offers a transparent, life cycle-based methodology for carbon accounting across diverse sectors.

By integrating international best practices, emerging technologies, and sector-specific insights, the documentation empowers businesses to implement effective carbon management strategies. It facilitates compliance with evolving regulatory frameworks and enhances environmental performance reporting. This guidance also supports stakeholder engagement by enabling organizations to make credible, evidence-based carbon-related claims.

The ICIS Carbon Footprint guide is part of a broader climate documentation series designed to promote consistency, accountability, and innovation in global sustainability practices.

Disclaimer for Carbon Footprint Documentation

This document is provided for informational purposes only as part of the ICIS Carbon Footprint Documentation series. It does not constitute legal, regulatory, or compliance advice. While the content reflects the current best practices and methodologies aligned with ISO 14025 and ICIS standards, users should consult the most up-to-date regulatory guidelines and sector-specific requirements applicable to their operations.

The guidance herein is subject to periodic updates to reflect advancements in climate science, environmental policy, and carbon accounting techniques. ICIS does not accept liability for any misinterpretation, misuse, or misapplication of the information provided. For official certification or validation, organizations must engage directly with ICIS or an approved verification body listed on www.climateintell.com.

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1.0 INTRODUCTION

A carbon footprint refers to the total amount of carbon dioxide (CO_2) emissions associated with a product, service, organization, or activity. These emissions result from processes across the full life cycle, such as raw material extraction, production, transportation, use, and disposal. To make results comparable across different gases, emissions are expressed as carbon dioxide equivalent (CO_2e), calculated using accepted global warming potential values.

Measuring and reporting carbon footprints has become an essential part of climate strategy for many organizations. Stakeholders increasingly require transparency about carbon performance, and regulatory frameworks are evolving to standardize reporting. Carbon footprint assessments help identify emissions hotspots, support reduction efforts, and improve accountability.

This certification program provides a structured, ISO 14067-aligned approach for organizations to document their CO_2 emissions and undergo third-party verification. It ensures data quality, comparability, and trust in claims made about carbon performance.

1.1 Carbon Footprint Standard

The Carbon footprint standard sets a common structure for consistent and transparent communication of carbon footprint performance. It recognizes that different organizations may be at various stages in their carbon management journey and therefore offers flexibility in how performance is documented and communicated.

This standard provides a framework to assess, verify, and label the carbon footprint of a product, service, event, or organization. It requires emissions to be quantified using robust methodologies—primarily ISO 14067—and verified through an independent review process. The certification can apply to:

- A specific product or product range.
- A full organization.
- A service or business activity
- An event or operation.

The scope of certification must be clearly defined and supported by data, and the results must be communicated in a way that is understandable, accurate, and not misleading. The standard encourages consistent terminology, public transparency, and comparability between similar claims.

2.0 BASIS OF CARBON EMISSIONS

The foundation of carbon footprint certification lies in the accurate measurement and reporting of carbon dioxide emissions associated with a specific product, service, or organization. The ICIS Carbon Footprint Certification Program is built upon the globally recognized methodology outlined in ISO 14067: Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification.

A carbon footprint represents the total amount of carbon dioxide equivalent (CO_2e) emissions resulting from activities across a defined life cycle or operational boundary. These emissions include both direct emissions (such as on-site fuel combustion) and indirect emissions (such as emissions from purchased electricity or material inputs). However, under this certification program, the focus remains strictly on CO_2 emissions and does not extend to the full family of greenhouse gases, which are addressed under a separate ICIS GHG program.

3.0 SCOPE CLASSIFICATIONS AND BOUNDARIES

To effectively measure carbon emissions, it is important to define where and how emissions occur. Emissions are generally classified into three categories, originally introduced by the Greenhouse Gas Protocol:

- **Scope 1: Direct Emissions:** Emissions from sources directly owned or controlled by the organization, such as fuel combustion in company vehicles, on-site energy generation, or process emissions.
- **Scope 2: Indirect Energy Emissions:** Emissions resulting from the generation of purchased electricity, heating, or cooling consumed by the organization. These occur off-site but are driven by on-site energy use.
- **Scope 3: Value Chain Emissions:** All other indirect emissions from upstream and downstream activities, including raw material sourcing, business travel, transportation, product use, and end-of-life treatment.

Scopes help organizations distinguish between direct and indirect responsibilities and prioritize their reduction strategies. While Scope 1 and 2 emissions are usually easier to measure and manage, Scope 3 often represents the majority of total emissions, though it is also the most complex.

3.1 Organizational Boundaries

Comprehensive boundary-setting is critical for accurate carbon footprint measurement. Organizations must define which operations, facilities, subsidiaries, and activities fall within their reporting boundaries. Two approaches exist: the control approach (accounting for emissions from operations over which the organization has financial or operational control) and the equity share approach (accounting for emissions according to the organization's share of equity in the operation). Consistent boundary definition ensures comparability across reporting periods and prevents inadvertent emissions omissions.

3.2 Common Challenges

Common challenges in scope definition include data availability for Scope 3 categories, avoiding double-counting between organizations, allocating emissions from shared facilities or operations, and maintaining consistent methodologies over time as organizational structures change. Many organizations begin their carbon management journey by focusing on Scope 1 and 2 emissions while gradually expanding to include material Scope 3 categories as data collection capabilities mature.

4.0 MEASUREMENT METHODOLOGIES

The ICIS Carbon Footprint Certification is based primarily on ISO 14067, which provides standardized guidance for product carbon footprint quantification. However, supporting references may include well-established methods such as LCA, PAS 2050, and elements of ISO 14064 for organizational emissions.

4.1 Life Cycle Assessment (LCA)

LCA offers a broad view of environmental impacts across a product's life cycle—from raw material extraction to disposal. When focused on carbon footprint, LCA helps identify emissions hotspots and informs reduction strategies. ISO 14040 and 14044 provide foundational principles for conducting a robust and transparent LCA, including defining system boundaries, selecting relevant data, and interpreting results.

4.2 ISO 14064 & PAS 2050

- **ISO 14067** is the core reference for product-level carbon footprinting and the primary basis for ICIS certification. It includes detailed requirements for data collection, boundary definition, and emissions calculation.
- **PAS 2050** complements ISO 14067 by offering specific guidance for consumer goods, including treatment of carbon storage, land use change, and biogenic carbon.

These methods ensure that results are scientifically credible, consistent, and comparable across sectors.

4.3 Data Quality & Verification

Reliable results depend on strong data. Organizations are encouraged to use primary data for core processes and validated secondary data where direct measurements are unavailable. All calculations must use recognized emission factors and maintain documentation for traceability.

Third-party verification plays a critical role in ensuring data accuracy, appropriate methodology, and compliance with certification requirements. Verification typically involves reviewing calculation logic, checking emission factors, and validating data sources.

5.0 CARBON CALCULATION TOOLS & RESOURCES

The ICIS certification process is designed to provide organizations with a transparent and credible framework to validate their carbon footprint calculations. The process includes five key stages: application, documentation, verification, certification issuance, and logo usage.

5.1 Application Submission

Organizations must submit their application through the ICIS platform (www.climateintell.com), indicating the type of entity (product, service, organization, or event), assessment scope, and intended certification level. The application should also provide a summary of activities covered and any prior carbon assessments conducted.

5.2 Required Documentation

Applicants are expected to provide supporting documentation that aligns with ISO 14067, including:

- Carbon footprint calculation report
- Description of the functional unit and system boundaries
- Data sources and emission factors used
- Calculation methodology and assumptions
- Life cycle stages included (e.g., raw material, production, transport)
- Third-party verification reports (if applicable)

The submitted documents must clearly outline how the carbon emissions were measured, which tools or software were used, and what boundaries were applied.

5.3 Verification Procedure

The verification process is conducted by ICIS-approved assessors. It includes:

- Review of submitted reports and data accuracy
- Evaluation of boundary setting and functional unit definition
- Validation of emission factors and allocation procedures
- Clarification with the applicant if any gaps or inconsistencies are identified

Depending on the scope and complexity, additional documentation or a virtual/onsite review may be requested.

5.4 Certificate Issuance

Once verification is successfully completed, ICIS issues an official certificate valid for one year. The certificate includes:

- Name of the organization and assessed entity
- Certification level (CO_2e Assessed, Reduced, or Carbon Neutral)
- Verified carbon footprint value in CO_2e
- Scope of assessment and system boundaries
- Certificate ID and validity dates

Certified entities will also receive a verification summary report for internal use or stakeholder communication.

5.5 Logo Usage Guidelines

Certified organizations are permitted to use the ICIS Carbon Footprint Certification logo on approved communication materials. This may include:

- Product packaging or labels
- Sustainability reports
- Company websites and marketing materials

Logo usage must be limited to the scope covered by the certification. Any misuse or misrepresentation of certification claims may result in temporary suspension or revocation of the certification status.

6.0 CARBON CALCULATION TOOLS & RESOURCES

6.1 Software Solutions

Specialized carbon management platforms like Sphera, Watershed, and Persefoni offer comprehensive functionalities for data collection, calculation, visualization, and reporting. These solutions often include features for scenario modeling, target tracking, and integration with enterprise systems.

6.2 Sector specific Tools

Industry organizations have developed tailored calculation tools addressing unique sector challenges, such as the GLEC Framework for logistics, the Hotel Carbon Measurement Initiative for hospitality, and Farm Carbon Calculator for agriculture.

6.3 Technological Innovations

Emerging technologies promise to enhance carbon tracking precision and efficiency. Internet of Things (IoT) sensors enable real-time monitoring of energy consumption and emissions. Blockchain applications are being developed to improve supply chain emissions transparency and traceability. Artificial intelligence and machine learning help identify patterns and optimization opportunities within emissions data. Satellite monitoring is advancing to detect and quantify emissions from specific facilities. These innovations will progressively close data gaps and reduce reliance on estimations and averages, though implementation challenges around cost, complexity, and data integration remain.

7.0 CARBON FOOTPRINT IN MANUFACTURING

Manufacturing plays a critical role in global carbon emissions. Carbon footprints from this sector are shaped by both direct process emissions and indirect emissions related to materials and energy use.

7.1 Process Emissions

Many manufacturing processes release CO_2 as a direct result of chemical reactions. For example, emissions in cement production come largely from the calcination of limestone. Steel manufacturing emits CO_2 during iron reduction using coke, and semiconductor manufacturing uses high-impact gases. These emissions are difficult to avoid because they are intrinsic to the process rather than energy-related.

7.2 Reduction Strategies

To reduce emissions, manufacturers are upgrading energy systems, optimizing material use, and shifting to low-carbon processes. Improvements like heat recovery, automation, and efficient design reduce both emissions and costs. Some companies are adopting alternative technologies, such as electric furnaces or renewable power systems, to replace fossil-fuel-based operations.

7.3 Embodies Carbon in Materials

The materials used in manufacturing carry their own carbon footprints. Selecting low-carbon alternatives, like recycled instead of virgin aluminum, can greatly reduce total emissions. Choices made during product design—such as using lighter or bio-based materials—also affect the overall carbon impact across the product's life cycle.

7.4 Industry Examples

Leading manufacturers are already making progress. Toyota has reduced emissions per vehicle through process improvements and renewable energy. Interface has lowered product emissions significantly through material and efficiency innovations. Siemens has reached carbon neutrality at several facilities using a mix of clean energy and process optimization. These examples show that meaningful reductions are achievable while maintaining productivity and competitiveness.

7.5 Barriers and Opportunities

Although the transition to low-carbon manufacturing offers long-term benefits, it also presents challenges. High capital costs, long asset lifespans, and limited alternatives for certain processes can slow change. However, benefits such as reduced energy bills, compliance readiness, access to green finance, and growing market demand for sustainable products continue to drive progress. Supportive government policies and funding mechanisms can help overcome these barriers.

8.0 CARBON FOOTPRINT IN BUILDINGS & INFRASTRUCTURE

The carbon footprint of buildings and infrastructure includes two main components: embodied carbon from construction materials and processes, and operational carbon from energy use over time. Both are important for ICIS carbon footprint certification, particularly in full life cycle assessments.

8.1 Net Zero Building Design

Net-zero buildings aim to achieve zero net carbon emissions by minimizing energy demand and generating renewable energy on site. This is accomplished through efficient envelopes, passive design, and high-performance systems. Projects like the National Renewable Energy Laboratory's Research Support Facility demonstrate these strategies in practice.

8.2 Embodied Carbon Reduction

Materials such as concrete, steel, and insulation contribute significantly to early-stage emissions. Using alternatives like low-carbon concrete, recycled steel, or mass timber can reduce embodied carbon by 30–50%. Material choices made at the design stage are critical to managing a building's total footprint.

8.3 Smart Building Technologies

Automation systems, sensors, and energy management tools enable buildings to reduce operational carbon by optimizing systems in real time. Common measures include occupancy-based controls, predictive maintenance, and continuous commissioning.

8.4 Infrastructure Carbon

Infrastructure projects require broader carbon accounting due to their long lifespans and indirect impacts. ICIS assessments may consider emissions from construction, maintenance, use-phase energy, and the development patterns a project enables. Including carbon in early planning helps identify lower-impact alternatives.

8.5 Existing Buildings

Retrofitting existing buildings offers major carbon savings. Improvements to insulation, HVAC, lighting, and controls—combined with renewable energy—can reduce operational emissions by 50–90%. Electrification of systems and integration with decarbonizing grids are key to long-term impact reduction.

9.0 CARBON FOOTPRINT IN TRANSPORTATION

Transportation accounts for a significant share of global CO_2 emissions, mainly from road vehicles and freight operations. The carbon intensity of transport varies by mode, fuel type, and efficiency. Understanding these factors is important for organizations calculating their transport-related carbon footprint under ICIS certification.

9.1 Emissions Mode

Road transport generates the highest emissions, while rail and maritime modes are generally more efficient. Electric vehicles offer lower emissions, especially when powered by clean electricity. Organizations should use verified emission factors for each mode to ensure accurate reporting.

9.2 Reduction Strategies

Emission reductions can be achieved through better vehicle maintenance, route planning, and load optimization. Telematics systems help monitor fuel use and improve driver behavior. Electrifying fleets and using cleaner fuels further reduce transport emissions over time.

9.3 Alternative Fuels and Technologies

Electric vehicles reduce tailpipe emissions and are increasingly viable for light-duty fleets. Hydrogen and biofuels offer options for heavier transport where electrification is limited. Transitioning to cleaner transport requires investment but aligns with long-term carbon reduction goals.

9.4 Aviation and Shipping

These sectors are harder to decarbonize but offer some short-term improvements through efficiency measures. Long-term strategies include sustainable aviation fuels and low-carbon shipping fuels. ICIS certification may consider transport impacts within product or organizational boundaries.

10.0 CARBON FOOTPRINT IN AGRICULTURE AND FOOD SYSTEM

The agriculture and food sectors are major contributors to global carbon emissions. Emissions arise throughout the value chain—from production and processing to transport, consumption, and waste.

Accurate assessment of these emissions is essential for footprint certification and developing targeted reduction strategies.

10.1 Agricultural Emission Sources

Agricultural production accounts for the largest share of food system emissions. Livestock, especially cattle, generate high levels of methane through digestion, while fertilizer use releases nitrous oxide, a potent greenhouse gas. Other sources include energy use in irrigation, fuel consumption in machinery, and emissions from rice cultivation. Carbon footprint assessments in this sector must account for both direct emissions from farming and indirect impacts from land use and inputs.

10.2 Supply Chain and Processing Emissions

Emissions beyond the farm include those from food processing, packaging, refrigeration, and transportation. The carbon footprint of food products varies widely depending on supply chain length and transportation mode. Air-freighted goods have a far greater footprint than those shipped by sea. Food waste also contributes significantly, as emissions from all prior stages are lost when food is discarded.

10.3 Climate Smart practices

Sustainable farming methods can reduce emissions and increase carbon storage. Practices such as precision agriculture, reduced tillage, crop rotation, and agroforestry help lower carbon intensity while improving soil health. Improved livestock diets and manure management also reduce methane and nitrous oxide emissions. These methods support both mitigation and long-term productivity.

10.4 Role of Industry and Consumers

Reducing food system emissions requires action across the supply chain. Food companies can reformulate products, improve packaging, and reduce waste. Retailers can optimize inventory and support surplus redistribution. Consumers influence emissions through dietary choices and waste reduction. Plant-based diets and reduced food waste are key levers at the individual level.

11.0 CORPORATE CARBON MANAGEMENT STRATEGIES

Effective carbon management requires companies to set credible targets, integrate emissions into core business processes, and engage both leadership and employees. Beyond reporting, carbon management should drive real reductions and align with long-term business and climate goals.

11.1 Science Based Target Setting

Setting science-based targets ensures emission reductions are aligned with global efforts to limit warming to 1.5°C. The Science Based Targets initiative (SBTi) offers sector-specific pathways to determine appropriate targets. Most companies pursuing these goals aim for at least 4–5% annual emission reductions, with more aggressive targets for high-emitting sectors.

Science-based targets provide accountability and help companies gain trust from investors, regulators, and customers. More than 2,000 global companies have committed to SBTi, showing that climate action is increasingly a mainstream business responsibility.

11.2 Governance and Internal Carbon Pricing

Carbon reduction must be embedded in business decision-making, not managed in isolation. Strong governance includes clear accountability—from board oversight to operational teams—and integration into key functions such as capital planning, product development, and procurement.

Many companies use internal carbon pricing to guide investment and strategy. This can take the form of:

- Shadow pricing, where carbon cost is considered in planning
- Internal fees, where departments pay for their emissions to fund reduction projects

Pricing levels vary widely, but many leaders use $40–$80 per ton of CO_2e to reflect the social cost of carbon and future policy risk.

11.3 Leadership and Employee Engagement

Leadership commitment is key to long-term carbon success. Executives set the tone, allocate resources, and communicate progress. Increasingly, organizations appoint climate leaders (e.g., Chief Sustainability Officers) who report directly to the CEO, signaling strategic importance.

Employee engagement can unlock practical emission reduction ideas across operations. Successful programs raise awareness, provide tools, and link sustainability to team goals and recognition systems. Some companies integrate carbon metrics into performance reviews, helping align individual efforts with corporate climate goals.

12.0 CARBON REDUCTION TECHNOLOGIES

A range of technologies can help organizations reduce their carbon footprint and align with emission reduction goals. Selecting the right mix depends on the sector, scale, and type of emissions involved. The following categories represent key solutions used across industries.

12.1 Energy Efficiency

Energy efficiency is one of the most practical and cost-effective ways to reduce emissions. Upgrades such as LED lighting, high-efficiency HVAC systems, and smart controls in buildings can lower energy use by 20–50%. In manufacturing, waste heat recovery, efficient motors, and better insulation offer similar savings. These improvements not only reduce carbon emissions but often result in operational cost savings, making them a strong starting point for any carbon reduction strategy.

12.2 Carbon Capture Utilization and Storage (CCUS)

Carbon capture, utilization, and storage (CCUS) technologies remove CO_2 from point sources like power plants and industrial facilities or directly from the atmosphere. Post-combustion capture using chemical solvents represents the most mature approach, though newer technologies using solid sorbents, membranes, and cryogenic separation show promise for reducing energy penalties and costs. Captured carbon can be permanently stored in geological formations, utilized in durable products like concrete and carbon fiber, or converted into fuels and chemicals. While current costs range from $40- 120 per ton of CO_2 captured, technological improvements and economies of scale are expected to reduce costs by 30- 50% by 2030.

12.3 Renewable Energy and Storage

Switching to renewable energy significantly reduces Scope 2 emissions. On-site solar installations are common in corporate facilities, while Power Purchase Agreements (PPAs) support larger off-site clean energy projects. Energy storage systems, including batteries and thermal storage, help manage supply and demand, enabling more consistent use of renewable power. Some companies are now adopting 24/7 clean energy strategies to match consumption with hourly clean generation.

12.4 Process Optimization and Materials Substitution

Advanced technologies like AI and machine learning can optimize industrial processes to reduce energy consumption and waste. In data centers, for example, smart cooling systems have achieved major efficiency gains. Materials substitution involves replacing high-emission inputs with lower-carbon alternatives—such as using alternative cements or recycled materials. Circular economy approaches, such as remanufacturing and closed-loop recycling, can further reduce life cycle emissions.

12.5 Negative Emission Technologies (NETs)

NETs help remove carbon from the atmosphere and are increasingly used to balance emissions that cannot be fully avoided. Natural solutions include afforestation, soil carbon management, and coastal restoration. Technological approaches include direct air capture (DAC), bioenergy with carbon capture (BECCS), and biochar production. These solutions vary in cost and readiness but play a growing role in long-term carbon management strategies.

13.0 CARBON OFFSETTING AND COMPENSATION

Carbon offsetting allows organizations to balance residual emissions by supporting projects that remove or reduce emissions elsewhere. While offsets are not a substitute for direct reductions, they are a valid tool in a broader carbon management strategy—especially for hard-to-abate emissions. To maintain environmental integrity, offsets must meet specific quality criteria and follow credible standards.

13.1 Offset Quality Criteria

High-quality offsets must be:

- **Additional**: Emission reductions would not have occurred without the offset project
- **Permanent**: Reductions or removals should be long-lasting and protected against reversal (e.g., forest loss)
- **Leakage-free**: Projects should not cause emissions to rise elsewhere
- **Accurately quantified**: Using conservative, transparent methods
- **Verified**: Independently reviewed and monitored over time

These criteria ensure that offsets contribute genuine climate benefits.

13.2 Verification Standards

Several independent standards govern the voluntary offset market.

- Verra (VCS) is the largest, covering forestry, energy, agriculture, and more

- Gold Standard emphasizes co-benefits and Sustainable Development Goals
- Climate Action Reserve and American Carbon Registry focus on North American projects
- Puro.earth specializes in long-term carbon removal technologies

Organizations should choose standards aligned with their goals, geographic focus, and project type.

13.3 Offset Strategy Design

Offsets should only be used for emissions that cannot be eliminated directly. A strong strategy includes:

- Prioritizing direct reductions first
- Diversifying project types and locations
- Considering both environmental impact and alignment with company values
- Favoring high-durability removals over basic avoidance projects

More companies are shifting toward removal-based offsets, such as afforestation or direct air capture, to support long-term climate goals.

13.4 Mitigation Hierarchy

Best practice follows a clear sequence:

- Avoid emissions where possible
- Reduce emissions through operational change
- Offset only the residual emissions

Offsets should complement, not replace, a company’s direct reduction efforts. Frameworks now distinguish between carbon neutrality (balancing all emissions with offsets) and net-zero (deep cuts + removal of residuals). This reflects the growing emphasis on transformation over compensation.

14.0 REGULATORY LANDSCAPE FOR CARBON MANAGEMENT

The global carbon policy environment is evolving rapidly, with increasing pressure on organizations to measure, reduce, and report their emissions. A sound understanding of international agreements, pricing mechanisms, and product-level regulations is essential for aligning business practices with current and future compliance expectations.

14.1 Paris Agreement and Global Frameworks

The 2015 Paris Agreement, adopted under the UNFCCC, set the global goal of limiting warming to well below 2°C, with efforts to stay within 1.5°C. All countries must submit Nationally Determined Contributions (NDCs), updated every five years to reflect greater ambition. The Glasgow Climate Pact (COP26) strengthened this framework by supporting Article 6 market mechanisms, encouraging more frequent NDC updates, and calling for a 45% reduction in global CO_2 emissions by 2030 (relative to 2010 levels).

These mechanisms provide the foundation for national climate laws and international carbon markets that affect corporate reporting and carbon credit participation.

14.2 Carbon Pricing Mechanisms

Carbon pricing is expanding, now covering over 20% of global emissions. Two main approaches are used:

- **Carbon taxes**: A fixed fee per ton of CO_2e emitted, offering price certainty
- **Cap-and-trade systems**: A limit on total emissions, with tradable allowances. Prices fluctuate with market demand

Major systems include:

- **EU Emissions Trading System (EU ETS)** – the largest global carbon market, with steadily rising prices
- **China's National ETS** – initially covering the power sector, with future expansion planned
- **California and RGGI (US)** – regional trading programs
- **National carbon taxes** – in countries like Sweden, Canada, and Singapore

Some jurisdictions are introducing carbon border adjustments, which apply carbon pricing to imported goods based on embedded emissions—raising compliance requirements for exporters.

14.3 Product Labeling and Extended Producer Responsibility (EPR)

Governments are increasingly linking product carbon footprint disclosure to consumer policy. Examples include:

- EU's Product Environmental Footprint (PEF) initiative, standardizing footprint calculations
- France – mandatory labeling for furniture, textiles, hotels, with food next
- UK – developing sector-specific carbon labeling standards

These are complemented by voluntary labels like the Carbon Trust Carbon Footprint Label, which require verified data and reduction commitments.

At the same time, Extended Producer Responsibility (EPR) laws are evolving to integrate carbon metrics alongside waste and recycling obligations. Some frameworks now assign fees based on a product's carbon footprint to promote low-carbon design. The EU's Circular Economy Action Plan explicitly links material efficiency with climate goals, and similar trends are emerging in Canada, Australia, and Asia.

Looking ahead, regulatory expectations are likely to grow. These include:

- Mandatory Scope 3 reporting
- Product-level footprint audits
- Stricter disclosure and verification standards
- Sector-specific rules for high-emission industries

Organizations must proactively monitor these changes, engage in policy development, and build internal systems to adapt quickly. Integrated governance and strong data systems are key to future compliance and certification readiness.

15.0 CARBON IN SUPPLY CHAIN MANAGEMENT

For most organizations, the majority of emissions—often 70–90%—come from their supply chains. Managing these Scope 3 emissions is essential for achieving credible climate goals and obtaining

ICIS carbon footprint certification. Supply chain carbon management includes identifying emissions hotspots, engaging suppliers, collaborating across sectors, and using data to drive decisions.

15.1 Hotspot Identification

The first step is to map the supply chain and identify where emissions are highest. This can be done using:

- Spend-based emission factors (estimations based on how much is purchased)
- Industry benchmarks
- Primary data from key suppliers

Organizations should prioritize high-impact categories based on emissions, spend, data availability, and potential for reduction. Many use frameworks like the CDP Supply Chain program, which helps standardize data collection across global supplier networks.

A phased approach is recommended—starting with estimates for broad coverage, then collecting more accurate, supplier-specific data for high-emission categories over time.

15.2 Supplier Engagement

Procurement teams play a key role in reducing supply chain emissions. Carbon performance should become a criterion in supplier selection, alongside price, quality, and delivery.

Approaches include:

- Minimum carbon performance standards
- Weighted scoring systems
- Total cost of ownership models that include emissions

Organizations may also support suppliers through training, tools, and emissions tracking resources. Some companies cascade their carbon reduction targets down to suppliers or require science-based targets from key vendors. Contracts can include clauses for data reporting, emissions targets, or financial incentives tied to performance.

Major companies like Apple, Microsoft, and Unilever already integrate carbon metrics into their supplier scorecards and decision processes.

15.3 Collaborative Reduction Programs

Supply chain decarbonization often requires collective action. Industry groups like the Sustainable Apparel Coalition and Clean Cargo Working Group help companies align methodologies and reduce duplication of supplier demands.

In some cases, buyers and suppliers co-invest in emission reduction projects, renewable energy purchases, or development of low-carbon products. These partnerships reduce costs, improve impact, and build long-term trust in the supply chain.

15.4 Supply Chain Analytics and Visualization

Modern tools help companies visualize carbon emissions across their supplier network. These platforms highlight hotspots by product, region, or supplier tier, and allow for scenario modeling—such as evaluating the impact of switching suppliers or adopting new materials.

Tools like Ecovadis Carbon, CDP Analytics, and Microsoft Cloud for Sustainability support data-driven decision-making by making supply chain carbon data accessible to procurement teams, sustainability leaders, and executives.

16.0 SUMMARY

This document provides a comprehensive overview of carbon footprint management, emphasizing practical strategies and best practices across sectors and value chains. It outlines the foundations of carbon accounting based on ISO 14067 and highlights the growing importance of accurate, verifiable reporting in alignment with global climate goals and regulatory trends.

Key areas addressed include:

- **Carbon footprint calculation** methodologies for products, organizations, and value chains
- **Reduction strategies** such as energy efficiency, renewable energy, and process optimization
- **Technology applications**, including carbon capture, negative emissions, and digital tools
- **Offsetting approaches**, with a focus on quality criteria and the mitigation hierarchy
- **Sector-specific insights**, covering manufacturing, buildings, transport, agriculture, and food systems
- **Corporate practices**, such as science-based targets, governance frameworks, and supply chain engagement
- **Regulatory developments**, including carbon pricing, product labeling, and extended producer responsibility

Organizations aiming for credible climate leadership must adopt a structured approach—starting with emissions measurement, followed by prioritized reduction efforts, and supported where necessary by verified offsets. Cross-functional engagement, transparent reporting, and continuous improvement are essential for long-term success.

As climate expectations increase, aligning with certification programs like ICIS ensures consistency, integrity, and stakeholder confidence. By integrating carbon management into core operations and decision-making, organizations can reduce risk, uncover efficiency gains, and contribute meaningfully to the global climate transition.