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WHEN AN ESTIMATE BECOMES A WARRANTY

CLIMATE DATA AND REVISION RISK UNDER THE CISG

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ABSTRACT

When a supplier revises an earlier greenhouse gas emissions estimate, the discrepancy may expose a breach of a contractual undertaking, reflect an evidentiary improvement upon a calculation that was properly performed, or capture upstream activities falling outside the scope of the original agreement. Allocating the resulting investigation and recalculation expenses raises foundational questions of contractual responsibility that mandatory climate-reporting regimes do not resolve on their own terms. Drawing upon a hypothetical cross-border sale of manufactured goods between a Singaporean seller and an Australian buyer, this doctrinal study examines how the United Nations Convention on Contracts for the International Sale of Goods governs the cost of investigating and correcting historical production data. The analysis separates the object of a contractual promise from its standard of performance, demonstrating that an undertaking to apply a prescribed calculation method may impose strict liability as to process without warranting the numerical accuracy of the resulting figure, whilst an accurate report may simultaneously reveal that the delivered goods exceed an agreed carbon ceiling. Competing scholarly accounts concerning obligations of effort and exemption from damages under article 79 are evaluated by tracing their consequences for the buyer's remaining non-damages remedies. The study further critiques the automatic extension of the goods-centric notice and cut-off periods under articles 38 and 39 to independently due reporting obligations, whilst acknowledging both the commercial rationale for the analogy and the risk of opportunistic pleading designed to revive lost conformity claims. By connecting the classification of primary obligations to post-delivery evidence and the recoverability of verification costs, the article demonstrates how targeted contractual mechanisms governing record access, timely correction, and reassessment funding can preserve effective legal recourse whilst distinguishing defective performance from subsequent improvements in emissions data.

Keywords: international sales law; climate disclosure; emissions estimates; contractual interpretation; revision risk; supply-chain accountability

1 INTRODUCTION

Suppose an Australian industrial manufacturer purchases steel pump housings from a supplier based in Singapore. Under their contract of sale, the supplier undertakes to compile designated foundry production records, apply an agreed emissions-accounting methodology, and set out the material limitations affecting its calculation of cradle-to-gate greenhouse gas emissions per housing. Following delivery of both the housings and the accompanying report, which states a figure of 80 kilograms of carbon-dioxide equivalent per unit for the relevant production year,[1] the supplier issues a revised figure of 112 kilograms. Having already incorporated the initial 80-kilogram figure into its statutory climate disclosures, the buyer commissions an independent technical investigation and seeks to recover the resulting expenditure from the supplier. Although simple arithmetic establishes a 40% upward revision from the original report, that numerical movement neither explains why the figure changed nor determines which party must bear the cost of verification and restatement.

Several distinct factual possibilities could account for the 112-kilogram figure while yielding markedly different legal outcomes. An audit might reveal that the supplier failed to collect a primary furnace energy record that it had expressly promised to obtain. Equally, the supplier might have complied with every data-collection and methodological step required by the contract, yet subsequent metering or refined emission factors might have generated more reliable evidence regarding the

[1] Carbon-dioxide equivalent expresses the radiative forcing and warming effects of different greenhouse gases in a single common metric: Australian Accounting Standards Board, *AASB S2 Climate-related Disclosures* (September 2024) app A (definition of 'CO2 equivalent') ('AASB S2'). The transaction and numerical figures used throughout this study are hypothetical.

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completed production year. A third possibility is that the revised calculation incorporates downstream transport or auxiliary processes that were excluded from the original contractual boundary. Because any of these three scenarios can produce the identical revised number, the supplier's unilateral characterisation of its update as a 'correction' or an 'improvement' cannot settle the question of contractual liability.

The buyer's remedial position depends just as heavily on the content of the seller's primary undertaking. Beyond requiring the supplier to follow a designated calculation protocol, the parties might stipulate that the reported figure will be accurate within a defined percentage tolerance, or they might require that the housings themselves be manufactured with production emissions not exceeding 100 kilograms of carbon-dioxide equivalent per unit on an agreed basis. Where both assurances have been given and the agreed accuracy tolerance is exceeded, reliable proof that actual production emissions reached 112 kilograms per unit operates on two distinct planes: it establishes both that the initial documentary report was inaccurate and that the physical goods failed to conform to their agreed environmental ceiling. Separating these promises explains why truthful reporting of high emissions may discharge a duty to provide accurate data whilst simultaneously exposing a breach of goods conformity, whereas delivering housings well below the 100-kilogram ceiling will not excuse a failure to supply calculation records independently required by the contract.

In a qualifying cross-border transaction between Singapore and Australia, these obligations fall to be analysed within the framework of the United Nations Convention on Contracts for the International Sale of Goods (CISG).[2] Throughout this study, the term 'warranty' is employed in a descriptive sense to denote a contractually agreed assurance of numerical accuracy or a promised characteristic of the goods, rather than importing any domestic common-law division between conditions and warranties. Whether an emissions estimate carries that promissory force turns upon the interpretation of the parties' agreement under the Convention rather than the mere fact that a subsequent calculation produces a different number. The central doctrinal problem is how the precise content of the seller's promise governs the relevance and weight of post-performance evidence, the preservation of remedies through timely notice, and the recovery of investigation and correction expenses.

Recent scholarship has established the foundational distinction between contractual requirements defining the sustainable qualities of the goods themselves and collateral duties concerning supply-chain information, due diligence, or cooperation. Whilst Schwenzer's early work, together with her later collaboration with Muñoz, demonstrated that unethical or carbon-intensive production methods can render goods non-conforming under article 35 even where their physical utility is unimpaired, Atamer and Wittum have examined how additional sustainability undertakings operate outside the conformity regime, particularly where they take the form of obligations of effort.[3] The present study addresses a more specific evidentiary and remedial problem that arises after delivery: when information concerning completed manufacturing operations improves over time, the law must determine which contractual undertaking, if any, that subsequent evidence proves to have been broken. Resolving that question requires separating the object of a promise from its standard of performance, because an unqualified commitment to execute a named calculation method is strict as to process without necessarily guaranteeing the empirical accuracy of its numerical output.

To isolate these variables, the article proceeds doctrinally through successive variations of the pump-housing hypothetical, testing the text of the CISG, decided cases, scholarly commentary, and the persuasive opinions of the CISG Advisory Council against each variation. Mandatory Australian sustainability reporting rules provide the regulatory backdrop explaining why the buyer requires verifiable value-chain data, even though those domestic statutory duties do not automatically alter the bilateral terms of the supply contract. The analysis reflects the state of the law as at 9 November 2026 and assumes a prospective transaction involving an Australian corporate buyer whose transitional first-year relief for Scope 3 value-chain disclosures has expired, leaving standalone data-consultancy contracts, forward-looking emissions projections, and third-party investor litigation outside the scope of inquiry.

How sales law allocates revision risk carries practical significance well beyond the immediate balance sheet of the contracting parties. Corporate officers tasked with preparing mandatory sustainability disclosures rely routinely upon operational records held by upstream manufacturers, and cannot responsibly investigate an unexpected restatement without contractual rights of access, adequate time, and financial resources. Yet shifting the entire cost of every subsequent refinement onto the supplier would effectively treat the uncertainty inherent in emissions estimation as a contractual default, even where the parties expressly contracted for an approximation. The task for private law is therefore to show how commercial contracts can secure verifiable supply-chain data and a meaningful opportunity to test it, whilst maintaining a principled boundary between purchasing a specified calculation and transferring the risk that empirical knowledge may later improve.

2 CLIMATE REPORTING AND THE CONTRACTUAL DEMAND FOR INFORMATION

2.1 REPORTING RESPONSIBILITY AND CALCULATION BOUNDARIES

Under section 292A of the Corporations Act 2001 (Cth), corporate entities that meet prescribed statutory thresholds and are required to prepare annual financial reports under Chapter 2M must also prepare an annual sustainability report. Sections 296A, 296C, and 296D govern the substantive contents and climate-statement requirements of those reports, with phased mandatory commencement operating under section 1707B. Within that statutory architecture, Australian Accounting Standards Board standard AASB S2 mandates the disclosure of Scope 3 greenhouse gas emissions (defined as indirect greenhouse gas

[2] United Nations Convention on Contracts for the International Sale of Goods (adopted 11 April 1980, entered into force 1 January 1988) 1489 UNTS 3 ('CISG'). Unless otherwise indicated, all article references in the text and footnotes are to the CISG.

[3] Yeşim M Atamer and Patrick Wittum, 'Sustainability Due Diligence in International Sales Contracts: Insights from the CISG' (2025) 30(3) *Uniform Law Review* 287, 300–02 <https://doi.org/10.1093/ulr/unaf038>; Ingeborg Schwenzer, 'Ethical Standards in CISG Contracts' (2017) 22(1) *Uniform Law Review* 122, 123–27 <https://doi.org/10.1093/ulr/unw061>; Ingeborg Schwenzer and Edgardo Muñoz, 'Sustainability in Global Supply Chains Under the CISG' (2021) 23(3) *European Journal of Law Reform* 300, 319–20, 327–33 <https://doi.org/10.5553/EJLR/138723702021023003002>.

emissions, other than Scope 2 emissions, that occur in the reporting entity's value chain), subject to materiality assessments and transitional reliefs. Although paragraph C4(b) of AASB S2 grants transitional relief from disclosing Scope 3 emissions during the first annual reporting period in which an entity applies the standard, the hypothetical examined here concerns a subsequent reporting period in which the buyer must account for its upstream purchased goods.[4]

In Regulatory Guide 280, the Australian Securities and Investments Commission (ASIC) acknowledges that reporting entities may need to request emissions data from value-chain counterparties and may rely upon reasonable estimates subject to AASB S2's reasonable-and-supportable-information requirement.[5] From a contractual perspective, however, engaging an upstream supplier to provide product-level carbon data neither delegates the buyer's statutory reporting responsibility nor implies an open-ended undertaking by the supplier to perform whatever supplementary recalculations the buyer may later find convenient. Because articles 8, 9, and 29 of the CISG anchor contractual obligations in the ascertainable agreement of the parties, the sales contract itself must define both the scope of the initial calculation work and the extent of any ongoing duty to assist with subsequent reporting cycles.

Fixing the technical boundary of that calculation is essential to determining whether a revised figure reflects a breach. Under the Greenhouse Gas Protocol's technical guidance for calculating Scope 3 emissions, Category 1 (purchased goods and services) captures upstream 'cradle-to-gate' emissions generated up to the point where the product leaves the supplier's facility, whereas transportation and distribution of the purchased product from the supplier to the reporting company's own facilities are accounted for separately under Category 4 when undertaken in vehicles and facilities not owned or controlled by the reporting company.[6] An emissions figure calculated by a component manufacturer may therefore provide a vital supplier-specific input for the buyer's Category 1 inventory without purporting to represent the buyer's complete Scope 3 footprint for those goods. Throughout the hypothetical variations analysed below, the figures of 80, 100, and 112 kilograms of carbon-dioxide equivalent per housing all refer to an identical cradle-to-gate manufacturing boundary unless a specific variation alters that scope. Consequently, a buyer's post-delivery demand to incorporate international shipping emissions between Singapore and Australia seeks an expansion of the contractual service, which must be distinguished from discovering that the supplier omitted an upstream heat-treatment process that fell squarely within the original manufacturing boundary.

Beyond fixing the upstream boundary of the calculation, the agreement must also be interpreted to establish how facility-wide emissions are allocated to individual units and the effect of any agreed threshold of error on contractual recourse. Raw meter readings from a multi-line foundry cannot yield a per-housing figure until an agreed allocation key (whether based on physical mass, machine hours, or economic value) partitions the plant's aggregate energy consumption across a defined production period and output volume. Any contractual tolerance or 'materiality' qualifier attached to that figure must likewise be construed autonomously under article 8 of the CISG rather than conflated with reporting materiality under AASB S2.[7] Whereas regulatory materiality under AASB S2 asks whether omitting, misstating, or obscuring information could reasonably be expected to influence decisions that primary users of general purpose financial reports make on the basis of those reports, a bilateral supply contract must be interpreted on its own terms. Even where a supplier's omission of a promised primary energy record produces only a minor ripple across the buyer's consolidated corporate inventory, that omission may nonetheless constitute a serious breach of an express documentary or informational obligation under the contract of sale.

2.2 REVISIONS, ERRORS AND CHANGING MEASUREMENT RULES

The accounting rules governing sustainability disclosures expressly anticipate that value-chain figures will evolve over time. AASB S2 permits a reporting entity to measure Scope 3 emissions using estimation approaches and requires it to use 'all reasonable and supportable information that is available to the entity at the reporting date without undue cost or effort' when choosing its approach, inputs and assumptions, whilst requiring disclosures regarding the characteristics of the inputs used and the resulting measurement uncertainty. Crucially, Appendix D of AASB S2 distinguishes between revised comparative amounts reflecting new evidence about a previously estimated metric, provided that it concerns circumstances existing in the preceding period (addressed in paragraphs B50 and B51, subject to impracticability relief) and the correction of prior-period reporting errors (addressed in paragraphs 83 to 85), which arise from a failure to use, or the misuse of, reliable information that was available when the earlier sustainability disclosures were authorised for issue and could reasonably have been expected to be obtained and considered.[8]

Because a reporting entity may be required to restate a comparative Scope 3 figure when superior empirical data becomes available, the mere existence of an accounting restatement does not establish that an upstream supplier breached its sales contract. Where the supplier undertook only to apply a specified secondary emission factor to its existing utility bills, the ordinary expense of upgrading to primary sub-metered data in a subsequent reporting year rests with the buyer, absent a separate undertaking to fund it. Conversely, how the buyer classifies an adjustment in its own financial and sustainability statements cannot insulate a defaulting supplier from contractual liability: an update presented externally as a routine comparative revision may in fact have been triggered by discovering that the supplier omitted a foundry dataset it had strictly

[4] Corporations Act 2001 (Cth) ss 292A, 296A, 296C, 296D, 1707B (Compilation No 149, 19 September 2026) vols 2 and 6; AASB S2 (n 1) para 29(a)(i)(3), app A (definitions of 'Scope 3 greenhouse gas emissions' and 'Scope 3 categories'), app C paras C4(b), C5.

[5] Australian Securities and Investments Commission, *Sustainability Reporting* (Regulatory Guide 280, 31 March 2025) RG 280.30 note, RG 280.103–280.107 ('RG 280'); CISG (n 2) arts 8–9, 29.

[6] World Resources Institute and World Business Council for Sustainable Development, *Technical Guidance for Calculating Scope 3 Emissions* (Version 1.0, 2013) ch 1, 21–22, box 1.1, 24–25, 27 ('Scope 3 Guidance') (distinguishing at 25 upstream transportation of inputs to the Tier 1 supplier from transportation of the purchased product to the reporting company); ch 4, 49–50, table 4.1; ch 9, 102.

[7] Scope 3 Guidance (n 6) 27; AASB S2 (n 1) app D paras 17–19; CISG (n 2) art 8.

[8] AASB S2 (n 1) para 29(a)(iii), app B paras B38–B42, app D paras 77–85, B50–B51 (with para B51 also addressing forward-looking metrics and the condition against hindsight when revising a forward-looking comparative metric).

promised to include. Accounting classifications and contractual breach answer different normative questions, requiring the legal analysis to return to the precise performance purchased under the contract of sale.

Regulatory amendments to measurement methodologies reinforce the need to separate physical manufacturing reality from reported metrics. Prior to the cut-off date of this study, the Australian Accounting Standards Board issued amending standard AASB S2025-1, which formally commences on 31 December 2026 and applies mandatorily to annual reporting periods beginning on or after 1 January 2027, subject to earlier voluntary adoption through a written directors' election under section 336A(3) of the Corporations Act 2001 (Cth).[9] Amongst other targeted adjustments, AASB S2025-1 extends jurisdictional relief concerning the use of alternative measurement methods and global warming potential values mandated by a relevant regulatory authority or listing exchange, provided the specified conditions hold for the relevant part of the reporting entity and only for as long as the relevant requirement applies to that part. Because an upstream supplier does not become part of its customer's consolidated reporting entity merely by sitting within its value chain, and because the hypothetical here applies the baseline September 2024 text of AASB S2, such regulatory changes illustrate a broader contractual point: identical physical production emissions can yield a different reported kilogram figure solely because global warming potential multipliers or calculation rules have been updated. Whether a supplier is obliged to recalculate historical production runs under newly promulgated methodologies depends entirely upon how the sales contract allocates the risk of methodological change.

3 IDENTIFYING THE PERFORMANCE PURCHASED

3.1 THE CONVENTION AND THE PARTIES' AGREEMENT

Because both Australia and Singapore are Contracting States to the CISG, a contract for the sale of manufactured pump housings between parties whose relevant places of business are situated in those jurisdictions falls directly within the autonomous applicability rule of article 1(1)(a). Although Singapore lodged a reservation under article 95 upon ratification, that declaration excludes only the indirect application of the Convention via rules of private international law under article 1(1)(b) and leaves direct application between Contracting States under article 1(1)(a) intact; sections 3 and 4 of Singapore's Sale of Goods (United Nations Convention) Act 1995 accordingly give the Convention the force of law with statutory priority over inconsistent domestic rules.[10] For the purposes of the hypothetical, it is assumed that the parties have not opted out of the Convention under article 6, that the Australian buyer does not supply a 'substantial part of the materials necessary for such manufacture or production' under article 3(1), and that the supplier's emissions-reporting duties do not constitute 'the preponderant part of the obligations of the party who furnishes the goods' so as to remove the transaction from the Convention under article 3(2). By contrast, a standalone consultancy agreement commissioned purely for carbon accounting would fall outside the CISG and require independent characterisation under domestic choice-of-law rules.

Where the contract of sale falls within the Convention, article 4 provides that the CISG governs 'the formation of the contract of sale and the rights and obligations of the seller and the buyer arising from such a contract'. As Atamer and Wittum have shown, ancillary reporting or due-diligence obligations incorporated into an international sales contract are governed by the Convention's remedial framework even where they do not concern the physical conformity of the goods.[11] Whether a corporate supplier code of conduct, a technical carbon-accounting schedule, or a post-formation sustainability questionnaire forms part of the parties' agreement is determined by the formation provisions of articles 14 to 24 alongside the interpretive standards of articles 8 and 9. Under article 8(1), statements and conduct are interpreted according to the speaker's intent 'where the other party knew or could not have been unaware what that intent was', failing which article 8(2) looks to 'the understanding that a reasonable person of the same kind as the other party would have had in the same circumstances', taking into account negotiations, established practices, usages, and subsequent conduct under article 8(3) and article 9.

Applying these formation and interpretation rules prevents unilateral reporting expectations from being treated as binding contractual promises. Merely posting a sustainability policy on a buyer's corporate procurement portal does not incorporate its terms into a supply contract; as CISG Advisory Council Opinion No 13 confirms, standard terms become part of the agreement only where the parties have expressly or impliedly agreed to their inclusion and the counterparty had a reasonable opportunity to take notice of their text.[12] Similarly, a detailed emissions questionnaire sent by the buyer after the contract has been concluded may either operationalise a reporting obligation already agreed at formation or constitute an offer to modify the contract under article 29(1), to which the supplier's mere silence or inactivity cannot amount to acceptance under article 18(1). Timing is equally decisive for disclaimers: whereas an express methodological caveat agreed at contract conclusion defines and limits the scope of the seller's initial promise, a unilateral liability disclaimer printed for the first time at the foot of a delivered emissions report cannot retroactively cut down a contractual assurance already purchased by the buyer, particularly where article 29(2) enforces an agreed no-oral-modification clause absent preclusive reliance.

Whilst the CISG governs whether an exclusion clause, liability cap, or cost-reimbursement formula has been validly incorporated and how its wording is to be construed, article 4(a) generally leaves 'the validity of the contract or of any of its provisions' to the applicable domestic law identified by private international law. In Opinion No 17, the CISG Advisory

[9] Australian Accounting Standards Board, *AASB S2025-1 Amendments to Greenhouse Gas Emissions Disclosures* (December 2025) 8 (amending paras B21–B22, B24), 11–12 (inserting paras C1B, C6(a) and commencement provision); Corporations Act 2001 (Cth) s 336A(3) (requiring a written directors' election for early application, with para C6(a) of AASB S2025-1 governing comparative adjustments upon adopting the amended relief).

[10] CISG (n 2) arts 1(1)(a), 3, 6, 95; Sale of Goods (United Nations Convention) Act 1995 (2020 Rev Ed, Singapore) ss 3–4; United Nations Treaty Collection, 'United Nations Convention on Contracts for the International Sale of Goods' (Status of Treaties, Chapter X.10, entries and declarations for Australia and Singapore).

[11] CISG (n 2) arts 4, 8–9, 14–24, 29, 45; Atamer and Wittum (n 3) 300–03.

[12] CISG Advisory Council, *Inclusion of Standard Terms under the CISG* (Opinion No 13, 20 January 2013, Rapporteur Sieg Eiselen) rules 2–4, 7–8 ('Opinion No 13'); CISG (n 2) arts 8, 18(1), 29.

Council underscores this jurisdictional boundary in relation to limitation and exclusion clauses.[13] The resulting two-step inquiry requires a tribunal first to determine the exact scope of the agreed risk allocation under articles 8 and 9 of the Convention before testing whether that clause offends mandatory domestic validity rules.

3.2 THE OBJECT OF A PROMISE AND ITS STANDARD OF PERFORMANCE

In analysing climate-data clauses, it is essential not to conflate the civil-law distinction between obligations of effort (obligations de moyens) and obligations of result (obligations de résultat) with the substantive distinction between a calculation duty and an accuracy warranty. A contract may require the supplier to use reasonable efforts to request primary emissions data from its sub-tier ingot suppliers, or it may impose an unqualified duty to obtain a specified utility dataset from its own foundry. Similarly, the supplier may undertake strictly to execute a prescribed carbon-accounting formula even though that formula incorporates industry-average emission factors. Both the unqualified data-collection duty and the formula-application duty concern the performance of a calculation process, yet only the sub-tier enquiry clause is limited to a standard of reasonable care. Where the supplier has strictly promised to apply a designated calculation protocol, a breach is established by proving that it deviated from the formula or omitted a required input, rather than by attempting to show that the resulting figure diverged from an unknowable exact physical total.

A warranty of numerical accuracy addresses a fundamentally different contractual object. To define an accuracy assurance with precision, the agreement should specify the metric warranted, the permissible margin of tolerance, and the reference methodology against which any alleged departure is to be measured. A bare stipulation that a reported product carbon footprint is 'accurate within plus or minus 10%' may leave uncertainty about the applicable system boundary, allocation rule, and verification benchmark. Rather than promising access to an unmediated ontological 'truth' about historical molecular emissions, commercial parties may anchor an accuracy warranty in the output that an independent verifier would reach when applying a named standard (such as ISO 14067 or the GHG Protocol Product Standard) to the plant's operational records. Construing the agreement under article 8 must respect these drafting choices: describing a reported figure as an 'estimate' neither immunises the supplier against liability where a specific tolerance has been warranted nor converts a basic process obligation into a guarantee of numerical precision.[14]

Contractual knowledge qualifications introduce a third analytical category that must be kept distinct from both process obligations and numerical tolerances. Where a supplier warrants that, to the best of its knowledge and belief after reasonable enquiry, the delivered emissions report contains no material misstatement, proving a breach requires examining the supplier's actual cognitive state and the diligence of its internal enquiries at the time of certification, without turning the statement into an insurer's guarantee that subsequent third-party audits will confirm the number. Moreover, sophisticated supply contracts may layer these mechanisms within a single transaction, combining a strict obligation to apply an agreed calculation tool for direct foundry operations, a reasonable-efforts undertaking to gather upstream raw-material data, and an objective ceiling on the embedded emissions of the delivered housings. Each undertaking must be interpreted and tested for breach on its own terms.

3.3 GOODS CONFORMITY AND DOCUMENTARY PERFORMANCE

Under article 35(1) of the CISG, the seller 'must deliver goods which are of the quantity, quality and description required by the contract'. As both the sustainability scholarship and CISG Advisory Council Opinion No 19 establish, intangible production characteristics and manufacturing history can form part of the agreed quality and description of the goods even where they leave the physical durability and mechanical operation of the product unaffected.[15] Where a sales contract expressly stipulates that the steel pump housings must be manufactured with cradle-to-gate emissions not exceeding 100 kilograms of carbon-dioxide equivalent per unit, that ceiling defines the conformity of the goods under article 35(1). It does not follow, however, that every contractual clause requiring the disclosure of product emissions implies a qualitative cap on the goods themselves: an industrial buyer compiling a transparent Scope 3 baseline may knowingly purchase carbon-intensive housings provided their actual footprint is accurately reported. Where the contract contains no express carbon ceiling under article 35(1), a buyer seeking to establish non-conformity under article 35(2)(a) or (b) must prove either that exceeding a particular emissions threshold renders the housings unfit for the purposes for which goods of the same description would ordinarily be used, or that the buyer expressly or impliedly made known a particular low-carbon purpose at contract conclusion, taking account of whether the buyer relied, and could reasonably rely, on the seller's skill and judgement.

Thus, if the buyer informs the supplier during negotiations that the housings are being acquired for integration into a certified low-carbon infrastructure project with fixed embodied-carbon limits, that communicated purpose may ground an obligation under article 35(2)(b). Absent such specific communication or an established trade usage under article 9, the general commercial importance of corporate climate reporting cannot by itself conjure an implied maximum carbon intensity across ordinary industrial sales. Furthermore, while article 35(3) excludes the seller's liability under article 35(2)(a)–(d) where 'at the time of the conclusion of the contract the buyer knew or could not have been unaware of such lack of conformity', that statutory exclusion does not automatically displace an express contractual warranty of quality agreed under article 35(1).[16]

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[13] CISG (n 2) arts 4(a), 6; CISG Advisory Council, *Limitation and Exclusion Clauses in CISG Contracts* (Opinion No 17, 16 October 2015, Rapporteur Lauro Gama Jr) rules 1–2, 4 ('Opinion No 17').

[14] CISG (n 2) art 8; Schwenzer and Muñoz (n 3) 327–30; Atamer and Wittum (n 3) 301–02. International Organization for Standardization, *ISO 14067:2018 Greenhouse gases: Carbon footprint of products: Requirements and guidelines for quantification* (August 2018) abstract; World Resources Institute and World Business Council for Sustainable Development, *Product Life Cycle Accounting and Reporting Standard* (2011) 5–6.

[15] CISG (n 2) art 35(1)–(2); Schwenzer, 'Ethical Standards' (n 3) 123–27; CISG Advisory Council, *Standards and Conformity of the Goods under Article 35 CISG* (Opinion No 19, 25 November 2018, Rapporteur Djakhongir Saidov) rules 3–4, comments 3.1–3.4, 4.5, 4.10–4.11 ('Opinion No 19').

[16] CISG (n 2) arts 9, 35(2)–(3); Opinion No 19 (n 15) comments 4.16–4.22 (noting that art 35(3) expressly qualifies liability under subparas (a)–(d) of art 35(2) rather than overriding an express quality stipulation under art 35(1)).

Documentary obligations require equally precise classification. Article 34 provides that where the seller 'is bound to hand over documents relating to the goods, he must hand them over at the time and place and in the form required by the contract'. In Opinion No 11, the CISG Advisory Council confirms that 'documents relating to the goods' under article 34 are not confined to documents of title or transport documents controlling physical possession (such as bills of lading), but extend to certificates of origin, quality, weight, and technical compliance.[17] An emissions certificate required upon delivery to verify that the identified shipment of pump housings satisfies an agreed 100-kilogram ceiling falls squarely within that documentary category and remains intimately tied to the conformity of the goods. By contrast, an undertaking to provide an annual factory-wide emissions reconciliation, to preserve underlying calculation spreadsheets for five years, or to notify the buyer within thirty days of discovering a material methodological error serves an informational function that may extend well beyond the physical delivery of any single consignment. Chronology alone cannot resolve that classification: a compliance certificate tendered months after physical delivery may still relate directly to the conformity of the goods delivered, whereas an independent data-architecture duty may fall due even before the first shipment leaves the factory.

Because article 45(1) grants the buyer remedies whenever 'the seller fails to perform any of his obligations under the contract or this Convention', a supplier's breach of an ancillary reporting obligation can ground a claim for damages under article 74 even where the delivered housings comply fully with their 100-kilogram ceiling.[18] Recognising that independent remedial pathway does not mean, however, that every dispute involving an inaccurate emissions figure bypasses the examination and notice regime of articles 38 and 39. Where the alleged defect consists in an inaccurate certificate attesting to a warranted characteristic of the goods themselves, the claim remains tethered to the conformity regime regardless of whether the buyer pleads its case as defective reporting rather than defective goods. Navigating these overlapping obligations requires tracing how post-delivery evidence and notice rules apply to each distinct promise.

4 LATER EVIDENCE AND EXEMPTION FROM DAMAGES

4.1 WHAT THE REVISED NUMBER ESTABLISHES

Unless the parties have agreed to incorporate evolving regulatory methodologies dynamically over the life of the contract or subsequently modified their agreement under article 29, the benchmark governing the seller's performance is fixed at the time of contract conclusion. For claims concerning the conformity of the goods, article 36(1) renders the seller liable 'for any lack of conformity which exists at the time when the risk passes to the buyer, even though the lack of conformity becomes apparent only after that time', whilst article 36(2) governs subsequent non-conformities caused by a breach of obligation, including an express guarantee that the goods will retain specified qualities or characteristics for a defined period. In a transaction involving annual carbon accounting, four distinct temporal points must therefore be kept separate: the historical production period during which the housings were cast, the date on which risk passed to the buyer under articles 66 to 69, the contractual due date for delivering the emissions report, and the subsequent date on which an investigation uncovers a discrepancy. Delivering an annual emissions report sixty days after the close of a calendar year does not alter the historical period being measured or shift the moment at which the delivered housings had to conform under article 36(1).[19]

Applying these temporal and mathematical distinctions to the pump-housing hypothetical clarifies what is at stake in the numbers. If a verified post-delivery reconstruction establishes that the housings were manufactured with emissions of 112 kilograms of carbon-dioxide equivalent per unit, that figure exceeds the agreed 100-kilogram product ceiling by 12 kilograms, representing a 12% exceedance of the ceiling. By contrast, the 40% increase cited in the introduction measures the 32-kilogram gap between the originally reported estimate of 80 kilograms and the revised figure of 112 kilograms. The difference between those two denominators is legally decisive: the 40% movement measures the upward revision relative to the initial statement, whereas the 12% overrun measures the physical non-conformity of the goods. Whether an accuracy tolerance is exceeded depends on the denominator specified or ascertainable under the contract. Neither calculation can sustain legal liability if the subsequent study measures a different manufacturing batch, applies an unagreed allocation key, or expands the system boundary without reconciling those adjustments back to the contractual baseline. Moreover, because emissions figures remain subject to inherent measurement uncertainty, a single point estimate generated by a later consultant is not self-proving; the buyer's expert evidence must account for material measurement uncertainty, including any reported confidence intervals and demonstrate that the true figure under the contractually agreed method departed from the warranted tolerance or ceiling on the applicable standard of proof.

The decision of the United States Court of Appeals for the Seventh Circuit in *Chicago Prime Packers Inc v Northam Food Trading Co* illustrates the evidentiary discipline required when connecting post-delivery inspections to the relevant contractual point in time. Affirming the judgment below on conformity grounds without reaching the district court's alternative holdings on timeliness of notice under articles 38 and 39, Flaum CJ held that under the CISG the buyer bears the burden of proving that the delivered goods were non-conforming at the time risk passed, and upheld, on clear-error review, the finding that the buyer had failed to discharge that burden in respect of a shipment of pork back ribs.[20] Crucially, the buyer's evidentiary case collapsed because third-party processors had handled the meat in the interim, the inspected ribs could not be definitively matched to the seller's shipment, and the evidence failed to rule out post-transfer spoilage. Although embedded manufacturing emissions obviously do not spoil in cold storage after risk passes, an analogous evidentiary difficulty arises whenever a buyer

[17] CISG (n 2) art 34; CISG Advisory Council, *Issues Raised by Documents under the CISG Focusing on the Buyer's Payment Duty* (Opinion No 11, 3 August 2012, Rapporteur Martin Davies) rule 1, comments 1.1–1.2, 3.1–3.2 ('Opinion No 11').

[18] CISG (n 2) art 45(1); Atamer and Wittum (n 3) 300–03.

[19] CISG (n 2) arts 34, 36(1)–(2), 66–69; Opinion No 19 (n 15) rule 2, comments 2.1–2.2 (distinguishing the contract conclusion date used to identify applicable standards from the passage-of-risk date used to assess conformity under art 36(1)).

[20] *Chicago Prime Packers Inc v Northam Food Trading Co* 408 F 3d 894, 898–900 (7th Cir 2005) (affirming on burden-of-proof and conformity grounds under CISG art 36(1) without deciding the district court's alternative holdings on timeliness of examination and notice under arts 38–39).

seeks to impeach earlier deliveries using a subsequent factory-wide carbon audit: the study must establish traceably that its inputs relate to the specific production run delivered under the contract and justify any retrospective inference drawn from later operating conditions. Neither *Chicago Prime Packers* nor the supplier's voluntary issuance of a revised number relieves the buyer of the burden of proving that a specific contractual obligation was broken.

In practice, comparing the supplier's original and revised calculation spreadsheets will often establish a breach of a methodological duty far more directly than debating competing headline numbers. Discovering that the supplier applied a generic grid factor where the contract mandated a facility-specific power-purchase factor, or omitted a promised natural-gas ledger altogether, pinpoints an exact operational failure. Conversely, where a revision rests upon readings from sub-meters installed a year after the housings were manufactured, the buyer must establish why those new measurements prove a breach of the earlier obligation rather than a mere post-performance upgrade in factory instrumentation. Where the supplier undertook only to make reasonable enquiries of its upstream raw-material vendors, the subsequent surfacing of a third-party record must be evaluated against the scope of enquiries reasonably required when the report was compiled; its later emergence does not automatically prove that the original enquiries were negligent. For that reason, contractual clauses governing record retention and audit access directly shape a buyer's practical ability to discharge its burden of proof without formally reversing the legal incidence of that burden.

4.2 EFFORT, RESULT AND THE COMPETING ACCOUNTS OF ARTICLE 79

The most significant theoretical disagreement in the contemporary CISG sustainability literature concerns the boundary between defining the seller's primary obligation and excusing non-performance under article 79. Atamer and Wittum argue that obligations of reasonable effort must be located squarely within the definition of the seller's primary contractual duty under article 8: if a supplier has promised only to exercise due diligence or reasonable efforts in gathering supply-chain information and has exercised that care, it has fully performed its obligation and committed no breach.[21] On that analysis, the CISG's adherence to strict contractual liability simply means that once a breach of an agreed obligation (whether of effort or of result) is established, the buyer need not prove fault as an additional precondition to claiming damages under article 45(1)(b); it does not convert a promise to take reasonable steps into a guarantee of a successful outcome, nor does it require recourse to article 79 to excuse a diligent seller.

By contrast, Schwenzer and Muñoz explore how best-efforts commitments interact with article 79 where the contract maintains an objective sustainability requirement for the goods themselves. They suggest that contractual best-efforts or due-diligence provisions can operate via article 6 to modify the standard of exemption under article 79(1), recalibrating what counts as an impediment beyond the seller's sphere of control and what the seller can reasonably be expected to overcome when supervising remote supply-chain actors.[22] Under that construction, delivering goods that violate an agreed sustainability standard remains an objective breach of article 35, yet a seller who has complied with the agreed due-diligence protocol may be exempted from paying damages under article 79(1), whilst leaving the buyer's non-damages remedies intact by virtue of article 79(5). Properly understood, Schwenzer and Muñoz do not contend that exercising reasonable care automatically satisfies the unmodified text of article 79(1); rather, they rely upon party autonomy under article 6 to explain how a best-efforts clause can soften the financial consequences of strict conformity liability.

Each of these two doctrinal accounts captures a distinct commercial configuration. The exemption model advanced by Schwenzer and Muñoz is particularly persuasive where the parties intentionally combine an uncompromising goods specification with a negotiated shield against open-ended financial exposure. For example, our Australian buyer might insist upon an objective right to reject or reduce the price of pump housings whose manufacturing emissions exceed 100 kilograms per unit, whilst agreeing that the Singaporean supplier will not be liable in consequential damages if an upstream pig-iron smelter supplies falsified data despite the supplier having carried out an agreed verification audit. If a tribunal were to collapse the entire bargain into a pure obligation of effort at the primary stage, the buyer would be stripped of the very conformity remedies (such as price reduction under article 50 or avoidance under article 49) that the objective 100-kilogram ceiling was designed to secure. Treating the due-diligence clause as a contractual modification of article 79(1) preserves that bifurcated remedial allocation, provided always that interpretation under article 8 shows that the parties intended both an objective ceiling and a conditional damages exemption.

Conversely, the critique developed by Atamer and Wittum is compelling whenever the seller's sole undertaking from the outset was an obligation of conduct. If the supplier never warranted a numerical ceiling or an exact outcome, but promised only to use reasonable efforts to canvass sub-tier energy records, treating an incomplete dataset as a breach of contract and remitting the supplier to an article 79 defence would fabricate a primary result obligation that the supplier never agreed to sell. Moreover, because article 79(5) provides that '[n]othing in this article prevents either party from exercising any right other than to claim damages under this Convention', routing a fulfilled conduct obligation through article 79 would anomalously expose a compliant seller to claims for specific performance, price reduction, or avoidance for failing to achieve an unpromised result. Because article 79 cannot manufacture a primary obligation where none exists, the soundest analytical sequence is first to determine under article 8 whether each distinct clause imposes a duty of conduct or of result, and only then to inquire whether the parties have exercised their freedom under article 6 to modify the exemption threshold for any obligation found to have been breached.[23]

Applying that two-stage sequence to the pump-housing variations yields clear doctrinal answers. A supplier who promises only to make reasonable enquiries for sub-tier data and conducts those enquiries diligently commits no breach when better figures later emerge. Likewise, a supplier who strictly promises to execute an agreed calculation formula using designated factory records and performs that calculation without error discharges its obligation even if a subsequent

[21] Atamer and Wittum (n 3) 301–02, especially 302 n 138.

[22] Schwenzer and Muñoz (n 3) 331–33; CISG (n 2) arts 6, 79(5).

[23] CISG (n 2) arts 6, 8, 45, 79; Atamer and Wittum (n 3) 301–02; Schwenzer and Muñoz (n 3) 331–33.

methodological refinement produces a higher number. Where, however, the supplier has additionally warranted that the reported figure is accurate within 5% or that the housings themselves do not exceed 100 kilograms of carbon-dioxide equivalent per unit, proving that it took reasonable care in compiling its spreadsheet will not defeat a finding of breach. Although an express contractual clause may modify article 79's application to that warranty breach, a tribunal must identify the specific contractual wording and surrounding circumstances that justify that modification rather than relying on vague appeals to 'best efforts' or the inherent difficulty of carbon accounting.

Where the unmodified text of article 79(1) applies, a defaulting seller can escape liability for damages only if it proves that the failure to perform

> was due to an impediment beyond his control and that he could not reasonably be expected to have taken the impediment into account at the time of the conclusion of the contract or to have avoided or overcome it or its consequences.

Ordinary commercial friction in gathering factory utility bills, or the routine margin of error built into an estimation methodology that the seller voluntarily chose to warrant, will not satisfy those cumulative threshold requirements. Once the buyer discharges its initial burden of proving that a warranted accuracy tolerance or product ceiling was broken, the burden shifts squarely onto the supplier to establish each element of exemption under article 79(1), keeping in mind that whilst giving a numerical warranty strongly informs the contractual allocation of risk, it should not be described as ousting article 79 across every conceivable supervening catastrophe.[24]

4.3 DELEGATED REPORTING AND THE LIMITS OF EXEMPTION

Suppliers who lack in-house carbon-accounting expertise may retain external sustainability consultants or verification bodies to compile their product emissions reports. Delegating that work does not by itself discharge the supplier's contractual obligation to the buyer. Where an external consultant is engaged as an economically and functionally independent third person to perform the whole or part of the supplier's contractual reporting duty, article 79(2) imposes a double threshold for exemption: the supplier is exempt from damages only if '(a) he is exempt under the preceding paragraph; and (b) the person whom he has so engaged would be so exempt if the provisions of that paragraph were applied to him'. As CISG Advisory Council Opinion No 7 explains, article 79(2) distinguishes independent subcontractors entrusted with performing a portion of the contract itself from the seller's own employees as well as from ordinary upstream suppliers of raw materials or components, whose defaults generally remain within the seller's own sphere of risk under article 79(1).[25] Whether an upstream metal supplier who provides defective primary emissions data alongside raw steel ingots counts as an upstream procurement supplier under article 79(1) or a third person engaged to perform part of the reporting duty under article 79(2) turns on its functional role in the contractual arrangement; in neither case, however, can the seller obtain an exemption merely by showing that it exercised care in selecting a reputable specialist.

Even where a genuine supervening impediment satisfies article 79(1) or (2), its remedial shelter remains tightly circumscribed by paragraphs (3) to (5). Under article 79(3), the exemption operates only 'for the period during which the impediment exists', meaning that a temporary disruption to factory data systems does not permanently excuse delayed reporting once records can be reconstructed. Furthermore, article 79(4) requires the non-performing party to notify the buyer 'of the impediment and its effect on his ability to perform', rendering a silent supplier liable for damages resulting from the non-receipt of notice within a reasonable time after it knew or ought to have known of the obstacle. Finally, while article 79(5) preserves every remedy other than damages, each remaining remedy must still satisfy its own substantive preconditions under the Convention: avoidance under article 49(1)(a) requires a fundamental breach, and an order for specific performance under articles 46 and 28 cannot compel a supplier to produce historical meter readings that were physically destroyed in a fire.[26] Separating the absence of a breach from an exempted breach therefore carries direct practical consequences for the parties' surviving remedies without implying that every non-damages remedy will be available on the facts.

5 NOTICE AND THE PRESERVATION OF MEANINGFUL REMEDIES

5.1 GOODS AND DOCUMENTS CONNECTED WITH CONFORMITY

Whenever the buyer complains that the delivered housings exceed their agreed 100-kilogram emissions ceiling, its remedies are conditioned upon compliance with the examination and notice provisions of articles 38 and 39. Article 38(1) obliges the buyer to 'examine the goods, or cause them to be examined, within as short a period as is practicable in the circumstances', whilst article 39(1) provides that the buyer

> loses the right to rely on a lack of conformity of the goods if he does not give notice to the seller specifying the nature of the lack of conformity within a reasonable time after he has discovered it or ought to have discovered it.

[24] CISG (n 2) art 79(1) (where the contractual risk allocation informs whether an impediment could reasonably have been taken into account or overcome, whereas careful performance of an independent conduct obligation does not itself operate as an exemption for breaching a separate warranty).

[25] CISG (n 2) art 79(1)–(2); CISG Advisory Council, *Exemption of Liability for Damages under Article 79 of the CISG* (Opinion No 7, 12 October 2007, Rapporteur Alejandro M Garro) rules 2.1–2.3, comments 15–22, especially 18–19 ('Opinion No 7').

[26] CISG (n 2) arts 28, 46, 49, 79(3)–(5).

As CISG Advisory Council Opinion No 2 emphasises, the period for examining the goods under article 38 and the period for giving notice under article 39(1) are distinct sequential inquiries, and what constitutes a practicable examination depends upon the nature of the goods and the overt signs of any latent defect.[27] Because no physical inspection or metallurgical test of a finished steel pump housing can reveal the kilowatt-hours of electricity consumed during its casting in Singapore, embedded carbon emissions are quintessential non-observable characteristics. Yet the impossibility of detecting carbon intensity through visual inspection of the metal does not entitle a buyer to remain passive indefinitely if accompanying documentation, internal arithmetic contradictions in the supplier's report, or agreed audit rights put the buyer on inquiry.

Crucially, article 39(1) does not require the buyer to possess a fully quantified forensic reconstruction before giving notice. Where preliminary scrutiny reveals that a promised foundry furnace ledger has been omitted from the calculation pack, or that the supplier's stated energy totals contradict its production volumes, the buyer can and should notify the supplier of those specific irregularities and state that they cast doubt upon compliance with the agreed carbon ceiling. In Opinion No 2, the CISG Advisory Council confirms that where precise root-cause diagnosis is not yet practicable, a notice describing the observable symptoms or indicators of non-conformity can satisfy article 39(1), whereas an unspecific expression of general dissatisfaction will not suffice.[28] Delaying all communication until external consultants have finalised their fee invoices or until the buyer prepares its next annual statutory sustainability report risks forfeiting the claim altogether by depriving the supplier of a timely opportunity to inspect its records and cure the defect.

Alongside the relative notice period in paragraph (1), article 39(2) imposes an absolute cut-off:

> [i]n any event, the buyer loses the right to rely on a lack of conformity of the goods if he does not give the seller notice thereof at the latest within a period of two years from the date on which the goods were actually handed over to the buyer, unless this time-limit is inconsistent with a contractual period of guarantee.

Because that two-year clock starts running upon the physical handover of the housings rather than upon the passage of risk under article 36 or the later delivery of an annual climate report, a substantial portion of the cut-off period may already have expired before the buyer receives the revised 112-kilogram figure. Moreover, an undertaking by the supplier to furnish annual emissions updates over a three-year supply relationship does not automatically amount to a three-year 'contractual period of guarantee' of the goods' conformity within the meaning of the article 39(2) proviso; as the UNCITRAL Digest of Case Law observes, tribunals distinguish true contractual guarantees of quality from clauses that merely describe expected product performance.[29]

Although a clause expressly requiring the supplier to stand behind the historical carbon intensity of delivered housings throughout a multi-year regulatory reconciliation window presents a stronger candidate for the article 39(2) guarantee proviso than a bare covenant to supply future data, leaving that question to judicial implication is commercially hazardous. Because extending a substantive guarantee does not automatically dispense with the requirement to give notice within a reasonable time after discovery under article 39(1), well-counselled parties should use their freedom under article 6 to vary both legs of article 39 expressly. Absent such drafting, a buyer whose conformity claim is otherwise time-barred must look to the statutory exceptions in articles 40 and 44. Under article 40, the seller is precluded from relying upon articles 38 and 39 'if the lack of conformity relates to facts of which he knew or could not have been unaware and which he did not disclose to the buyer', a threshold that will be met where the supplier knowingly suppressed a furnace dataset when issuing the 80-kilogram figure. Where the seller lacks such culpable knowledge, article 44 allows a buyer who has a 'reasonable excuse for his failure to give the required notice' under article 39(1) to reduce the price under article 50 or claim damages other than loss of profit, though article 44 confers no relief whatsoever once the absolute two-year cut-off in article 39(2) has expired.[30]

Nor can a buyer sidestep the notice discipline of articles 38 and 39 simply by framing its complaint around a defective emissions certificate under article 34. Both CISG Advisory Council Opinion No 21 (addressing repair and substitute delivery) and Opinion No 5 (addressing avoidance for non-conforming goods or documents) treat accompanying compliance documents as closely integrated with the conformity regime.[31] Where an emissions certificate is contracted for specifically to evidence that a delivered batch of pump housings complies with an agreed 100-kilogram ceiling, allowing the buyer to rebrand a time-barred conformity claim as an unnotified documentary breach would subvert the finality policy of article 39.

5.2 THE CASE FOR AND AGAINST EXTENDING NOTICE TO INDEPENDENT REPORTING

A far more intricate doctrinal question arises where the seller's breach concerns a genuinely independent informational obligation rather than a certificate of goods conformity. Suppose the pump housings comply comfortably with the 100-kilogram ceiling (or the contract contains no carbon ceiling at all), yet the supplier breaches a separate contractual undertaking to provide a factory-wide multi-year reconciliation report, to preserve primary calculation spreadsheets for audit, or to notify the buyer within thirty days of discovering a material change in an emission factor. Whilst Atamer and Wittum note that the applicability of article 39(1) to breaches of collateral sustainability obligations is contested, the scholarly debate extends well beyond

[27] CISG (n 2) arts 38–39; CISG Advisory Council, *Examination of the Goods and Notice of Non-Conformity: Articles 38 and 39* (Opinion No 2, 7 June 2004, Rapporteur Eric E Bergsten) art 38 rules 1–3, art 39 rules 1–3 ('Opinion No 2'); Schwenzer, 'Ethical Standards' (n 3) 127.

[28] Opinion No 2 (n 27) art 39 rules 3–4; CISG (n 2) art 39(1).

[29] CISG (n 2) art 39(2); United Nations Commission on International Trade Law, UNCITRAL *Digest of Case Law on the United Nations Convention on Contracts for the International Sale of Goods* (United Nations 2016) art 39 paras 28–29 ('UNCITRAL Digest').

[30] CISG (n 2) arts 6, 8, 39–40, 44; UNCITRAL Digest (n 29) art 39 paras 9, 28–29.

[31] CISG Advisory Council, *Delivery of Substitute Goods and Repair under the CISG* (Opinion No 21, adopted following the meeting of 3–4 February 2020, Rapporteurs Ingeborg Schwenzer and Ilka H Beimel) n 2; CISG Advisory Council, *The Buyer's Right to Avoid the Contract in Case of Non-Conforming Goods or Documents* (Opinion No 5, 7 May 2005, Rapporteur Ingeborg Schwenzer) comments 4.7–4.9 ('Opinion No 5').

paragraph (1): Schlechtriem argued forcefully that where a sales contract governed by the CISG includes ancillary service or work obligations, articles 38, 39(1), and the absolute two-year cut-off in article 39(2) should all apply by analogy to defective performance of those services.[32]

The teleological case for Schlechtriem's analogy deserves serious weight. Whether a seller's defective performance lies in the physical fabrication of the goods or in ancillary installation, testing, or technical reporting duties incorporated into the same contract of sale, the seller has an identical commercial interest in receiving prompt specification of alleged defects, an opportunity to investigate and cure at minimal cost, and eventual repose from stale liabilities. Allowing a claimant to evade the Convention's prompt-notice discipline merely by characterising a closely bound technical service as an independent obligation under article 45 would invite artificial pleading and fragment the remedial administration of a single commercial bargain. Whenever a climate report serves as the agreed evidentiary vehicle for proving a warranted characteristic of the goods, those functional considerations strongly reinforce applying articles 38 and 39.

Extending that analogy automatically to an independent reporting obligation falling due years after delivery is, however, textually and practically problematic. By its express terms, article 39 governs the buyer's right 'to rely on a lack of conformity of the goods', and article 39(2) anchors its two-year outer limit specifically in 'the date on which the goods were actually handed over to the buyer'. If that handover date were mechanically imported into an obligation to deliver a multi-year Scope 3 reconciliation report thirty months after physical delivery of the housings, the buyer's remedies would be extinguished under article 39(2) six months before the reporting duty even fell due to be performed. Answering that anomaly by asserting that sophisticated commercial parties ought to contract out of article 39(2) begs the central interpretive question of whether the Convention imposes that default rule on non-goods obligations in the first place. An alternative judicial adaptation would be to apply article 39(2) by analogy whilst resetting the two-year clock to run from the date on which the independent report was handed over. Although commercially sensible, constructing a new limitation commencement date that appears nowhere in the text of article 39(2) must be justified rigorously as gap-filling under article 7(2) rather than treated as a straightforward application of the treaty text.

Under article 7(2), matters governed by the Convention that are not expressly settled in it must be resolved 'in conformity with the general principles on which it is based or, in the absence of such principles, in conformity with the law applicable by virtue of the rules of private international law'. Even if one accepts general principles of good faith, informational cooperation, and protection of the seller's right to cure within the Convention, those principles do not inevitably compel the drastic sanction of total remedial forfeiture (and an absolute two-year cut-off) for every ancillary obligation outside article 35. Where a buyer delays unreasonably in notifying the seller of an obvious omission in an independent data report, the mitigation duty under article 77 already bars recovery of any incremental losses that timely communication would have avoided, without extinguishing the underlying claim in its entirety.[33] Recognising the operation of article 77 does not negate the seller's legitimate interest in finality, but it demonstrates why general principles alone do not compel exporting the drastic forfeiture rule of article 39(2) to every obligation independent of goods conformity.

On balance, the sounder doctrinal view is to confine the handover-based two-year cut-off in article 39(2) to claims alleging non-conformity of the goods and documentary defects bound up with goods conformity, while declining to export it automatically to autonomous reporting or financial reimbursement undertakings. The case against analogous forfeiture is strongest where the informational obligation has its own post-delivery due date, addresses factory-wide or methodological verification distinct from the physical quality of the goods, and causes pure financial or compliance expenditure independently of any defect in the delivered housings. Even within that category, however, a tribunal persuaded by Schlechtriem's broader analogy may still require the buyer to give notice of an apparent reporting error within a reasonable time under article 39(1), making the boundary between articles 39 and 77 a live interpretive controversy rather than settled law.

The judgment of the Oberlandesgericht Düsseldorf in the *Television Sets* case illustrates how a carefully structured financial allocation can operate outside the articles 38 and 39 conformity regime. In that dispute, the seller had agreed to bear excess warranty and repair expenses once more than 5% of the delivered television sets required such work; the court construed that undertaking not as an ordinary claim for non-conformity of individual units subject to articles 38 and 39, but as an independent contractual cost-allocation guarantee triggered once the proportion of sets requiring warranty or service work crossed the agreed percentage.[34] Whilst that decision does not exempt ancillary services generally from notice requirements, it confirms that commercial parties may draft a self-standing reimbursement or reassessment payment trigger that operates independently of proving a defect in individual goods. To avoid the uncertainty of competing judicial analogies, parties drafting climate-data clauses should specify express notice periods measured from the receipt of the relevant report or revision notice and state clearly whether those periods operate as an article 6 derogation from article 39.

5.3 CORRECTION, PERFORMANCE AND AVOIDANCE

Where a reporting defect is identified early, the Convention's cure provisions distinguish sharply between documentary corrections and physical non-conformity. Under article 34, if the seller has handed over documents before the contractually required date, it may 'up to that time, cure any lack of conformity in the documents, if the exercise of this right does not cause the buyer unreasonable inconvenience or unreasonable expense', whilst article 48(1), subject to article 49, empowers the seller even after the delivery date to 'remedy at his own expense any failure to perform his obligations, if he can do so without

[32] Atamer and Wittum (n 3) 302 nn 141–42; Peter Schlechtriem, 'Interpretation, Gap-Filling and Further Development of the U.N. Sales Convention' (Martin Koehler tr, 2004) 16 *Pace International Law Review* 279, 294–97, especially 297 <https://doi.org/10.58948/2331-3536.1165> (expressly advocating the analogous application of both paras (1) and (2) of art 39 to defective service obligations governed by the CISG).

[33] CISG (n 2) art 7(2); Ingeborg Schwenzer, 'Interpretation and Gap-Filling under the CISG' in Ingeborg Schwenzer, Yeşim M Atamer and Petra Butler (eds), *Current Issues in the CISG and Arbitration* (Eleven International Publishing 2014) 109, 112, 115–16.

[34] Oberlandesgericht Düsseldorf, 28 May 2004, Case No I-17 U 20/02 (*Television Sets*), CISG-online 850, paras 37–39.

unreasonable delay and without causing the buyer unreasonable inconvenience or uncertainty of reimbursement by the seller of expenses advanced by the buyer'. Under both articles, the buyer retains its right to claim damages for any loss not eliminated by the cure. Crucially, however, re-running a spreadsheet calculation on retained foundry records can cure only a documentary or informational breach; it cannot retroactively extract greenhouse gases already emitted into the atmosphere when the steel housings were cast. Conflating documentary recalculation with physical 'repair' under article 46(3) obscures the fundamental difference between correcting an inaccurate report and curing a breach of an agreed 100-kilogram product ceiling, the consequences of which may be addressed by substitute delivery where article 46(2) permits it, or by contractually agreed offsets.[35]

A buyer seeking to compel the supplier to produce omitted records or deliver a compliant calculation invokes the general performance right in article 46(1), which entitles the buyer to 'require performance by the seller of his obligations unless the buyer has resorted to a remedy which is inconsistent with this requirement', subject always to the forum proviso in article 28 that a court is not bound to enter a judgment for specific performance unless it would do so under its own domestic law for similar sales contracts. By contrast, the heightened fundamental-breach requirement in article 46(2) and the reasonableness qualifier in article 46(3) govern only requests for substitute delivery or repair in cases of non-conformity of the goods. Where an independent reporting obligation is delayed, the buyer may fix an additional period of reasonable length (Nachfrist) under article 47(1), during which article 47(2) precludes resort to remedies for breach unless the buyer receives notice that the seller will not perform within that period, while preserving the buyer's claim for delay damages. Importantly, however, a seller's failure to comply with a Nachfrist notice fixing an additional deadline for an ancillary climate report does not entitle the buyer to avoid the entire sales contract automatically under article 49(1)(b), because that shortcut applies only to 'case of non-delivery' of the goods themselves; avoiding the contract for a reporting failure requires establishing a fundamental breach under articles 25 and 49(1)(a), subject to the time limits in article 49(2).[36]

Under article 25, a breach is fundamental only if it results in such detriment to the buyer

> as substantially to deprive him of what he is entitled to expect under the contract, unless the party in breach did not foresee and a reasonable person of the same kind in the same circumstances would not have foreseen such a result.

Although a supplier's failure to deliver verified emissions data before a statutory reporting deadline may cause acute commercial difficulty, the regulatory importance of climate disclosure does not automatically render every reporting error a fundamental breach of a contract for the sale of industrial pump housings. If the housings themselves perform their mechanical function and the supplier delivers usable corrective figures in time for the buyer to meet its statutory filing window (or rely upon permitted estimation reliefs), those circumstances weigh against a finding that the buyer has been substantially deprived of its contractual expectation. Conversely, where primary foundry measurements were never taken during the production run and physical reconstruction is impossible, ordering specific performance under article 46(1) would be futile.[37] These remedial constraints explain why well-designed supply contracts prioritise ongoing audit access and structured interim correction procedures over relying upon contract avoidance or ex post damages litigation.

6 INVESTIGATION COSTS, REIMBURSEMENT AND STATUTORY PROTECTION

6.1 THE LOSS CAUSED BY THE PARTICULAR BREACH

Where a breach of a calculation duty, accuracy warranty, or conformity ceiling is established, the recoverability of the buyer's investigation and restatement expenditure is governed by articles 74 and 77. Article 74 defines damages as 'a sum equal to the loss, including loss of profit, suffered by the other party as a consequence of the breach', capped at

> the loss which the party in breach foresaw or ought to have foreseen at the time of the conclusion of the contract, in the light of the facts and matters of which he then knew or ought to have known, as a possible consequence of the breach of contract,

whilst article 77 requires the aggrieved party to take reasonable measures to mitigate its loss. Applying the but-for causal baseline of article 74 requires comparing the buyer's actual financial position with the position it would have occupied had the supplier performed the exact obligation promised in the contract. Because even spotless performance of a contractual calculation duty might still have left the buyer incurring routine internal verification costs or paying external assurance providers to audit its consolidated Scope 3 inventory, the buyer cannot recover an entire consultancy invoice merely by showing that it was incurred after the supplier issued the 112-kilogram revision. Instead, the buyer must isolate the specific incremental expenditure made necessary by the supplier's breach.[38]

Tracing causation across our hypothetical variations illustrates how the scope of recoverable loss shifts with the broken promise. If the supplier breached a strict obligation to obtain and include a primary foundry furnace ledger, the reasonable fees charged by an external engineer to reconstruct that missing energy dataset are a direct consequence of the reporting breach and remain recoverable under article 74 even if the reconstruction ultimately confirms that total emissions per housing stayed below the 100-kilogram product ceiling. Conversely, if the supplier provided every promised record and executed the agreed calculation formula accurately, the cost of a buyer-commissioned study that installs finer sub-metering to narrow the margin of estimation uncertainty purchases an informational upgrade beyond the contractual bargain and must be borne by the buyer. Where the supplier breached an express numerical accuracy warranty or the 100-kilogram product ceiling, the buyer must similarly disaggregate its consultant's invoice to separate recoverable forensic investigation and restatement costs caused by the breach from routine statutory assurance fees that the buyer would have incurred in any event.

[35] CISG (n 2) arts 6, 34, 46(2), 48–49; Opinion No 5 (n 31) comments 4.7–4.9.

[36] CISG (n 2) arts 25, 28, 46–49; Opinion No 5 (n 31) comment 4.10.

[37] CISG (n 2) arts 25, 46(2)–(3), 49; Schwenzer, 'Ethical Standards' (n 3) 127–28; Opinion No 5 (n 31) comments 4.1–4.9.

[38] CISG (n 2) arts 74, 77.

In Opinion No 6, the CISG Advisory Council recognises that reasonable expenses incurred by a buyer in ascertaining whether delivered goods conform to the contract are recoverable under article 74 where a lack of conformity is actually established and properly notified.[39] Extending that principle to proved breaches of contractual reporting obligations justifies awarding the reasonable cost of investigating a suspect emissions calculation, provided that the investigation confirms a breach of the seller's undertaking. It does not, however, entitle a buyer to commission speculative third-party audits at the supplier's expense whenever a revised estimate triggers commercial anxiety: if the audit reveals that the supplier complied fully with its contractual obligations, shifting the cost of that verification requires a contractual cost-sharing clause rather than a damages claim under article 74. Even where a breach is established, the reasonableness of the buyer's expenditure under articles 74 and 77 must be assessed at the time the costs were incurred, taking into account whether the supplier offered to cure the calculation free of charge under article 48 and how much time remained before the buyer's statutory filing deadline. Communicating the existence and timing of the buyer's mandatory AASB S2 reporting obligations at contract conclusion will readily place the foreseeable costs of an emergency recalculation within the supplier's contemplation under article 74.

Causal precision is equally vital where the supplier's sole breach consists in delayed notification. Suppose the supplier's initial 80-kilogram calculation complied fully with the contract, subsequent utility reconciliations revealed the 112-kilogram figure, and the supplier then breached an express contractual obligation to notify the buyer of any material revision within thirty days. Even if the supplier had given timely notice on day thirty, the buyer would still have had to update its Scope 3 inventory to reflect the 112-kilogram figure. Consequently, the loss caused by the notification breach is not the baseline cost of revising the disclosure, but only the incremental expense caused by the delay, such as overtime rush fees charged by the buyer's external auditors or the wasted cost of an interim report compiled in ignorance of the update. Furthermore, where the buyer exacerbates the reporting error by commingling incompatible datasets or stripping out methodological caveats that the supplier had expressly attached to the 80-kilogram figure, its recovery is curtailed by article 77 to the extent of a failure to mitigate consequential loss. Article 80 applies only where the buyer's conduct caused the supplier's failure to perform and provides that '[a] party may not rely on a failure of the other party to perform, to the extent that such failure was caused by the first party's act or omission'.[40]

To avoid the evidentiary friction of proving breach and causation after the event, commercial parties may incorporate an autonomous contractual reimbursement clause allocating the cost of reassessment upon specified objective triggers. For instance, the contract might stipulate that the supplier will reimburse up to a fixed sum of verification expenses whenever a revised report departs from the initial estimate by more than 25%, or whenever an agreed methodological departure is identified, or simply upon the joint commissioning of a third-party review. Under the first trigger, the 40% revision from 80 to 112 kilograms would activate the supplier's payment obligation even if the original calculation involved no breach of contract, whereas the second trigger would require proof of methodological error. As the *Television Sets* decision demonstrates, such autonomous cost-allocation clauses operate according to their agreed contractual conditions under articles 6 and 8 rather than the breach-and-damages rules of article 74, though their interaction with contractual liability caps and domestic validity doctrines under article 4(a) must still be examined.[41] Conversely, where verification costs are claimed as damages for breach under article 74, any quantifiable financial benefit that the buyer derives from the study (such as reusable production-line mapping that saves expenditure in future reporting years) must be brought into account under the principle against overcompensation articulated in CISG Advisory Council Opinion No 6, provided there is a sufficient causal nexus between the breach and the resulting advantage.[42]

6.2 THE AUSTRALIAN RESTRICTION ON PROCEEDINGS

Where the dispute is litigated in an Australian forum or subject to mandatory Australian statutory provisions, the contractual analysis must contend with a significant statutory bar on civil proceedings. Section 1707D of the Corporations Act 2001 (Cth) restricts the commencement or continuation of legal proceedings against a person in relation to defined 'protected statements', carving out exceptions only for criminal proceedings and proceedings brought by ASIC. Protected statements encompass, inter alia, statements concerning Scope 3 greenhouse gas emissions, scenario analysis, or transition plans made in a sustainability report for the purpose of complying with a sustainability standard, or in the corresponding auditor's report for the purpose of complying with the Act or auditing standards, for financial years commencing during the three-year transitional window beginning on 1 January 2025. The section also protects qualifying future-facing climate statements in reports for financial years commencing in 2025, and certain Commonwealth-law-required statements that repeat a protected statement or differ only through updates or corrections. Because those dates define the qualifying financial years rather than imposing a sunset date on the immunity itself, protection for statements made in those reports endures beyond 1 January 2028; moreover, sections 1707DA and 1707DB (inserted with effect from 5 December 2025 by the Treasury Laws Amendment (Strengthening Financial Systems and Other Measures) Act 2025 (Cth)) extend parallel protections to qualifying voluntary sustainability reports accompanied by the required directors' declaration and to statements in relief-condition reports specified by the relevant exemption order.[43]

At first glance, a private spreadsheet delivered by a Singaporean component manufacturer under a commercial supply contract does not itself constitute a statutory sustainability report prepared under Chapter 2M of the Corporations Act 2001

[39] CISG Advisory Council, *Calculation of Damages under CISG Article 74* (Opinion No 6, Spring 2006, Rapporteur John Y Gotanda) rule 4, comment 4.2 ('Opinion No 6').

[40] CISG (n 2) arts 74, 77, 80; Atamer and Wittum (n 3) 311–12 (noting that art 80 addresses buyer-caused failure of performance rather than mere contributory negligence in respect of consequential loss).

[41] *Television Sets* (n 34) paras 37–39; CISG (n 2) arts 4(a), 6, 8; Opinion No 17 (n 13) rules 1–2, 4.

[42] Opinion No 6 (n 39) rule 9, comments 9.1–9.3; CISG (n 2) art 74.

[43] Corporations Act 2001 (Cth) ss 1707, 1707D(1)–(4), 1707DA, 1707DB, as amended by the Treasury Laws Amendment (Strengthening Financial Systems and Other Measures) Act 2025 (Cth) s 2 table item 4, sch 4 pt 1 div 2 item 13 (commencing 5 December 2025); RG 280 (n 5) RG 280.63–280.69.

(Cth). Nevertheless, the sweeping statutory language barring proceedings 'against a person in relation to' a protected statement creates a genuine interpretive hazard for supply-chain litigation. A defending supplier could plausibly argue that where an Australian buyer sues to recover the costs of investigating and restating a Scope 3 figure published in the buyer's own qualifying sustainability report, the contractual action is a proceeding 'in relation to' that protected statement and is therefore barred by section 1707D. Conversely, the buyer's strongest counter-argument is that the statutory immunity should be construed as shielding reporting entities and their officers from third-party and investor suits over uncertain Scope 3 disclosures, without extinguishing bilateral contractual remedies against an upstream vendor who breached an independent commercial warranty or data-delivery covenant, particularly where the investigation costs were incurred to verify goods conformity or internal procurement compliance independently of the published statement.[44]

Because neither the text of section 1707D nor ASIC's commentary in Regulatory Guide 280 expressly addresses upstream B2B supply-contract claims, and no reported judicial decision resolving that boundary was identified in the authorities examined as at 9 November 2026, the maintainability of such an action turns upon how a court construes the required statutory nexus between the pleaded contractual breach, the loss claimed, and the protected disclosure. A claim framed carefully around the supplier's breach of a bilateral manufacturing ceiling or independent record-delivery covenant stands on firmer ground than a pleading that seeks direct indemnification for statutory restatement expenses.

7 EVIDENCE, COST AND RESPONSIBILITY IN THE SUPPLY CHAIN

Ultimately, how a sales contract allocates revision risk determines which commercial actor must invest the time, resources, and institutional transparency required to make supply-chain climate metrics answerable to empirical verification. A corporate buyer's sustainability team cannot explain a 40% jump in product emissions to its auditors or regulators without examining the underlying calculation architecture, yet those primary utility ledgers and allocation worksheets sit inside the supplier's premises, frequently commingled with confidential costings and production runs for competing customers. Purchasing an express warranty of numerical accuracy without securing contractual rights of audit and record access risks leaving the buyer holding a hollow substantive right that it cannot prove in litigation. Equally, subjecting an upstream manufacturer to unconstrained, open-ended demands for primary factory records imposes unpriced administrative burdens detached from the value of the goods sold. Maintaining the doctrinal distinction between the performance actually purchased and subsequent demands for improved data provides the blueprint for balanced contractual design.

A robust contractual regime begins by specifying exactly which primary operational records the supplier must retain, requiring the preservation of original baseline calculation files alongside any subsequent revisions, and confining audit access strictly to data necessary to verify compliance with the agreed contractual boundary. Where commercial sensitivity prevents direct inspection by the buyer's personnel, interposing an independent third-party verifier bound by confidentiality undertakings protects the supplier's trade secrets whilst allowing the calculation to be audited. Crucially, the contractual record-retention period must be synchronised with the limitation and notice periods governing substantive remedies: obliging a supplier to retain foundry records for three years while leaving the unmodified two-year handover cut-off in article 39(2) untouched risks preserving evidence for a claim that has already been extinguished at law.[45] Expressly coordinating an article 6 derogation from article 39 with the contractual reporting timetable and the applicable domestic limitation statute eliminates that trap.

Financial allocation for post-delivery audits requires equivalent contractual precision. Where a supplier has priced and given an express warranty of numerical accuracy or a strict 100-kilogram product ceiling, it has contractually accepted the risk of non-conformity within those boundaries; where it has promised only to execute an agreed estimation protocol, the buyer has purchased a more limited service. Because asymmetric bargaining power may leave one party controlling both the standard terms and the operational evidence, the normative justification for an express reassessment clause is that it renders the contractual undertaking practically testable without turning every routine data refinement into a full-scale breach dispute. Commercial parties can achieve this balance by establishing a provisional funding mechanism for a limited technical review, under which the buyer advances the initial verification fee and final liability for the cost shifts to the supplier only if the verifier finds a departure from the agreed methodology or a breach of the warranted tolerance.

Structuring reassessment funding in this manner may also reduce perverse incentives to conceal superior data. If every upward revision of an earlier estimate automatically exposed the supplier to damages liability regardless of fault or compliance with the agreed protocol, rational suppliers would face a strong disincentive against volunteering improved emissions measurements. Separating a compliant methodological revision from a breach of contract can reduce that penalty for transparency, whilst preserving liability for breach of a numerical warranty or suppression of promised primary records. Coupling that distinction with an independent covenant requiring the supplier to notify the buyer promptly upon discovering any material change in inputs can promote timely information flow, with damages for late notice confined strictly to the incremental losses caused by the delay. Where neither party has breached the contract, the cost of incorporating newly available empirical data can be shared according to an agreed contractual formula.

Where disputes turn upon technical recalculation under agreed accounting boundaries, referring the discrepancy to expert determination offers a swift alternative to litigation, provided the expert's mandate is carefully delineated. As V K Rajah J explained in the Singapore High Court decision of *Evergreat Construction Co Pte Ltd v Presscrete Engineering Pte Ltd*, the binding force of an expert determination rests upon 'the sanctity [the law] accords to contractual arrangements', with the result that commercial parties who appoint an expert for speed and finality remain bound even by an erroneous valuation unless they establish fraud, partiality, or a material departure from instructions.[46] Crucially, Rajah J observed that whereas an expert's remit may validly encompass legal as well as factual questions if drafted broadly, where the parties 'fail to stipulate or mandate in the

[44] Corporations Act 2001 (Cth) s 1707D(1)–(4); RG 280 (n 5) RG 280.63–280.69.

[45] CISG (n 2) arts 6, 8, 39(2); UNCITRAL Digest (n 29) art 39 paras 28–29.

[46] *Evergreat Construction Co Pte Ltd v Presscrete Engineering Pte Ltd* [2005] SGHC 224, [2006] 1 SLR(R) 634 [34]–[37], [41], [44]–[47], especially [45] (V K Rajah J).

terms of reference for a "speaking" or "reasoned" award the court itself cannot, and indeed should not, insist' upon one. Although *Evergreat* Construction represents domestic Singaporean contract law rather than an autonomous CISG ruling, its drafting lessons apply directly to international supply contracts: parties who wish to assign technical carbon reconciliation to an emissions verifier while reserving questions of contractual interpretation and legal liability to an arbitral tribunal or court must define that jurisdictional boundary expressly, guarantee access to primary records, afford both sides an opportunity to make submissions, and mandate a fully reasoned written determination.

Finally, it must be recognised that these contractual mechanisms operate primarily between the commercial parties to the contract of sale. Because article 4 confines the CISG to 'the rights and obligations of the seller and the buyer arising from such a contract', the Convention's conformity rules and bilateral reporting covenants do not, by force of the Convention alone, confer enforceable third-party rights upon communities affected by industrial emissions or public stakeholders relying upon corporate sustainability disclosures.[47] Protecting those broader societal interests remains the province of public environmental regulation, mandatory disclosure statutes, tort law, and any applicable domestic rules on third-party contractual rights. Within its proper sphere, however, private sales law performs an indispensable institutional function: it links a reporting company's public climate statements to an enforceable bilateral duty requiring upstream manufacturers to produce, preserve, and correct the underlying empirical evidence. While empirical research must determine whether specific contractual clauses reduce industrial emissions in practice, rigorous doctrinal analysis shows how commercial parties can make climate assurances legally enforceable without penalising the honest improvement of scientific and operational knowledge.

8 CONCLUSION

A supplier's revision of a previously reported product emissions figure carries no single, predetermined legal meaning under the CISG. Its remedial consequences depend upon the precise object and standard of the performance purchased under the contract of sale and the underlying reason why the numerical estimate changed. A strict undertaking to apply a prescribed calculation methodology to designated factory records is discharged when that process is faithfully executed, even if the resulting estimate remains subject to uncertainty and is later refined; conversely, an express warranty of numerical accuracy within a defined tolerance or an objective product emissions ceiling under article 35(1) can be breached notwithstanding the supplier's utmost care in calculation. Post-delivery audit evidence must therefore be tied back rigorously to the agreed system boundary, historical production period, and allocation key, without treating measurement uncertainty itself as an unexpressed warranty.

Maintaining the doctrinal boundary between primary obligations of effort and modifications of the exemption regime under article 79 is essential because the two pathways yield materially different remedial outcomes. Where the seller promised only to exercise reasonable efforts in gathering upstream data and fulfilled that duty of conduct, no breach of contract arises to require excuse. Where, however, the contract pairs an objective conformity ceiling or accuracy warranty with a due-diligence limitation of liability under article 6 and article 79, a departure from the ceiling remains a breach that leaves the buyer's non-damages remedies intact under article 79(5), subject to their individual statutory preconditions. Construing the agreement under article 8 must establish which structure the parties actually adopted, recognising that taking reasonable care neither enlarges a primary duty of conduct into a guarantee of result nor satisfies the unmodified text of article 79(1) where a result was warranted.

The preservation of remedies through timely notice similarly follows the functional nature of the obligation breached. Whilst articles 38 and 39 govern claims that the delivered goods exceed an agreed carbon ceiling and extend coherently to accompanying compliance certificates integral to goods conformity, exporting the handover-based two-year cut-off in article 39(2) automatically to independent future reporting covenants lacks textual support and risks extinguishing rights before performance falls due. Just as a buyer should not be permitted to revive a time-barred conformity claim by relabelling it as a reporting error, a physical handover cut-off should not automatically defeat an autonomous post-delivery informational obligation. Express contractual drafting addressing notice triggers, retention horizons, and article 6 derogations provides far greater commercial certainty than relying upon contested gap-filling analogies.

Ultimately, damages under article 74 compensate only the incremental investigation and restatement expenses caused by the seller's specific breach within the limits of foreseeability, mitigation under article 77, and any applicable statutory bar on proceedings under section 1707D of the Corporations Act 2001 (Cth). Routine verification costs that the buyer would have incurred even upon full contractual performance require an autonomous cost-sharing agreement if they are to be shifted onto the supplier. By incorporating targeted clauses governing record retention, confidential audit access, timely revision notices, and provisional reassessment funding, commercial parties can render that doctrinal distinction workable in practice. Their broader significance lies in aligning the legal responsibilities of those who generate primary production data with those who must account for it publicly, ensuring that promised environmental assurances remain enforceable whilst leaving room for empirical knowledge to improve after performance is complete.

[47] CISG (n 2) art 4.