

CBAM

From Embedded Emissions to Compliance and Cost

A Practical Guide to the EU Carbon Border Adjustment
Mechanism, Definitive Regime

Steel in depth • Cement • Aluminium • Fertilisers • Hydrogen
Official 2026 default values • Egypt case study

Eng. Ahmed Samir Farag

First edition • Law and guidance as at 5 October 2026

CBAM: From Embedded Emissions to Compliance and Cost

A Practical Guide to the EU Carbon Border Adjustment Mechanism, Definitive Regime

Eng. Ahmed Samir Farag

This is a free sample. The full book is available at

https://leanpub.com/cbam_from_embedded_emissions_to_compliance_and_cost_first_edition_ebook



Available on Leanpub

Full edition · 300 pages · PDF and EPUB

12 parts · 38 chapters · 8 worked cases · 6 appendices

First edition · October 2026

Law and guidance as at 5 October 2026

© 2026 Ahmed Samir Farag. All rights reserved. This sample may be shared freely in its complete, unaltered form.

Contact: tradezoneup25@gmail.com · [linkedin.com/in/ahmed-ewais-ab7b1598](https://www.linkedin.com/in/ahmed-ewais-ab7b1598)

Preface

On 1 January 2026 the EU Carbon Border Adjustment Mechanism stopped being a reporting exercise and became a price. From that date, imports of steel, aluminium, cement, fertilisers, hydrogen or electricity give rise to an obligation on the authorised CBAM declarant to buy and surrender certificates (sales open on 1 February 2027; the first surrender is due by 30 September 2027) for the emissions embedded in those goods, less the free allocation that EU producers still receive and any carbon price already paid abroad. The number that drives the cost, the specific embedded emissions of each good, is calculated at the installation that made it, usually outside the EU, under rules written in Brussels.

This book is written for the people who have to produce, check or rely on that number: operators and their engineers, importers and customs declarants, verifiers, and the advisers who work between them. It follows the calculation from the legal definition through monitoring, attribution, precursors and defaults to the certificate obligation, and then through the documents, controls and verification that make the number defensible.

Three choices shape the book. First, it works from the binding texts and treats Commission guidance as guidance: useful, often decisive in practice, but not law, and in places wrong. Every statement carries a label that says which it is. Second, every worked example has been re-performed, including the Commission's own; where the published figures do not reproduce, the book says so and shows the corrected result. Third, iron and steel are treated at full engineering depth, because that is where most MENA exposure lies; the other five sectors are treated at the level of principles and one illustrative example each.

The regime is still moving. [Chapter 38](#) lists what was open at the date of writing, and the book is written so that each open item can be updated without rewriting the chapters that depend on it.

How to use this book

Structure. Parts I–III set the legal frame and scope. Parts IV–VI contain the calculation method: embedded emissions, monitoring and the sector rules. Parts VII–IX cover the documents, data controls and verification. Part X turns emissions into certificates and cost. Part XI applies everything to eight cases, ending with an Egyptian DRI/EAF exporter measured against the official default values, and Part XII turns it into a programme for an operator or exporter.

Statement labels. Every substantive statement carries one of seven labels (§5.3):

Label	Meaning
[L]	Legal text in force, with its citation
[G]	Commission guidance, not binding
[I]	The author's interpretation
[P]	Professional practice
[T]	Tension between sources, or a drafting error
[U]	Unresolved or unknown at the date of writing
[A]	Assumption in a worked example

Numbers. Decimals use a comma (0,545) and thousands a space (1 037 310), as in the *Official Journal*. Emissions are in tonnes of CO₂ equivalent (t CO₂e) unless stated. Intermediate results are carried unrounded; displayed results are rounded to the digits shown.

Citations. "Reg." is Regulation (EU) 2023/956 as consolidated on 20 October 2025. "Methodology Act" (MA) is Commission Implementing Regulation (EU) 2025/2547. Annex points are cited as in the act (for example, Annex II B.3.3(3)). Equation numbers are those of the Methodology Act ([Appendix B](#)).

Each chapter ends with common errors, a quality-control checklist, key takeaways, professional questions and references.

Contents

Part I — Foundations	10
Chapter 1 — Why CBAM Exists: Carbon Leakage and the End of Free Allocation	11
Chapter 2 — Actors, Obligations and the Annual Cycle	14
Chapter 3 — The Definitive Shift: What Changed on 1 January 2026	18
Part II — The Legal Framework	22
Chapter 4 — The Legal Architecture of CBAM	23
Chapter 5 — Citing, Reading and Labelling the Sources	27
Part III — Scope	31
Chapter 6 — Scope: Goods, Origin and CN Classification	32
Chapter 7 — Aggregated Goods Categories, Functional Units and Gases	35
Chapter 8 — The De Minimis Threshold, Special Procedures and Circumvention	38
Part IV — Embedded Emissions	41
Chapter 9 — What Embedded Emissions Are, and Are Not	44
Chapter 10 — Dividing the Installation into Production Processes	60
Chapter 11 — Attribution: Heat, Waste Gases and Electricity Between Processes	74
Chapter 12 — Precursors and Complex Goods	87
Part V — Monitoring	103
Chapter 13 — Monitoring Direct Emissions: Methodologies and Calculation Factors	104
Chapter 14 — The Mass Balance Method and Biomass	119
Chapter 15 — Non-CO ₂ Gases, CO ₂ Transfers and Sector-Specific Monitoring Rules	126
Chapter 16 — Activity Data, Uncertainty, the Cost Test and the Control System	135
Chapter 17 — Electricity: Indirect Emissions and Imported Electricity	144
Chapter 18 — Default Values, Mark-ups and Data Gaps	152
Part VI — Sectors	161
Chapter 19 — Iron and Steel: Goods, Routes, System Boundaries and Precursors	162
Chapter 20 — Iron and Steel: Calculating SEE, SEFA and the Certificate Obligation	169
Chapter 21 — Cement, Aluminium, Fertilisers, Hydrogen and Electricity: Principles	178
Part VII — Documents and Systems	192
Chapter 22 — The Monitoring Plan	193
Chapter 23 — The CBAM Data Model and Workbook Controls	197
Chapter 24 — The Operator's Emissions Report, Summary and Declarant-Specific Addendum	201
Chapter 25 — The CBAM Registry for Third-Country Operators	205

Part VIII — Data Quality and Controls	209
Chapter 26 — Data Types, Data Quality and the Evidence Chain	210
Chapter 27 — Designing Controls with Tolerances	214
Chapter 28 — Twenty-Five Failure Modes and How to Prevent Them	217
Part IX — Verification	221
Chapter 29 — Verification: Who, When and Under Which Rules	222
Chapter 30 — Verification in Practice: Risk-Based Testing, Findings and Fast Tests	227
Part X — Certificates and Cost	231
Chapter 31 — CBAM Certificates: Declaration, Price, Holding, Surrender, Repurchase, Cancellation	232
Chapter 32 — The Two Deductions: SEFA and Carbon Price Paid	237
Chapter 33 — The Economics of Proof: When Actual Data Pay	240
Chapter 34 — Penalties, Mitigation and Contractual Liability	243
Part XI — Eight Illustrative Cases	246
Case 1 — "Nile Scrap Steel": scrap-EAF and caster (Ch. 13–16, 19, 28)	248
Case 2 — "Delta Iron": gas DRI-EAF long products (Ch. 10–20, 22, 24)	249
Case 3 — "Suez Re-Rolling": billets and FeMn purchased (Ch. 12, 18, 30)	250
Case 4 — "Red Sea Integrated": BF-BOF works (Ch. 10–11, 19–20, 30)	251
Case 5 — Mass-balance file audit (Ch. 14, 27–28, 30)	252
Case 6 — "Two Rivers Metals": two sites, five customers (Parts IV–XII)	253
Case 7 — "Canal Fasteners": finishing plant (Ch. 12, 19, 33)	254
Case 8 — Egypt: a DRI/EAF rebar exporter under the definitive regime (Ch. 18, 20, 31–33, 37)	255
Part XII — Implementation and Outlook	258
Chapter 35 — The Readiness Roadmap	259
Chapter 36 — The Supplier Programme: Precursor Data by Design	262
Chapter 37 — CBAM in the Boardroom: Three Numbers and One Date	265
Chapter 38 — What Is Still Moving: Law in Force versus Proposals	268
Appendices	271
Table of provisions cited	275
Index of terms	296

Chapter 3 — The Definitive Shift: What Changed on 1 January 2026

Learning objectives. After this chapter the reader can list the main changes from the transitional period (October 2023 – December 2025) to the definitive period, detect transitional habits in a calculation workbook, and apply the 2026 reporting-period rule.

3.1 From reporting to paying

G The transitional period was a learning and data-collection phase with quarterly reports and no financial obligation. From 2026, embedded emissions determine certificate purchases, so the Methodology Act moves to prescriptive, standardised rules [**G**: Guidance No. 3 §2].

3.2 The main changes

G The Commission's own table of changes, condensed [**G**: Guidance No. 3, Table 2-1; references to CIR 2025/2547]:

Area	Transitional period	Definitive period	Book ch.
Reporting period	Operator could choose (e.g. fiscal year)	Calendar year of production (Art. 1(5)); for 2026 imports, 2026 (Art. 7(1))	9, 12
Record retention	4 years	6 years (Annex II A.2(4))	23
Cost test	EUR 20 reference price; EUR 2 000 floor	EUR 80; EUR 4 000 (A.3(8))	16
Functional unit, cement	Tonnes of product	Tonnes of clinker contained (Art. 4(5))	12, 21
Functional unit, fertilisers	Tonnes	kg N or supplementary unit (Art. 4(4))	12, 21
Composition-based SEE	—	Ranges ≤ 10 % (Eq. 64–66)	12
Several routes, one functional unit	Could be separated	Mandatory averaging (Art. 4(6))	10
Size/shape variants in steel and aluminium	Separate	Mandatory multifunctional process (Annex II A.4)	10, 19
5 % alloy/mass threshold	Applied	Deleted	19

Area	Transitional period	Definitive period	Book ch.
Precursor production period	Not presumed	Presumed = year of complex good (Art. 13)	12
Precursors from several periods or suppliers	Tracked separately	Weighted average by CN code by default (Art. 14)	12
Precursor data validity	Not formalised	Verified report by accredited verifier for the right period (A.1(4)–(5))	12
Indirect emissions	Reported for all goods	Only non-Annex II goods, plus non-Annex II precursors in Annex II goods (Annex I 3.1)	17, 19
"Relevant precursors" lists	Listed per category	Any Annex I good can be a precursor	12
EU-origin precursors	—	Zero-rated, quantity still reported	12
Language	—	Plan and report in English (Art. 5(6), 10(4))	22, 24
Reporting documents	One optional template	Report, summary, declarant-specific addendum (Art. 10)	24

T Two slips in the Commission's table: it cites Art. 7(2) for the import-year presumption, which is in **Art. 7(1)** (Art. 7(2) concerns electricity). It also calls the summary "public-facing", whereas the summary is prepared for the verifier and declarants and disclosed at the operator's discretion (CIR 2025/2547 Art. 10; Reg. Art. 10(7)).

3.3 The 2026 reporting-period rule

L "Where a good was imported during the year 2026, the reporting period shall be the year 2026." For later import years, the default is the year of import, rebuttable with evidence of the actual production time [**L**: CIR 2025/2547 Art. 7(1)]. **G** For precursors, verifiers disregard evidence of a production year before 2026, because no verified emissions, accredited verifiers or defaults exist for earlier years [**G**: Verification guidance §7.2].

I Consequence: goods produced in late 2025 and imported in 2026 take **2026** data or 2026 defaults. Precursor stocks carried into 2026 are treated as 2026 (§12.5.2).

3.4 Transitional habits to remove from a workbook **P**

1. Quarterly calculations or fiscal-year periods.
2. Indirect emissions reported for steel or aluminium goods as part of specific embedded emissions (SEE).

3. Separate SEE per route or per product shape where averaging or a multifunctional process is mandatory.
4. Cement SEE per tonne of cement without clinker-content conversion.
5. Supplier data accepted without verification evidence.
6. The 5 % alloy threshold still applied.
7. "Estimated" values filled in without a conservative-estimate method.

3.5 Common errors

#	Error	Correct treatment
1	Keeping quarterly calculations or fiscal-year reporting periods	The reporting period is the calendar year of production; for goods imported in 2026 it is 2026 (§3.2–3.3)
2	Using 2025 production data for goods produced in late 2025 and imported in 2026	Goods imported in 2026 have 2026 as their reporting period whatever the production date; for precursors, evidence of pre-2026 production is disregarded (§3.3)
3	Including indirect emissions in the SEE of steel or aluminium goods	In the definitive period, indirect emissions count only for non-Annex II goods, plus non-Annex II precursors in Annex II goods (§3.2, §3.4)
4	Expressing cement SEE per tonne of cement	The functional unit is tonnes of clinker contained (Art. 4(5)) (§3.2)
5	Accepting supplier precursor data without verification evidence	Precursor data require a verified report by an accredited verifier for the right period (§3.2, §3.4)

3.6 Quality-control checklist

- ☐ Separate SEE per route or product shape have been replaced by averaging or a multifunctional process where mandatory.
- ☐ The 5 % alloy threshold is no longer applied.
- ☐ Every "estimated" value is backed by a conservative-estimate method.
- ☐ The monitoring plan and report are in English.
- ☐ Records are kept for 6 years.

3.7 Key takeaways

- From 2026 the numbers cost money, so the rules are stricter: calendar year, prescribed functional units, averaging, precursor validity, direct-only for Annex II goods, English documents.

3.8 Professional questions

1. Audit a transitional-period workbook against the seven habits.
2. A cargo of billets produced in November 2025 arrives in February 2026. Which reporting period and which data apply?

3.9 References

- **L** CIR 2025/2547.
- **G** Guidance No. 3 §2, Table 2-1.
- **G** Verification guidance §7.2.

Chapter 31 — CBAM Certificates: Declaration, Price, Holding, Surrender, Repurchase, Cancellation

Learning objectives. After this chapter the reader can compute an obligation in certificates and euros, model the quarterly holding on the correct basis, and apply the repurchase and cancellation rules, including the special rules for 2026.

31.1 The annual cycle

Date	Event	Basis
During year y	Imports; from 2027 quarterly holding of $\geq 50\%$	Reg. Art. 22(2)
From 1 February 2027	Certificates sold on the common central platform	Art. 20(1)
30 September y+1	CBAM declaration for year y; surrender of certificates (first time 30 September 2027 for 2026)	Art. 6(1), 22(1)
31 October y+1	Deadline to request repurchase of excess certificates	Art. 23(1)
1 November	Cancellation of certificates bought in the year before the previous year	Art. 24(1)

31.2 The declaration

L The declaration states, per type of goods, the total quantity (MWh for electricity, tonnes otherwise, including goods below the mass threshold), the total embedded emissions, the number of certificates to surrender after the Art. 9 reduction and the Art. 31 free-allocation adjustment, and copies of verification reports where applicable [**L**: Art. 6(2)].

Number of certificates for good g = $M_g \times (SEE_g - SEFA_{g,y})$ – carbon-price reduction (Art. 9) [**L**: Art. 6(2)(c), 31; CIR 2025/2620, Annex point 2], floored at zero in this book [**I**; see §2.2].

31.3 The price

L The certificate price is the **weekly** average of EU ETS auction closing prices, published on the first working day of the following week [**L**: Art. 21(1)–(2)]. **L** For emissions declared **for 2026**, the price is the **quarterly average** of auction closing prices for the **quarter of importation** [**L**: Art. 21(1a)]. **L** CIR 2025/2548 fixes the method. The price is the average of the auction clearing prices of all allowances auctioned on the common auction platform and on the opt-out platforms, each weighted by the volume auctioned, excluding cancelled auctions; it is calculated in euro and rounded to the nearest cent, quarterly for 2026 and weekly from 2027 [**L**: CIR 2025/2548, Art. 1(1), (3)–(5), Art. 5]. Auctions for buildings, road transport and additional sectors are excluded [**G**: CIR 2025/2548, recital 2]. **I** The Regulation's "closing prices" and the implementing act's "clearing prices" refer to the same figure: recital 4 identifies the clearing price as the final price of each auction under Delegated Regulation (EU) 2023/2830. **L** Each 2026 quarterly price is calculated in the first calendar week of the following quarter and published on the first working day of the next calendar week; from the third quarter of 2026 the prices are also available in the CBAM registry [**L**: CIR 2025/2548, Art. 1(2), Art. 4]. **G** The Q3 2026 price, EUR 82,32, was published on 5 October 2026, the cut-off date of this edition; Q4 is due on 4 January 2027 [**G**: Commission, Price of CBAM certificates]; quarterly prices are carried as symbols P_Q1 ... P_Q4.

31.4 Quarterly holding (from 2027)

L At the end of each quarter, the declarant's account must hold certificates equal to at least **50 %** of the embedded emissions of all goods imported since the start of the year, determined either (a) with **default values without the mark-up**, or (b) by reference to the certificates surrendered for the previous year, if the imports match the previous declaration by CN code and country of origin. The free-allocation adjustment is taken into account [**L**: Art. 22(2)]. **L** A declarant crossing the mass threshold complies by the end of the following quarter [**L**: Art. 22(2a)]. **L** Shortfalls are notified by the competent authority, with one month to correct [**L**: Art. 22(3)].

L No quarterly holding applies during 2026: the obligation starts in 2027 [**L**: Art. 22(2); Art. 36(2)(c)], and certificates for 2026 emissions are bought in 2027.

31.5 Repurchase and cancellation

L On request by **31 October**, excess certificates are repurchased at the **purchase price**, limited to the number the declarant was obliged to buy under Art. 22(2) in the year of purchase (all of them if the threshold was expected but not exceeded) [**L**: Art. 23]. **L** Certificates bought in 2027 for 2026 emissions may be repurchased **only in 2027** [**L**: Art.

23(2a)]. **L** On 1 November each year, certificates bought in the year before the previous year are cancelled without compensation; certificates bought for **2026 emissions are cancelled on 1 November 2027** [**L**: Art. 24(1)–(2)].

I For 2026, the practical rule is: buy what you need for the 2026 declaration in 2027, surrender by 30 September 2027, request repurchase of any excess by 31 October 2027 – anything left is lost on 1 November 2027. **U** Repurchase is capped by Art. 23(2) at the number the declarant had to hold under Art. 22(2) in the year of purchase; how that cap applies to 2026 certificates bought in 2027 should be confirmed, so avoid buying beyond need.

31.6 Worked example 31.1: a 2026 rebar importer

Facts. **A** An EU declarant imports rebar (CN 7214 20 00) from the installation of worked example 20.3 (specific embedded emissions, SEE = 0,81118 t CO₂e/t, verified). Quarterly imports in 2026: Q1 10 000 t, Q2 15 000 t, Q3 12 000 t, Q4 13 000 t (total 50 000 t). **L** SEFA_g = **0,51144 t CO₂e/t**, the year-independent specific embedded free allocation on the actual-data (column A) basis, derived in §20.5 under CIR 2025/2620, Annex point 3, Eq. 2–5; the DRI mass used there is an assumption **A**. No carbon price paid in the country of production.

Calculation.

- $SEFA_{2026} = 0,975 \times 1,0 \times 0,51144 = 0,49865$ t CO₂e/t (CBAM factor 97,5 %; CSCF 1,0 [**L**: Commission Implementing Decision (EU) 2026/1862, Art. 1]).
- Certificates per tonne = $0,81118 - 0,49865 = \mathbf{0,31253}$.
- Certificates per quarter: Q1 3 125,30; Q2 4 687,95; Q3 3 750,36; Q4 4 062,89; total **15 627** (rounded from $50\,000 \times 0,31253 = 15\,626,5$).
- Cost = $3\,125,30 \times P_{Q1} + 4\,687,95 \times P_{Q2} + 3\,750,36 \times P_{Q3} + 4\,062,89 \times P_{Q4}$ (Art. 21(1a)).

Sensitivity. **A** At an assumed EUR 75 in every quarter, cost $\approx 15\,626,5 \times 75 \approx$ EUR 1 171 988, i.e. about EUR 23,44 per tonne of rebar. **I** If the same rebar were imported in 2030 with unchanged SEE and SEFA_g, $SEFA_{2030} = 0,515 \times 1,0 \times 0,51144 = 0,26339$. Certificates per tonne then rise to 0,54779, about 1,75 times the 2026 level, purely through the phase-out.

Published prices. **G** The Commission has published the first three 2026 quarterly prices, calculated under CIR 2025/2548 (§31.3): **Q1 2026 EUR 75,36** (published 7 April 2026), **Q2 2026 EUR 75,28** (6 July 2026) and **Q3 2026 EUR 82,32** (5 October 2026). Q4 is due on 4 January 2027; from 2027 prices are weekly [**G**: Commission, *Price of CBAM certificates*; legal basis CIR 2025/2548]. **I** Applied to worked example 31.1, the first nine months cost $3\,125,30 \times 75,36 + 4\,687,95 \times 75,28 + 3\,750,36 \times 82,32 =$ EUR 897 161, against EUR 867 271 at the illustrative EUR 75: a difference of EUR 29 890, or 3,4 %. The first half-year was within 0,4 % of the assumption; Q3 alone was 9,8 % above it. **P** Keep EUR 75 as the book's

illustrative price for comparability between chapters, but budget 2026 at the published quarterly prices and carry Q4 as a sensitivity range (for example EUR 75–90) until it is published on 4 January 2027.

Status. **L** method, benchmarks and CSCF; SEFA_g from §20.5 (one assumed mass **A**); **A** quantities and price.

31.7 Common errors

#	Error	Correct treatment
1	2026 imports priced at the weekly average	Use the quarterly average for the quarter of importation (Art. 21(1a))
2	Quarterly holding applied during 2026	Quarterly holding starts in 2027; certificates for 2026 emissions are bought in 2027
3	Quarterly holding computed on default values including the mark-up	Use default values without the mark-up, or the previous year's surrender basis (Art. 22(2))
4	Excess 2026 certificates kept beyond 2027	Request repurchase by 31 October 2027; anything left is cancelled on 1 November 2027 (Art. 23(2a), 24)
5	Goods below the mass threshold left out of declared quantities	The declaration states the total quantity, including goods below the mass threshold (Art. 6(2))

31.8 Quality-control checklist

- ☐ Certificates per good are computed as $M_g \times (SEE_g - SEFA_{g,y})$ less any Art. 9 reduction, floored at zero.
- ☐ 2026 imports are priced by quarter of importation ($P_{Q1} \dots P_{Q4}$); later years at weekly averages.
- ☐ From 2027, the end-of-quarter holding of at least 50 % is checked on the chosen basis (a) or (b), with the free-allocation adjustment taken into account.
- ☐ Declaration and surrender are scheduled for 30 September y+1 (first time 30 September 2027 for 2026).
- ☐ Excess certificates are identified and repurchase requested by 31 October, before cancellation on 1 November.
- ☐ Copies of verification reports are attached to the declaration where applicable.

31.9 Key takeaways

- First declaration and surrender: 30 September 2027, for 2026 imports.
- 2026 emissions are priced at the quarterly average of the import quarter; later years at weekly averages.

- Quarterly holding of 50 % starts in 2027, on defaults without mark-up or last year's surrender.
- 2026 certificates: repurchase only in 2027, cancellation on 1 November 2027.

31.10 Professional questions

1. Recompute worked example 31.1 for import in 2028.
2. Why might a declarant choose basis (b) for the quarterly holding?
3. A declarant bought 17 000 certificates for 2026 but needs 15 627. What must it do, and by when?

31.11 References

-  Reg. 2023/956 Art. 6, 20–24, 31.
-  CIR 2025/2620; Commission Implementing Decision (EU) 2026/1862 (CSCF).

Chapter 33 — The Economics of Proof: When Actual Data Pay

Learning objectives. After this chapter the reader can compute the corrected break-even between actual and default values, place a client in one of four archetypes, and sequence partial adoption of actual data.

33.1 The corrected break-even

I Annual benefit of actual values over defaults (§18.5):

$$B = [(SEE_def - SEFA_B) - (SEE_act - SEFA_A)] \times M \times P_cert - C_MRV$$

where SEE is the specific embedded emissions (default or actual), SEFA is the specific embedded free allocation for the year ($CBAM_y \times CSCF_y \times$ the benchmark-based value; column B for defaults, column A for actual values), and C_MRV is the annual incremental cost of monitoring, verification and data management. Actual values pay when $B > 0$.

I Four drivers: the **gap** between the installation and the country default (widened by the mark-up: 10 % – 30 %; fertilisers fixed at 1 %); the **SEFA difference** between columns A and B; **volume** M exported to the EU; and **price** P_cert. C_MRV is largely fixed, so volume dominates for small exporters.

33.2 Four archetypes **P**

Archetype	Profile	Decision
1 Clear winner	SEE well below default; material EU volume	Actual values from year one; register; verify early
2 Marginal	SEE near default; moderate volume	Actual values if $SEFA_A \geq SEFA_B$; revisit in 2028 when mark-up reaches 30 %
3 Small exporter	Low EU volume; C_MRV exceeds benefit	Defaults for now; build data for later
4 High emitter	SEE above default even net of SEFA	Defaults; invest in abatement; actual values later

P For a gas-based DRI-EAF producer ($SEE \approx 0,8$, archetype 1 in most cases), the question is not whether but how fast. For fertiliser producers, the 1 % mark-up often places them in archetype 2.

33.3 Partial adoption P

Actual values can be adopted in stages. A practical sequence: (1) own process actual, precursors on defaults (Art. 15); (2) add the largest precursor supplier's verified data; (3) add actual electricity factors where a direct link exists; (4) extend to remaining suppliers. Each step is justified by its own marginal benefit.

Worked illustration. A For the re-roller of worked examples 12.1 and 18.1 (SEE 2,01698, case (i)), against the official 2026 default of 4,396 t CO₂e/t (§18.2): net gap 2,37902 t/t (equal SEFA on both bases, case (i) of example 18.1), M = 50 000 t, P = EUR 75 – gross benefit EUR 8 921 325. With C_MRV = EUR 150 000, B ≈ EUR 8,77 million per year. The break-even volume is 150 000 / (2,37902 × 75) ≈ **841 t** per year. I At that volume, a single shipment justifies the monitoring system.

33.4 Common errors

#	Error	Correct treatment
1	Actual SEE compared with the default gross of SEFA	Compare net: (SEE_def – SEFA_B) – (SEE_act – SEFA_A)
2	Monitoring and verification costs ignored	Subtract C_MRV, the annual incremental cost of monitoring, verification and data management
3	Actual values treated as all-or-nothing	Sequence partial adoption; justify each step by its own marginal benefit
4	Decision taken once and never revisited	Revisit as the mark-up rises (10 % – 30 %; fertilisers stay at 1 %)
5	Small exporter adopts actual values although C_MRV exceeds the benefit	Defaults for now; build data for later

33.5 Quality-control checklist

- ☐ The benefit B is computed with the formula in §33.1, using SEFA_A for actual values and SEFA_B for defaults.
- ☐ C_MRV is estimated as the annual incremental cost of monitoring, verification and data management.
- ☐ The break-even volume (C_MRV divided by net gap × P_cert) is computed and compared with the EU export volume.
- ☐ The client is placed in one of the four archetypes of §33.2, with the reasons stated.
- ☐ The mark-up applicable to the year and sector is used in SEE_def.
- ☐ Each partial-adoption step is justified by its own marginal benefit.

33.6 Key takeaways

- Compare net of SEFA.
- Subtract C_MRV.
- Volume and the mark-up schedule decide timing.
- Actual values need not be all-or-nothing: partial adoption proceeds step by step, each step justified by its own marginal benefit.

33.7 Professional questions

1. Recompute the break-even volume of the worked illustration at a certificate price of EUR 100.
2. Why does the 1 % mark-up often place fertiliser producers in archetype 2?
3. A small exporter falls in archetype 3. What should it do now so that it can adopt actual values later?

33.8 References

- [Chapters 18, 20, 31, 32.](#)

About the author

Eng. Ahmed Samir Farag is a Mechanical Power Engineer and CBAM & Decarbonization Strategy Advisor at Ta-meri Systems LLC, Egypt. He is a Certified Carbon Footprint Auditor accredited by the Egyptian Organization for Standardization and Quality (EOS) and a DBA candidate specialising in strategic decarbonisation. His work covers GHG accounting under ISO 14064-1, EU CBAM compliance for steel and cement exporters, and the design of monitoring and verification systems for energy-intensive industry.

END OF SAMPLE

The full book covers the whole regime, from the installation fence to the certificate bill

300 pages · 12 parts · 38 chapters · 8 worked cases · 6 appendices

- System boundaries, production processes and attribution
- Precursors, complex goods and the official 2026 default values
- Monitoring, mass balance, non-CO₂ gases and electricity
- Steel in depth; cement, aluminium, fertilisers and hydrogen
- Monitoring plan, data model, controls and 25 failure modes
- Verification, certificates, SEFA, carbon price paid and penalties
- Readiness roadmap, supplier programme and board briefing

Eng. Ahmed Samir Farag

tradezoneup25@gmail.com · [linkedin.com/in/ahmed-ewais-ab7b1598](https://www.linkedin.com/in/ahmed-ewais-ab7b1598)