

CO2 Price: Cost Driver and Steering Metric in Industrial Procurement

The CO2 price is the monetary price that emitters must pay for emitting carbon dioxide or CO2 equivalents, whether via certificates, taxes or levies. For industrial buyers it is increasingly becoming a plannable cost driver that directly makes energy, materials, logistics and purchased services more expensive. Anyone who understands their supply chain in terms of emissions can anticipate, negotiate and strategically manage CO2 costs. The term is therefore both a fiscal policy instrument and an operational metric in category management.

Key facts

- The CO2 price denotes the monetary value per tonne of CO2 or CO2 equivalent incurred via emissions trading, CO2 tax or levy.
- In Europe, the EU Emissions Trading System (ETS) is the central market model for pricing CO2 certificates.
- For buyers, CO2 prices take effect via energy costs, upstream products, transport and increasingly via supplier metrics in tenders.
- In practice, the CO2 price is often considered in tenders as a separate evaluation category or cost factor alongside price and delivery time.
- Typical internal shadow prices lie in a wide range depending on the company and objectives and primarily serve investment and procurement governance.
- CO2 prices are closely linked to reporting obligations such as the German Supply Chain Due Diligence Act and European sustainability reporting.

Definition: CO2 price

The CO2 price is the price payable for the emission of one tonne of carbon dioxide or a CO2 equivalent. It arises either market-based through the trading of emission certificates or is set by the state through CO2 taxes and levies. For companies it is a compliance- and cost-relevant metric that flows directly into calculations, procurement and bid comparison.

Distinction: CO2 price, shadow price and internal carbon price

To be distinguished from the market-based CO2 price is the internal shadow price: an accounting value set by the company itself, used to factor emissions into investment decisions, make-or-buy analyses and supplier evaluations. While the real CO2 price affects liquidity, the shadow price is a steering instrument. Both values should be defined consistently in procurement and documented in the category charter so that comparisons across material groups remain reliable.

Legal and political foundations

In Germany and the EU several instruments interact: the EU Emissions Trading System for energy-intensive installations and increasingly further sectors, national CO2 levies on energy and fuels,

and cross-border mechanisms such as the EU border adjustment system for import-sensitive commodity groups. Added to this are reporting and due diligence obligations, for example arising from the German Supply Chain Due Diligence Act. The specific design changes regularly; binding statements in individual cases should always be verified against the current legal situation.

Mechanisms of impact in procurement

CO2 prices do not take effect in procurement as a separate invoice line, but are embedded in suppliers' cost structures. They increase suppliers' energy, production and transport costs, which are passed on to buyers via sales prices. Buyers must therefore understand which drivers channel CO2 costs into their material groups and services.

Direct and indirect cost drivers

CO2 prices have a direct impact on purchased energy, fuels and transport-related surcharges. Indirectly, they take effect via emissions-intensive upstream products such as steel, aluminium, cement or chemicals, whose manufacturers pass certificate costs into their prices. In subcontracting and contract manufacturing, too, CO2-related additional costs can appear as price adjustment clauses or index surcharges. A supplier landscape analysis by emissions intensity shows where the lever is greatest.

CO2 price in tenders and negotiations

In tenders and RFQs, practice has established querying CO2 relevance as a separate evaluation criterion alongside price, quality and delivery time. Suppliers typically provide emissions values per unit, energy sources or decarbonisation plans. A standardised request structure helps with comparability; a non-binding offer can signal early on how seriously the topic is taken. In follow-up negotiations, the CO2 price can be used as an argument when suppliers fail to pass on energy cost benefits from decarbonisation.

Integration into the commodity strategy

Within the commodity strategy, the CO2 price becomes a planning factor alongside material price indices, exchange rates and capacity data. For emissions-intensive material groups, a dedicated price forecast with CO2 scenarios is worthwhile. Market segmentation in procurement helps to assign alternative sources, material substitutions or process changes in a targeted manner to segments with high emissions intensity. This turns CO2 from a compliance metric into a strategic cost lever.

Methods and approach for integration into procurement processes

The systematic handling of CO2 prices follows a multi-stage approach: capture emissions relevance, build a data basis, consistently anchor evaluation and actively develop suppliers. The effort should match the emissions and cost weight of the respective commodity group.

Data basis and supplier surveys

The starting point is a structured survey: which material groups, production sites and logistics chains are emissions-intensive? Helpful measures include supplier segmentation by emissions relevance, querying energy mix and certifications, and, where available, product footprints calculated by the supplier. Identifying suppliers via uniform standards such as the Global Location Number (GLN) facilitates the consistent assignment of sites and emissions data across systems.

Anchoring the evaluation logic in awards

In the next step, an internal CO2 accounting value is defined and stored in bid evaluations. In practice, it has proven useful to extend Total Cost of Ownership models with an emissions component estimated from transport distance, mode of transport, energy intensity and material input. For logistics-heavy awards, carrier performance and transport emissions can additionally be evaluated together. Transparency is crucial: suppliers must know according to which criteria CO2 flows into the evaluation.

Supplier development and contracting

Beyond evaluation, the focus is on supplier development: joint measures on energy efficiency, renewable energies, material substitution or optimised transport consolidation. Contractually, emissions pathways, reporting obligations and incentives can be agreed via bonus-malus arrangements. For long-running framework agreements, adjustment mechanisms are sensible that pass rising or falling CO2 prices through to prices in a traceable way.

Key KPIs for the CO2 price

For steering purposes, buyers need a manageable number of metrics that link emissions and costs. These KPIs add a sustainability dimension to classic procurement metrics.

Key metrics at a glance

The four most important metrics can be grouped into four categories: absolute in-scope emissions, CO2 cost intensity per procurement spend, share of low-emission alternatives and supplier progress on decarbonisation targets. A clear system boundary is essential: which scopes (Scope 1, 2, 3) and which data sources are considered binding? Without this definition, metrics are not comparable across sites and years.

Interpretation and limits of measurability

In practice, supplier emissions data is often estimated, derived from secondary databases or heterogeneous in methodology. Buyers should document data quality and interpret metrics more as a trend indicator than as an exact figure. For award decisions, combining them with hard cost data is recommended so that sustainability aspects do not act in isolation.

Risks and controls

Dealing with CO2 prices carries risk on several levels: cost risks from rising certificate and levy prices, compliance risks from reporting obligations and strategic risks from a one-sided focus on low-emission but fragile supply chains. Controls must systematically address these dimensions.

Cost and price risks

Rising CO2 prices can quickly lead to price adjustment clauses and index adjustments. Buyers should review contracts for CO2-related adjustment mechanisms, define reference values and quantify the impact of scenarios. Without clear contractual rules, renegotiations under time pressure loom. Supplier location risk and the CO2 intensity of a site are frequently coupled, for example with energy-intensive manufacturing in regions with an emissions-heavy electricity mix.

Compliance and reporting risks

Regulatory requirements for emissions reporting and supply chain transparency are increasing.

Companies should ensure that collected supplier data is consistent, source-verified and documented in an audit-proof manner. The German Supply Chain Due Diligence Act and comparable European rules extend obligations along the supply chain; concrete applicability should be legally verified in individual cases. Poor data quality is in practice the greatest implementation risk.

Strategic misdirection

Anyone focusing exclusively on the lowest CO2 footprint risks longer lead times, higher dependencies or quality risks. Supply chain resilience and emissions reduction must be considered together. Conflict minerals and social criteria also belong to a holistic evaluation, as does the process capability of an alternative supplier. Sustainability goals must not mean isolating classic supplier criteria.

Current developments and outlook

CO2 price formation is becoming more dynamic: tighter emission caps in certificate trading, extension to further sectors and rising requirements from sustainability reporting are increasing both cost pressure and data needs. At the same time, more standardised emissions data is emerging at product and supplier level.

Digitalisation of emissions data

In practice, digital platforms, supplier portals and standardised data exchange formats are gaining in importance. They make it possible to integrate emissions values directly into tendering and ERP systems. AI-supported analyses help to draw reliable comparisons from heterogeneous supplier statements. The effort pays off especially with large supplier landscapes and many material groups.

Consequences for procurement strategies

For buyers, the trend means: CO2 prices are turning from a regulatory sideline into a firm component of price negotiations, supplier selection and location decisions. Low-cost country sourcing will in future be weighed more strongly against transport emissions and local CO2 regulation. Companies that integrate CO2 costs early into their category management governance secure cost advantages and regulatory robustness.

Typical metrics

CO2 intensity of procurement spend: tCO2e per € million of procurement spend (typically double-d

Baseline metric for trend comparisons; define system boundary clearly

Share of suppliers with emissions data: typically > 70 % of procurement spend after 1–2 years

Evaluate data quality separately

CO2 cost effect of award decisions: in practice 1–5 % emissions reduction per award round

Impact depends heavily on the material group

Share of low-emission alternatives in the assortment: typically 10–30 % at the outset

Set target values per material group

Practical example

A mid-sized mechanical engineering company with around 400 actively supplied material groups

introduced an internal CO2 shadow price to make emissions visible in bid evaluations. A supplier landscape analysis revealed that a few emissions-intensive groups – steel, aluminium and transport services – accounted for the majority of the procurement spend's CO2 footprint.

- Definition of an internal CO2 accounting value per tonne and anchoring it in the category charter as a binding evaluation metric
- Adding standardised questions on energy sources, product emissions and decarbonisation plans to the RFQ template
- Shifting part of the transport volume and renegotiating DAP Incoterms arrangements in order to actively manage transport routes and thus emissions
- Establishing a joint decarbonisation programme with three strategic key suppliers, including annual reporting obligations

Conclusion

For industrial buyers, the CO2 price is no longer an abstract climate issue but a measurable cost driver and steering lever. Those who systematically collect emissions data, use a consistent internal accounting value and anchor CO2 criteria in tenders, contracts and supplier development can identify cost risks early and actively shape decarbonisation. What matters is a sound data basis, clear system boundaries and linkage to classic procurement metrics. This turns CO2 management from a compliance obligation into a genuine competitive advantage in the supply chain.

Frequently asked questions

What is the CO2 price in simple terms?

The CO2 price is the amount that must be paid for emitting one tonne of carbon dioxide, for example via certificates in emissions trading or a CO2 tax. For companies this means: the more emissions-intensive the energy, material or transport, the higher the costs. In procurement, the CO2 price therefore acts as a hidden price component in virtually all sourcing decisions.

What is the current CO2 price per tonne?

The CO2 price fluctuates: in the EU Emissions Trading System the price is formed daily by the market, while government CO2 levies are set politically and typically rise step by step. For planning purposes, a scenario corridor that is regularly updated is therefore recommended rather than a single value. Binding statements about the current level should always be verified against up-to-date official sources.

What is the difference between CO2 price and shadow price?

The CO2 price is a price actually paid, e.g. for emission certificates or as a levy to the state. The shadow price, by contrast, is an internal accounting value used by companies to factor emissions into investments, make-or-buy decisions and supplier evaluations, without any payment being made. The two values can differ and serve different purposes.

How does the CO2 price affect procurement prices?

CO2 prices increase suppliers' energy, production and transport costs and are frequently passed on in sales prices. This is particularly noticeable with emissions-intensive upstream products such as steel, aluminium or chemicals, as well as with logistics-intensive purchases. Buyers should therefore govern CO2-related price adjustments contractually and factor them into TCO calculations.

How do I factor CO2 into tenders and supplier selection?

A proven approach has three steps: first, capture the CO2 relevance of each material group; then define an internal accounting value and embed it in bid evaluation; finally, survey suppliers on emissions data and decarbonisation plans. Transparency towards suppliers is important, as is linking to classic criteria such as price, quality and delivery time.