



WHITE PAPER

SAP CPE & Aggregator Feeds: A New Standard for Commodity Pricing

Integrating Market Data for Risk and Valuation

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Introduction

This paper explores the integration of market data aggregator services, such as Enverus MarketView and Refinitiv, into SAP Commodity Management's (CM) Commodity Pricing Engine (CPE). It highlights key considerations and best practices for implementing or updating CPE integrations, supported by real-world examples from the oil and gas industry.

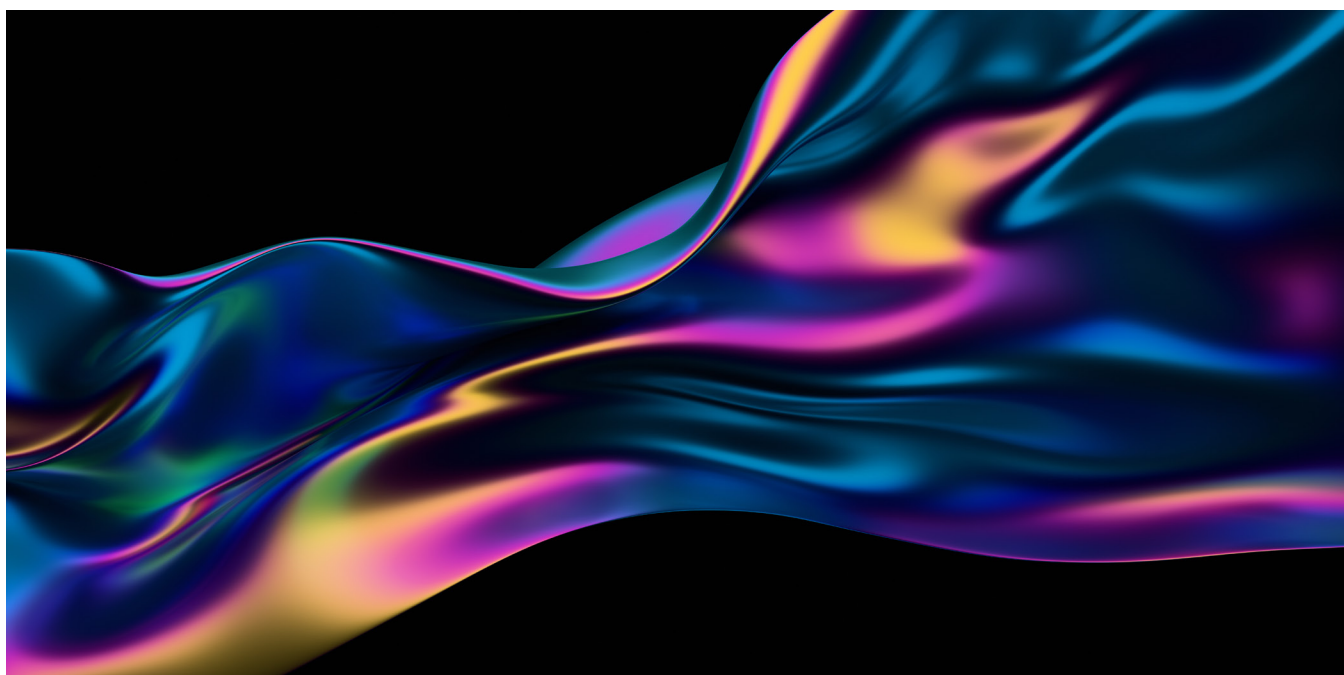
Commodities are typically priced, valued and settled using third-party market sources to ensure transparency and prevent manipulation, fostering efficient liquid markets.

The sources include Price Reporting Agencies (PRAs) and Exchanges (among other sources like Brokers, fundamental analysis, etc.) such as S&P Global, Argus, ICE Exchange and CME/NYMEX Exchange, which publish market values and transaction assessments for products like oil, gas, power and chemicals. These organizations provide the foundation for effective commodity pricing and risk management when integrated into enterprise systems like SAP CPE. Their aggregated data is distributed via subscription services like Enverus MarketView, LSEG Refinitiv, Bloomberg, Gravitare and DTN, enabling seamless IT enterprise integration.

Incorporating these feeds into SAP Commodity Price Engine (CPE) is critical for accurate trade capture, inventory valuation, risk management and regulatory compliance. It also supports financial oversight and seamless settlement through the invoice-to-cash process.

To guide organizations in this process, this paper provides best practices and key considerations for implementing such integrations, supported by practical examples from the oil and gas industry.

Additionally, the content delves into SAP CPE architecture, integration strategies, a Gulf Coast West Texas Intermediate (WTI) crude purchase example and an implementation roadmap covering data quality assurance. For clarity and focus, related topics — such as condition-technique pricing and logistics formula pricing — are excluded from the scope of this paper.

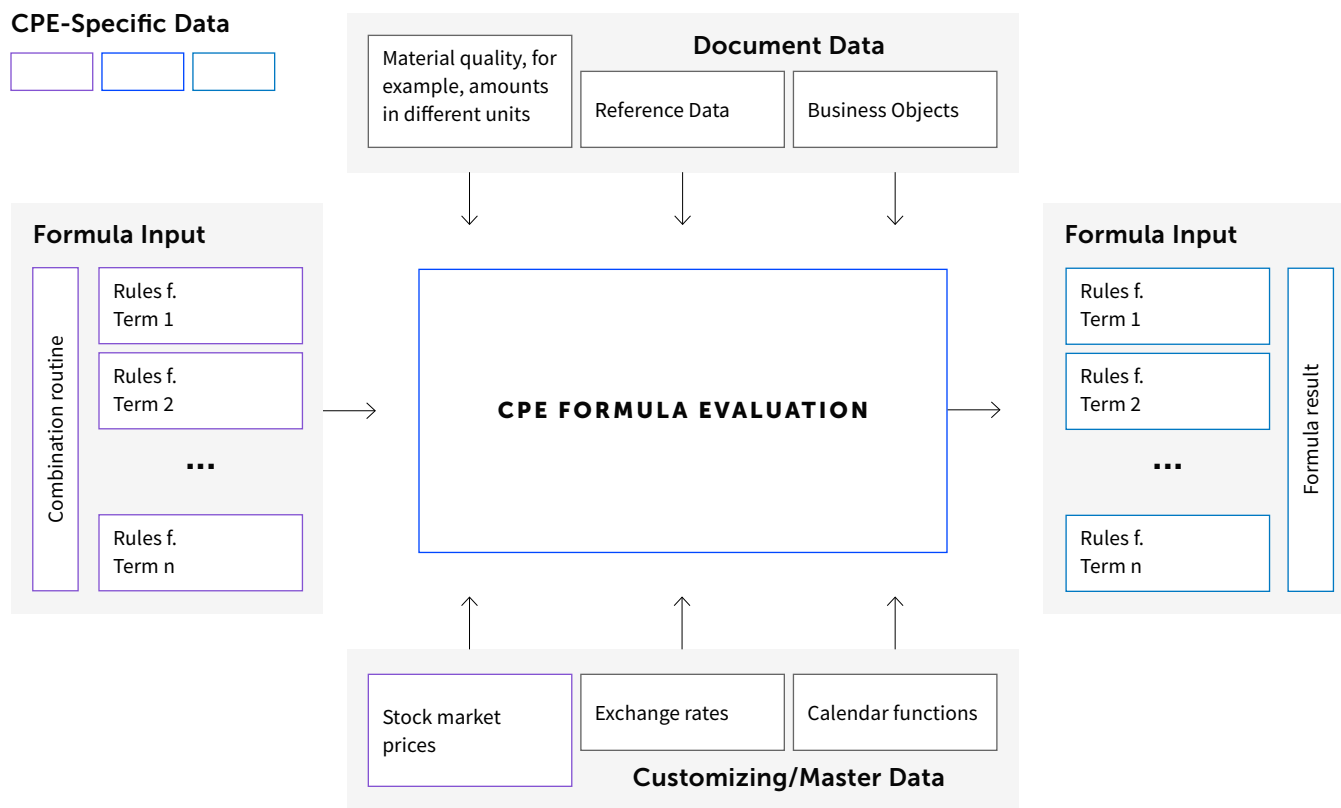


CPE Architecture

The SAP [CPE architecture](#) is more complex than traditional E/CTRM solutions, as it is built to cover all commodities. This requires a deeper understanding of its design principles.

This [CPE starting point](#) covers the basics of pricing for deals, structure of formulas to terms and inter-related functions. It also covers the difference between CPE and traditional SD/MM SAP Condition-technique pricing strategy (using condition records, pricing procedure access sequences, etc.).

For [logistics](#), CPE can be implemented in SD/MM. Alternatively, BRF+ can be used to integrate CPE into TM/TD for formula-based logistics costing, such as tariffs and operator storage or movement charges.



CPE master data architecture will be set up to integrate multiple spot, basis, ad-hoc, operator fee and forward/future price types, not just the listed futures prices as was the basis for SAP design (read on [DCS](#): Derivative Contract Specification).

Market Identifier Code (MIC)

- 4-character key identifying price source, e.g., CME, ICE, ARGU (Argus), OPIS.
- Structure: Assigned to “child” DCS and each DCS must have at least one parent MIC. One MIC can be assigned to a DCS for cases of similar contracts across trading platforms or PRAs, but it is unlikely.
- Purpose: uniquely identify price source.
- Keys: keeping MIC as price source only, not embedding commercial rules that will go into DCS, quotation rules or date routines for product/instrument/calendar/aggregation specific logic.

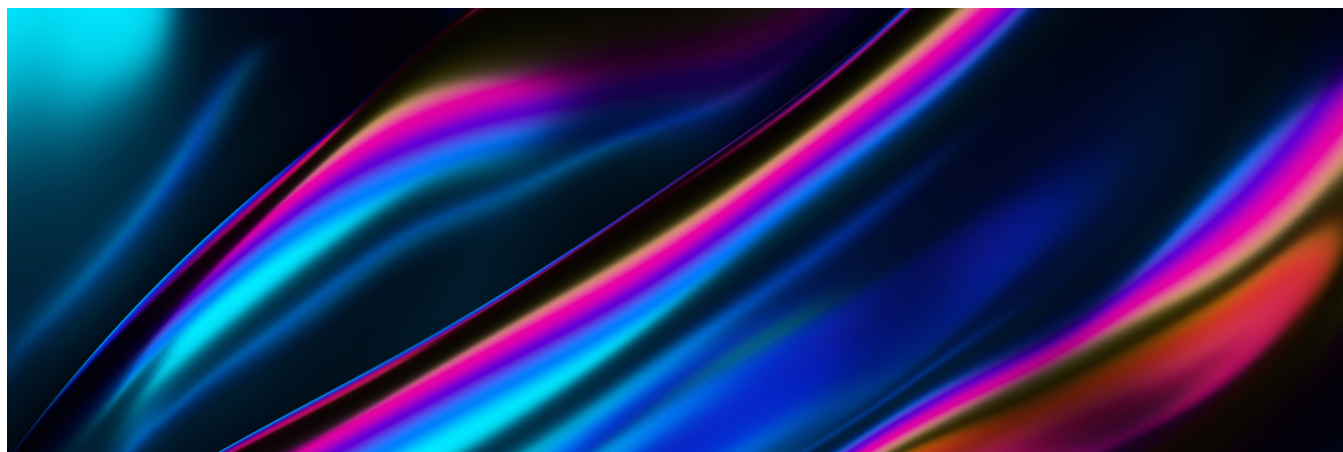
Derivative Contract Specification (DCS)

- Purpose: child to MIC, instrument details (product + location) and price details like lot size, currency and decimal places.
- Keys: here is the art of holding a lot of pricing information in a master data type that prices/quotes will interface under:
 - Product: WTI, Brent, C3 Propane, CBOB, Tariff, etc.
 - Instrument: futures, spot, differential and basis component.
 - Note the physical location referenced by futures contract or assessed price can be called out or simply inferred.
 - Calendar to reference (as period dates are associated at DCS level): US vs CA.
 - For example, a DCS might reference a specific source, product, instrument, location and calendar, such as CME_WTI_FUT_CUSH_US (CME WTI Futures at Cushing, US calendar), or OPIS_CBOB_SPOT_LA_US (OPIS CBOB Spot in Los Angeles, US calendar).

Quotes

- Purpose: finally at the actual numerical “prices” (Quotation Price) imported into SAP.
- Every imported quote reference is imported for foreign key master data check against MIC + DCS.
- Price import date, import time, Price Type (Spot, Future, Settle, Average), MatKeyDate (effective from date, note no “end date”, prices are effective infinitely until new quote imported with MatKeyDate after current latest), Time to Maturity (where run up required), Quotation Price and Currency.

You are now ready to pull pricing into valuing CM deals or pulling quotation pricing into logistics modules like TM or TD via BRF+ rules for movement costing.



Integration Pattern into CPE

Basic architecture and integration patterns are publicly available.

- Price source through SAP BTP Integration Suite — Business Technology Platform/middleware to SAP CPE APIs (list options to hit quote table).
 - Reference Master data setup prior to receiving quotes.

CPE consumes quotation prices tied to master data (required to be setup prior to receiving price quote records), Market Identifier Codes (MICs), referenced in Derivative Contract Specifications (DCS, note convention to exchange traded derivatives as direct source) and governed by SAP CM Quotation rules (which prices/quotes to use and how to evaluate them in given SD/MM document type).

For more details, refer to the SAP Help documentation on the [Commodity Pricing Engine](#).

Typical Integration Pattern

- Source (Price Aggregation Service) → SAP BTP Integration Suite → SAP CPE quotation import.
- Three overarching import paths: primary large volume Quotation Import, SAP GUI or custom BTP inbound.
- All map the quote fields for RIC, symbol, tenor, effective date, value and UOM.

For more details, refer to the SAP Help documentation on the [Integration Suite](#).

[CPE quotation processing Datafeed APIs](#).

Two Connection Components with Middleware Transformation

- Source (Price Aggregation Service) → SAP BTP Integration Suite
 - Cloud integration HTTP receiver using [OAuth2](#) authentication flow typically, housing token retrieval and reuse in BTP.
 - Storing client id/secret/token as Security Material (Secure Parameters, no hard-coding!).
 - Run scheduled [iFlows](#) (i.e., morning, middays, market closing, final EOD and final EOM).
- BTP mapping logic (BTP transform)
 - Provider MIC, Price Type, Quote Date / Delivery Month, Value, Currency, UOM, External Symbol / Interface Code, Source Timestamp, Version.
 - Do the canonical mapping in BTP, rather than SAP side FM/BAAdl development work, using one of multiple scripting languages.
 - Tenor normalization, price type naming conventions, datatypes, etc.
 - BTP supports message [persistence](#) for audit and operational reference and write to custom HANA table or Object Store for historical and raw archives.
- SAP BTP Integration Suite → SAP CPE
 - UPSERT via OData/RFC/FM loader aligned with [Price](#) Quotation Processing, if on-prem, using a function module (own namespace) for data load, exposed to SAP Gateway or Cloud Connector called from the iFlow.
 - JSON from BTP is converted to the quotation structure and loaded with timestamp (to support position snapshot reporting as well).

Gulf Coast WTI Basis Priced Crude Purchase Example

01

Define the Formula and Terms

The crude purchase deal begins with specifying the Formula and/or Term combinations in SAP CPE. These combinations include:

- **CPE formula or term components:** define the pricing structure for the deal.
- **Quotation rule:** determine which price/quote values to include.
- **Date routine:** determine what weekday, event key dates to use (i.e., off delivery, BOL, ticketing, other), holiday/weekend skip/roll forward/back logic to employ.
- **Price type:** Maintained on the quote record and used to value CM deals/contracts before creating Sales Orders (SO) or Purchase Orders (PO) in SD/MM.

02

Apply Quotation Rules

Once the Formula and Terms are defined, SAP CPE applies Quotation Rules to pull the relevant quote data. Key steps include:

- **Determine the data source:** each DCS (Derivative Contract Specification) applies a Quotation Rule to pull quote data based on the Market Identifier Code (MIC) and price type.
- **Period determination rules:** define the period for which the quotes are valid. For example:
 - WTI CMA rule: average of daily settlement for delivery month.
 - Argus CMA roll differential rule: daily average $2/3^*$ (Futures K1 – Futures K2) + $1/3^*$ (Futures K1 – Futures K3) for each day associated with deal delivery period (K^* = contract month).
 - This calculation is applied for each day within the delivery period.
- **Adjustments:** incorporate roll adjustments, transport costs and quality differentials. For example:
 - A quality differential is applied if the deal product differs from the NYMEX WTI Futures specification at Cushing.

03

Resolve the Final Price

SAP CPE resolves the final deal price by evaluating each Term and applying the Quotation Rules. The process includes:

- **Identify key data:** look at deal delivery date, i.e., Dec 2025, delivery location and product/material.
- **Evaluate pricing terms:**
 - CME WTI Future CMA for daily settle, averages all daily settle price type quotes in Dec 2025 US business calendar.
 - Argus USGC Diff time roll + logistics basis, averages daily differentials for delivery period.
 - Quality premium applies that constant via Term assignment in Key Data Structure based on deal Product/Material.
 - Each Term value determined via called Period Determination Rule.
- **Write results to SAP pricing conditions:**
 - The calculated price is written to the designated SAP pricing condition on the deal, ensuring it is ready for further processing in SD/MM.

Market Price Risk Reporting

01

Decompose Exposure by CPE Term Component

Using the December 2025 delivery deal, the SAP Position Report breaks down exposure by CPE Term components. Each component is analyzed for its contribution to the overall price:

Component	Exposure Volume	MIC + DCS	Quotation Rule	Price Value (\$/bbl)	Exposure (\$)
Flat Price (CME WTI CMA)	100k bbl	CME (SETT)	Delivery month CMA (US)	78.50	7,850,000
Basis (Argus USGC Diff)	100k bbl	Argus (IDX)	B/L -15 → -5 (US cal)	+1.20	+120,000
Quality diff	100k bbl	Fixed Term	Constant	+0.15	+15,000
Pipe Tariff	100k bbl	Fixed Term	Constant	+0.22	+22,000
Delivered GC	100k bbl	Formula	Resolved	80.07	8,007,000

02

Analyze Mark-to-Market (MtM) Changes

The SAP MtM report tracks price changes over time for both fixed and floating components. For example:

Date	Term	Quote Used	Old Price	New Price	Δ Price	Vol	Δ MtM (\$)
2025-12-02	CME WTI CMA	CME SETT 12/02	78.50	79.10	+0.60	100k	+60,000
2025-12-02	Argus USGC Diff	Argus 12/01 → 12/02	1.20	1.15	-0.05	100k	-5,000
2025-12-02	Quality diff	Fixed	0.15	0.15	0.00	100k	0
2025-12-02	Tariff	Fixed	0.22	0.22	0.00	100k	0
Total	Delivered	Resolved	80.07	80.62	+0.55	100k	+55,000

03

Interpret Results and Manage Basis Risk

The report highlights a long positive swing in WTI Futures contracts and a negative swing in Argus basis day-over-day. This results in a net long gain to the future position while keeping constant components (e.g., quality differential, tariff) stable. Basis risk can then be managed as needed.

Key Design Considerations

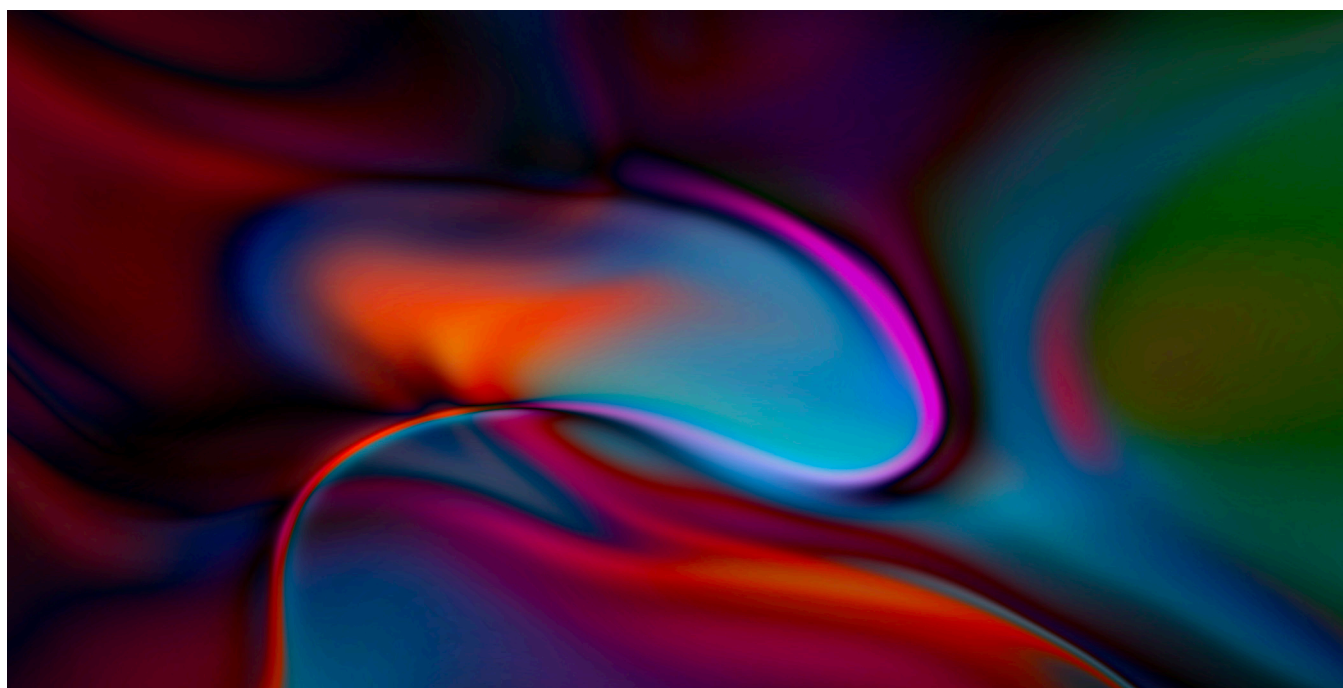
Continuation from DCS design, what to consider and best practices for energy pricing.

SAP Quote Type Futures vs Forward

- Efficient pricing relies on the trifecta of forward no-arbitrage, spot and third party unbiased (by counterparties, not actual or predicted bias) assessments working together.
- Price Type (Future vs Forward) in CPE refers to a design choice between DCS and the Quotation Rule, telling SAP how to interpret the Price Type specified in DCS Price Type Field (F = Futures, O = Forward).
- Typical design choice:
 - Futures: maps to exchange-traded commodity contracts pricing convention (NYMEX WTI, ICE Brent), quotations tied to standard contract months, using roll rules for future > prompt > cash > price fixed settlement dates.
 - Allows monthly, daily to intraday pricing data (not restricted to) mapping as typical market convention.
 - Forward: map to OTC and broker quotes, meant for pricing strips and some extrapolation to future pricing months.

Market Price Risk Decomposition

- MtM and exposure reporting focus on identifying the most discrete sources of a resolved deal or inventory price (PBI components of Price-Basis-Index). These sources are typically managed between Futures market pricing and the basis risk that can be reasonably controlled.
- SAP treats the commodity contract or inventory document as the “risk object” representing physical price exposure. This object is created and classified by pricing status, such as Fully Priced, Future Only, Basis Only. The Risk Distribution Profile (RDP) sets how exposures are allocated across time or business units.

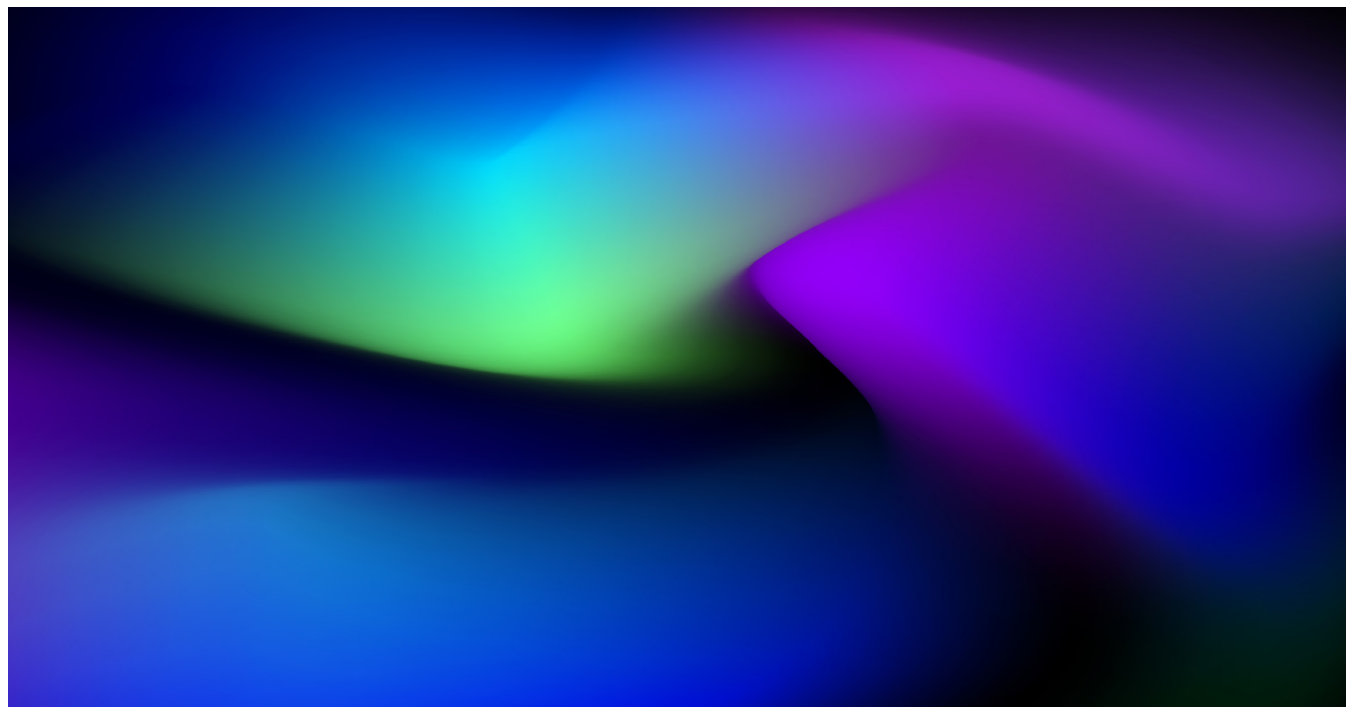


- RDP defines how the pricing formula components (e.g., flat price, basis, other) are split out for reporting, measurement and management.
 - Decision point: when pulling price types (e.g., futures, basis, differentials) onto physicals, the choice is between using Formula CPE Terms or Condition Types.
 - Terms:
 - Represent pricing building blocks of pricing.
 - Deal pricing components follow the physical inventory and settlement process.
 - Terms are visible in risk decomposition reports, showing which quotes contributed to the resolved price.
 - Condition Types (pricing procedure in SD/MM):
 - Represent resolved prices from CPE.
 - Typically drive FI/CO accruals, inventory valuation and invoicing.
 - Flattened into single net price for financial reporting.

- Setting up decomposition along these five dimensions using this CPE design architecture ensures full price risk transparency.
 - MIC/Provider
 - DCS/[Product + Location + Type]
 - Quotation Rule
 - Price Type
 - Formula Term and Condition Type application
- This dual layer enables operational risk reporting and finance to concentrate only on consolidated settlement cash flows.

Provisional to Final [Invoicing](#)

- CPE deal Quotation Rules and Condition records in SD/MM control what SAP treats as estimate vs final price (price is fixed, known, maturity reached).
- Purchase contract > CPE Formula assignment or Terms on the deal point to Pricing Procedure with DCS entries defining quotation source and rules > pricing calculated at inception (full or partial period price loads) > Provisional invoices can be generated > Using quotation Final Settlement Indicator or Price Fixation replacement to flag that all or part of the formula is final price > Invoice Control reconciles and posts final invoice.



Implementation Roadmap

Managing false positives (error flagged on valid data) and negatives (missing a real problem) is a must-have, given internal and bi-lateral reliance on external market data feeds to run the business. Proactively identifying expected prices and invalid values is essential for effective price control. Given typical source → Middleware → receipt integration pattern, below are the keys to price feed reconciliation and controls.

Integration Layer

- Adequate load testing, balancing, redundancy, retry, backfill and monitoring on BTP/other pipelines making call to market data provider.
- Record count validation
 - Expected vs received per market/product.
 - Utilize market data providers symbol metadata and notification APIs for status and availability exceptions, treating SAP quotation rule as canonical for expected count.
 - Bottom line: expected count from external feed should match dates generated by quotation rule + business calendar for that DCS.
- Curve mapping check
 - Interface code to SAP MIC/DCS.
 - Middleware pre-check incoming symbol exists in mapping table, else quarantine record.
- Price type attribution
 - Quotes tagged correctly as Forward vs Settlement.
 - Consider segregating forward vs settle prices under separate DCS.
- Completeness by calendar
 - Align imported dates with commercial calendar defined in quotation rules (US, CA, UK, etc.).
 - BTP/SAP/Middleware generates an expected date list for each DCS for imported price dates vs expected and flag exceptions.

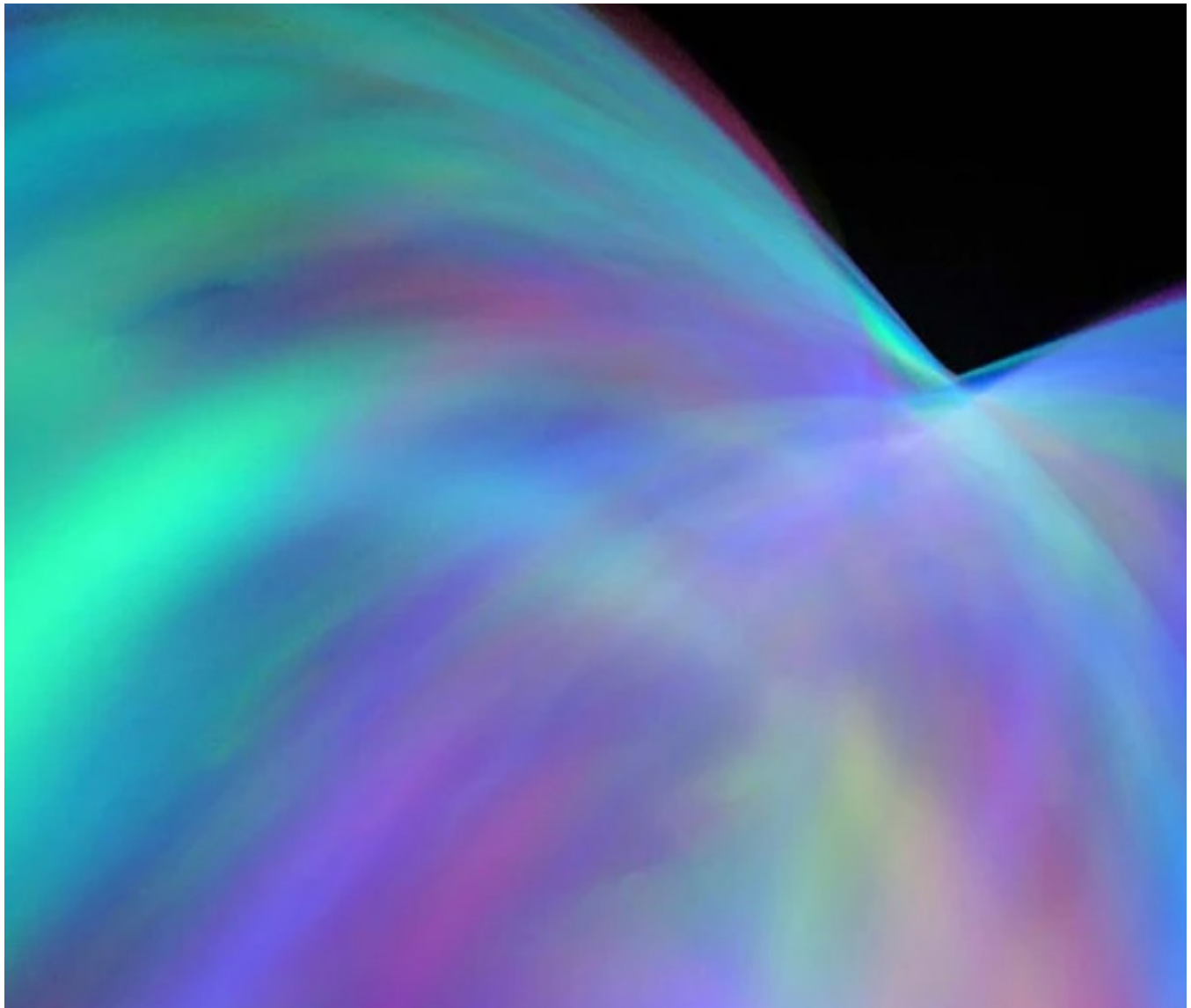
SAP Quotation Level Controls

- Duplicate prevention
 - UPSERT for MIC, Price Type and Quote date.
 - Replace for revised prices received.
- Versioning
 - Stamp source system and load timestamp for estimate vs final.
- Tolerance checks
 - Swing thresholds by market/product (DCS) vs prior quote.
- Missing values
 - If expected by quotation rule, mark as provisional.
- Formula traceability
 - Each CPE Term returns a quote record, else flag.

Conclusion

By addressing integration challenges and aligning trade capture, risk management and settlement needs with a practical configuration plan, energy companies can improve the accuracy and timeliness of their pricing processes in SAP. Leveraging aggregator APIs ensures consistency, reduces manual data entry risks and strengthens compliance.





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