intratec

OCTOBER 2026

Report Methodology

Energy Prices & Markets

12	33	3
ENERGY COMMODITIES	COUNTRIES	CORE TOPICS

CHAPTER 1

Methodology Overview

SUMMARY

- Every edition covers a fixed set of twelve energy commodities across 33 countries, so coverage and comparisons stay consistent from month to month.
- A shared foundation of independent sourcing, common conventions, and two-layer validation underlies every price reference the program produces.
- Five price types — trade-based, formula-based, freight-based, manufacturing cost-based, and compiled — cover the full range of assessments, chosen case by case as data availability allows.
- The full methodology is public, requires no login, and every change is documented in monthly Release Notes.

Energy Prices & Markets publishes price references for energy markets, produced under a structured, price-based discipline that collects market data, transforms it to common bases, and applies dedicated modeling on a monthly cycle. The same energy price references also feed other Intratec models, such as industrial utility cost estimates. The purpose of this document is to make every step from raw inputs to a finished assessment transparent: where the data comes from, how it is validated, how each price is modeled, and how its reliability is tracked and published.

The full methodology is public and auditable. It requires no login or subscription, and any change to a method or a figure is documented in monthly Release Notes that are themselves publicly available, so the evolution of every method can be traced over time.

What the Program Covers

Energy markets are volatile and fast-moving, shaped by shifting trade alliances, supply-chain disruptions, and an ongoing transition toward renewable sources. Energy Prices & Markets responds with monthly, country-level assessments of energy prices and markets worldwide — each edition dedicated to a single country and released early in the month, so the analysis reflects the latest prices, forecasts, market trends, and trade dynamics.

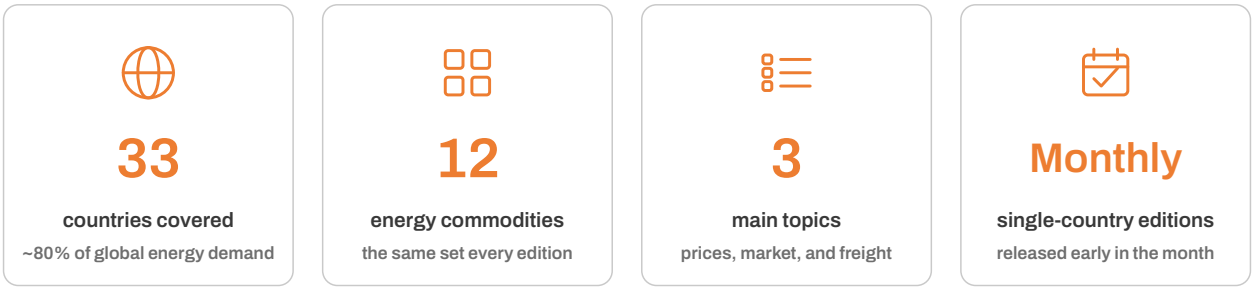

Figure 1.1 Energy Prices & Markets assesses 12 energy commodities across 33 countries through five price-assessment approaches, in a monthly report dedicated to a single country.

Each report is built to answer the essential questions a decision-maker asks about a country's energy market:

* How have energy prices changed historically, and recently?
* What are the price forecasts for energy commodities?
* How do local energy prices compare to global market prices?
* What are the key trends in the country's energy production and consumption?
* How are freight and insurance costs affecting the competitiveness of energy imports and exports?
* To what extent is the country self-sufficient in energy production?
* Which countries are its main energy trade partners, and how reliant is it on energy imports or exports?
* How exposed is the country to financial or supply risks in its energy trade relationships?

Every report covers the same fixed set of twelve energy commodities, so coverage stays consistent across countries and editions. The set spans primary energy sources — extracted directly from reserves — and secondary energy obtained by transforming them into usable fuels and power.

Table 1.1 The twelve energy commodities assessed in every report.

GROUP	COMMODITIES
Primary fossil sources	Crude Oil, Natural Gas, Coal
Refined & processed products	Naphtha, Gasoline, Kerosene, Diesel, Fuel Oil, LPG
Electricity	Electricity
Renewable fuels	Ethanol, Biomass-Based Diesel

Countries Covered

The program covers 33 countries individually, each with its own monthly report, together accounting for around 80% of global energy demand — a set broad enough to capture the markets that drive worldwide supply, pricing, and trade. Each edition focuses on a single country drawn from this fixed universe of 33; holding the set constant keeps comparisons consistent from month to month and country to country.

Table 1.2 The 33 countries covered by the program, by Intratec world region.

REGION	COUNTRIES
Americas	Brazil, Canada, Chile, Colombia, Mexico, United States
Europe	Belgium, Czech Republic, Finland, France, Germany, Hungary, Italy, Netherlands, Norway, Poland, Russia, Spain, Sweden, Turkey, United Kingdom
Asia	Australia, China, India, Indonesia, Japan, Philippines, Singapore, South Korea, Taiwan, Thailand
Africa & Middle East	Saudi Arabia, South Africa

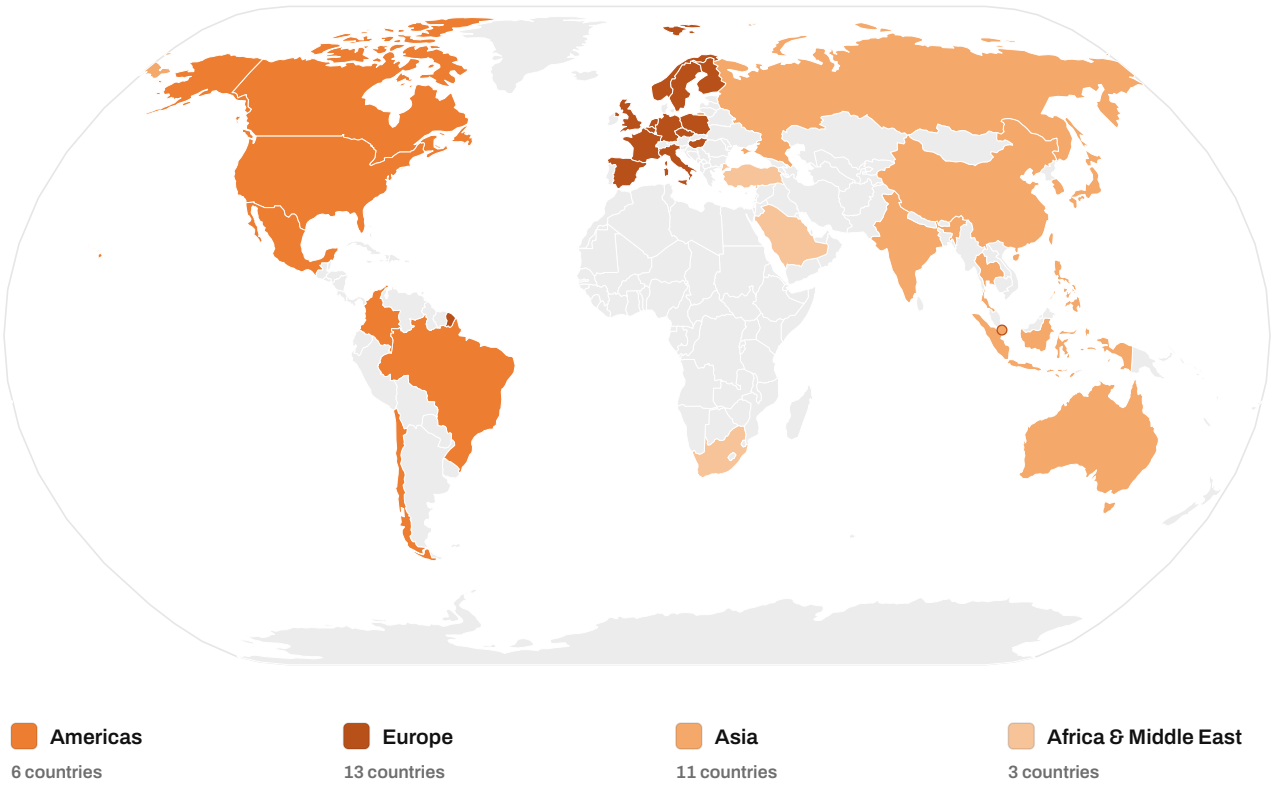

Figure 1.2 The 33 countries covered by Energy Prices & Markets, shaded by Intratec world region — Americas, Europe, Asia, and Africa & Middle East. The set is held constant across editions, so month-to-month and cross-country comparisons stay consistent.

A Shared Foundation

The program belongs to a family of Intratec solutions that rest on one common foundation and differ only in what each one measures. That shared base is what makes the price references independent and reproducible, regardless of the specific price type behind any single figure.

Table 1.3 The common foundation behind every assessment.

LAYER	WHAT IT PROVIDES
Core principles	Independent sourcing, no commercial ties to market participants, and impartial, auditable methods
Shared conventions	The US dollar anchors all monetary figures with a single set of reference exchange rates; reported quantities follow the International System of Units; one world-regions hierarchy of region, sub-region, and country organizes every analysis geographically
Quality philosophy	A two-layer validation runs before publication — automated processing and cross-referencing of sources, then expert human review as the final quality gate — and the methodology is reviewed continuously

Core Principles

Every assessment is built under the same eight commitments. They govern sourcing, independence, and disclosure alike, and they are the reason a published figure can be traced back to its inputs and the rules that produced it.

Table 1.4 The eight commitments behind every assessment.

COMMITMENT	WHAT IT MEANS
Sourcing	The program is not a primary source for pricing data; the vast majority of data comes from public official sources — statistics bureaus, trade agencies, multilateral organizations, and market exchanges. Private and producer data are used only with the rights holder's permission, and surveys occur only in very exceptional circumstances
Independence	No commercial relationships are held with commodity market participants, removing any single party's incentive to influence results
Impartial, auditable methods	All data is processed through methods that let each figure be traced to its sources, with no commercial interest entering the calculation
Two-layer validation	Before publication, data passes automated cross-referencing of multiple sources followed by expert human review; both layers run every month
Continuous improvement	Models and methods are reviewed continuously rather than on a fixed cycle, with subscriber feedback feeding directly into corrections
Transparency of changes	Every methodology and data change is documented each month in the publicly available Release Notes
Automated collection at scale	Collection runs on automated, large-scale, resilient systems, gathering a large volume and variety of data consistently every cycle
Continuous strengthening of the source base	The set of sources grows over time, official and recognized institutions are prioritized, and discontinued sources are quickly replaced

Quality is sustained by two mechanisms working together. The monthly validation gate flags inconsistencies automatically and then submits them to market experts as the final review before release. Separately, the source base itself is continuously expanded, prioritized toward official institutions, and repaired whenever a source is discontinued, so coverage and continuity are preserved. Subscribers can also question any published figure through a formal assessment-complaint process, and resolved complaints feed the same continuous cycle of reviews.

What the Program Produces

The methodology turns raw market data into published price assessments. The modeling path is not uniform: it depends on the price type, which in turn depends on the commodity, the available data, and the point in the supply chain being priced. Five price types cover the program, complemented by the treatment of data shortages, short-term forecasts, and the accuracy metrics that accompany them.

* Trade-based prices
* Formula-based prices
* Freight-based prices
* Manufacturing cost-based prices
* Compiled prices

Each of these is defined and worked through in detail in Chapter 6. The mechanics are introduced here only to orient the reader to the kinds of references the program publishes.

How This Document Is Organized

The chapters follow the journey of a number, from raw inputs to a finished, revised assessment.

* The principles that keep assessments independent, and the known limits of the methods, frame the work.
* Data collection and integration — where the data comes from and how raw inputs are prepared and made comparable — is covered in Chapter 3.
* The modeling approaches that turn prepared data into assessments are developed in Chapter 4, with the detailed price-type mechanics in Chapter 6.
* Validation and the review cadence that gate every release are covered in Chapter 2.
* Publication timing, data status labels, and revisions close the lifecycle.

The figure below traces that journey end to end:

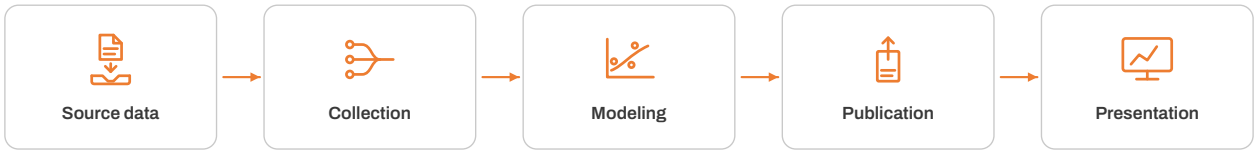

Figure 1.3 The end-to-end methodology pipeline: source data is collected, modeled into assessments, published, and presented to readers.

Cross-references throughout point to the chapter where a topic is treated in full, so any single chapter can be read on its own.

CHAPTER 2

Review, Validation, and Release Cadence

SUMMARY

- Three nested cycles — annual methodology review, continuous data and model maintenance, and monthly processing and release — keep assessments current and reliable, and no change is ever published silently.
- A two-layer validation, automated cross-referencing followed by risk-based expert review, runs before every figure is released.
- Price and freight assessments run through the latest reported month and add a forecast, while energy-balance and market figures trail roughly four months behind to rest on verified official data.
- Each figure carries one of three status labels — Final, Preliminary, or Forecast — marking how settled its value is.

Every figure published by Energy Prices & Markets passes through three nested cycles that keep the assessments current and reliable. They differ in period and purpose. A monthly workflow collects, processes, and releases each new edition. A continuous cycle of data validation and model maintenance keeps the sources and series sound. An annual review confronts the methodology itself with market research and relevance checks. Each cycle feeds the others, and every change any of them produces is documented in the monthly, publicly available Release Notes.

Three Review Cycles at a Glance

The three cadences operate at different periods and on different objects — the methodology, the data and models, and the individual figures — but share one discipline: a change is never published silently.

Table 2.1 The three cycles that keep assessments current.

CYCLE	CADENCE	WHAT IT REVIEWS AND WHAT CAN CHANGE
Methodology review and assurance	Annual (continuous, formalized at least yearly)	All methodologies and methodology documents — relevance, raw-data changes, modeling enhancements, and clarification or simplification from subscriber feedback
Data validation and model maintenance	Continuous / per cycle	Data-source checks, series evaluation, model recalibration against final values

CYCLE	CADENCE	WHAT IT REVIEWS AND WHAT CAN CHANGE
Data processing and release	Monthly	The figures themselves — collection, two-layer validation, status labeling, and publication of each edition

The three cadences and the tasks each carries are shown below:

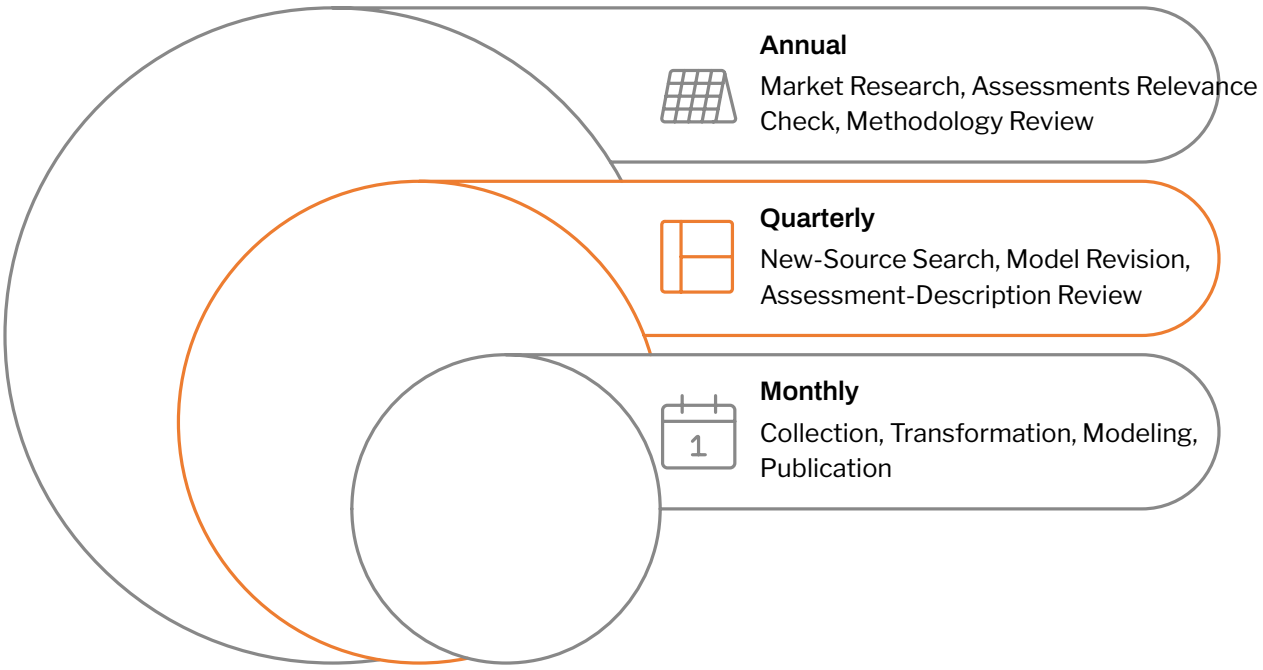

Figure 2.1 The methodology's three task cadences: a monthly production cycle, quarterly maintenance reviews, and an annual methodology review.

The Annual Methodology Review and Assurance

Methodologies are reviewed continuously, with a formal review of all methodologies and methodology documents at least once a year. The review is the mechanism that keeps every assessment relevant over time rather than merely current. Three kinds of findings can justify a change after a review: alterations in the raw data used for the calculations; modifications to the calculation methodology, such as modeling enhancements; and clarification or simplification of the methodology documents themselves, prompted by subscriber feedback.

Subscriber feedback is a standing criterion in these reviews, alongside raw-data changes and modeling improvements, so the assessments evolve with what readers report needing clarified or improved.

Feedback reaches the methodology through two paths. Individually, a formal assessment-complaint process is available to any subscriber who wishes to question a published figure; a resolved complaint can prompt an adjustment to the affected value. Collectively, the accumulated feedback becomes one of the inputs weighed at review time.

Changes that result from a review are announced to subscribers in advance — before they take effect — together with the duration of the transition period, and are then documented in the monthly Release Notes. The advance notice and defined transition window are what distinguish a methodology change from a routine monthly update: subscribers learn what is changing, and when, before any figure shifts.

Continuous Data Validation and Model Maintenance

Between methodology reviews, a continuous cycle keeps the data sources and the models themselves sound. It rests on a two-layer validation approach applied to all data before publication: an automated processing stage followed by expert human review. Both layers run every cycle, before any figure is released.

The automated stage prepares and tests the data. It cross-references multiple official sources — comparing the same data point across independent official records to confirm agreement — and applies mathematical models to identify inconsistencies between them. Running the same consistent, validated rules each cycle reduces errors introduced through manual handling and removes bias from market participants.

After the automated stage, market experts — analysts with sector-specific knowledge — review the model outputs and serve as the final quality gate, the last check a figure passes before release. The review is risk-based rather than random: any value the automated stage flags as anomalous or inconsistent is always routed to an expert, concentrating attention where the probability of an issue is highest, while a sample of the remaining unflagged values is also reviewed each cycle as an independent check that the automated rules are not silently missing problems.

Model maintenance is the other half of the cycle. Accuracy is evaluated as part of modeling itself, with a built-in back-test supplied by the data lifecycle: every forecast and every preliminary figure is eventually confronted with the final official value once it arrives. Comparing what the models predicted with what the sources later reported shows directly how each model performs. Deviations are flagged for investigation — analysts trace the cause, from erroneous data entry to market changes the model has not yet captured — and the model is recalibrated, improved, or replaced when it no longer reflects conditions. The insights feed back into the models, so reliability improves over time. The mechanics of the accuracy metrics behind this evaluation are detailed in Chapter 4.

When a source fails for a prolonged period — its data insufficient, inadequate, or unavailable — one of four approaches keeps the series representative rather than publishing it at a lower standard: estimate the assessment with a model built on good prior or related data; replace the failing source with another that meets the requirements; alter the assessment's definition so it can be produced reliably from the

data available; or, if the shortage persists, discontinue the series. The governing commitment is quality over continuity: a series, ranking, or assessment may be initiated, changed, or retired at any time, and one that can no longer be produced reliably is changed or retired rather than published unreliably. Every such addition, change, and retirement is recorded in the monthly Release Notes.

The Monthly Data-Processing and Release Workflow

Assessments are published on a monthly cadence, with every assessment refreshed once per calendar month. Each monthly edition supersedes the prior one, building a continuous, regularly spaced record over time.

The cycle follows a fixed sequence. Official government data — figures issued by national statistical and regulatory authorities — is collected during the last week of each month. At the start of the following month, that data is processed, validated through the two-layer approach, and assessed to produce the update. Exact release dates for each series are listed in the published release schedule.

Every country in an assessment follows the same monthly collection-and-processing cutoff. Because all inputs are gathered and assessed at the same point in the cycle, the figures within a single edition reflect a common reference moment, which keeps cross-country comparison valid — no country's data is more or less current than another's within the same edition. The collection and integration of these inputs is covered in Chapter 3.

Each monthly cycle runs the same release sequence:

Figure 2.2 The monthly release workflow: report and API database update, test presentation display, release notes, and communication.

How Current Each Figure Is

An edition carries two kinds of data that move on different clocks. Price and freight assessments run through the latest reported month, while energy-balance and market figures trail roughly four months behind the period they describe.

Energy-balance and market data — production, consumption, trade flows, self-sufficiency, and consumption-weighted metrics such as the average energy price — rest on official energy and foreign-trade

statistics, which national agencies release one to three months after the period they cover. Formatting, alignment, and validation then follow, so the finished balance figures settle about four months behind the period, and the same lag carries into every metric derived from them. The payoff is that these figures rest on verified official data rather than provisional estimates.

Price and freight assessments do not wait for the full official record. While official data is still pending, preliminary model estimates marked "(P)" stand in, so these series extend to the most recent month and add a six-month forecast for selected assessments, with each preliminary value revised to its final figure once official data arrives. Energy-balance and market figures, by contrast, are not forecast — they are reported as historical values, with preliminary estimates filling the most recent periods until official data confirms them.

The split is deliberate: price signals stay timely for fast-moving market decisions, while balance and trade figures wait for verified official data rather than provisional estimates. The maturity of every figure is marked by the status label described next.

Data Status Labels

Because official statistics arrive with a lag and some periods have not yet been reported by any source, not every figure in an edition is equally settled. Each figure therefore carries one of three status labels, placed directly alongside the value throughout the data tables and charts so its maturity and basis are clear at the point of reading, without consulting separate notes.

Table 2.2 The three data status labels.

LABEL	CODE	MEANING
Final	Fi	Verified official statistics; the settled value, not expected to change
Preliminary	P	A model-generated estimate used while official data is unavailable or lagging — an interim value, with a revision expected
Forecast	F	A forward-looking model prediction for periods not yet reported by any source

A figure carries the Preliminary label when the relevant official source data has not yet arrived — typically a source lag of one to three months — and a model estimate stands in its place. It moves from Preliminary to Final once the official statistics for that period are released and verified: the model estimate is replaced by the confirmed official value, and the label updates from P to Fi. This Preliminary-to-Final transition is also what supplies the back-test described above, since each estimate is eventually measured against the official value that replaces it.

Advance Notice and Release Notes

Two communication mechanisms close every cycle. Advance notice applies to methodology changes: before a reviewed change takes effect, subscribers are told what is changing and the length of the tran-

sition period, so no change to how a figure is produced arrives unannounced. The monthly Release Notes are the standing public record: every addition, change, and retirement of a series, every correction, and every methodology change is documented there, keeping the path from review or feedback to revision traceable. The treatment of corrections and the associated disclaimers is covered in Chapter 10.

CHAPTER 3

Collection and Integration

SUMMARY

- The vast majority of inputs come from public, official sources; private sources are used only with rights-holder permission and supplement rather than override official records.
- A fixed pipeline of extraction, transformation, and loading — cleaning, standardizing, and filtering every raw figure — puts data on common ground before modeling begins.
- Trade data is filtered and clustered by volume, specification, location basis, and delivery terms, so a single unrepresentative trade cannot skew an assessment.
- Modeled estimates keep coverage continuous through the one-to-three-month lag before official data arrives, and every source change is recorded in the monthly Release Notes.

Before any price is assessed, raw information has to reach the system in a form the analysis can use. Energy Prices & Markets organizes this as a pipeline with three stages — extraction of data from external sources, transformation into a consistent internal form, and loading into the system that feeds the assessments. Around that pipeline sits a fixed collection schedule and a set of publication lags that govern how fresh each figure can be. This chapter describes the path a figure travels from its public source to the point where it is ready for modeling; the modeling stage itself is covered in Chapter 4, and the validation and review cadence in Chapter 2.

Extraction: the source base

The methodology is built on public, official information. The vast majority of inputs come from public official sources, and the program is deliberately not a primary source for pricing data — an approach that minimizes subjective influence and self-reporting bias in the assessments. The collection portfolio spans six categories of source.

Table 3.1 The six categories of source feeding the analysis.

SOURCE CATEGORY	WHAT IT PROVIDES
National statistics bureaus	Official trade, price, and economic statistics
Governmental agencies	Regulatory, fiscal, infrastructure, and labor data
International multilateral organizations	Cross-country economic indicators and technical references

SOURCE CATEGORY	WHAT IT PROVIDES
Commodity exchanges	Quoted commodity and derivatives prices — settlement prices, spreads, freight quotations — from public and private trading platforms
Producers' data	Prices of commodities as sold and published by the producers themselves
Technology licensors	Published consumption figures, investment levels, and plant capacities, verified before use

Government-reported trade statistics form the foundation of the analysis. Because they are published by national authorities and statistical bureaus, the figures are public, verifiable, and free of any single party's commercial interest, and each result can be traced back to its official source. Data from international and multilateral organizations supplements those trade statistics where broader context or technical reference points are needed. Private sources — private trading platforms, producers' data, and licensors' publications — are used only with permission from the rights holders, and supplement rather than override official records.

When more than one source covers the same data point, official and recognized institutions take priority for final figures. Accuracy is favored over speed: a slower official source outranks a faster private one. The source base is not judged once and left alone — reliability is assessed continuously, the number of sources keeps growing past 350+, validation procedures are progressively strengthened, and any discontinued source is replaced quickly so coverage stays uninterrupted.

Extraction: collection schedule

Collection follows a fixed calendar. Automated systems gather data from official government sources during the last week of each monthly cycle. Processing and assessment then take place at the start of the following month, before the edition is published. This repeatable cutoff keeps each edition aligned to a consistent reference point.

Transformation: cleaning and standardizing

Every raw figure passes through a preparation stage before it enters any assessment. In this stage the value is cleaned, its format standardized, validated against expected ranges, and screened for anomalies. Only figures that clear these steps move forward, so downstream calculations rest on a consistent, vetted foundation.

Source data arrives in many file and number formats, each provider following its own conventions. Three things happen to bring them onto common ground:

- **Format conversion** — all incoming files and number formats are converted into a single internal convention.
- **Unit standardization** — values are converted to the International System of Units using fixed conversion factors, so a figure means the same thing regardless of where it came from.
- **Range validation** — each value is checked against expected ranges before any anomaly screening begins.

These consistency checks ensure that differences observed later between figures reflect the market, not formatting artifacts.

Trade data needs a further step. Official trade statistics aggregate transactions that can differ widely in volume, specification, and delivery conditions, and mixing them indiscriminately would distort the assessed price level. Trades are therefore filtered and clustered before use, applying criteria in four categories.

Table 3.2 The four filtering criteria applied to trade data.

CRITERION	PURPOSE
Minimum-volume thresholds	Exclude trades too small to represent the market level
Specification and grade	Keep together only trades matching the assessed specification
Location basis	Group trades by the location basis they reflect
Trade size and delivery terms	Prevent distortions from mixing trades of different sizes or delivery conditions

The filter criteria categories are disclosed; the specific numeric thresholds and the statistical techniques applied within them are proprietary.

> **Example:** a single unusually large cargo mixed into a month of smaller spot trades would pull the aggregate away from the mid-market level; clustering keeps such trades from skewing the assessment.

Preparation is the first half of the transformation stage. The second half — normalization to a common comparison basis — leads into the modeling work described in Chapter 4.

Loading: into the assessment system

Figures that clear preparation are loaded into the internal system as a consistent, vetted foundation for analysis. From this point the data is on common ground — single file convention, standardized units, validated ranges, trades clustered by specification and basis — and ready for the modeling stage to act on it.

Source timing and freshness

Freshness is bounded by how quickly official data becomes available. Official trade statistics are generally released one to three months after the period they describe. This delay is a normal feature of official data: governments require time to compile, validate, and publish national figures, and the analysis is structured around that reporting rhythm rather than treating it as a shortcoming.

To keep coverage continuous through that lag, internally developed mathematical models generate estimates for periods still awaiting official release. Internally developed models are not a data source — they fill the gap until the official figure arrives. Every modeled value carries a data-status label, either Preliminary or Forecast, so an estimate is always distinguishable from a settled official value. Once the official data is released and verified, the estimate is replaced and the figure becomes Final.

The same mechanism absorbs disruptions to the source base. A source may be temporarily unavailable, still lagging, or permanently discontinued; in every case the published series does not break. Model estimates keep coverage continuous while a substitute source is incorporated quickly under the same official-first priority. Every such change is documented in the monthly, publicly available Release Notes, so the lineage of an affected series remains traceable — the record shows how and why the sourcing behind a figure changed over time.

The Collection-and-Integration Path

The figure below summarizes the path, from source extraction through transformation to loading into the system that feeds modeling:

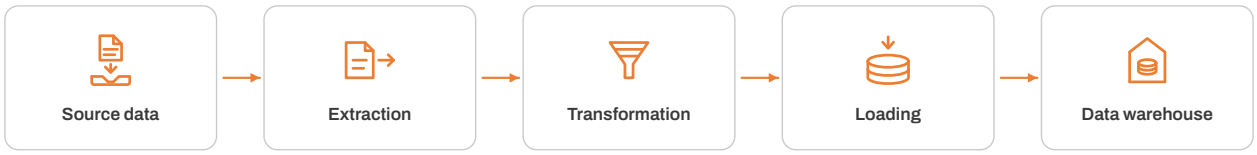

Figure 3.1 Data collection and integration: raw source data is extracted, transformed, and loaded into the data warehouse.

CHAPTER 4

Modeling

SUMMARY

- The model applied to a given commodity and location is chosen case by case from five approaches, weighing data availability, timeliness, and fit to the targeted specification; the trade-based approach is the default wherever suitable data exists.
- When market data is scarce or absent, qualified analysts estimate values from related assessments, indexes, completed deals, and market fundamentals, keeping estimation a disciplined step rather than free-form judgment.
- Forecasts extend the most recent path about six months ahead, refreshed monthly as point values without confidence intervals.
- Normalization corrects for differences in delivery location, data quality, quantity, specification, and timing, so figures from diverse markets sit on a common, comparable basis.

Once raw information has been cleaned, standardized, and loaded, the modeling stage turns it into published price assessments. Energy Prices & Markets does not apply a single modeling recipe: the appropriate model is chosen per commodity and location, the stage absorbs cases where suitable raw data is scarce or absent, it extends recent trends a short way into the future, and it expresses every figure on a common, comparable basis. This chapter describes that shared modeling layer. The five specific price models — and the mechanics that distinguish them — are detailed in Chapter 6; this chapter covers what is common to all of them.

Regardless of price type, the shared modeling layer follows one flow:

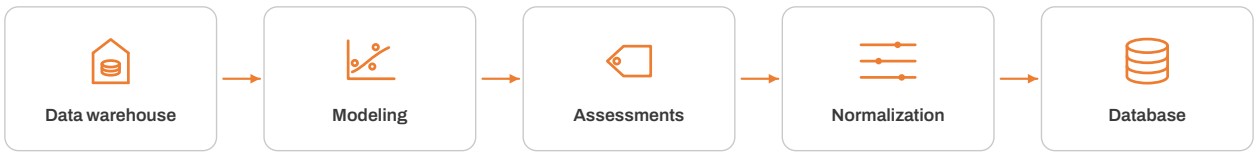

Figure 4.1 Modeling flow: warehouse data is modeled into assessments, normalized to a common basis, and stored in the published database.

Selecting the model

Selection follows from what the market actually offers for a given commodity at a given location, weighing three things together: how available the data is, how timely it is, and how well it fits the targeted specification — the exact grade and form being priced. The choice is made case by case rather than scored: the trade-offs are conceptual, and there is no published ranking or error rate that elects one model over another.

Each model carries its own data requirement, and the model is chosen to match the conditions the market presents.

Table 4.1 What each modeling approach requires, and the conditions that favor it.

APPROACH	REQUIRES, AND BEST WHEN
Trade-based	Official trade statistics that are timely and suitable for the targeted specification — the preferred approach wherever such data exists
Formula-based	A stable relationship with related commodity prices and economic variables — used where the price moves predictably with measurable drivers
Freight-based	An existing assessment at another location, plus freight and insurance rates — used to carry a value to a location another assessment already anchors
Manufacturing-cost-based	Known production economics: input costs, utilities, labor, overhead — used where market prices are scarce but the cost of producing the commodity is known
Compiled	Several public-source price series that can be validated — used where a validated monthly average represents the market

The trade-based approach is the default wherever suitable trade data exists; the others come into play as the data picture thins. The individual mechanics of each are covered in Chapter 6.

When raw data is insufficient

When the available inputs are insufficient, inadequate, or unavailable — or when a purely data-driven approach would not yield a representative assessment — qualified analysts estimate values from a wide range of factual market information: related assessments, producer or export indexes, completed deals, labor costs, spread and exchange trades, and supply-and-demand fundamentals. Analysts verify all data used and may propose adjustments to the underlying models, so estimation stays a disciplined modeling step rather than free-form judgment.

The most common gap is timing. Some official statistics are released one to three months after the period they describe, so model-based estimates stand in for the period up to the current month, derived from related assessments that carry no such lag. These interim values are marked Preliminary and are

expected to be revised once the official figure arrives. Every estimate is distinguishable from a settled official value by its data-status label, described later in this chapter.

New series and assessments, and changes that come out of a methodology review, are not switched on without a trial. New series and assessments undergo shadow testing for a period before official release, and methodology changes are announced to subscribers in advance — together with the duration of the transition period — before they take effect. This keeps a new or revised model under observation against live conditions before it carries published figures.

Keeping models accurate

Model evaluation runs continuously alongside the modeling itself, with a formal review of all methodologies at least once a year. The accuracy of the models — forecasts included — is evaluated during modeling, and computational algorithms and regression models are adjusted when necessary. When a series shows atypical behavior or an inconsistency surfaces, the data behind it is flagged for verification; this can trigger a recalibration of the model, or its replacement when it no longer reflects the conditions of the market it covers. Analysts also investigate the cause of each inconsistency — from an erroneous data entry to a market change the model has not yet accounted for — and feed those findings back into the models, so accuracy and reliability improve over time.

Short-term forecasts

For periods not yet reported by any official source, the modeling stage extends the most recent path forward. A forecast is a forward-looking estimate, generated by statistical and machine-learning models trained on historical series together with related economic variables — commodity prices, economic indices, and industry indicators. The models learn patterns from past behavior and from variables that move together with the series being projected.

A forecast reaches about six months ahead of the latest reported period. This horizon balances analytical usefulness against the rising uncertainty of longer projections, keeping forward-looking values close enough to observed conditions to stay informative. Because the underlying market parameters can shift quickly, forecasts are refreshed monthly, each one reflecting the most probable scenario as of its update date. Forecasts are published as point values; they do not carry confidence intervals.

The forecasting approach is stated openly — the model families, the variables they draw on, the horizon, and the monthly refresh. What stays proprietary are the parameters that produce individual values: the exact model architecture, the specific input features and their relative weights, and the underlying coefficients.

Normalization and comparability

Normalization is the adjustment of gathered market information so it matches the base standard reflected in the published assessments. Markets are diverse — trades differ in delivery location, data

quality, quantity, specification, and timing — and merely averaging them would not represent the assessment value accurately. Normalization happens concomitantly and iteratively with the modeling work, not as a strictly sequential step before it. Each kind of difference has its own correction.

Table 4.2 How differences across sources are corrected during normalization.

DIFFERENCE ACROSS SOURCES	HOW IT IS CORRECTED
Delivery location	Freight rates
Data quality	Factors, indexes, and cross-reference with other sources
Quantity and specification	Averages and outlier detection
Timing between assessment curves	Mathematical formulas

Location is the correction most visible in the published series. Trades reflecting different delivery points are adjusted using freight rates, so every figure is expressed at the published location basis — typically the location where trading of that commodity is most common. This is how the program publishes energy commodity prices on a per-country basis: the same underlying market information, translated to each country's reference location through freight adjustments.

Two further conventions keep the dataset internally consistent. Series published less often than the monthly cadence — quarterly or annually — are aligned to the monthly grid through interpolation, so every month can be compared across the full dataset. And at the end of the transformation stage, figures are rounded by maturity: historical and preliminary data to three significant figures, forecast data to two. The coarser rounding on forecasts is deliberate honesty about precision — forward-looking estimates carry greater uncertainty than observed values, and the published figure reflects that.

> **Example:** a price observed at a loading terminal in one country and a price at a destination terminal in another describe the same market, but at different points in the supply chain; freight adjustment brings both onto each country's published location basis so the two can sit side by side in the same series.

Data-status labels

The modeling stage produces the values in a series that are not yet verified — preliminary estimates standing in for lagging official data, and forward-looking forecasts. Each such figure carries a status label (Final, Preliminary, or Forecast) signaling how settled it is; the labels and the Preliminary-to-Final transition are defined in Chapter 2.

The reliability of preliminary and forecast values is itself measured and published; that accuracy tracking is covered in Chapter 6.

CHAPTER 5

Information Publication

SUMMARY

- Every assessment clears a two-layer validation — automated cross-referencing followed by expert human review — before it is released.
- Expert review is risk-based: a flagged value is always checked, while a representative sample of unflagged values is reviewed each cycle as an independent check on the automated rules.
- Published assessments are organized into monthly editions delivered in several formats, while the methodology behind them stays publicly accessible with no login or subscription required.

Before any figure produced by Energy Prices & Markets reaches subscribers, it passes a final review and is then made available in a defined form. This chapter covers those two closing steps: the last cross-checks and consistency checks applied to a finished assessment, and the way published assessments are presented while the methodology behind them remains openly accessible.

The Final Review

Every assessment clears a two-layer validation before release: an automated processing stage followed by expert human review. The automated stage prepares and tests the data, and market experts — analysts with sector-specific knowledge — act as the final quality gate, the last check a figure passes before publication.

The automated stage cross-references multiple official sources and applies mathematical models to identify inconsistencies between them. Cross-referencing compares the same data point across independent official records to confirm it agrees. Running the same consistent, validated rules every cycle reduces errors introduced through manual handling and removes bias from market participants.

Expert review then examines the model outputs, adding contextual judgment that automated rules alone cannot provide. It keeps processing consistent while confirming that outputs remain sensible in real market conditions. This review is risk-based rather than exhaustive: it covers a representative sample of each cycle's output.

Table 5.1 How the final review allocates expert attention

WHAT THE VALUE IS	HOW IT IS REVIEWED
A value flagged as anomalous or inconsistent by the automated stage	Always routed to expert review, concentrating attention where the probability of an issue is highest
A value the automated stage did not flag	A sample is reviewed each cycle, an independent check that the automated rules are not silently missing problems

The combination directs expert judgment where it matters most while keeping the entire pipeline under human oversight. Only after a finished assessment clears both layers does it move to publication. The cadence on which review and release recur, and the status labels a released figure can carry, are described in Chapter 2.

How Assessments Are Published

Published assessments are organized into monthly editions. Each edition presents the assessments together at a common reference moment, so the figures it contains can be read and compared as a coherent set. The timing rules that define an edition — and how revisions are handled after release — are covered in Chapters 2 and 10.

Once an edition clears the final review, it is published and made available in several formats:

* Report PDFs
* The web API
* Spreadsheet and BI add-ins

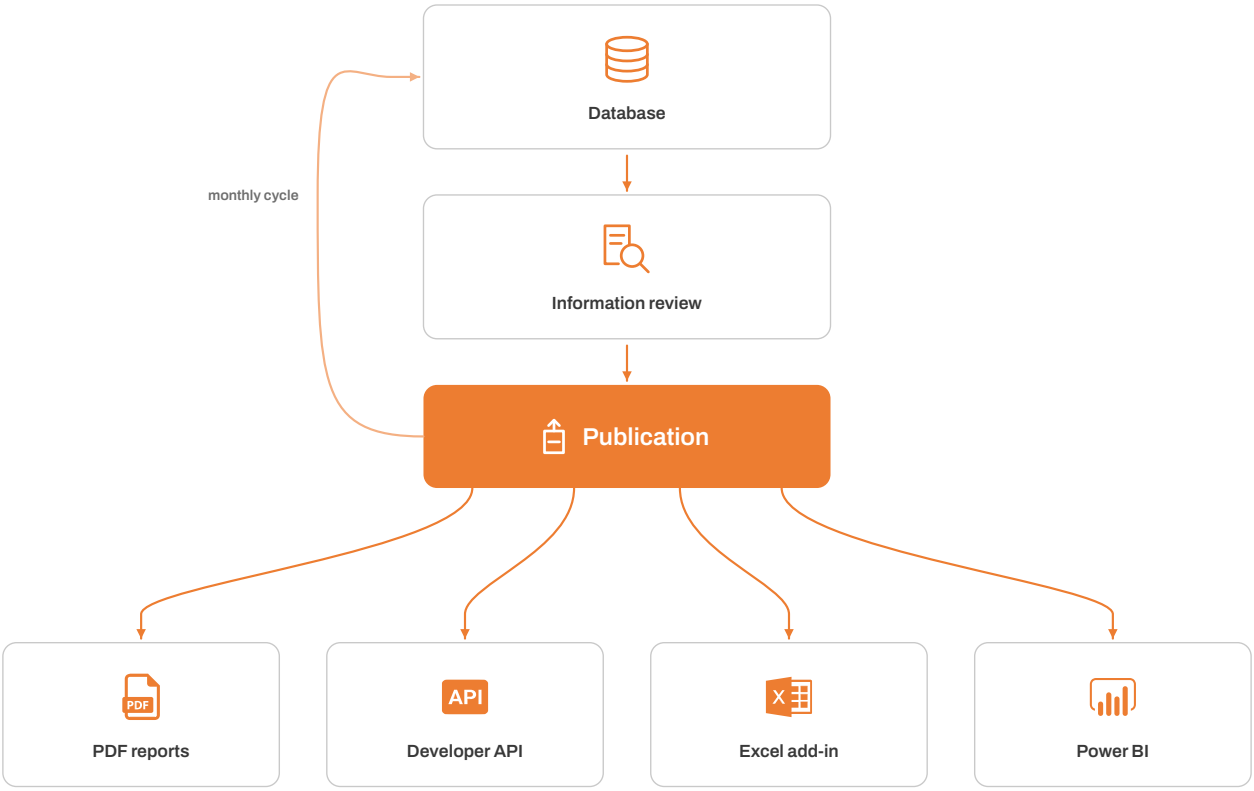

Figure 5.1 The publication flow: reviewed database content is published and delivered through report, API, and spreadsheet or BI formats.

Open Access to the Methodology

The reasoning behind every published assessment stays publicly available. All methodology documents are accessible with no subscription or login required, so a reader can trace each step from raw inputs to finished assessment. The aim is to make the path from raw data to published figure transparent: every step is documented and open to inspection, independent of access to the assessments themselves.

The disclosure covers the data sources behind each assessment, the modeling approach applied to produce it, and the structural logic that combines inputs into a finished figure. The precise calibration behind each model — the specific weights, coefficients, and normalization constants — stays proprietary, a boundary detailed in Chapter 10.

CHAPTER 6

Prices Modeling

SUMMARY

- Five price types cover the program — trade-based, formula-based, freight-based, manufacturing cost-based, and compiled — each matched to the commodity, the available data, and the point in the supply chain being priced.
- Preliminary estimates and short-term forecasts fill gaps left by delayed official statistics, keeping every assessment current between consolidated data releases.
- Model performance is tracked continuously through the Accuracy Index and Model Performance Score, so the reliability of preliminary and forecast prices is disclosed alongside the figures themselves.

Energy Prices & Markets converts raw market data into published price assessments through a modeling stage that validates price, volume, specification, and location, removes outliers, and applies the model appropriate to each assessment. The modeling path is not uniform: it depends on the price type, which in turn depends on the commodity, the available data, and the point in the supply chain being priced. Five price types cover the program, complemented by the treatment of data shortages, short-term forecasts, and the accuracy metrics that accompany them.

Trade-Based Prices

Trade-based prices come from international trade information reported by countries. Candidate data are selected by a criterion of **data homogeneity** — a check that all records refer to the same assessment: the same commodity, with similar specifications and trade conditions. A perfectly homogeneous dataset shows no variation, but real trade data carry some spread even for a single specification, so a tolerable homogeneity level is set to keep price calculations sound. A clustering algorithm then groups similar transactions by their statistical modes and dispersion; each cluster yields a single price assessment, which avoids the “basket” effect of mixing dissimilar trades. A dataset with no discernible homogeneity is treated as unqualified for price calculation.

From homogeneous data, two trade-based price types follow, differing mainly in the statistical treatment used to detect and remove outliers:

* **Unit value** — the total amount of money divided by the total quantity of a commodity traded in a month by a specific country, as reported by customs authorities. It carries no statistical treatment.
* **Transaction price** — treated to remove inconsistent values. Records below a minimum traded quantity are filtered out, then a univariate outlier-detection method removes inaccurate data. The minimum volume is set as a multiple of a typical trade size — often two or three times the standard cargo size for the region and commodity, or a multiple of the most common transport unit for domestic and small-quantity trades. Gross outliers — prices that deviate sharply from the median of all transactions — are excluded using the Median Absolute Deviation, a dispersion measure more resilient to outliers than the standard deviation.

A raw unit value is the simplest of these figures and the least refined, and its lack of statistical treatment carries three limitations against the transaction and compiled prices. Customs records group heterogeneous products under broad classifications, so a unit value blends distinct commodities into one average that can drift from the price of any specific grade traded (aggregation bias); it does not exclude implausible or erroneous transactions, which the transaction-price filters remove (no outlier removal); and it averages across market destinations, price types, and specifications at once — segmentation that compiled prices preserve (lack of market specificity). A unit value therefore serves as a transparent, unadjusted reference, while transaction and compiled prices give the more robust basis for tracking a specific market.

Because some official trade statistics are published with a delay of one to two months, **preliminary prices** fill the gap: model-based best estimates for the period up to the current month, derived from related assessments with no lag through a regression adjustment. Assessments carrying preliminary values are marked as such.

Formula-Based Prices

Formula-based assessments are derived from the prices of other commodities — typically raw materials or primary derivatives identified by market research as related to the assessment. A regression model is fitted so its parameters reproduce the assessment curve from those related assessments; the fitted model is then fed current commodity prices to produce the assessment value. In short, the price is a function of the prices of related commodities, economic indicators, and currency rates. Assessments produced this way are identified as formula-based.

Freight-Based Prices

Freight-based prices carry a price already established at one location to a different point in the supply chain by adding or subtracting the cost of moving the commodity. Two assessment types follow from the direction of travel:

* **Netforward** — from a price at the loading terminal (an FOB basis), maritime freight and insurance are added to express the delivered cost at the destination terminal (a CIF basis).
* **Netback** — from a delivered price at the destination terminal (a CIF basis), insurance and maritime freight are subtracted to recover the value at the loading terminal (an FOB basis).

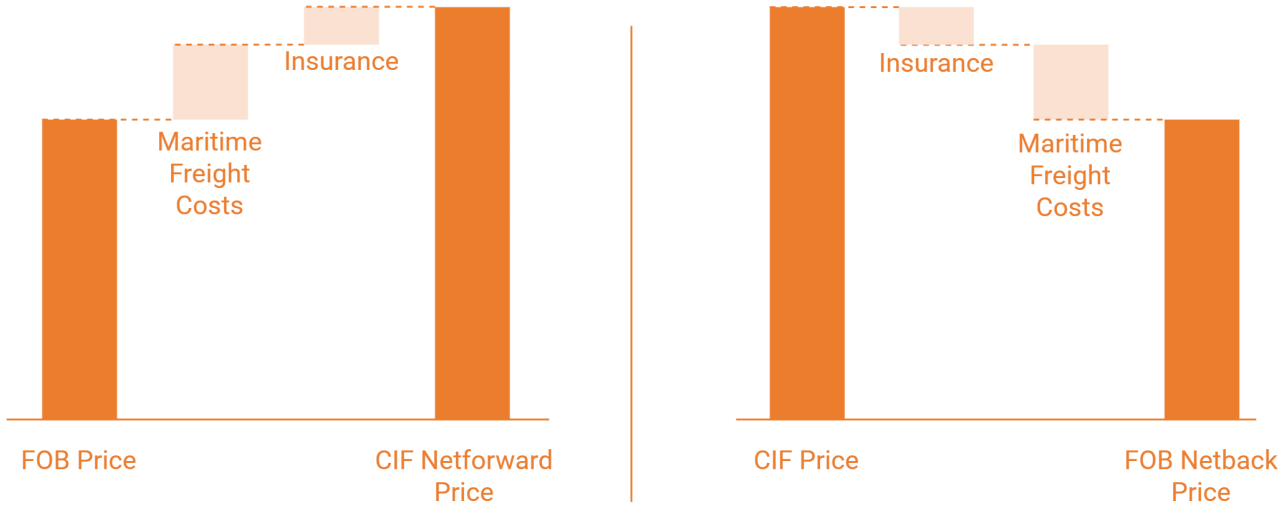

Figure 6.1 Netforward builds a delivered (CIF) price by adding maritime freight and insurance to an FOB price; netback works in reverse, recovering an FOB price by subtracting insurance and freight from a CIF price.

The freight rate reflects the transport form most commonly used for each assessment. Each result is reported in the currency and quantity unit of the assessment, so a freight-based price sits on the same basis as the other prices in its series. The price is a function of another assessment, the applicable freight rates, and insurance.

Manufacturing Cost-Based Prices

Manufacturing cost-based prices estimate the operating cost of producing a commodity from its process inputs. The build-up can include raw materials net of by-product credits, utilities, labor, maintenance, operating charges, plant overhead, local taxes, and insurance.

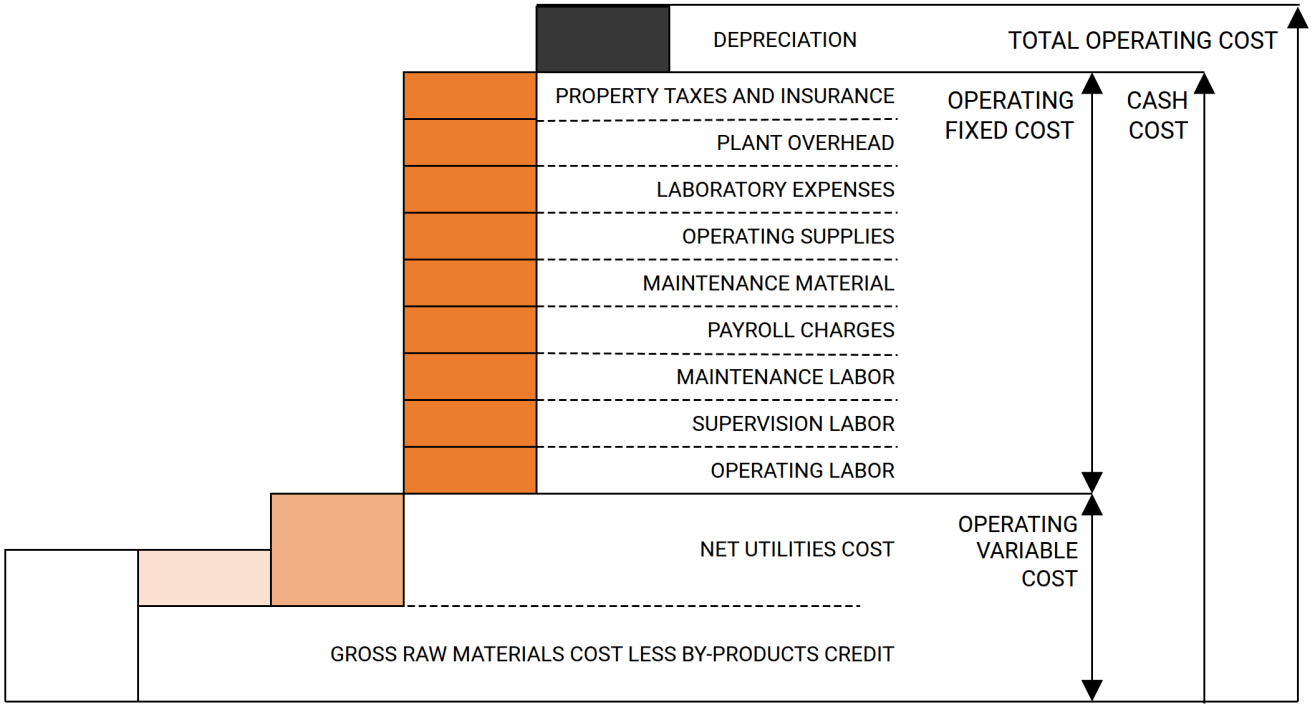

Figure 6.2 Manufacturing cost build-up: gross raw materials cost less by-product credits and net utilities form the variable cost; operating labor through plant overhead, taxes, and insurance form the fixed cost; together they total the operating cost.

Raw material and by-product prices are drawn from Intratec Primary Commodity Prices, and utility prices from Intratec Industry Economics Worldwide. The resulting price is a function of process indicators, raw-material and utility prices, labor, and an industrial-cost index.

Compiled Prices

Some assessments are built from price data published by public sources — price series stated as a value per quantity over a month. The raw public data first pass a formatting step that adapts them to the internal system; statistical validation then detects and removes anomalies and outliers. These assessments are typically computed as a monthly average of closing prices for daily or weekly published data, after which the series moves to normalization.

Preliminary Prices and Forecasts

When data are insufficient, inadequate, or unavailable — or when a data-driven approach would not yield a representative assessment — analysts estimate values from a wide range of factual market information: other assessments, producer or export indexes, labor costs, completed deals, spread and exchange trades, and supply-and-demand fundamentals. Preliminary data are the most common case, produced by proprietary models that address the one-to-two-month lag in official statistics and provide the best estimate up to the current month. Preliminary assessments are marked with “(P)”.

Short-term price forecasts are provided for selected assessments, derived from models that use the prices of related commodities, economic indices, and industry indicators. A forecast reflects the most probable scenario for the upcoming six months as of its update date; because the underlying market parameters can shift quickly, forecasts are refreshed monthly. The reliability of both preliminary and forecast prices is tracked and published, as described next.

Model Performance and Accuracy

To convey the reliability of preliminary and forecast prices, model performance is evaluated continuously and published. Three foundational metrics underpin the evaluation: the **Mean Absolute Percentage Error (MAPE)**, the deviation between estimated and consolidated prices; the **Mean Absolute Percentage Accuracy (MAPA)**, calculated as $100\% - \mathrm{MAPE}$; and the **Directional Accuracy (DA)**, which measures how often the model correctly predicts whether prices rise or fall. Average MAPA and DA are computed over three windows — the last 3, 6, and 12 months where consolidated prices exist.

For each window, an **Accuracy Index (AI)** combines MAPA and DA into a single 0–100% indicator:

$$\mathrm{AI} = \frac{\mathrm{MAPA} \times (24 - n_{\mathrm{obs}}) + \mathrm{DA} \times n_{\mathrm{obs}}}{24}$$

where 24 is the maximum number of months used and n_{obs} is the number of data points available in the window. The three Accuracy Indexes roll up into a **Model Performance Score (MPS)**, which weights recent performance more heavily on a 5:3:2 ratio across the three windows:

$$\mathrm{MPS} = \frac{0.5 \times \mathrm{AI}_{\text{3-mo}} + 0.3 \times \mathrm{AI}_{\text{6-mo}} + 0.2 \times \mathrm{AI}_{\text{12-mo}}}{20}$$

The MPS is reported on a zero-to-five-circle scale, where five filled circles (●●●●●) mark an excellent model and three or fewer (●●●●●) flag room for improvement. It covers preliminary assessments and M1 (forward-month) forecasts, the horizons most relevant to short-term decisions. For M6 (six-month-ahead) forecasts, performance is gauged against a Constant Price (Naïve) baseline through a relative performance ratio:

$$\text{Relative Performance Ratio} = \frac{\mathrm{MAPA}_{\text{Intratec model}}}{\mathrm{MAPA}_{\text{Naïve model}}}$$

Values above 100% indicate that the model adds predictive value beyond a no-change assumption. Where historical data are too sparse to estimate all parameters, the metric is reported as not available (NA).

CHAPTER 7

Market Modeling

SUMMARY

- A country's energy balance ties production, trade, stock changes, transformation, demand, and consumption into one internally consistent identity, solved for each of the 33 countries modeled.
- Where a direct input is missing, the balance is either rearranged to recover it from known variables or filled by a mathematical model tied to related series.
- Self-sufficiency, trade partners, and trade dependencies extend the balance into metrics that place a country within global energy markets and its trading relationships.

Energy underpins modern economies, fueling industries, transportation, households, and nearly every facet of daily life. Understanding an energy market means analyzing both the flow and the characteristics of its commodities. Energy Prices & Markets does this through a standardized methodology that turns data gathered from public sources into modeled energy flows for each commodity, then normalizes, reviews, and publishes them. Energy commodity data are typically organized by flow in energy units, and where relevant in mass or volume units. The sections below describe how a country's energy balance is assembled and the analytical metrics that can be read from it.

Energy Balance

The energy balance is a comprehensive overview of the relationship between production, imports, exports, demand, and consumption. It is the key indicator of how energy moves within a country, exposing self-sufficiency levels, trade dependencies, and consumption patterns. Each component of the balance is an *energy flow*.

An energy commodity passes through several stages from its first appearance to final consumption: production, transformation, trade through imports and exports, stock changes, and consumption. Fossil fuels are extracted from reserves, while renewables such as wind, hydro, and solar contribute mainly through electricity generation. A country may import energy to meet domestic needs or export surplus production.

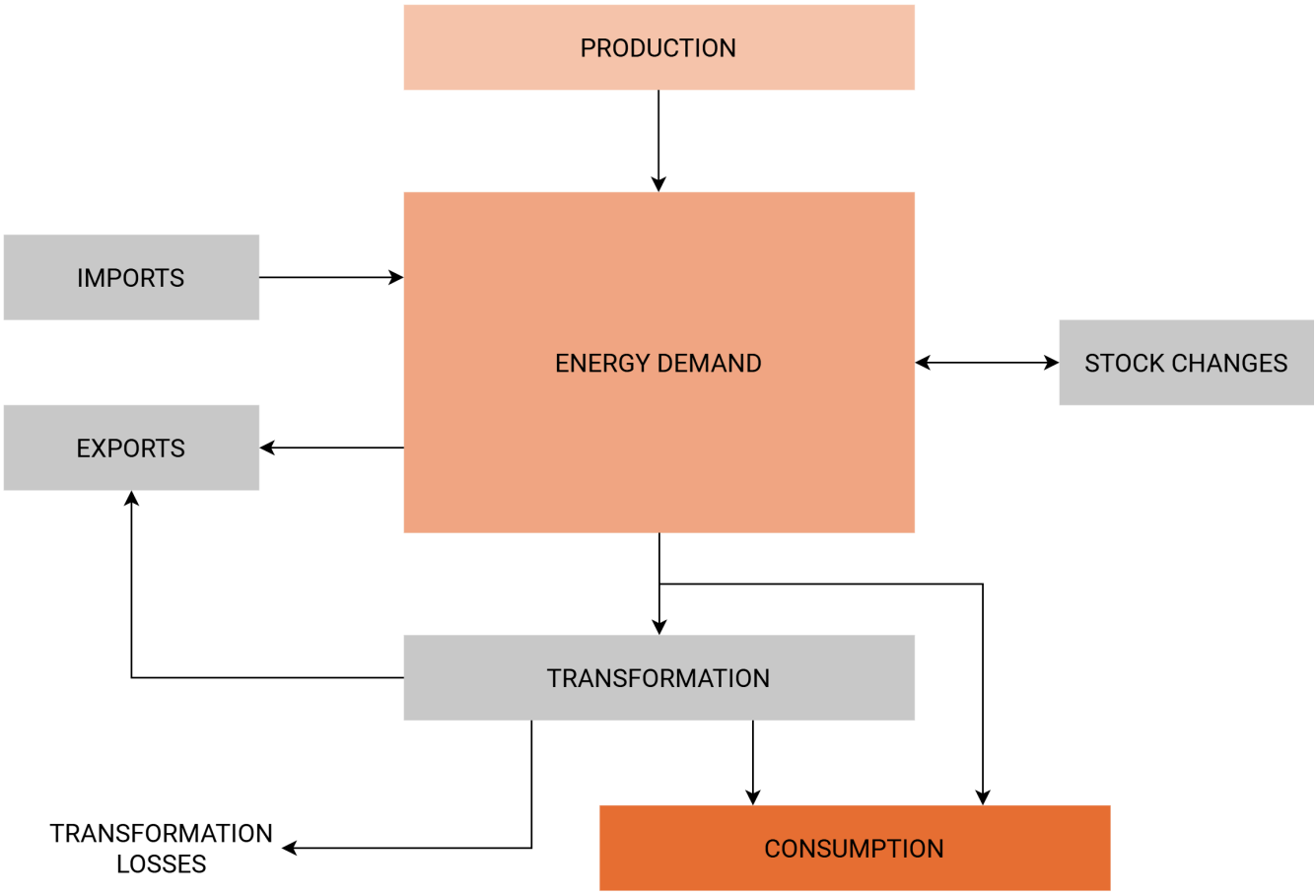

Figure 7.1 The path of an energy commodity from first appearance to final consumption: production and imports add supply, exports and stock changes adjust it, transformation converts primary sources into secondary products, and consumption is the energy used by end users.

The flows that make up the balance are defined as follows:

* **Production** — extraction or generation of energy from fossil, nuclear, or renewable sources.
* **Imports and Exports** — quantities physically crossing a national boundary through transactions by entities residing in the country, regardless of when customs clearance occurs; minor or thinly-reported flows may be excluded to preserve analytical relevance. Net trade is the difference, `Net Trade = Imports – Exports`, marking a country as a net importer (positive) or net exporter (negative).
* **Stock Changes** — the difference between closing and opening inventories, `Stock Change = Closing Stock – Opening Stock`. Stocks buffer short-term mismatches between supply and demand; a stock build raises inventories, a stock draw lowers them.
* **Demand** — the total energy required by end users, `Demand = Production + Imports – Exports – Stock Change`.

* **Energy Transformation** — conversion of a primary source into a secondary commodity better suited to a specific use: coke from coal, electricity from natural gas, oil products from refining crude, LPG from steam-cracking naphtha. Statistical differences are also treated as transformation.
* **Oil Products Domestic Supply** — the availability of refined products, `Oil Products Domestic Supply = Demand + Energy Transformation`.
* **Consumption** — energy used directly by end users across industrial, residential, and transport sectors, including non-energy uses such as fossil fuels as chemical raw materials. Because a portion of energy is lost in conversion, final consumption differs from demand.

Building and Solving the Balance

Most energy balances are built from a set of core inputs and equations. Input data are gathered directly from public sources; the remaining values are calculated or estimated. All data are modeled in energy units so that energy types stay consistent with one another.

For each energy commodity — coal, natural gas, oil, biofuels, and oil products such as gasoline, diesel, fuel oil, and LPG — a system of linear equations built on physical energy flows is solved around a single balance identity of eight terms: some are read directly from public sources, the rest derived from them.

Table 7.1 The eight balance terms — some read directly from public sources, the rest derived through the identity.

BALANCE TERM	HOW IT IS OBTAINED
Imports	Often reported directly by public sources
Exports	Often reported directly by public sources
Net trade	Imports − Exports
Production	Often reported directly by public sources
Stock changes	Often reported directly by public sources
Demand	Production + Imports − Exports − Stock changes
Energy transformation	Often reported directly by public sources
Consumption	Demand + Energy transformation

For each of the 33 countries modeled, this set of eight terms is defined per energy source and solved with numerical algorithms optimized for linear systems, so that every output complies with energy-conservation principles and stays internally consistent across the full energy matrix. For oil products specifically, domestic supply is found by adding final consumption to the portion of oil products used for electricity generation.

When a specific input is unavailable, one of two estimation methods fills the gap: rearranging the balance equation to recover the missing value from known variables, keeping the balance consistent; or applying a mathematical model — seasonalizing an annual or quarterly input from a related monthly series, using

the monthly variation of another series as an index, or fitting a regression tied to related assessments. The result is a coherent representation of each national energy system that supports both internal validation and cross-market comparison.

Analytical Metrics

Beyond the balance itself, several market indicators enrich the picture of a country's energy position.

Table 7.2 The three analytical metrics reported alongside the energy balance.

METRIC	WHAT IT SHOWS
Trade Partners	The key partners in a country's energy imports and exports, focused on Oil, Oil Products, Natural Gas, and Coal over the last four years.
Energy Self-Sufficiency	The ratio of domestic production to total demand, `Self-Sufficiency = Production / Demand`. Above 100% signals supply security and export potential; below 100% implies reliance on imports and exposure to external shocks.
Trade Dependencies	The economic relationships with major partners — the share of GDP attributed to energy imports, the contribution of top partners to that reliance, and exports as a percentage of GDP.

Together these metrics place a country within global energy markets and quantify the economic ties that bind it to its main trading partners.

Electricity generation by source extends this view, breaking a country's power output into the primary inputs that produced it — fossil fuels such as coal, natural gas, and oil, nuclear power, and renewables including hydro, wind, solar, geothermal, and biomass. The breakdown shows how the national electricity mix is structured and how reliant it is on each source, adding a focused view of the power sector to the wider balance.

Because the balance and these metrics are built from official statistics rather than the preliminary models that keep prices current, they trail the latest price assessments: national agencies release energy and foreign-trade statistics one to three months after the period they cover, and the formatting, alignment, and validation that follow add further time, so the finished figures settle roughly four months behind the period they describe. The same lag carries into metrics derived from the balance, such as the consumption-weighted average energy price; Chapter 2 covers how current each figure is.

CHAPTER 8

Freight and Insurance Modeling

SUMMARY

- Energy commodities are grouped by physical and chemical properties into compatible vessel types, and each maritime route is assessed as either compiled from public rate data or estimated from a comparable reference route.
- Insurance cost is calculated as a percentage of the CFR price, derived from international trade data under the same homogeneity and outlier-removal criteria used for price assessments.
- Preliminary values stand in when official trade statistics are delayed, keeping freight and insurance figures current before consolidated data arrives.

Transportation costs shape the final price of energy commodities and the competitiveness of suppliers across regions. Energy Prices & Markets therefore assesses the main cost components of moving commodities by sea — freight rates and cargo insurance — and the way each is modeled.

Freight Assessments

Maritime freight rates are the cost of shipping energy commodities along international trade routes by sea. The figures cover maritime transportation only; they exclude the cost of moving goods between the port and the country. For a landlocked country, the rate refers to the port in a nearby country through which its goods are typically shipped.

Because similar vessel classes carry different commodities, fuels are grouped by their physical and chemical properties — the characteristics that drive handling, storage, and shipping requirements — so each is matched to a compatible freight type, such as tankers for liquids or bulk carriers for solids.

Heavy Oils and Liquid Fuels travel as conventional liquid cargo, carried on standard tankers. Hydrocarbon Gas Liquids ship in pressurized-liquid form, which calls for specialized tankers built to hold that pressure. Liquefied Natural Gas is transported in cryogenic form, requiring dedicated LNG carriers designed to keep the fuel at the extremely low temperatures that liquefaction demands. Coal Products, being solid rather than liquid, move on bulk carriers instead of any tanker type.

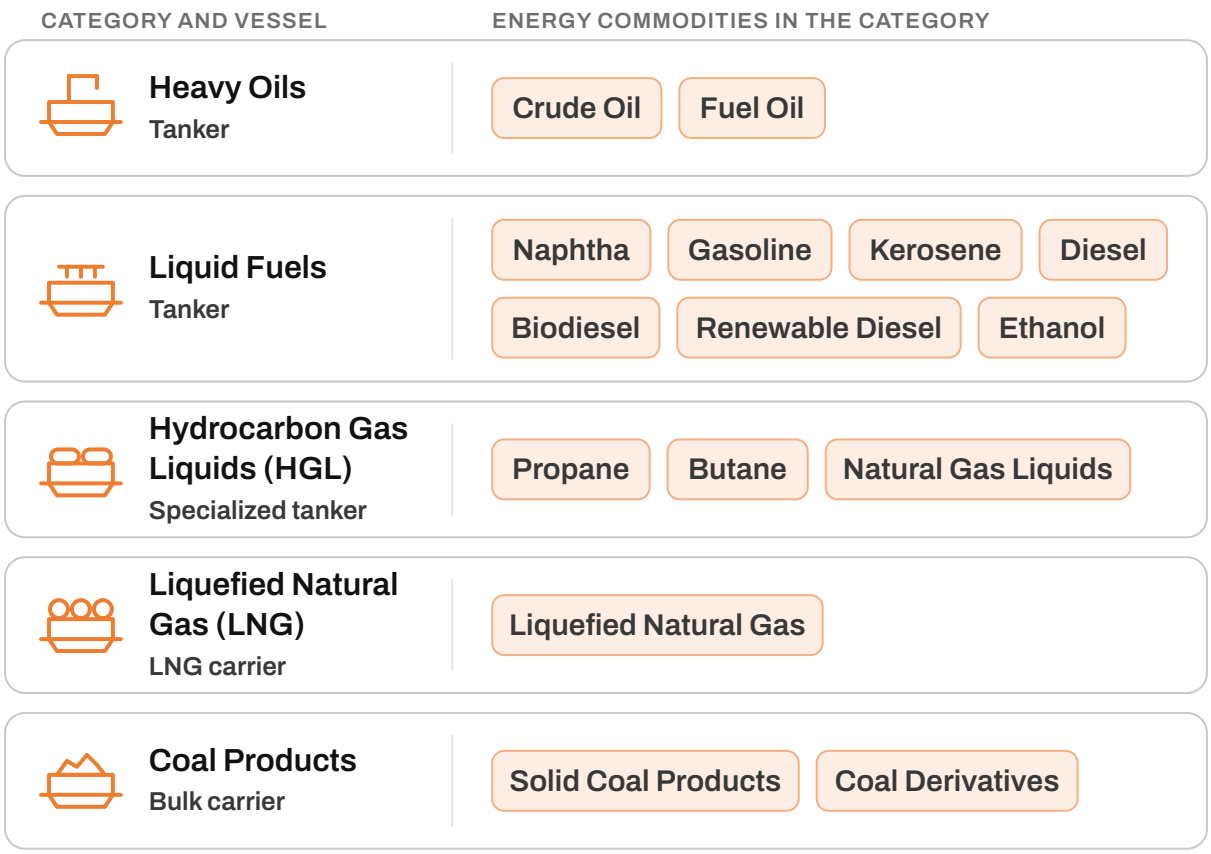

Figure 8.1 Energy commodities grouped for shipping by physical and chemical properties — Heavy Oils, Liquid Fuels, Hydrocarbon Gas Liquids (HGL), Liquefied Natural Gas (LNG), and Coal Products — each matched to a compatible vessel type.

Freight assessments fall into two types according to how they are modeled:

* **Compiled freights** cover prominent global routes, where the volume and transparency of trade let raw data closely reflect actual freight activity. They are modeled from freight rate series gathered from public sources over a month: the raw data are first formatted to align with the internal system, then statistically validated to remove anomalies and outliers, and usually computed as a monthly average of the closing values of daily or weekly published rates before normalization.
* **Estimated freights** cover less prominent routes where direct data are limited. A compiled freight from a comparable route is taken as a reference and adjusted in proportion to differences in route distance and time.

Short-term forecasts are provided for selected freight assessments. They come from mathematical models that incorporate projected freight costs for related routes, the prices of relevant commodities such as fuels, and economic indicators, and each reflects the most likely scenario over the next six months as of its latest update.

Insurance

Insurance covers the risks of cargo transport, protecting shipments against potential losses. Its cost is calculated as a percentage of the CFR (Cost and Freight) price and varies by commodity.

The percentage for each commodity is derived from international trade information reported by countries for each traded good. That data is gathered and transformed to retain everything needed to estimate insurance costs, and the percentage is taken as the average of selected records under a criterion of data homogeneity, a minimum traded volume, and gross-outlier removal.

Preliminary Values

Official foreign trade statistics are often published with a delay of one to two months, owing to confidentiality or processing time. When data are insufficient, inadequate, or unavailable, preliminary assessments stand in: supporting data are carefully collected and verified, and suitable mathematical models are applied. Preliminary values are marked "(P)" to set them apart from consolidated data. Freight and insurance assessments then proceed to normalization and are published in line with the methodology's information-publication procedures.

Once normalized and published, freight and insurance figures feed directly into freight-based price assessments: the insurance cost is added to the origin price when building a netforward and subtracted from the destination price when building a netback, alongside the maritime freight rate for the same route. Where a freight forecast exists for a route, the same freight-based approach extends forward, so netforward and netback prices can be projected for future periods as well as computed for the current one (see Chapter 6).

CHAPTER 9

Global Prices Comparison

SUMMARY

- Commodity rankings and the average energy price are derived entirely from price and consumption assessments already produced elsewhere — no separate data is gathered to build them.
- Monthly commodity rankings order countries for a fixed set of fuels, each using one documented assessment per country.
- The average energy price is a consumption-weighted synthetic indicator of national energy affordability and competitiveness, comparable across countries rather than tied to any single consumer's cost.

Global prices comparisons stand apart from the price, market, and freight-and-insurance assessments: no data is gathered specifically to produce them. They are derived from price and consumption assessments already obtained. Commodity-ranking modeling draws on price assessments, while the average energy price is an average of those same price assessments weighted by energy-consumption assessments. Once modeled, both series are normalized and published in line with the methodology's information-publication procedures.

Commodity Rankings

A monthly price ranking orders countries for a set of specific commodities: natural gas, electricity, gasoline, diesel, fuel oil, and naphtha. Each ranking is built by selecting one commodity assessment for every country covered. The particular assessment chosen for each country and commodity is documented in the Country Specific Assessments Guides, published alongside the methodology.

Average Energy Price

The country average energy price is the representative unit cost of energy across an economy — expressed, for example, in USD/MMBtu. It serves as a proxy for national energy affordability, industrial competitiveness, and market efficiency: a lower figure can point to better access to domestic resources, more efficient infrastructure, or favorable policy, while a higher figure can reflect import dependency, regulatory burdens, or underdeveloped infrastructure.

The figure is best read not as the price paid by any single consumer or sector, but as a synthetic indicator — comparable to GDP per capita — designed for cross-country comparison and macroeconomic energy analysis. It is built as a consumption-weighted average of the most relevant energy price assessments available for each country, prioritizing accuracy and comparability. The specific assessments included for a country, together with documentation of the underlying data sources and weighting procedures, are set out in the Country Specific Assessments Guides.

Figure 9.1 Energy price assessments per commodity and energy-consumption assessments combine into a consumption-weighted average across energy types, producing the country average energy price — derived entirely from assessments already obtained, with no separate data collection.

The metric supports several kinds of analysis:

Table 9.1 Analytical uses of the average energy price.

USE CASE	DESCRIPTION
Market benchmarking and competitiveness analysis	Comparing national energy cost levels to assess competitive positioning across markets.
Policy and investment decision-making	Informing decisions that depend on the relative cost of energy across countries.
Risk and exposure assessment	Evaluating energy cost exposure in portfolios or supply chains with cross-border footprints.
Macroeconomic and trade studies	Incorporating energy price levels into broader economic and trade analysis.

CHAPTER 10

Disclaimers and Limitations

SUMMARY

- Every assessment change, correction, and retirement is documented in the monthly Release Notes, keeping the published data auditable rather than silently revised.
- No commercial relationships are maintained with market participants, and the modeling approach is fully public while calibration parameters stay protected.
- Published figures carry real limitations — dependence on official source data, modeled estimates where data is missing, and forecasts issued without confidence intervals.

Energy Prices & Markets is built to be auditable end to end: assessments evolve as the underlying data evolves, every change is documented in a public record, and the methods that produce each figure are disclosed openly. This closing chapter sets out how assessments are added, changed, and retired; how corrections are made and traced; the independence commitments that underpin the analysis; and the boundaries within which the published figures should be read.

Assessment Additions, Changes, and Retirements

A series may be initiated, terminated, or changed at any time, driven by the availability and quality of raw data from the sources in each country. Because the vast majority of data comes from public official sources, the continuity of an assessment ultimately depends on those sources continuing to publish data that meets the assessment's requirements. The governing commitment is quality over continuity: an assessment that can no longer be produced reliably is changed or retired rather than published at a lower standard.

When data for an assessment is insufficient, inadequate, or unavailable for a prolonged period, one of four approaches is adopted to keep the published series representative.

Table 10.1 The four approaches when an assessment's data falls short over a prolonged period.

APPROACH	WHAT IT DOES
Use a model	Estimate the assessment with a model built on good previous and/or related data.
Change the data source	Replace the failing source with another that meets the requirements.
Alter the assessment	Adjust the assessment's definition so it can be produced reliably from the data available.
Discontinue the assessment	If the lack of suitable data persists, retire the series rather than publish unreliable figures.

Short-term gaps — a source that is merely lagging or temporarily unavailable — are not handled this way. They are addressed earlier in the pipeline through model-generated preliminary estimates and quick source replacement, as covered in the price-modeling chapters.

Relevance over time is maintained through the methodology review process itself, and subscriber feedback is a standing criterion in those reviews — alongside changes in the raw data and modeling enhancements — so the assessments evolve with what readers report needing clarified or improved.

Data Corrections and Their Documentation

A published figure is revised for three main reasons: official statistics arrive and replace earlier estimates, the normal preliminary-to-final transition; continuous model reviews and methodology improvements introduce corrections that refine previously published values; or a submitted assessment complaint is resolved, prompting an adjustment to the affected figure. The full validation and complaint mechanism is described in Chapter 2.

Every change is documented in the Intratec Release Notes, published each month and publicly available. The Release Notes record data revisions, methodology changes, assessment additions and retirements, and corrections, so any reader — subscriber or not — can trace how and why a figure changed over time. This monthly public record keeps the published data auditable: a number never changes silently.

The same record makes the path from complaint to correction fully traceable. A formal assessment-complaint process is available to subscribers who wish to question any published figure. A submitted complaint is investigated, and when the investigation confirms an issue, the affected figure is corrected and the change is documented in the same monthly Release Notes — so the route from a raised question to a published correction can be followed by anyone.

Methodology changes — as distinct from individual figure corrections — are additionally announced to customers in advance, with a defined transition period, before they take effect.

Ethics, Compliance, and Independence

The analysis rests on impartial, auditable methods applied to data drawn, for the vast majority, from public official sources — statistics bureaus, trade agencies, multilateral organizations, and market exchanges. Private sources and producers' data are used only with permission from the rights holders, and Energy Prices & Markets is not a primary source for pricing data.

No commercial relationships are maintained with the participants of the markets covered — the producers, traders, and other firms active in those markets — and surveys are used only in very exceptional circumstances. This removes the incentive for any single party to influence the results, and keeps the assessments independent of the interests they measure.

Transparency is maintained without exposing internals. The methodology approach is fully public, requiring no login or subscription: the data sources, the modeling approaches, the assessment structure, the baselines, and the data status labels are all disclosed. What remains proprietary is the precise calibration — model parameters, regression coefficients, and normalization constants. The approach is disclosed; the parameters are protected.

Limitations of the Analysis

Published figures should be read against the boundaries of the data and methods that produce them.

* **Dependence on official source data.** Figures depend on official source data, which can lag or be revised later. Where official statistics are delayed, preliminary estimates fill the gap until verified data arrives.
* **Modeled estimates.** Some values are modeled estimates, used where official data is missing or insufficient. The data status label on each figure signals how settled the underlying value is.
* **Forecasts without confidence intervals.** Short-term forecasts are estimates of the most probable scenario for the period ahead, published without confidence intervals; because the underlying market parameters can shift quickly, they are refreshed each cycle. How preliminary and forecast figures are produced and how their reliability is tracked is described in Chapters 4 and 6.

Usage limitations specific to each product — what each dataset should and should not be used for — are documented in the Intratec Help Center.

CHAPTER 11

Methodology References

SUMMARY

- The methodology stands on an established body of published reference literature — statistical manuals, textbooks, and technical papers on energy markets and robust price estimation.
- Recurring terms are defined in the online Glossary, and the methodology site always carries the most recent edition of the methodology.

The methodology rests on an established body of reference literature — textbooks, statistical manuals, and technical papers on the prices and markets of energy commodities, and on the robust-statistics methods used to estimate prices from trade data. This bibliographical foundation, drawn on throughout the development of Energy Prices & Markets and the elaboration of its methodology, is listed below, alongside where recurring terms are defined and where the up-to-date methodology can be found.

Bibliography

Table 11.1 Reference literature behind the Energy Prices & Markets methodology.

NO.	REFERENCE
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5	Mankiw, G. 2020. Principles of Economics (9th ed.). Cengage.
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7	Perrotta, D. et al. 2020. The Robust Estimation of Monthly Prices of Goods Traded by the European Union. EUR 30188 EN. Publications Office of the European Union, Luxembourg. ISBN 978-92-76-18351-8. doi:10.2760/635844.

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8	Riani, M. et al. 2018. The Use of Prior Information in Very Robust Regression for Fraud Detection. International Statistical Review, vol. 86(2), pp. 205–218.
9	Rais, S. 2008. Outlier Detection for the Consumer Price Index. In Proceedings of the Survey Methods Section: Statistical Society of Canada Annual Meeting, vol. 110.
10	Schofield, N. C. 2021. Commodity Derivatives: Markets and Applications (2nd ed.). John Wiley and Sons.
11	Spyros, A. et al. 2015. The Estimation of Fair Prices of Traded Goods from Outlier-free Trade Data. EUR 27696 EN. doi:10.2788/57125.
12	Temere, Dawit Sisay. 2016. Disaggregated International Trade Prices. Nationaløkonomisk Tidsskrift.
13	United Nations. 1981. Strategies for Price and Quantity Measurement in External Trade: A Technical Report. Series M, No. 69.
14	United Nations. 2018. International Recommendations for Energy Statistics. Series M, No. 93.

Defined Terms

Recurring terms used throughout the methodology — the price types, status labels, and accuracy metrics — are defined in full in the Glossary on the methodology site: methodology.intratec.us/glossary.

The Up-to-Date Methodology

This document reproduces the methodology as of the edition date printed on its cover. The methodology itself is reviewed continuously — data sources are checked and replaced, models are recalibrated, and clarifications from subscriber feedback are folded in, with every change documented in the monthly Release Notes — so a downloaded or printed copy gradually falls behind. The most recent version is always the one published on the methodology site, publicly available with no subscription or login required: methodology.intratec.us.