Global Energy Markets and Trading

Energy Market Analysis

Auction – a market mechanism where electricity supply offers are matched with demand bids at a single clearing price.
Related terms: day-ahead market, capacity auction, price formation.
Explanation: Participants submit quantity-price pairs; the market operator ranks offers and bids, determines the intersection, and sets the market clearing price.
Example: In the European Power Exchange (EPEX SPOT), generators submit hourly supply curves, and utilities submit demand bids for the next day.
Practical application: Enables transparent price discovery and efficient allocation of generation resources across regions.
Challenges: Susceptible to price volatility, strategic bidding, and requires robust data handling to prevent market manipulation.

Balancing Mechanism – the process by which system operators ensure real-time supply-demand equilibrium by procuring upward or downward adjustments.
Related terms: frequency control, ancillary services, imbalance settlement.
Explanation: When actual generation deviates from scheduled amounts, the operator dispatches reserve resources or issues penalties to restore balance.
Example: In the UK, National Grid Electricity System Operator (ESO) issues balancing orders to generators and demand-side response providers.
Practical application: Maintains grid stability and prevents blackouts.
Challenges: Accurate forecasting is essential; insufficient reserve capacity can lead to high balancing costs and reliability risks.

Base Load – the minimum level of continuous electricity demand that must be met at all times.
Related terms: peak load, load curve, dispatch order.
Explanation: Base load plants, such as nuclear or large coal units, operate near full capacity to provide a steady supply.
Example: A nuclear power station supplying 1,200 MW continuously to meet the baseline demand of a national grid.
Practical application: Provides a reliable backbone for the power system, reducing the need for frequent start-up and shutdown cycles.
Challenges: Inflexibility makes it harder to integrate variable renewable generation; economic viability may decline as markets shift toward lower-carbon sources.

Bid Curve – a graphical representation of the quantities a market participant is willing to sell at various price levels.
Related terms: offer curve, supply function, price elasticity.
Explanation: The curve slopes upward, reflecting higher quantities offered at higher prices, and is used by

the market clearing algorithm.
Example: A gas-fired plant submits a bid curve indicating 300 MW at €30/MWh, 500 MW at €45/MWh, and 800 MW at €60/MWh.
Practical application: Allows participants to express marginal cost structures and capture revenue opportunities.
Challenges: Complex bid structures can increase computational load; inaccurate cost assumptions may lead to suboptimal dispatch.

Capacity Market – a mechanism that rewards generators for maintaining available capacity, independent of energy production.
Related terms: capacity auction, resource adequacy, reliability standard.
Explanation: Capacity providers receive payments for committing to be available during peak periods, ensuring long-term security of supply.
Example: The United States Federal Energy Regulatory Commission (FERC) oversees regional capacity markets where utilities purchase capacity credits.
Practical application: Encourages investment in firm generation and demand-side resources that can be called upon during scarcity.
Challenges: Determining appropriate payment levels, avoiding over-compensation, and integrating with energy-only markets.

Congestion Management – the set of actions taken to alleviate transmission bottlenecks that prevent low-cost electricity from reaching demand centers.
Related terms: grid constraints, redispatch, congestion pricing.
Explanation: System operators may re-schedule generation, curtail flows, or employ financial transmission rights to manage congestion.
Example: In Germany, the transmission system operator (TSO) issues redispatch orders to shift coal generation away from congested north-south corridors.
Practical application: Optimizes utilization of the transmission network and minimizes price differentials across regions.
Challenges: Requires accurate network modelling; frequent congestion can erode market efficiency and increase operating costs.

Demand Response – a set of programs that incentivize consumers to modify electricity usage in response to price signals or reliability needs.
Related terms: load shifting, capacity participation, price elasticity.
Explanation: Participants reduce or shift consumption during high-price periods, providing a flexible resource akin to generation.
Example: An industrial facility curtails 10 MW of process load when the spot price exceeds €100/MWh, receiving compensation through a demand-response contract.
Practical application: Helps balance supply-demand mismatches, reduces peak load, and defers infrastructure upgrades.
Challenges: Requires advanced metering infrastructure, clear communication of price signals, and reliable verification of load reductions.

Derivative – a financial contract whose value derives from an underlying energy commodity, such as electricity, gas, or oil.
Related terms: futures, options, swap.
Explanation: Derivatives enable market participants to hedge price risk, speculate on future price movements, or lock in financing terms.
Example: A utility purchases a three-month electricity futures contract at €45/MWh to hedge against spot price spikes.
Practical application: Provides price certainty for budgeting, facilitates risk transfer, and contributes to market liquidity.
Challenges: Counterparty credit risk, basis risk between physical and financial markets, and regulatory compliance.

Dispatch Order – the sequence in which generation units are called upon to produce electricity based on economic merit and system needs.
Related terms: merit order, economic dispatch, priority ranking.
Explanation: Units with lower marginal costs are dispatched first; the order may be adjusted for constraints, outages, or ancillary service requirements.
Example: A solar farm is dispatched before a gas turbine because its marginal cost is effectively zero.
Practical application: Minimizes total generation cost and reduces emissions by prioritizing low-cost resources.
Challenges: Integrating variable renewables, handling transmission constraints, and accommodating non-economic priorities such as reliability.

Distributed Energy Resources (DERs) – small-scale generation or storage assets located close to the point of consumption.
Related terms: microgrids, behind-the-meter, virtual power plant.
Explanation: DERs include rooftop solar, battery storage, and demand-side resources that can participate in markets through aggregation.
Example: A neighborhood of rooftop PV systems collectively provides 2 MW of capacity to the grid via an aggregator platform.
Practical application: Enhances grid resilience, reduces transmission losses, and supports renewable integration.
Challenges: Coordination of numerous assets, data privacy, and establishing fair compensation mechanisms.

Energy Arbitrage – the practice of buying electricity when prices are low and selling or consuming it when prices are high.
Related terms: price spread, storage utilization, market timing.
Explanation: Participants, often battery operators, exploit temporal price differences to generate revenue.
Example: A battery charges at €20/MWh during off-peak night hours and discharges at €80/MWh during peak demand.
Practical application: Provides revenue streams for storage assets and contributes to grid balancing.
Challenges: Requires accurate price forecasting, sufficient round-trip efficiency, and may be limited by market rules.

Forward Contract – a bilateral agreement to exchange a specified quantity of electricity at a predetermined price on a future date.
Related terms: OTC, delivery point, settlement.
Explanation: Unlike exchange-traded futures, forwards are customized and settled directly between counterparties.
Example: A power producer signs a one-year forward contract to sell 100 MW at €55/MWh to a retailer.
Practical application: Enables tailored risk management and price certainty for both producer and consumer.
Challenges: Counterparty risk, lack of transparency, and potential for non-standard terms that complicate accounting.

Fuel Mix – the proportion of different primary energy sources (e.g., coal, gas, renewables) used to generate electricity.
Related terms: generation portfolio, carbon intensity, fuel diversification.
Explanation: The mix influences market prices, emissions, and system flexibility.
Example: A national grid with a fuel mix of 40 % natural gas, 30 % wind, 20 % nuclear, and 10 % coal.
Practical application: Guides policy decisions, investment strategies, and emissions reporting.
Challenges: Balancing cost, reliability, and sustainability; managing variability of renewable components.

Forward Curve – a graphical representation of market expectations for future electricity prices across different delivery periods.
Related terms: term structure, price projection, futures market.
Explanation: The curve reflects supply-demand fundamentals, fuel price outlooks, and policy signals.
Example: The forward curve for the next twelve months shows higher prices in summer months due to anticipated heat-driven demand.
Practical application: Informs hedging strategies, investment planning, and capacity expansion decisions.
Challenges: Subject to forecasting errors, sudden policy changes, or extreme weather events that can distort expectations.

Generation Outage – an unplanned loss of generating capacity due to equipment failure, maintenance, or external events.
Related terms: forced outage rate, capacity shortage, reliability index.
Explanation: Outages reduce available supply, potentially leading to price spikes and increased reliance on reserves.
Example: A 500 MW coal plant experiences a forced outage, prompting the system operator to activate additional gas turbines.
Practical application: Highlights the importance of contingency planning and reserve procurement.
Challenges: Accurate outage modeling, rapid response coordination, and mitigating market impacts through ancillary services.

Grid Congestion – a condition where transmission lines are overloaded, preventing the free flow of electricity from low-cost to high-cost areas.
Related terms: capacity constraints, redispatch, congestion rent.
Explanation: Congestion creates locational price differences (LMPs) and may require operational

interventions.
Example: In a congested corridor, the price in the generation-rich north may be €30/MWh while the demand-heavy south reaches €70/MWh.
Practical application: Signals the need for infrastructure upgrades and informs investment in transmission assets.
Challenges: Managing congestion without excessive curtailment, ensuring fair cost allocation, and integrating renewable generation.

Hedging Strategy – a systematic approach to reduce exposure to price volatility using financial instruments or physical contracts.
Related terms: risk management, portfolio optimization, derivative.
Explanation: Market participants offset potential adverse price movements by locking in prices or diversifying their exposure.
Example: A utility hedges 60 % of its forecasted load with futures contracts while retaining 40 % as a spot-market position.
Practical application: Stabilizes cash flow, supports budgeting, and protects against market shocks.
Challenges: Determining the optimal hedge ratio, accounting for basis risk, and managing transaction costs.

Imbalance Settlement – the process by which deviations between scheduled and actual generation/ consumption are financially reconciled.
Related terms: balancing mechanism, system imbalance price, penalty charges.
Explanation: Participants that over- or under-produce relative to their schedule pay or receive payments based on the system imbalance price.
Example: A wind farm that generates 5 MW less than its contracted schedule incurs a penalty calculated at the prevailing imbalance price.
Practical application: Encourages accurate forecasting and incentivizes participants to maintain schedule adherence.
Challenges: Volatile imbalance prices can impose significant costs; small participants may lack the resources to manage exposure.

Index Price – a reference price derived from a basket of market data, used for contract settlement or benchmarking.
Related terms: benchmark, price reference, settlement price.
Explanation: Index prices provide a transparent, market-wide figure that participants can use to price contracts without negotiating each time.
Example: The European Energy Exchange (EEX) publishes a daily electricity index price based on weighted average spot prices across multiple zones.
Practical application: Facilitates standardized contracts, simplifies accounting, and enhances market comparability.
Challenges: Index composition must reflect market realities; changes in methodology can affect contract valuations.

Interconnection – a physical link that allows electricity to flow between separate power systems or market

zones.
Related terms: cross-border trade, capacity allocation, balancing area.
Explanation: Interconnections enable import/export of electricity, supporting resource sharing and enhancing reliability.
Example: The North Sea interconnector between the United Kingdom and the Netherlands transfers up to 1 GW of power.
Practical application: Expands market access, reduces price volatility, and enables integration of renewable generation across borders.
Challenges: Coordinating market rules, managing congestion, and allocating transmission costs fairly.

Load Forecasting – the prediction of future electricity demand over various time horizons using statistical, physical, or machine-learning techniques.
Related terms: short-term forecast, mid-term forecast, demand modeling.
Explanation: Accurate forecasts are essential for scheduling generation, planning reserves, and setting market prices.
Example: A utility employs a neural-network model to predict hourly demand for the next 48 hours with a mean absolute percentage error of 2 %.
Practical application: Improves dispatch efficiency, reduces operating costs, and enhances reliability.
Challenges: Weather variability, economic fluctuations, and behavioral changes can introduce forecast errors.

Liquidity – the ease with which market participants can buy or sell electricity contracts without causing significant price impact.
Related terms: market depth, order book, transaction cost.
Explanation: High liquidity indicates a vibrant market with many participants and tight bid-ask spreads.
Example: The EEX spot market typically exhibits high liquidity, with average daily volumes exceeding 10 GW.
Practical application: Enables efficient price discovery, lowers trading costs, and supports hedging activities.
Challenges: Liquidity can dry up during extreme events, leading to wider spreads and increased price volatility.

Locational Marginal Price (LMP) – the price of electricity at a specific node, reflecting the marginal cost of serving an additional unit of load at that location, including congestion and loss components.
Related terms: nodal pricing, congestion component, loss factor.
Explanation: LMPs provide granular price signals that guide investment and operational decisions.
Example: In the PJM market, the LMP at a congested node may be €85/MWh, while a nearby uncongested node trades at €55/MWh.
Practical application: Encourages generation siting in high-price zones, informs transmission planning, and supports demand response participation.
Challenges: Complexity of calculation, data transparency, and the need for sophisticated trading systems.

Margin Call – a demand by a clearinghouse for additional collateral when a participant's position deteriorates beyond preset risk thresholds.
Related terms: collateral management, risk exposure, variation margin.

Explanation: Margin calls protect the clearinghouse and market integrity by ensuring participants can meet potential obligations.
Example: After a sudden price surge, a trader's short futures position triggers a €500,000 margin call.
Practical application: Maintains financial stability and mitigates systemic risk in derivative markets.
Challenges: Rapid market moves can create liquidity strain for participants; excessive margin requirements may deter market entry.

Market Coupling – the integration of separate regional electricity markets through coordinated auction mechanisms to optimize cross-border flows.
Related terms: interconnector capacity, price convergence, coordinated dispatch.
Explanation: By jointly clearing markets, market coupling reduces price differentials and maximizes overall welfare.
Example: The EU's Coupling of the German and Austrian markets enables simultaneous clearing of bids, improving efficiency.
Practical application: Facilitates seamless cross-border trade, enhances renewable integration, and reduces congestion.
Challenges: Harmonizing market rules, handling differing time zones, and managing asymmetries in participant behavior.

Merit Order – the ranking of generation units based on ascending marginal cost, determining the sequence of dispatch in an energy-only market.
Related terms: dispatch order, economic dispatch, price formation.
Explanation: Units with lower operating costs are dispatched first; the market price is set by the most expensive unit needed to meet demand.
Example: Solar (zero marginal cost) → wind → coal → gas; if demand exceeds wind output, gas sets the market price.
Practical application: Minimizes total generation cost and encourages low-cost generation.
Challenges: Variable renewables can cause rapid shifts in merit order; transmission constraints may force deviations from the purely economic order.

Mid-term Forecast – a demand or price projection covering periods from one month to a few years, often used for planning and budgeting.
Related terms: load forecasting, scenario analysis, capacity planning.
Explanation: Incorporates macro-economic indicators, policy developments, and technology adoption trends.
Example: A utility forecasts a 5 % annual growth in electricity demand over the next three years based on GDP projections.
Practical application: Guides investment decisions, informs regulatory filings, and supports risk management.
Challenges: Uncertainty in policy (e.g., carbon pricing), technology disruption, and long-term weather patterns affect accuracy.

Natural Gas Curve – the supply-demand relationship for natural gas, often used as a proxy for electricity

price formation in gas-fired generation.
Related terms: fuel price linkage, heat rate, fuel cost pass-through.
Explanation: Changes in gas prices directly impact the marginal cost of gas-based plants, influencing electricity market prices.
Example: A rise in the Henry Hub price from $2 to $4 per MMBtu raises the operating cost of gas turbines, shifting the electricity price upward.
Practical application: Provides insight for hedging strategies and informs generation dispatch decisions.
Challenges: Gas market volatility, regional price differentials, and regulatory constraints on price pass-through.

Net Transfer Capacity (NTC) – the maximum allowable electricity transfer between two control areas, accounting for reliability and security constraints.
Related terms: interconnector capacity, capacity allocation, congestion management.
Explanation: NTC determines how much power can be scheduled across borders without jeopardizing system stability.
Example: The NTC between France and Spain is set at 2 GW for a given day, limiting the volume of cross-border trades.
Practical application: Enables coordinated cross-border scheduling and supports market coupling.
Challenges: Accurate calculation requires real-time network data; unexpected outages can reduce NTC, leading to congestion.

Off-take Agreement – a contract in which a buyer commits to purchase a specified quantity of electricity from a generator over a defined period.
Related terms: PPA, contract for difference, revenue certainty.
Explanation: Off-take agreements provide revenue streams for generators, supporting financing and project development.
Example: A renewable developer signs a 15-year off-take agreement to sell 100 MW of solar output at a fixed price of €45/MWh.
Practical application: Reduces market risk for project owners and offers price certainty for buyers.
Challenges: Contractual flexibility, renegotiation risk, and alignment with evolving regulatory frameworks.

Option – a derivative that grants the holder the right, but not the obligation, to buy (call) or sell (put) electricity at a predetermined strike price before or at expiration.
Related terms: premium, exercise, hedge.
Explanation: Options provide asymmetric risk-return profiles, allowing participants to protect against adverse price movements while retaining upside potential.
Example: A utility purchases a call option with a strike price of €60/MWh to cap its exposure to rising spot prices.
Practical application: Enhances risk management flexibility and can be used for speculative strategies.
Challenges: Premium cost, liquidity of option contracts, and complexity of valuation models.

Peak Load – the highest level of electricity demand observed within a specific period, typically during daytime hours in summer or winter.

Related terms: load curve, capacity planning, demand response.
Explanation: Peak load determines the required capacity to ensure reliability and influences market pricing during high-demand intervals.
Example: A regional grid experiences a peak load of 15 GW at 6 p.m. on a hot summer day.
Practical application: Drives investment in peaking plants, storage, and demand-side programs.
Challenges: Managing variability, avoiding over-capacity, and integrating flexible resources to meet peaks.

Power Purchase Agreement (PPA) – a long-term contract between an electricity generator and a buyer, specifying the price, quantity, and delivery terms.
Related terms: off-take agreement, fixed-price contract, revenue contract.
Explanation: PPAs provide financial certainty, facilitating project financing and encouraging renewable development.
Example: A corporate buyer signs a 10-year PPA to purchase 50 MW of wind power at a fixed price of €40/MWh.
Practical application: Enables corporations to meet sustainability goals and lock in energy costs.
Challenges: Contractual duration versus market price evolution, regulatory risk, and potential need for renegotiation.

Price Cap – a regulatory limit on the maximum price that can be charged in a particular electricity market segment.
Related terms: price floor, regulatory intervention, market control.
Explanation: Caps aim to protect consumers from extreme price spikes while preserving market incentives.
Example: A national regulator imposes a €200/MWh cap on the day-ahead market during emergencies.
Practical application: Prevents price gouging, ensures affordability, and stabilizes market expectations.
Challenges: May reduce investment signals, create arbitrage opportunities, and require careful calibration to avoid market distortion.

Price Floor – a regulatory minimum price set to ensure that generators receive sufficient revenue to cover costs and support investment.
Related terms: price cap, minimum tariff, revenue adequacy.
Explanation: Floors protect against excessively low market prices that could jeopardize generation viability.
Example: A renewable support scheme guarantees a floor price of €30/MWh for wind generators.
Practical application: Encourages development of capital-intensive technologies and stabilizes cash flows.
Challenges: May lead to over-compensation, distort market signals, and require funding mechanisms.

Price Spread – the difference between two price points, such as between peak and off-peak periods, or between two market zones.
Related terms: arbitrage, temporal variance, spatial differential.
Explanation: Spread analysis informs trading strategies, storage utilization, and investment decisions.
Example: The price spread between the 12 p.m. and 2 a.m. slots is €45/MWh, indicating a potential for storage arbitrage.
Practical application: Guides battery dispatch, demand-response timing, and hedge placement.
Challenges: Spread volatility, forecasting accuracy, and transaction costs can affect profitability.

Pricing Zone – a defined geographical area within an electricity market that shares a common price due to similar supply-demand conditions and network constraints.
Related terms: nodal pricing, regional market, congestion.
Explanation: Zones simplify market operation by aggregating nodes with limited internal congestion.
Example: The UK market is divided into England, Scotland, and Wales pricing zones, each reflecting local generation mixes.
Practical application: Facilitates transparent pricing, enables zone-based trading, and supports congestion management.
Challenges: Zone boundaries may become outdated as network conditions evolve; intra-zone congestion can still occur.

Quarterly Futures – exchange-traded contracts that lock in electricity prices for a three-month period, settled at the end of each quarter.
Related terms: futures contract, delivery period, settlement.
Explanation: Quarterly futures provide medium-term price certainty and are used for hedging and speculation.
Example: A utility buys a Q3 2027 futures contract at €50/MWh to hedge against expected price increases.
Practical application: Smooths cash flow, reduces exposure to spot-market volatility, and supports budgeting.
Challenges: Basis risk between futures and actual physical delivery, liquidity considerations, and regulatory compliance.

Quota Allocation – the distribution of limited transmission or generation capacity rights among market participants, often through auctions or administrative methods.
Related terms: capacity rights, allocation mechanism, congestion management.
Explanation: Quotas determine who can schedule specific volumes on constrained assets, influencing market participation.
Example: An interconnector with limited capacity allocates quotas to participants via a sealed-bid auction, granting 500 MW to the highest bidders.
Practical application: Ensures fair access, encourages efficient use of scarce resources, and generates revenue for asset owners.
Challenges: Designing transparent allocation rules, preventing market power abuse, and handling secondary market trading.

Regulatory Asset Base (RAB) – a valuation method that allows utilities to recover investments and earn a regulated return on infrastructure assets through tariffs.
Related terms: cost-plus regulation, tariff setting, investment incentive.
Explanation: The RAB model links allowed revenues to the capital invested, promoting long-term infrastructure development.
Example: A transmission operator's RAB is set at €10 billion, permitting a 6 % annual return through regulated charges.
Practical application: Provides stable financing for large-scale projects such as grid upgrades and new transmission lines.

Challenges: Balancing investor returns with consumer cost, updating asset valuations, and adapting to market reforms.

Renewable Energy Certificate (REC) – a tradable instrument that represents the environmental attributes of one megawatt-hour of renewable electricity generation.
Related terms: green certificate, compliance market, carbon offset.
Explanation: RECs enable generators to monetize their renewable output and allow purchasers to meet sustainability obligations.
Example: A solar farm sells its RECs to a corporate buyer seeking to claim 100 % renewable electricity.
Practical application: Supports renewable financing, drives demand for clean energy, and facilitates tracking of renewable targets.
Challenges: Ensuring additionality, preventing double counting, and maintaining market integrity.

Reserve Margin – the amount of installed capacity exceeding peak demand, expressed as a percentage, used to ensure reliability.
Related terms: capacity adequacy, resource adequacy, safety margin.
Explanation: A higher reserve margin provides a buffer against unexpected outages, demand spikes, or forecasting errors.
Example: A system with 20 GW peak load and 24 GW installed capacity has a reserve margin of 20 %.
Practical application: Guides capacity planning, informs regulatory standards, and enhances system resilience.
Challenges: Over-building can increase costs; under-building raises reliability risk.

Risk-Adjusted Return – a performance metric that accounts for the level of risk taken to achieve a given return, often expressed through Sharpe or Sortino ratios.
Related terms: risk-return trade-off, portfolio performance, hedge effectiveness.
Explanation: Investors compare risk-adjusted returns to evaluate the attractiveness of market positions or projects.
Example: A battery storage asset yields a 12 % annual return with a Sharpe ratio of 1.2, indicating favorable risk-adjusted performance.
Practical application: Informs capital allocation, pricing of contracts, and strategic decisions.
Challenges: Accurate risk modeling, accounting for non-linear exposures, and integrating market volatility.

Spot Market – a short-term electricity market where transactions for immediate delivery (typically next-day or same-day) are executed.
Related terms: day-ahead market, intraday market, real-time market.
Explanation: Prices are determined by supply-demand balance, reflecting current system conditions and forecasted needs.
Example: The EEX spot market clears at €55/MWh for the 12 p.m. to 1 p.m. interval the following day.
Practical application: Provides price signals for generators, informs operational decisions, and enables short-term hedging.
Challenges: Price volatility, limited liquidity during off-peak hours, and exposure to forecasting errors.

Strategic Reserve – a stockpile of generation capacity held by a system operator or government to be deployed in emergencies or during extreme scarcity.
Related terms: contingency reserve, emergency capacity, reserve activation.
Explanation: The reserve can be called upon to prevent blackouts, often at a premium price.
Example: A national grid maintains a 2 GW strategic reserve of gas turbines that can be activated within 30 minutes.
Practical application: Enhances system reliability, provides a safety net during extreme events, and can support market stability.
Challenges: High cost of maintaining idle capacity, determining activation criteria, and ensuring swift deployment.

System Operator – an entity responsible for the real-time operation, balancing, and reliability of an electricity transmission network.
Related terms: TSO, balancing authority, grid management.
Explanation: The operator coordinates generation, demand, and transmission to maintain frequency and voltage standards.
Example: The French TSO (RTE) schedules generation, manages congestion, and oversees ancillary services.
Practical application: Guarantees secure electricity supply, enforces market rules, and facilitates integration of new resources.
Challenges: Managing increasing variability, coordinating cross-border operations, and integrating distributed resources.

Transmission Congestion – a situation where transmission lines reach their thermal or stability limits, restricting the flow of electricity and causing price differentials.
Related terms: grid bottleneck, congestion rent, redispatch.
Explanation: Congestion may arise from high load, limited infrastructure, or unexpected outages, leading to localized scarcity.
Example: A congested corridor between two regions forces the market price in the constrained area to rise to €80/MWh, while the uncongested side remains at €40/MWh.
Practical application: Signals the need for network reinforcement, informs investment decisions, and shapes market pricing.
Challenges: Accurately forecasting congestion, managing redispatch costs, and ensuring equitable cost allocation.

Utility-Scale Solar – large photovoltaic installations, typically ranging from several megawatts to gigawatt-scale, that feed electricity directly into the transmission grid.
Related terms: distributed solar, PV plant, capacity factor.
Explanation: Utility-scale solar offers bulk renewable generation, often with power purchase agreements and participation in wholesale markets.
Example: A 500 MW solar farm in Spain sells its output into the day-ahead market under a PPA.
Practical application: Contributes to renewable targets, reduces reliance on fossil fuels, and provides low-marginal-cost electricity.
Challenges: Intermittency, land use considerations, and integration with grid stability mechanisms.

Volatility Index – a statistical measure that quantifies the degree of price fluctuation in electricity markets over a given timeframe.
Related terms: price variance, risk metric, standard deviation.
Explanation: Higher volatility indicates greater uncertainty, influencing hedging strategies and risk premiums.
Example: The EEX volatility index for the day-ahead market shows a 15 % increase during a heatwave, reflecting heightened price swings.
Practical application: Assists traders in pricing options, informs risk management policies, and guides investment decisions.
Challenges: Volatility can be driven by exogenous factors such as weather events, making prediction difficult.

Wholesale Electricity Market – a platform where large-scale electricity transactions occur between generators, retailers, and other participants, typically through auctions or bilateral contracts.
Related terms: spot market, futures market, capacity market.
Explanation: The market determines prices based on supply-demand dynamics, facilitating efficient resource allocation.
Example: Generators submit offers to the day-ahead market, while retailers purchase the cleared volume for distribution to end-users.
Practical application: Enables price discovery, risk transfer, and coordination of generation with demand.
Challenges: Managing market power, ensuring transparency, and coping with integration of high-share renewables.

Yield Curve – a graphical representation of the relationship between contract maturities and their associated prices or implied returns in electricity markets.
Related terms: term structure, forward curve, price projection.
Explanation: The shape of the yield curve reflects market expectations about future supply, demand, and risk.
Example: An upward-sloping yield curve indicates higher prices for longer-dated contracts, often due to anticipated scarcity.
Practical application: Informs hedging strategies, investment timing, and valuation of long-term contracts.
Challenges: Sudden market shocks can flatten or invert the curve, complicating forecasting and risk management.