Glossary

ACE. Area control error is the instantaneous difference between actual and scheduled *interchange*, taking into account the effects of *frequency bias* (NERC).[1]

adequate installed capacity. *See* reliability.

adequacy. *See* reliability.

AGC. *See* operating reserve.

aggregate price spike. *See* price spike.

ampere (amp, A). The unit of electrical current flow. One amp flowing from a 120-V outlet delivers 120 W of power.

area control error. *See* ACE.

arbitrage. A zero-risk, zero-net-investment strategy that still generates profits. One type of arbitrage involves the transfer of a commodity from a high-priced location to a low-priced location; a second type involves the transfer of demand from a high-priced product to a low-priced product.

architecture. *See* market architecture.

auction market. A market where all traders in a commodity meet at one place or communicate with a central auctioneer to buy or sell an asset, e.g., the NYSE. Auctions require bids of buyers, sellers or both. The following are types of auctions:

English: buyers start bidding at a low price. The highest bidder wins and pays the last price bid

Vickrey: buyers submit sealed bids, and the winner pays the price of the highest losing bid. Also known as a **second-price** auction and, confusingly, as a **Dutch** auction.

Dutch: the auctioneer starts very high and calls out progressively lower prices. The first buyer to accept the price wins and pays that price.

Sealed-Bid: buyers submit sealed bids (as in a Vickrey auction), and the winner pays the price that is bid. Also known as a **first-price** auction, a **pay-as-bid** auction, and a **discriminatory** auction.

Reverse auction: used to purchase instead of sell. The lowest bid wins. All auction types can be used in reverse.

Double auction: both buyers and sellers submit bids. It can be run as a first-price auction, a second-price auction, or as a bid-ask market which trades continuously as the NYSE does after its opening second-price auction.

augmented load. Load plus *installed generating capacity* that is out of service.

automatic generation control. *See* operating reserves.

baseload generating capacity. Generators normally operated around the clock, also referred to as baseload generators. *See also* midload generator; peaker.

baseload. The minimum load for a given control area. This part of load is constant.

bilateral contracts. Contracts used to make trades between two private parties.

bilateral market. A market in which private parties generators, and loads, trade directly at negotiated prices. Neither an *exchange market* nor a pool. Trades may be arranged by brokers or dealers.

black-start capability. The ability of a generator to start without taking power from the grid. This allows it to help restart the power system in case of a complete failure.

broker. An intermediary in a *bilateral market* who arranges trades but does not "take a position," i.e. does not buy or sell the commodity. *See also* dealer.

capacity factor. The ratio of the total energy generated by a generating unit for a specified period to the maximum possible energy it could have generated if

1. Definitions followed by "(NERC)" are from NERC (1996) and those followed by "(DOE)" are from DOE (1998b).

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ment problem requires advanced mathematics and enormous computations.

uplift. A charge imposed on all customers, usually per MWh, that covers costs not covered by prices. Examples of such costs are, redispatch costs when congestion is not priced, side payments in pools, and fixed costs of transmission. Often referred to as a tax in this book.

value of lost load (VOLL). The average cost to customers per megawatt-hour of unserved load when they are disconnected during involuntary load shedding.

variable cost. A cost that varies with the level of output. In examples, generator supply curves are often modeled as having constant variable cost up to full output. This is the generator's marginal cost until full output is reached; then marginal cost becomes undefined or may increase rapidly in some narrow *emergency operating range*. In this book, the constant variable cost below full output is referred to simply as the generator's "variable cost" rather than its *marginal cost* which could be undefined. *See also* cost of production.

vesting contract. A contract signed by the purchaser of generating units, divested by a regulated utility, that generally specifies the price of a long-term power sale from these units to the regulated utility.

VOLL. *See* value of lost load.

VOLL market. A market that employs only VOLL pricing for the purpose of inducing adequate investment in installed capacity.

VOLL pricing. A pricing policy that sets the spot market price to VOLL whenever load must be shed and there is a partial blackout.

volt (V). The unit of electrical pressure. One *amp* of current forced through an appliance by 120 V of pressure delivers 120 W of power to the appliance.

Walrasian equilibrium. *See* equilibrium.

watt (W). The unit of *power* (electrical energy flow). One watt is the power delivered by 1 A of *current* flow under 1 V of pressure.

withholding. Reducing output below the competitive, price-taking level at the market price. Withholding is termed **financial** if it is accomplished by asking a price above marginal cost and **physical** if it is accomplished by simply not producing.

The **quantity withheld** is the difference between the competitive supply at the market price and actual supply. There are three other measures of the effect of *market power* on prices and quantities. **Markup** is the price analog of quantity withheld and is the difference between actual quantity supplied and the competitive supply price (marginal cost) of the quantity.

Quantity distortion is the difference between competitive supply and the actual supply, while **price distortion** is the difference between the market price and the competitive price.

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