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Gas Imbalance Market (GIM) – Conceptual Outline

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1) **Objectives**
    a. Facilitate more efficient gas market operations within the SoCal Operating Area
        i. In addition, the GIM has possible wider CA wide applicability as well
    b. Provide an intraday balancing market to address within day variances of demand versus supply
    c. Provide intraday price formation and price discovery in the gas market to compliment the within day/real-time price formation and price discovery in the electric market.
    d. Empower and unleash market forces to address reliability of both systems on a permanent self-correcting basis.
    e. Promote efficient market compatible investments on both the gas and electric side that acknowledge the real costs and benefits to market participants of operating in a reliable and efficient manner.
    f. Maintain Summer period storage inventories at between 70% and 80% of maximum working gas levels so as to both maintain deliverability (i.e., withdrawal capability) and injection capability (for absorbing gas supplies due to fast de-ramp of gas fired generators in particular) for reliable and predictable operations of the SoCal system.
2) **Market Rules**
    a. Core, Non-Core and Electric Generation participants including marketers to and agents of same (Market Participants) are all required to nominate, confirm and schedule flowing gas supplies to meet gas demand requirements within 5% +/- of burn every day.
    b. Market Operator would be chosen either for the state or on a by utility basis. If the Market Operator is one operator for each utility then the Market Operator is distinct from the utility's Gas Acquisition Department.
    c. Imbalances beyond 5% +/- are force-balanced by Gas Market Operator to the extent market participants do not self-balance as set forth below.
    d. Market Operator to maintain between 70% and 80% storage inventory between months of June thru October (i.e., Summer).
        i. Market Operator should use Gas Imbalance Market operations to go on maximum injections beginning in March of each year so as to attain minimum 70% (or greater not to exceed 80%) inventory position by June 1 of each year.
        ii. Market Operator takes bids from Market Participants and operates a reverse auction to acquire gas to achieve such injection level.
    e. Market Operator charges Market Participant(s) for imbalances that are Force-Balanced (i.e., not self-balanced by the Market Participant) as set forth below.
        i. There are charges for Within-day, and Daily Force Balance operations which vary based upon whether the system is under normal operations or OFO operations.

ii. For normal operations, they are based upon the same tiers as those for Monthly imbalances; however, instead of being based upon Monthly California Border Prices, they are based upon Daily California Border prices.
iii. For OFO operations, they are based upon those tiers employed during OFO periods.

f. Market Operator operates a within-day Gas Imbalance Market where Market Participants anonymously offer to sell (when they are long gas) or bid to buy (when they are short gas) in order to avoid Force Balance by Market Operator.
    i. Market Operator settles the Market Participants' buys and sells but does not take title, except as set forth below (i.e., when Market Operator is seeking to achieve or maintain target storage inventory levels).
    ii. Market Operator publishes settled prices by transaction and volume for all transactions.
        1. This attribute is particularly critical for delivering results that foster alignment with market objectives

g. During a normal operations day, in the within day, the Gas Imbalance Market has a Force Balance Rule that operates when a Market Participant's imbalance exceeds 15% +/- (supply to burn) during the lesser of a rolling 6 hour period or cumulative daily, and the Market Participant has not otherwise self-balanced prior to exceeding the 15% +/- level. When the Market Participant does not self-balance, the Market Operator will Force Balance the Market Participant to the +/- 15% level for the rolling 6 hour period(s) and to the +/- 5% level for the day. – ***This feature of the Gas Imbalance Market will cause Market Participants to gravitate to self-balance behaviors rather than face costs associated with Force Balance operations.***
    i. Note that where the Market Participant does not exceed 15% in any 6 hour period and remains fully matched the balance of the day, they are within the 5% daily balance requirement (i.e., 15% divided by 25% (the portion that 6 hours is of 24 hours) equals 2.5% for the day.
    ii. Likewise, where the Market Participant does not exceed 15% in any 6 hour (or cumulative period and remains within 2.5% of balance the balance of the day, they are within the 5% daily balance requirement (i.e., 15% divided by 25% (the portion that 6 hours is of 24 hours) equals 2.5%, and 2.5% for the balance of day (in the same direction) means that they will be at the 5% level for the day.

h. During an OFO day, in the within day, the Gas Imbalance Market has a more strict Force Balance Rule which requires that when a Market Participant's imbalance exceeds 5% +/- (supply to burn) during the lesser of a rolling 6 hour period or cumulative daily, and the Market Participant has not otherwise self-balanced prior to exceeding the 5% +/- level, the Market Operator will Force Balance the Market Participant to the +/- 5% level.
    i. It is expected that with the operation of the Gas Imbalance Market that there would be fewer and less extreme OFO days because Market Participants' actions to avoid costs will cause an overall more balanced scheduling behavior.

i. Supplies purchased or sold by the Market Operator under Force Balance conditions are purchased and injected into storage or sold out of storage. These transactions are also published as to volume and price.
    i. Again, this promotes transparency in the market.
j. For those times when the Storage Inventory of the Market Operator falls below 70%, the Market Operator conducts a reverse auction to acquire supplies for injection at optimum injection rates in order to return to a minimum 70% (or higher, not to exceed, 80%) level.
    i. Optimum injection rates should be as set by the Market Operator based upon forecasted weather.
k. For those times when the Storage Inventory of the Market Operator exceeds 80% (Summer) and a to be determined percentage (Winter), the Market Operator conducts an auction to sell supplies for withdrawal at optimum operational withdrawal rates in order to return to the maximum percentage (or lower not less than 70%) level.
    i. Optimum withdrawal rates should be as set by the Market Operator based upon forecasted weather.

3) Gas Imbalance Market Operations and Structure

a. The location of the GIM is a virtual location (a paper "Pool") associated with the default storage injection or withdrawal locations. Those Market Participants that are long (have gas to sell) would sell that gas at the paper Pool; or, end up selling to the Market Operator when they are Force Balanced. Likewise, those Market Participants that are short would either buy gas from one or more sellers at the Pool, or end up buying the gas from the Market Operator when they are Force Balanced. In either case with the GIM, the Market Operator would behave, and require Market Participants to behave, under the conditions currently imposed only during OFO days. GIM would operate throughout the day, every day.
    i. It is this aspect of the market which brings transparency and liquidity to the intraday gas market in CA and allows those prices to be reflected in the electric market.
b. The Market Operator would continue to assess delivery charges on gas delivered to end-use locations.

Discussion of Benefits:

Among the many benefits of the Gas Imbalance Market is that it will lead to transparency of intraday gas market pricing. This happens because there is a "default price" which drives and brackets the intraday price. This "default price" is based upon the Force Balance/Cash-Out price tiers in operation that day for 15% +/- (or greater) imbalances, within the day, and imbalances in excess of 5% cumulative for a day. Because these prices are discounts or premiums to the California Border Price, such bands of pricing in the intraday market are knowable. The location of the GIM is a virtual location (a paper "Pool") associated with the default storage injection or withdrawal location. Those that are long (have gas to sell) would sell that gas at the paper Pool; or, end up selling to the Market Operator. Likewise, those that are short would either buy gas from one or more sellers at the Pool, or end up buying the gas from

the Market Operator. In either case with the GIM the Market Operator would act under its system currently used only on OFO days. GIM would operate throughout the day, every day. It is this aspect of the market which brings transparency and liquidity to the intraday gas market in CA.

For Generators, this price transparency in the intraday market, and the predictability of pricing makes their interactions and bidding in the real-time Electric Energy Market more efficient and reflective of real costs. It will also promote economic dispatch to a greater extent.

Participation in the GIM would apply to both Non-Core and Core. For the Core, the particular utility's Gas Acquisition Department would be charged or credited with that Department's margin[1] on sales and/or purchases of its imbalances by Market Participants or the Market Operator. In short the utility's Gas Acquisition Department would behave like and be treated like any other Market Participant. The CPUC would determine ultimate disposition of such net margins on some periodic basis. We recommend being careful to provide rewards/incentives for rational economic and operational behaviors and penalties/disincentives for the opposite behaviors.

[1] Here "margin" is the difference between gas purchased in the day-ahead gas market and subsequent sale of that gas in the GIM during the Gas Day or purchase of additional gas for that Gas Day in the GIM.