

Competitive Asset Positioning White Paper

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**Newly formed generating companies can apply an approach derived from the
IPP project development process to position their plants to succeed in the
emerging ISO-based market structure**

Due largely to the regulatory framework established under the 1978 Public Utility Regulatory Policy Act (PURPA), independent power producer (IPP) businesses have been literally built on a proposal-by-proposal, project-by-project basis which puts profitable power plant performance at the center of the IPP strategic universe. Each power plant project is financially structured as a stand-alone enterprise based on a rigorous analysis that projects annual operational and financial performance over the 25-year life of its power sales agreement.

This paper draws on the IPP project development model to derive a systematic approach power generating companies (GenCos) can use to position plants to succeed in a deregulated power market—where not only revenue, but generation costs and dispatch level, will be determined by supply and demand forces. We call the approach "Competitive Asset Positioning":

- **Competitive** because it addresses power plant financial viability under a competitive market structure

- **Asset** because power plants represent the primary revenue-earning component of the GenCo business
- **Positioning** because it is based on the principles of competitive strategy that contend that profitability depends on successfully positioning your business vis-à-vis competitors to take advantage of the industry economic structure.¹

Implications of Competitive-Based Dispatch

Although the timing is uncertain and may vary from state-to-state, there is little doubt that the ongoing transformation of the U.S. power generation market will lead to a completely deregulated market structure. Consistent with its mandate under the 1992 Energy Policy Act to deregulate the power market, the Federal Energy Regulatory Commission (FERC) has established guidelines for independent systems operators (ISOs) around which competitive regional markets are already being formed. In a completely deregulated market, these regional ISOs will act much like a commodity broker in deriving a

market clearing price based on supplier's "bids" to sell power and customer's "asks" to buy power at prices specified by respective parties.

This process will function like the competitive model taught in introductory microeconomics courses—complete with supply and demand curves.² That is, a downward sloping regional power demand curve—representing the total quantity of power demanded as a function of a cents/kWh price schedule—intersects with an upward-sloping regional power supply curve—the quantity of power generators are willing to sell based on the same price schedule—to yield the market clearing price.

Competitive dispatch renders traditional supply-side plant operational management and load dispatch obsolete.

As “price-takers”, GenCos can specify the power bid price, but the market determines the quantity sold at such a price. The result is competitive-based dispatch which renders obsolete, the supply-side oriented operational management and load dispatch planning that has been the basis for traditional utility plant operations.

The implications of this can be gleaned by looking at data on the wholesale bulk power market which already functions as a commodity market. Figure 1 provides the plant dispatch curve for 1994 wholesale power transactions for the New York Power Pool (NPPC).³ For each plant operated by the utilities selling through this pool, this graph shows the average annual plant (capacity) factor percent (horizontal axis) as a function of each respective plant's average annual production costs (vertical axis).

The downward sloping curve reflects the inverse relationship between production cost and plant capacity factor, which in turn, reflects the working of a market in determining the amount of power sold and corresponding dispatch level as a direct function of price—i.e., the lower the

bid, the higher the quantity sold.

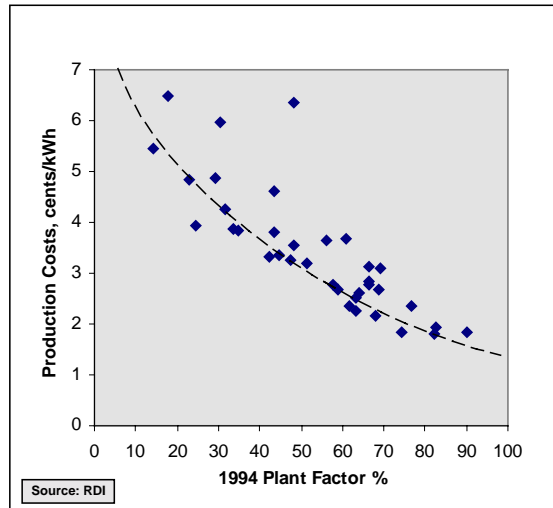


Figure 1: 1994 NPPC Plant Dispatch Curve

The lesson here for an ISO-based competitive market, is that the lower your plant's total costs are relative to other competing plants, the better the opportunity to bid sales at a price that can attain high levels of dispatch while still maintaining acceptable profit margins.

Virtuous and Vicious Cost, Dispatch and Production Circles

Because of the market price mechanism, financial and operational performance become linked through the ISO-based bidding and dispatching process. This linkage is reinforced by the unique nature of electricity as a “product”. Unlike steel, grain, pork bellies and all other commodities—electricity cannot be stored. For high cost plants, this exacerbates the impact of competitive dispatch on plant production costs and efficiency because uncompetitive bids immediately impact production levels.

For example, a high cost plant that consistently bids power sales at a price covering costs, will probably only be able to sell power during peak demand periods when the market clearing price reaches a level to accept such higher bids. This can be an operational nightmare as the

plant must be stopped/started or regularly cycled to keep production in sync with price fluctuations. Not only does such erratic operation reduce efficiency, but it also increases plant wear-and-tear, increasing maintenance costs and possibly both planned and forced outage rates. The alternative isn't much better—normalize production and bid sales at the prevailing market price, even if variable and/or fixed prices are not covered.

Entering the market as a low-cost producer not only provides an initial competitive advantage, but also one that is self-reinforcing.

Thus, not achieving low-cost producer status by the time the market is fully deregulated is both a financial and operational problem. On the other hand, if you can enter the market as a low-cost producer, you will not only enjoy an initial competitive advantage, but one that is self-reinforcing.

This can be explained in terms of the two feedback loops for Plant A and Plant B depicted in Figure 2. Plant A enters the market with total cost (variable and fixed) lower than the large majority of competing plants. This cost advantage, allows Plant A to bid low, relative to competing plants, but still cover all its costs plus retain a profit margin. The resulting high dispatch level is conducive to efficient production (higher plant capacity factor). This not only reinforces its competitive cost advantage, but also contributes income to an investment pool available for plant betterment to even further increase its competitive advantage—initiating round two in the virtuous circle.

Plant B, enters the market with total costs higher than the large majority of competing plants. This would likely result in a noncompetitive bid price even if, as indicated in Figure 2, this bid does not fully cover total costs.⁴ Higher bids lead to lower and erratic dispatch patterns—

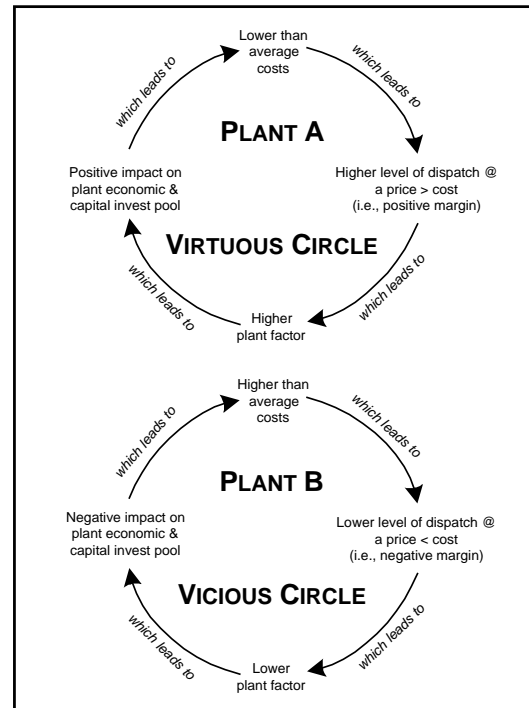


Figure 2: Virtuous & Vicious Circles

negatively impacting efficiency and costs as discussed above. To make matters even worse, as costs rise, the profit margin—if not already negative—could reach that point over repeated vicious cycles. The negative draw on total GenCo earnings erodes funds available for capital improvements; the fundamental solution to breaking the negative feedback circle.

Bounding a Future Income Stream—a Page From the IPP Book

Competitive asset positioning provides a pragmatic, plant-level approach GenCos can immediately initiate to lower plant costs to competitive levels before the market is fully deregulated. It is derived from the project financing strategy IPPs have traditionally used to develop plant projects as independent, financially viable business enterprises consistent with the opportunity provided by the PURPA-based regulatory process, *the* defining feature of the IPP market. This can be characterized as putting in place a

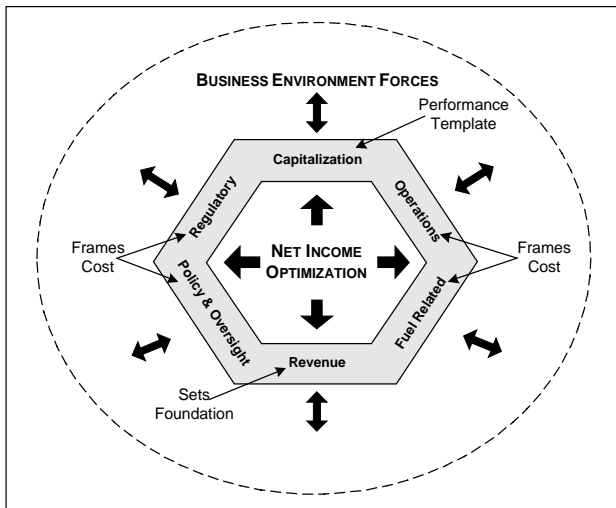


Figure 3: Plant Strategic Parameter Boundary

"strategic parameter boundary" made up of contracts and other agreements that separate plant internal management, from external business environment forces as depicted in Figure 3.

The process can be explained in terms of systematically framing a targeted flow of future net income from plant power sales by putting in place the six parameters that bound the area within the Figure 3 hexagon. It begins when an IPP secures a long-term power sales agreement (PSA) from an electric utility under which the IPP constructs a plant and sells power to the utility. The PSA provides the **Revenue Parameter**—setting the foundation (bottom parameter in the Figure 3 hexagon)⁵ for putting in place the other the project financing and other cost-related parameters.

With a PSA in hand, the IPP secures debt-based financing to leverage the return on equity investment, which provides the balance of project capitalization. The **Capitalization Parameter** (top of the hexagon) represents interest and other financing costs. To secure project financing, IPPs perform a rigorous analysis projecting annual financial and operational performance over the life of the PSA. Projections are provided as pro forma financial statements (the pro forma) and serve as a "performance template" against which actual performance is measured during plant development, construction and op-

erational phases.

The five cost-related parameters account for as much as 85 percent of plant production costs and are put in-place to ensure that a target rate of return on equity is protected from future market fluctuations.

Lenders and investors commit funds based on an expectation that actual costs incurred through each phase will compare favorably against pro forma projections. To ensure that this expectation can be met, IPPs put in place the contracts and agreements that make up the four remaining parameters (hexagon sides).⁶

- **A Production Parameter** represents the plant's technical design capability as defined in the engineering, procurement, and construction (EPC) contract—e.g., rated capacity, fuel, heat rate, emission and waste management control systems, operability, and maintainability.
- **A Regulatory Parameter** represents agreements with local, state and federal regulators for environmental, safety and other permits and guidelines that impact efficiency and cost.
- **A Fuel Related Parameter** represents contracts for fuel procurement and delivery and, for coal plants, other fuel-related commodities and services including lime procurement and ash-disposal services.
- **A Policy and Oversight Parameter** represents numerous corporate driven costs such as overhead and human resources practices that impact plant direct costs (e.g., payroll, union work rules) and indirect costs (e.g., overhead allocations).

The five cost-related parameters can account

for up to 85 percent of plant fixed and variable production cost. The goal in putting these parameters in place, is to ensure that the future cost stream associated with plant construction and operation, is sufficiently below the future revenue stream to provide a positive earnings that are consistent with a targeted rate of return on equity investment. The parameters then, are the key to optimizing income in the IPP power market segment, consistent with the opportunity defined by PURPA-based regulations.⁷

Coping With the Deregulation Challenge One Plant at a Time

Like this IPP process, GenCo competitive asset positioning would center on developing a multi-year plan to establish a strategic parameter boundary that optimizes plant income consistent with the prevailing market structure. For GenCos, however, the relevant market is the emerging ISO-based market described above and the goal is to restructure existing plant parameters—put into place in a regulated environment—to optimize net income in this new competitive environment.⁸ The urgency associated with doing this, depends on the pace set by state public regulatory commissions (PUCs) in extending deregulation to power market segments within their jurisdictional purview.⁹

The competitive asset-positioning (CAP) program is designed as a series of plant-specific interventions by a GenCo project team. The team is made up of plant management and other support staff representing functions responsible for performance in the strategic parameter categories. The program is initiated with a pilot assessment of a representative plant or multi-plant station. Assessment results are documented to provide a consistent methodology for assessing all other GenCo plants.

Identifying Critical Success Factors

Because success in a deregulated power market is based on achieving low-cost producer status, the starting point is determining the plant's com-

petitive ranking. This can be estimated by comparing the plant's total production costs against the costs of plants currently in the low cost, high plant capacity factor segment of wholesale market demand dispatch curves like the one provided in Figure 1.¹⁰ Data on regional wholesale market ranking and plant specific production costs are readily available from commercial sources.

Using a financial model, GenCos conduct a sensitivity analysis to identify the key critical success factors that underlie strategic parameters and drive long-term plant net income .

The initial team effort centers on identifying the operational, financial, regulatory, and other factors that are most significant in making up the six strategic parameters that account for the vast majority of plant variable and fixed costs as discussed above. A plant business model, patterned after what IPPs use in developing plant financial pro forma projections, is used for this analysis. GenCo teams can work with in-house financial experts to develop such models, which are input-driven, and link a pro forma income statement to an input matrix of assumptions regarding key production, cost, and revenue variables such as:

- **Cents/kWh Power Price**—e.g., ISO peak/non-peak prices, PUC transition pricing, contract pricing¹¹
- **Plant kWh Output**—e.g., rated capacity, heat rate, plant betterment to upgrade performance
- **O&M Costs** —e.g., staff changes, over-time rates, use of consultants, union work rules
- **Fuel and Other Variable Costs** —e.g., cents/kWh for fuel, lime, ash-disposal

- **Fixed Costs** —e.g., A&G allocations, property taxes
- **Capital Costs** —e.g., capital improvements, working capital

By defining alternative values for such variables, the team can identify the factors that have the greatest impact on the net present value of the plant's future annual net income stream—the figure of merit in conducting sensitivity analysis.¹²

A common way to approach this is to develop a baseline case that uses historic cost and production trends—a “business-as-usual” operations scenario—and varies the price and amount of power dispatched based on alternative “market-structure” scenarios. This would determine the plant's financial viability as the market becomes increasingly competitive, but operations continue on a business-as-usual basis. The next step is to systematically change the operations scenario to reflect improvements in fuel costs, heat rate, A&G allocations and other variables.

The goal is to identify what combination of changes is needed to achieve acceptable income levels in a competitive market—i.e., a competitive positioning strategy based on improvements in a relatively limited number of “critical success factors”.

Breaking Competitive Positioning in to Bite-Size Pieces

This sensitivity analysis provides a mechanism for team members to identify and see the financial impact of actions they can initiate to reduce cost and increase efficiency.¹³ For example, the fuel expert sees that coal prices—under a contract negotiated when fuel costs were a “pass-through”—are no longer viable because production costs are too high to allow competitive bids in an ISO-based market structure. By negotiating lower coal prices, both the GenCo and the coal supplier are better off as fuel costs decline, allowing lower bid prices which increase dispatch levels and coal consumption and revenues.

Similarly, the team engineer identifies plant upgrades that increase heat rate, rated capacity or bring other improvements, that increase net-income by an amount several times the amount of capital costs incurred for such improvements.

Team members learn how their respective functions—as well as the contributions of the other functions—can bring about the plant operational and financial performance improvements pivotal to maintaining acceptable income levels in a more competitive market environment.

A CAP multi-year plan takes shape as the team members start to identify their responsibility for the plant, department and team goals needed to make the assumptions behind pro forma financial projections a reality.

As this occurs, an action agenda for change begins to take shape. Like the process described above for IPPs, the team frames a set of strategic parameters bounding a future stream of income based on a rigorous analysis that projects future operational and financial performance over the economic life of the plant. The Revenue Parameter, grounding this effort, is an ISO-based market structure. The Capitalization Parameter incorporates GenCo financial criteria regarding capital investment recovery, return on equity, and other applicable standards—i.e., serves as the performance template.¹⁴

The results of this analysis are provided in the CAP Plan, which identifies the underlying factors that are most critical in shaping strategic parameters and projects annual financial performance as a plant pro forma financial statement. The plan also identifies key assumptions supporting this projection and provides a multi-year plan and action agenda defining plant, department and team goals for outcomes that make these assumptions a reality.

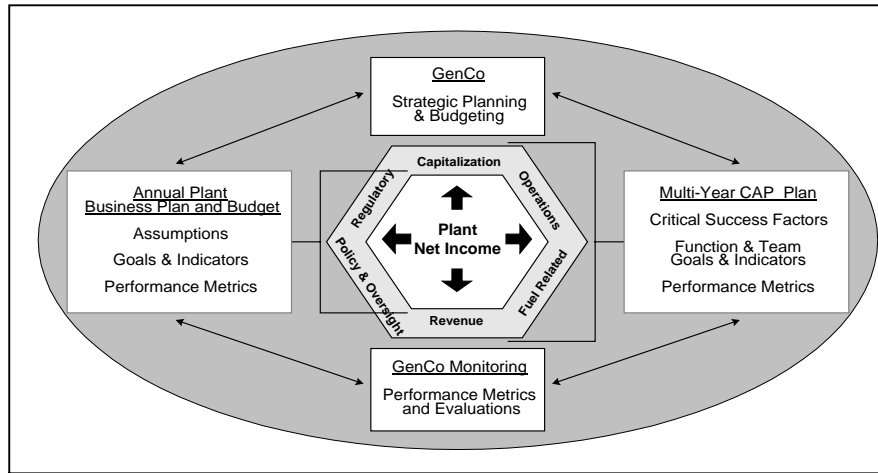


Figure 4: Putting Plants at the Center of the GenCo Business Universe

In short, The CAP process provides a forum for systematically breaking down the overall task of preparing for a deregulated power market into “bite-size” pieces. It first breaks positioning down by plant; next, by the strategic parameters driving plant profitability; and finally, by identifying and assigning plant and support staff responsibility for actions regarding a prioritized and limited set of critical success factors.

Putting Profitable Plant Operations at the Center of the GenCo Strategic Universe

The concept of a strategic parameter boundary is central to this approach. The six strategic parameter categories correspond to functional responsibilities and, at the same time, show how the combined efforts of each area comes together to frame a competitive strategy for profitable plant performance

As depicted in Figure 4, plant CAP plans should be integrated in the overall GenCo business planning, budgeting and monitoring process. Collectively, these plans provide the critical success factors, goals, and performance indicators that can guide a successful transition to the emerging market as outlined in the first half of

this paper. Accordingly they should provide the basis for an aligned set of performance metrics against which staff support functions should be held accountable as part of the GenCo performance planning and evaluation process.

At the plant-level, the operational, regulatory, contractual, financial, and other factors addressed in positioning plans provide the input assumptions for annual business plans and budgets. That is, the strategic parameters bound plant management’s decision-making authority with regard to maximizing plant income. As indicated by the left bracket in Figure 4, plant management should be held accountable for achieving operational and financial goals within this boundary—i.e., “push” actual earnings to the maximum level consistent with boundary constraints.

In sum, the CAP approach allows GenCo’s to put profitable plant operations at the center of their strategic universe through a team-based process that develops an aligned, action agenda for competitively positioning each plant to succeed in a deregulated power market.

¹ The concept is based on positioning products and services vis-à-vis actual and potential competitors through development, marketing, production and service strategies that create barriers to entry—i.e., provide an economic advantage over competition. See *Competitive Strategy*, by Michael Porter. © 1980 The Free Press, New York.

² Although the total market will also include long-term contracts to supplement the competitive "spot market", contract prices will tend toward the market-determined price for power. Long-term contract prices will be differentiated to the extent that buyers perceive the fixed price component of contracts and other convenience and service related advantages incorporated in contracts as adding value beyond that of the actual power acquired.

³ This pool is one of two bulk power pools operating within the Northeast Power Coordinating Council region of the National Electric Reliability Council. Wholesale power transactions include power purchases, sales for resale and interchange agreements. Production costs are based on the accounting requirements of the Operation and Maintenance Expense Accounts of the FERC Uniform System of Accounts. Data source: Resource Data International Inc., POWERDAT database, 1996. Copyright © Resources Data International, Inc.

⁴ In the short-term it makes economic sense to bid at a price that covers variable production related costs even if fixed costs are not fully covered (all costs are considered variable over the long-term, however).

⁵ For cogeneration plants, the sale of steam would also contribute to revenues. Other possible sources of revenue include excess power sales and the sale of waste products such as gypsum.

⁶ As a practical matter, the agreement and contracting process is done in conjunction with an ongoing financial analysis to ensure generally conservative lenders, in particular, that their investment is safe. A final analysis completed before construction loans are finalized is based on an engineering, procurement and construction contract which defines the large majority of project costs as well as operational and regulatory performance parameters.

⁷ In contrasting their approach to plant management vis-à-vis utilities, IPPs tend to emphasize a plant profit-driven O&M strategy based on lower plant staffing levels and multi-dimensional use of personnel. While these are worthy goals for utilities to emulate, the real key to an operational cost advantage is managing the strategic parameters which account for a much larger percent of costs than the size of the plant staff and associated variable costs over which plant management has discretionary decision-making authority. For example see: R. Swanekamp, Special Report: Operating and maintaining IPP/Cogen facilities. *Power*. September, 1994

⁸ Deregulation can be explained in terms of systematically dismantling the regulatory buffer that has hereto-

fore insulated plant financial performance from the direct impact of market forces. Under a regulated market, the revenue parameter is an outcome of a legal process ensuring that plant O&M and capital costs—driven by the four cost-related parameters in Figure 3—are prudently incurred. Total plant net income—the white area inside the hexagon—is derived by applying an approved return on the book value of capital put into rate base consistent with the Used and Useful Standard.

⁹ For a discussion of the overlapping jurisdiction of FERC and PUCs in overseeing deregulation see: Peter Navarro, Electric Utilities: The Argument for Radical Deregulation. Harvard Business Review, Vol 74, No. 1, January-February, 1996

¹⁰ A more comprehensive competitive analysis can be done by following the approach developed by Michael Porter referenced in Endnote 1. Such an effort would also include scenarios for new market entrants as well as companies or plants that could exit the market.

¹¹ Input assumptions regarding price schedules are developed to represent prevailing market structure during and following the transition to a fully deregulated power market. Power pricing during a PUC-regulated transition period should reflect the anticipated or approved schedule of prices. For example, several state PUCs define a performance-based price schedule which serves as a price ceiling, putting the burden on the utility to earn a profit by producing power at a cost less than such pricing.

¹² Note that a future present value stream of net income as the figure of merit in conducting a sensitivity analysis is compatible with common financial methods of decision making, including Economic Value Added (EVA) Analysis. To get a plant's EVA, you would subtract the present value of the capital employed in generating revenue from the net, after-tax operating profit (again on a present value basis). Corporate value is increased by earning a return greater than that required by shareholders. See Daniel J. McConville. *All About EVA*, Industry Week, April 16, 1994

¹³ This application of a business model to promote team learning is the same approach Peter Senge advocates with regard to "microworlds" which promote organizational learning by having managers see the end results of alternative business strategies. Microworld simulations, however, are based on system dynamics models which incorporate causal feedback loops like the ones presented in Figure 2. See Peter M. Senge, *The Fifth Discipline*, Chapter 17, *Microworlds: The Technology of the Learning Organization*. Currency Doubleday, New York. © Peter M. Senge, 1990

¹⁴ Note that this could include PUC approved provisions for stranded asset capital recovery for applicable years during the transition to a fully deregulated market