COMPETITION, COORDINATION, AND COMPLIANCE: THE ROLE OF INTEGRATED RESOURCE PLANNING IN A COMPETITIVE INDUSTRY

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INTRODUCTION

Integrated Resource Planning (IRP) currently plays a central role in electric utility planning and regulation. Its primary function is to identify and inform industry decision-makers of the mix of supply- and demand-side resources most likely to achieve a "least-cost" mix for the customer. Competitive bidding to implement such resource plans further promotes economic efficiency in a regulated industry framework. But even as environmental regulators adopt the same framework–through the use of emissions allowance or reduction credit trading–the system is being pulled apart. As open access and retail wheeling of electric power are considered the institutional structure by which IRP currently works is eroded. What role, if any, will IRP play in a competitive industry where–in theory–the collective actions of generators, transmission companies, distribution companies and consumers define the "least-cost" mix?

This paper discusses the future of IRP in a competitive industry marketplace. In essence, competitive markets work because the nature of the service is known and the multitude of players in the market know what their roles are in delivering that service. A competitive market is therefore a highly coordinated market; coordinated in the sense that the "transaction rules" are consistent and understood, even as the transactions themselves change.

Healthy competition assumes–and requires–this high degree of coordination. However, from a technical standpoint, a competitive power system will operate similarly to how it does now. Generators will burn fuel to produce electricity, electrons will flow over wires to houses and businesses, consumption will be metered and billed for. What will change radically is the ownership and control of the resources providing electric services. Regulators' primary functions change with this transformation as well, from reviewing the transaction and its prudency, to developing appropriate transaction rules and assuring those rules are adhered to. IRP will play an instrumental role in this transformation, helping to develop industry performance criteria and the effectiveness of the transaction rules.

IRP, or planning generally, will also play a role well beyond just guiding us through this transformation. It will also be essential for monitoring and improving overall industry performance by ensuring that the right balance of short-term, long-term, price and non-price factors are included in determining the portfolio of resource options. To use the "grocery shopping" analogy first presented in (Connors 1992), "What's on sale at the supermarket does not necessarily constitute a balanced diet."

Where the need to establish this "balanced diet" of electric service resources is most obvious is on the environmental side, where environmental competitiveness issues need to be folded in with traditional direct and total cost factors. Integrated resource planning will take on a new dimension as the industry changes, exploring alternatives and promoting industry coordination. What institutional arrangements will be necessary to ensure that knowledge–derived from the application of IRP tools–is used to better define a coordinated, competitive and clean industry structure? These are some of the issues that are explored below.

Competition–Industry Directions and Trends

The origin of competition in the electric industry is commonly thought to begin with PURPA in the late 1970s. Competition evolved through the 1980s with the advent of competitive bidding processes to implement "least-cost" and IRP strategies. This genesis of non-utility generators (NUGs) fostered the development of independent power producers (IPPs) who moved beyond PURPA rules, and the migration of energy service companies (ESCOs) from the customer service realm into that of utility regulation and planning.

The Energy Policy Act of 1992 (EPACT) further expedites the industry's transformation to a competitive structure. Provisions in the act rename IPPs into "exempt wholesale generators" (EWGs), further promoting the establishment of a wholesale generation market. EPACT nudged the industry further into the competitive realm by opening the door to the creation of an open access transmission system. By allowing the creation of "regional transmission groups" (RTGs) geographical barriers to EWGs limiting their customer base will fall creating–in theory–a fluid wholesale generation market.

How far will this alphabet soup of competition go? This is not a question to be saddled with, but to decide. Is a wholesale generation market with common carrier transmission enough competition? Are there sufficient gains in economic efficiency to warrant extending competition to the retail level–for all customers? These are serious questions, and they require answers early on if many of the ownership, sunk capital, reliability, and environmental compliance concerns are to be answered adequately. They must also be answered early on if the transformation to a stable competitive structure is to be made with a minimum of pain and uncertainty.

This is the first application of integrated resource planning for a competitive industry; educating ourselves as to how the pieces fit together and how to make them work. To what extent should competitive structures be introduced into the industry, and what are the transaction rules? Who offers the resources? Who purchases them? Who keeps score?

To get a leg up on these questions it is best to turn first to the industry's operational characteristics. For whatever the industry's eventual transformation, it will remain a collection of power plants, transmission and distribution lines, transformers, meters, and consumer end-uses. A competitive yet unreliable, un-operable system is something to plan against.

From a power quality / reliability standpoint there are a number of issues that must be addressed. Due to its inherent nature, electricity must be generated as it is used, requiring some power plants to be employed as "spinning reserve" units. Real and reactive power limitations along transmission distribution lines must also be maintained in order to keep the system balanced. These factors play an essential role in determining which power plants must run where, with minor regard to their "marginal dispatch cost." These operational limitations and requirements establish the foundation upon which a competitive industry structure *must* be built.

Operational requirements raise important contractual questions as well. If spinning reserve is a necessary component of keeping the transmission system operating, is the unit's operation bundled into the transmission wheeling rate, or is it a special class of generation in the wholesale power market? What about unforced outages? If a municipal power company wheels electricity in across the local transmission system and the generator experiences an outage, how is that outage handled? With the vertically integrated utility the power system compensated and that was that. In the competitive industry must the municipal have emergency arrangements with the electricity supplier, the transmission system, or other power suppliers?

All these questions are eminently answerable, but must be asked well before the prospect of any outages occur. Recognition of the operational complexity of the industry must be made up front, with industry planning tools employed rigorously to identify the opportunities and constraints of alternate competitive structures. Only through the application of such tools can we be sufficiently up the learning curve when it comes to implementing the new competitive structure.

There are many aspects to a competitive market structure that can only be alluded to in a paper of this length. Let's look at the role of generation and planning to meet capability needs in a competitive industry. An EWG developer must consider many factors when deciding what type, where, and when to build a generation unit. Does a region need additional generation? How much? What type–peak, intermediate, baseload? Are there siting restrictions? Interconnection problems? Are there distributed generation benefits or constraints? From a power purchaser's standpoint, what it its right mix of generation? What fuel mix? What mix of peak to average demand? How tight is the generation market? What mix of spot to firm capacity contracts? Certainly overcapacity in a region would benefit the purchaser of power, now that capital cost risk has been shifted to the developer. But with NIMBY pressures on both new generation and transmission (by virtue of EMF and other concerns), might the generation market be suppressed thereby driving up prices? Good questions all, and all requiring up-front planning analysis to identify the major factors effecting a competitive electric industry's balance and coordination.

COORDINATION–THE ROLE OF PLANNING IN A CHANGING INDUSTRY

Coordinated–or integrated–resource planning grew and adapted during the same time that PURPA set competitive forces in motion. Originally focusing on providing a common approach to evaluate utility and non-utility resources, both supply- and demand-side, IRP has accepted an increasing larger number of planning functions. Aside from the resource options themselves is the challenge of coordinating short-term cost and reliability targets with longer-range environmental and sustainability goals. These longer range goals include the assessment of many more non-price factors than in the past. In addition to traditional load growth and fuel market contingencies are "external" and environmental considerations. Add to these factors, changing technologies, regulations, and the industry itself, and the planning process reflects–all too well–the complexity of the industry at large. It is the fact that IRP tools can be used to model the total "industry" that makes them such valuable knowledge building tools in preparing for–and managing–a competitive industry.

IRP's Role in Helping Choose a Competitive Industry Structure

As mentioned above, IRP models can and should be used to assess how different forms of a competitive electric industry will perform. One way to think of this is to consider the IRP models as a *flight simulator* for the industry, where industry stakeholders are the test pilots assessing how various configurations of resources, regulations, and rules effect the performance of industry as it flies over uncharted territory–the future. The flight simulator is an apt analogy since it indicates the broad variety of approaches that can be evaluated to deal with a large range of options, uncertainties, and contingencies. Use of IRP-type tools in such a planning debate is essential if the policy dialogue is to go beyond the litany of stakeholder fears and concerns to become an evaluation of possible solutions.

Using IRP tools to evaluate alternate competitive arrangements not only allows the end result to be assessed, but transitional strategies to be evaluated as well. This may be critical since in the transition to a competitive industry structure we assume there to be only one ultimate set of transaction rules that apply to all eventual participants. Recognition of this is important since each utility, commission, and region of the country will begin their transition from a different starting point.

Figure One: Regional Differences Provide Different Starting Points

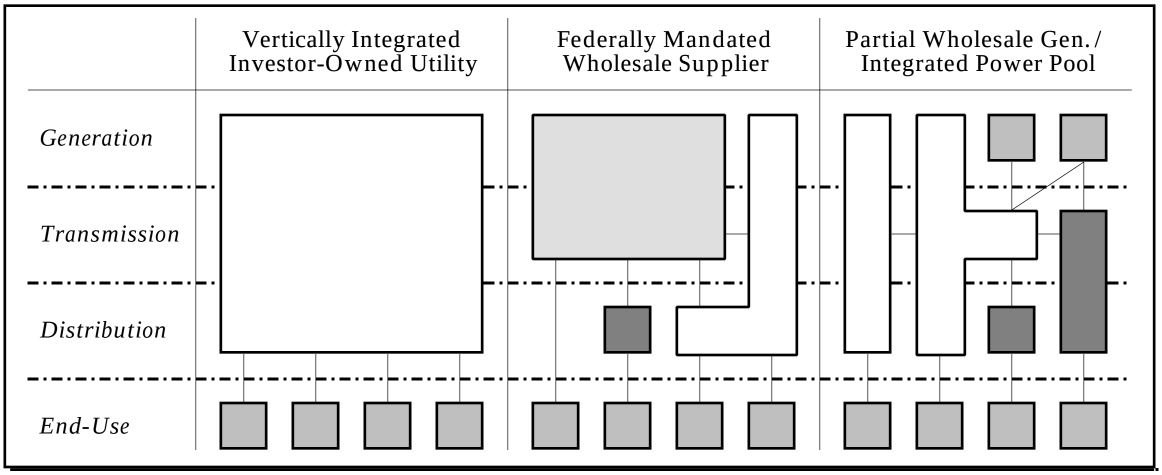
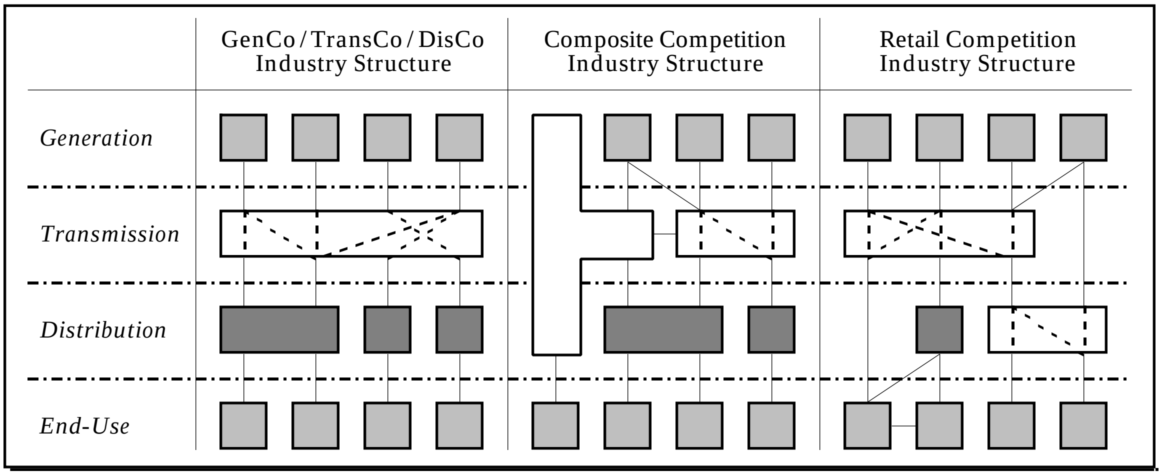


Figure One shows just several of the industry configurations existing today, including a monolithic vertically integrated utility, municipals, federally mandated wholesale providers such as TVA and BPA, and highly integrated power pools such as in the Northeast. Transitional strategies from existing industries to a proposed competitive structure help identify the feasibility of the various options.

Will a new generation of IRP tools be needed to conduct these types of analyses? Yes–to some extent at least. Current planning tools, such production-costing models are capable to of ascertaining the technological performance of various strategies. Such models are being enhanced to allow the evaluation of policy options such as emissions trading, and non-dispatchable technologies including demand-side management (DSM), renewable energy technologies, electric vehicles, and other electrotechnologies. These models simulate how the system *should* work, *if* whatever ownership arrangement and pricing strategy that was necessary was implemented *correctly*. The reason we can say this is because *if the market is set up correctly*, opportunities for windfall profits or misallocation of resources are minimized.

How do we analyze alternate transaction rules in order to select the most effective competitive arrangement? In order to simulate the performance of alternate ownership / pricing strategies, existing power system models will need to be modified. On the resource ownership side, factors related to generation unit cash flow and indebtedness may need to be added to assess power cost bid flexibility. Production costs, used to determine the most cost-effective “economic dispatch” of generation options in current models, will be replaced by bid criteria, allowing for more market flexibility in simulating power system operation and performance. Use of power cost bids rather than production costs automatically allows load shifting and load reduction options to enter the market. Other factors such as wheeling rates, interconnect and capacity charges can be factored in as well.

Figure Two: Alternate Competitive Industry Structures



In general, the selection of transaction rules identifies the ultimate structure of the competitive industry under consideration. Figure Two above illustrates some of the ownership and operational arrangements that have entered the policy discussion. The representation on the left shows a dis-integrated industry structure where the pre-existing industry resources have been broken up into separate wholesale generators, an open access transmission system (an RTG), and several geographically distinct distribution companies with native load customers only (i.e. no retail competition). In this example wholesale generators sell power directly to distribution companies using the transmission system as a common carrier for electric power and paying a wheeling rate. Distribution companies are the ultimate purchasers in the competitive structure, selecting resources to provide their native load customers with the preferred bundle of cheap, clean, and reliable electric services. Transaction rules bring generation owners and demand-side management providers together with the distribution companies, with the distribution companies deciding upon the best mix of resources for their captive customers.

The second example in the middle of Figure Two shows a composite industry structure with many features of the first, but for geographic or initial industry structure reasons the dis-integration of the vertically integrated utility is not fully realized. This example is included to illustrate that competition in the electric service industry may be attained without total reorganization of the current ownership arrangements. As with the assembly-line workers in the automotive industry, fear of unionization–not unionization itself–prompts management to offer equivalent wage and benefits packages to the company's employees. In this example, the "competitive" half of the electric service industry may set cost performance benchmarks for remaining vertically integrated utilities. As with most competitive industries, the transaction rules and quality of service are the most important aspects of industry performance, with ownership issues arranging themselves to follow suit.

The third industry structure example in Figure Two shows the greatest level of dispersed decision-making. With competition at the retail level, some individual end-users are managing their own electric service portfolios, employing the distribution company as a common carrier much like the transmission system. In some instances the transmission system, and even the distribution system can by bypassed if distributed generation or localized cogeneration options present themselves. Here distribution companies play multiple roles as managers of the resource portfolios for their remaining native load customers, and providers of emergency and backup power for large consumers engaged in the competitive market.

Which structure is right? The answer to that question will require hard work and lots of analysis. The eventual level of industry competitiveness desired may be determined by the cost of transition, plus the institutional and operational overhead associated with running one type of competitive industry versus another. Note that all three examples presented in Figure Two can occur if a staged transition is assumed. Initial dis-integration of the vertically integrated industry, as in the middle example, can over time lead to the GenCo/TransCo/DisCo structure, which can eventually evolve into the retail market example on the right. How can each of these structural examples operate to maintain the balance and coordination desired through the application of integrated resource planning techniques?

Who performs IRP in a Competitive Industry?

As ownership and control functions shift with industry dis-integration, who becomes responsible for the planning function? How is the planning function itself changed? Unlike many other industries, the electric service industry is unique. Rather than just a collection of buyers and sellers in a bidding frenzy, the electric system is an interconnected infrastructure all its own–one big integrated machine. Today’s industry recognizes this fact with large integrated utilities coordinating the building and operation of generating units with transmission system routing and operation, and the delivery of power down through the distribution system. Power pools recognize this “large machine” phenomena by coordinating the maintenance schedules of power plants owned by various utilities and IPPs. Operational performance is monitored as well, such as with the New England Power Pool’s “Performance Incentive Program” (PIP) whereby power plants with too high an unforced outage rate receive an economic penalty.

There are two types of planning issues when we look at a changing industry. First is the operational reliability of existing system components. As with the PIP program, there are operational rules that must be adhered to, just as there are transaction rules that serve to maintain the economic performance of the system. Many of these operational rules currently exist, such as the interconnection requirements that NERC (North American Electric Reliability Council) has established for new generators to hook up to the grid.

When we look at the GenCo / TransCo / DisCo example of Figure Two it becomes apparent that "infrastructure maintenance" planning will reside with the owners of those system components. But, who will manage the mix of those components? This is the second planning function, and it is the function most analogous to today's integrated resource planning. As with "infrastructure maintenance" planning, vertically integrated utilities manage their entire portfolio of resources, subject to regulatory approval. Resource ownership issues have little bearing in this portfolio management function, as can be seen with the concurrent growth in IRP and the participation of IPPs and ESCOs.

As we look at the alternative industry structures in both Figures One and Two, we see that the portfolio management function lies with the "purchasers" of power. In the GenCo / TransCo / DisCo example it is the distribution companies that will manage the portfolio on their native load customers' behalf. In the composite industry example it is a mixture of the DisCos and the remaining integrated utilities. In the retail competition example it is the retail customers playing the market who–by definition–have accepted responsibility for managing their own electric service portfolios, with the DisCos maintaining the portfolio management functions for their remaining "captive" customers.

IRP's Role in Managing a Balanced, Competitive Resource Portfolio

Just as we require the "flight simulator" of IRP tools to educate and inform ourselves of the competitive industry alternatives, we need to use IRP tools to manage our portfolio of electric service resources. This is the "grocery shopping" analogy referred to earlier. What is the mix of supply-side resources? Supply-side to demand-side? Short-term / spot to long-term / firm? As financial consultants attest, "we can design a resource portfolio that reflect *your* personal risk profile." Are you a rate minimizing industrial customer, or a green-pricing urban professional? What is your "balanced diet" of electric power resources?

As mentioned above, a balanced portfolio of electric service resources attempts to match the customers' preferences for cost reductions and power reliability and quality, with those aimed at reducing risks and improving environmental quality. Other factors such as employment impacts, low-income rate options, and overall resource use may also be considered. Those that make best use of the competitive market will be those who have best defined their preferred mix of resources.

The grocery shopping analogy essentially bridges this gap between determining one's balanced diet of electric power resources, and using the market to meet them. The first step is to use IRP tools to explore how different mixes of resources effect the cost, reliability, environmental factors, and vulnerability and volatility of services provided to the customer. Of course all components of a balanced portfolio are not subject to consumer choice. Regulation may define numerous "minimum dietary requirements," such as the recommended daily allowances of calories (minimum service requirements), vitamins (emissions limits), and fiber (fuel diversity).

Decisions delegated to the "shopper" relate to consumer's preference for seasonal produce (short-term contracts), canned goods (long-term contracts), seasoning (time-of-use rates), and dieting (DSM). Once the balanced diet is determined the retail customer, distribution company, or integrated utility can examine which resources are currently on hand (in the pantry or the fridge), and which it must go to the market for. Based upon what's on sale at the market the portfolio manager can select just enough to get through the week or "stock up." Based upon expectations of how long certain resources will be "on sale" and how dietary needs might change (unexpected company), the purchasers can alter their purchasing decisions while still maintaining their preferred long-term resource mix. As can be seen, the grocery shopping analogy can be stretched beyond recognition; short-term contingencies (borrowing from the neighbors), self-generation (the family garden), there's always room at the table for one more (commitment to serve), and packaged services (TV dinners).

In theory, once the longer-term balanced diet of resources are identified, generators, DSM providers, and other resource providers will be able to predict purchasers buying habits well enough to "keep the shelves stocked." Transmission and distribution companies will also be able to gauge how the industry is evolving well enough to supply sufficient power transfer capabilities. Again, foreknowledge of resource purveyors' general appetites will assist the infrastructure and its constituent players in transforming to–and maintaining–a stable competitive electric industry.

In this analogy the regulatory component serves to see that, 1) someone identifies the balanced diet of electric service resources, 2) someone goes to the market, 3) that the determination of the diet and the subsequent shopping are coordinated and consistent, and 4) that certain dietary minimums or maximums are maintained. As mentioned, this fourth point is where the coordination with environmental regulation occurs.

COMPLIANCE–COORDINATING COMPETITION & THE ENVIRONMENT

One of the big challenges in moving to a competitive electric service market is maintaining sufficient control over the system in order to meet environmental goals. The transportation sector already shows us the difficulty of regulating an industry of independent actors. Pollution allowances and emissions reduction credits are the latest example of how environmental regulators are using the tools of the market in order to attain emissions reductions in what is hopefully the most cost-effective manner. Are these types of emissions control strategies a burden or essential component of a competitive electric industry?

Environmental regulation in the electric sector is a piecemeal collection of rules. New Source Performance Standards (NSPS) for new generation specify LAER (Lowest Achievable Emissions Rate) and / or BACT (Best Available Control

Technology) technologies. Existing units, grandfathered under the Clean Air Act Amendments of the 1970s, now face RACT (Reasonably Available Control Technologies) for NO_x controls, and perhaps additional controls later depending upon the effectiveness of controls on cars and trucks and the accuracy of regional airshed models. Emissions trading for SO_2 is specified on a national basis by the 1990 Clean Air Act Amendment (CAAA), while regional applications of emissions permits or emissions reduction credits are being implemented along the east coast and in California. Siting is a whole other ballgame. Experimentation and trail runs of various emissions control strategies are an essential step in developing a reliable and consistent set of environmental "transaction rules," by which an increasingly diverse collection of industry actors will play by.

How do electric resource portfolio managers integrate such environmental goals into their plans when they no longer own the power plants, be they old or new? Let's take an extreme example. In an industry structure that allows retail wheeling, a electric service broker manages a portfolio of generation contracts, transmissions / distribution billings, and DSM initiatives for a small group of independent commercial establishments. Does the broker worry about the environmental compliance of resource contracts? The answer is not clear.

In a straight command and control regulation environment all the equipment under contract to the "portfolio cooperative" would meet environmental standards, with the cost of control bundled into the bids. However, straight technology specifications are now insufficient to assure compliance. A national SO_2 cap of 8.9 million tons by the year 2000 has been mandated by Congress in Title IV of the 1990 CAAA, with regional, seasonal, variable emissions caps to be expected for NO_x and VOCs (Volatile Organic Compounds) under Title I. How does this transformation from a "command and control," to a "command and compliance market" effect a competitive market structure? Do generation suppliers simply have to demonstrate they have purchased sufficient emissions allowances, or reduction credits elsewhere, or does the electricity buyer take the generation "as is," and generate his own allowances by playing the market, offsetting the emissions with renewables, by driving electric vehicles, or aggressively pursuing DSM? This is more a question for the environmental regulators.

Does the Environmental Protection Agency require the sellers or the purchasers of electric services to obtain and hold allowances? Requiring the sellers of electricity to obtain emissions allowances might reduce the scale of regulatory oversight, but could it seriously impede innovative compliance strategies that bundle disparate resources together. Since an allowance trading scheme is designed to facilitate innovative and cost-effective compliance strategies, it would seem unwise for environmental regulators to limit the range of participation early on. While a "polluter pays" mentality attacks the emissions at their source, a "user pays" approach may provide greater flexibility in devising compliance strategies.

Do environmental regulators have any "flight simulators" of their own? Can integrated resource planning tools be used concurrently to identify these resource options as well? One area of concern in the realm of emissions trading schemes is how emissions allowances, emissions reduction credits, and emissions caps interact. To demonstrate compliance with an emissions cap all major sources must be inventoried if not monitored. Allowances can be granted, or put up for sale, based upon the initial inventory and emissions reduction target. Emissions reduction credits, almost by definition, apply to "uninventoried" sources or else they would have allowances. This certainly applies to new generation sources. In a portfolio sense, new clean generation sources can be considered emissions reduction options if they are used to displace some of the largest polluters (i.e. reduction versus a cap). However under some definitions of emissions reduction credits (ERCs) a generator can only be considered a source of ERCs if its emissions reductions are "surplus" (i.e. in excess of what is required under environmental regulation). (Massachusetts 1992, p.108) Does this eliminate all new fossil generation from consideration since they must comply with LAER standards? Clearly this is an important issue, particularly as power systems age and the replacement of old generators with a new ones may achieve far greater emissions reductions than would be attained by putting additional controls on aging units. Do such restrictions on the definition of an ERC simply get in the way? How do we coordinate such compliance options, with themselves, as well as with a changing industry structure?

Discussion–Some Loose Ends in the Competitive IRP Debate

Other topics that need to be touched upon briefly incorporate the additional planning dimensions of long-term sustainable development, environmental risk mitigation, and technological change. Sustainable development has become a buzzword in some circles but warrants comment insofar that it reminds us that when it comes to the electric power sector, we are planning for the next generation as well as our own. As such, we should not forget long-term issues when looking to meet our short-term cost and reliability targets.

One of the hottest integrated resource planning topics of the past several years has been how to fold environmental and other "externalities" into the decision making process. Concerns over CO_2 emissions and global climate change, electromagnetic fields (EMF), small particulates, and air toxics are all valid since regulation of some type–if not the environmental health impacts themselves–may visit themselves upon us in the foreseeable future. One of the reasons the environmental externality debate got off to such a contestable start was that it was couched in an air of analytic certitude. All we had to do was add up these residual health and environmental damage costs and add them to the equation. This of course was never the case. One of the reasons they remained "external" was that they were hard to identify, difficult to quantify, nearly impossible to cost, and if the environmental regulators had done their job right–they were small.

Now for unregulated emissions such as CO_2 the "risk" and therefore impacts of future regulation could be high. Failure to consider these risks in the development of a competitive resource portfolio would be akin to ignoring fuel cost fluctuations when evaluating new fossil generation. In the case of CO_2, if the voluntary reductions requested in the administration's "Climate Change Action Plan" (Clinton and Gore 1993) don't occur, regulations requiring reductions post-2000 could be a real possibility.

By approaching the externality debate from an environmental risk mitigation standpoint we can utilize IRP tools to calculate the cost of "environmental insurance." By evaluating overcontrol options the premium (incremental cost) and coverage (additional emissions reductions) of various insurance policies can be ascertained and included into the resource mix. This may be good strategy even for criteria pollutants such as NO_x and SO_2, since some overcontrol allows increased flexibility in dealing with changes arising from shifting fuel costs, electricity demand, and the performance of emissions control technologies.

Environmental risk mitigation with respect to CO_2 emissions is probably the greatest concern however, not only because of its prominence in the political debate, but because of the fundamental changes it will require to significantly reduce CO_2 emissions and maintain those reductions over time. Unlike NO_x and SO_x emissions which are impurities in the combustion process, CO_2 formation is integral to the generation of electricity. It is the carbon-hydrogen bonds in fossil fuel which when broken release the energy by which turbine blades spin and generators produce electricity. True long-term reductions in CO_2 emissions, particularly as demand for electricity grows, will require a shift in the "metabolism" of the industry away from fossil fuels.

While it is prudent to evaluate such factors, it is not always necessary to take imminent action. Take for example today's rapid maturation of communication and computer technology. How fast is the technology developing? Aggressive introduction of such technologies early on might inhibit the acquisition of cheaper more powerful technologies later. Rapid development of both DSM and generation technologies *might* recommend a wait and see attitude. This approach to contingency planning is very apropos in the electric power sector where capital investments in generation and transmission system equipment have decades long consequences. Of course in a truly dynamic competitive environment investment in research for technology development as well as resource planning may have significant rewards, particularly if those developments help set the new standards.

CONCLUSION

Integrated resource planning tools will play an instrumental role in both the transition to, and operation of, a competitive electric industry. Used as a *flight simulator* to test out new transaction rules, IRP tools can be used to map out the transition to a competitive market structure as well as its ultimate configuration.

With careful application alternate market arrangements that concurrently address the issues of cost, reliability, quality, and environmental performance can be evaluated. Coordination of competitive market forces from both the public utility and environmental regulatory arenas will need to be evaluated with caution if they are not to impede one another in attaining a common goal.

Integrated resource planning will play a major role once the transition to a more competitive industry is under way. As changes to the industry occur the responsibility for maintaining a “balanced diet” of electric power resources will migrate from the vertically integrated utility of today to those responsible for procuring electric resources in the future, be they distribution companies, combined transmission-distribution companies, large retail customers playing the market, or “portfolio cooperatives” akin to today’s mutual fund managers. Integrated planning by electric resource portfolio managers is crucial if customers are to be afforded stable electric service costs with the level of reliability and power quality we enjoy today.

Also instrumental will be the ability of portfolio managers to use IRP tools to test the performance of resource options as fuel costs, technologies, and regulations change. Environmental risk mitigation, with respect to global climate change and other issues will need to be factored into resource decisions as better information becomes available. The responsibilities of public utility and environmental regulators will be to set the transaction rules by which industry operates, and the standards which resource portfolios must meet. Once the transaction rules are set regulators will have to allow market participants the ability to respond in order for the advantages of the marketplace to be captured. While the introduction of competitive forces into the electric industry will likely be an arduous task, use of integrated resource planning tools can smooth the transition, and make the end result a truly cost competitive and dynamic industry.

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