

The Power of Generation: Continued Economic Benefits from Independent Power Development in Louisiana



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EXECUTIVE SUMMARY

The purpose of this report is to update the CES IPP Study issued over one and half years ago on independent power development within Louisiana. This report addresses two major areas. The first area is providing an update to stakeholders on recent events in the competitive energy business, the factors leading to its recent downturn, and the impact that this downturn has had on power plant development in Louisiana. The second area addressed in the report is to provide an estimate of the potential economic opportunities for the more efficient dispatch of these merchant power facilities and the displacement of older, less efficient power generation facilities in the region.

Economic Opportunities Associated with the Construction and Operation of Independent Power Facilities

Over the past year, the industry has been rocked by a souring economy, industry scandals, regulatory uncertainty, and declining access to capital markets for continued generation development. As a result, a number of the projects that were originally envisioned for development in Louisiana, and around the U.S., have been cancelled. Despite the industry set-back, there is still a considerable amount of new development likely to come on-line in Louisiana over the next several years. This study finds that despite the industry set back, the economic benefits from independent power facilities include:

- A \$4.1 billion capital investment in the state by the end of 2005 in facilities that are likely to be completed;
- A likely investment of 7,406 MWs of new and efficient power generation;
- An estimated total economic impact associated with the construction of independent power facilities in Louisiana of \$1.5 billion by 2005. The direct economic impact is \$1.2 billion, and the “multiplier” effects of the construction activities in the state is \$179 million.
- The total potential employment opportunities associated with the construction of these independent power facilities is 4,963 jobs. Some 2,408 jobs are associated with the multiplier effects of these construction activities.
- Value added is a broader measure of the total income created directly in an industry. The estimated total value added associated with the construction of the independent power facilities likely to be developed in the state is \$237 million. Wages account for close to \$155 million of this increased value added.

- The estimated total economic impact associated with the annual operation of the facilities likely to be developed in Louisiana is \$932 million. Approximately \$31 million is associated with the multiplier effects of these activities.
- The estimated total employment opportunities associated with the operation of these independent power generation facilities is 787 jobs. Around 430 of these employment opportunities are from the multiplier effects of plant operations.

Efficiency Opportunities Associated with Dispatching Independent Power Facilities in Regional Wholesale Markets

- The standard efficiency rating used for electric power generation is referred to as the “heat rate” and is measured by the amount of energy used to generate one kilowatt-hour (kWh) of electricity. The unit of energy is typically measured in British thermal units (Btus). A lower heat rate entails a lower amount of energy used to produce a single kWh, while a higher heat rate entails that more energy is being used to generate a single kWh. The heat rates for new natural gas fired independent power facilities are very efficient:
 - As low as 5,000 Btu/kWh heat rate for a new cogeneration (combined heat and power) application;
 - As low as 6,000 Btu/kWh heat rate for a new combined cycle facility;
 - As low as 10,000 Btu/kWh heat rate for a new combustion turbine facility.
- There are 12,901 MWs of natural gas fired, utility generating capacity that is operating at a heat rate of 10,000 Btus/kWh or higher. There are 18,958 MWs of natural gas fired, utility generating capacity that is operating at a heat rate of 9,000 Btus/kWh or higher. This compares unfavorably with newer natural gas technologies under development by competitive developers.
- Louisiana and our regional utility generating facilities are old. Some 73 percent are over 20 years old, while some 43 percent are over the age of 30.
- There are potentially significant opportunities for independent power facilities to begin to displace older utility generation facilities. Based upon estimates provided in this report, the potential fuel cost savings associated with the displacement of these older units are as follows:

- For the Entergy sub-region as a whole, some \$411 million in 2000, \$825 million in 2003, and \$926 million in 2005;
- The share of these regional efficiency savings estimates for Louisiana could be as much as \$178 million in 2000, \$357 million in 2003, and \$401 million in 2005.

There is a lot of blame associated with the collapse of the competitive merchant energy industry.² A common and pervasive claim is that the industry has been the victim of its own negative actions. However, despite the purported revelations of anti-competitive practices and fraudulent activities, the industry is still an important party of the energy supply chain.

Generation developers will continue to be important as the operators of the fleet of power plants that will serve tomorrow's load. To date, this highly efficient power generation development has resulted in lower regional wholesale power prices, thus proving one of the points originally argued in the first CES IPP Study. Equally important is the fact that these IPP facilities will still have a considerable,

SECTION 2: REVISITING THE RISE OF INDEPENDENT POWER DEVELOPMENT

In the summer of 2000, the U.S. was rocked by another energy crisis that was most pervasively felt by the State of California. Here again, another regional power market was jolted by unexpected weather conditions, low generation availability, and high demand. Aggravating this situation was the fact that the annual average growth in peak demand for California during this period (1982-1998) was approximately 3.2 percent compared to an annual average increase in generating capacity of less than 1 percent.⁵ In addition, as many have recognized, the California regulatory structure for competitive markets was set up in such a manner that was doomed from its onset.

Some of the fundamental reasons for the regional dislocations of the late 1990s are:

- High growth in electricity demand that was not met by regulated utility generation additions; and
- A market that relied on older, less efficient technologies that do not run as reliably as newer ones.

The competitive energy business reacted favorably to both of these problems by announcing the development of a record number of power generation projects.

Throughout 2000-2001, the growth opportunities for the competitive energy business seemed boundless. Diversification into energy marketing and trading, to leverage the physical asset side of the business, seemed to be another stellar profit center for these companies. For the first time in almost 20 years, it became attractive to work in the high flying energy sector as young accountants, financial analysts, economists, and engineers flocked to the industry.

By late 2001, the fissures, that would quickly grow to gaping cracks, in the energy industry's financial and economic foundation were materializing. The retrenchment since that time has, and continues to be, relentless. Table 1 shows that the first casualty of the industry's demise was the competitive power generation opportunities scheduled for the next several years. Cancellations in independent power plants, scheduled to come on line in 2002, jumped to 15,000 MWs from a prior year level of close to 9,000 MWs. For the years, 2003-2004, these cancellations amount to well over 20 percent of originally planned projects. Each of these years could see at least 26,000 MWs of cancellations – if not more.

⁵ *Staff Report to the Federal Energy Regulatory Commission on Western Markets and the Causes of the Summer 2000 Price Abnormalities. Part 1 of Staff Report on U.S. Bulk Power Markets.* Washington, DC: Federal Energy Regulatory Commission, November 1, 2000: 2-3.

Year	Originally Announced Capacity	Annual Capacity Cancelled and Tabled	Annual Percent Cancelled and Tabled
2000	29,800	3,288	11.0%
2001	51,626	8,869	17.2%
2002	89,478	15,527	

Figure 1: Share Prices of Merchant Industry Participants by Originating Sector

Source: Various company stock prices

All of the indices have seen declines since the industry's high point in the late spring of 2001. By late fall, 2002, the utility index had fallen by over 25 percent, while the pipeline-originating merchants have fallen by over 50 percent. True independent merchants have fallen a dramatic 96 percent over a similar period. From about May 2001 to the end of 2002, the industry has seen a loss of market valuation of around \$250 billion.

The changes in debt ratings for many competitive energy companies have been equally traumatic and have resulted in serious financial impacts. For many companies, generation projects were financed under contingent lending, entailing that as debt ratings or financial performance change, so too do lending terms and schedules.⁶ Table 2 shows the changes in these debt ratings from 2001 to 2003

Company	Credit Rating	
	2001	2003
Allegheny	A+	BB-
Aquila	BBB	B+
Dynegy	BBB+	B
El Paso	BBB+	B+
Enron	BBB+	D
Mirant	BBB	BB
NRG	BBB-	D
PG&E/NEG	BBB	D
Reliant	BBB+	B-
Williams	BBB+	B+

Table 2: Competitive Energy Industry Debt Ratings

Source: Standard & Poor's

SECTION 3: REASONS FOR THE INDEPENDENT POWER INDUSTRY'S DOWNTURN

There is no single reason for the collapse of the competitive energy business. Some of the reasons are outcomes resulting from the industry' own decisions, while others are clearly exogenous. The remaining subsections addresses each of the issues in greater detail.

3.1 Industry Exuberance: No matter how you look at it, prior to 2001, there was a considerable amount of independent power plant development announced throughout the U.S. As shown earlier in Table 1, 511,000 MWs of capacity announced for development is equal to approximately 80 percent of the total 2000 electric utility generating fleet capacity.

The risk of developing this monumental and unprecedented level of power generation capacity did not go entirely unnoticed. In July and August, 2001, a number of equity analysts and investment bankers began to raise questions about the realism of these developments. In August 2001, for instance, Barron's noted that:

While brokerage analysts generally have applauded utilities' drive to exploit wholesale trading, some are now growing wary about the possible financial consequences of an energy glut. That's because a recent and unexpected short decline in power prices has raised red flags about the industry's future earnings from the sale of

In addition, it is probably not realistic to assume that most of the firms in the industry were unaware of the possibilities for over-development. However, even as late as 2001, there were still a number of positive indicators that could delay an overbuild situation, or at worse, minimize any over-development to a few players in a few geographic markets. The key to offsetting both of these potentially negative outcomes was: (1) continued strong electricity demand maintained by normal weather patterns and a healthy economy; and (2) the retirement of old, inefficient utility power generation. Both failed to occur, and as a result, the overbuild scenario became an unpleasant reality.

3.2 Economic Downturn: Throughout the late 1990s, there was a considerable amount of confidence about the continued upward pace of U.S. economic performance. This is probably best revealed in the rapid and continuous rise of the U.S. stock market as reflected in its major indices such as the Dow Jones Industrial Average, and more importantly, the technology-heavy Nasdaq. By spring 2001, however, the U.S. economy began to lose steam and fell into a recession. The terrorist events of September 2001, further exacerbated the already negative trends in the economy.

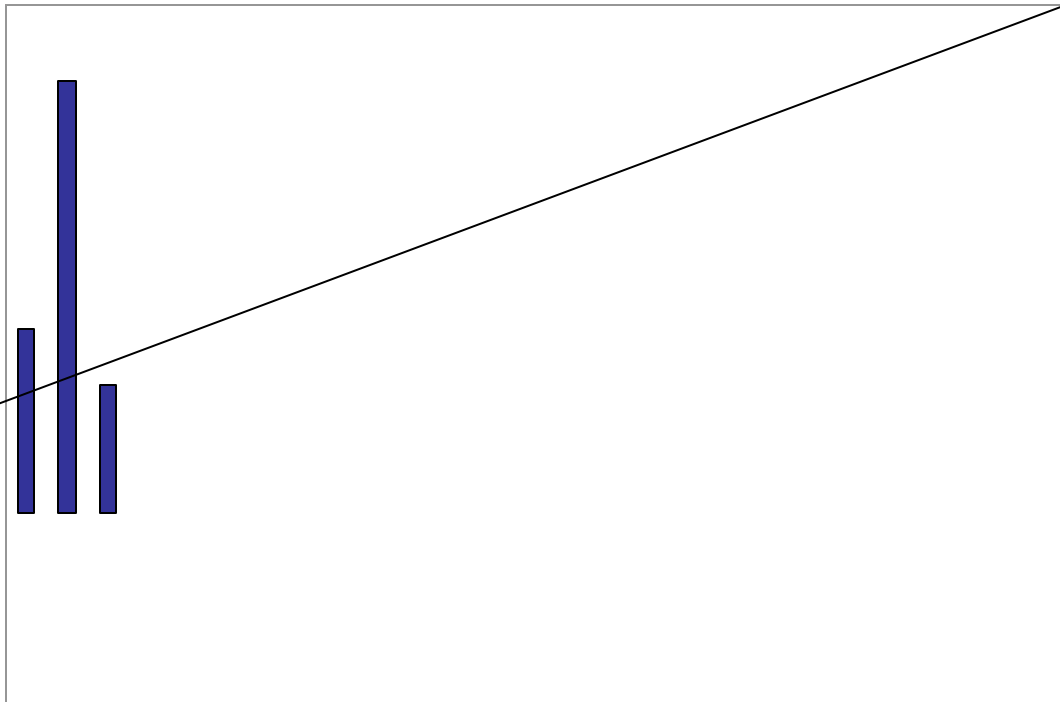


Figure 2: Annual Change of U.S. Real Gross Domestic Product (GDP)

Source: U.S. Department of Commerce

Outside of weather, economic activity is probably the most important determinant of electricity demand. If economic activity decreases, the amount of electricity demanded will decrease as well. As seen in Figure 2, the U.S. economy began to head into a recession in mid 2001. These decreases in economic activity, driven mainly by a sharp decline in the manufacturing and technology sectors, had significant implications for the independent power business.

Throughout the 1990s, the rate of growth of electricity ticked along at an average pace of about 2.7 percent per year. This growth was marked in part by the substantial performance of the U.S. economy. As seen in Figure 3, the growth of electricity consumption for 2001, however, fell to a degree not seen since the last recession in 1992.

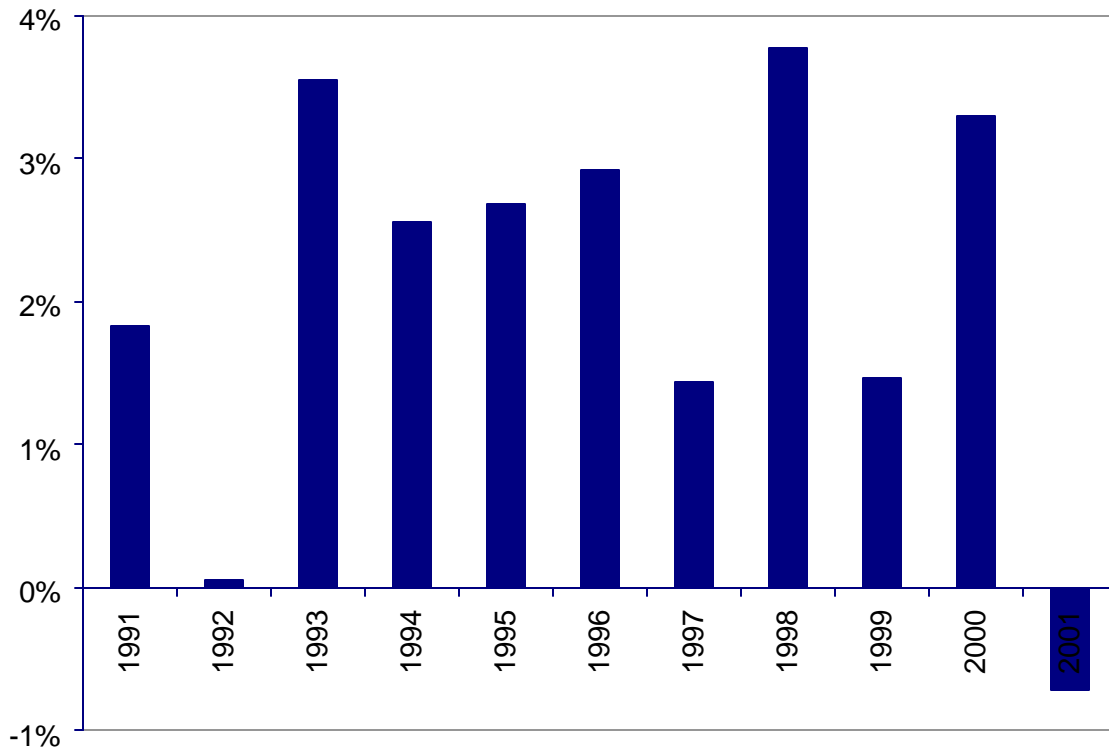


Figure 3: Annual Rate of Change of Electricity Consumption

Source: U.S. Department of Energy

The swift downturn of the economy caught the independent power business flatfooted. Electricity demand, stimulated by the high growth in manufacturing output and the electricity-hungry technology sector, vaporized. All that was left was the steady, but relatively limited growth in residential electricity usage – hardly enough to sustain the enormous amount of capacity scheduled to come

on line during the 2002-2003 time period. The per customer class changes in electricity consumption are provided in Table 3.

Year	Residential	Commercial	Industrial	Other	Total
2000	292,583	244,851	258,898	25,944	822,276
2001	322,613	256,980	247,563	27,208	854,365
2002	312,001	255,785	227,496	25,585	820,867

Table

not only in California, but also at the FERC, the Securities and Exchange Commission (“SEC”), and Congress. For instance, a recent Senate Governmental Affairs report was highly critical of FERC’s inability to adequately review and respond to the California crisis:

...the Commission did nothing to address the problem of individual companies’ abusive practices, including responding to staff’s proposal to continue its investigation, for almost 15 months after receiving the staff bulk power report. This was despite the fact that FERC continued to receive additional evidence that market abuse was occurring.

...Had the Commission agreed to start a more thorough investigation immediately following the release of the November 2000 Staff report [on Western Bulk Power Markets], it may well have uncovered earlier the type of evidence it believed necessary to substantiate the charges of market abuse in California.⁹

California has provided a virtual stream of constant bad news in the industry that continues to raise questions about the character, as well as long run liabilities, of the industry. As long as the Western power market problem remains unresolved, it will be a thorn in the development of the merchant energy industry and competitive wholesale markets.

3.4 Regulatory Shortcomings: Order 888 removed a number of important barriers to wholesale power competition. However, it did not go far enough in the area of transmission governance. From its promulgation in 1996, through to the follow-up Order 2000, the FERC has relied upon a light handed regulatory approach of voluntary organization as a means of removing the remaining vestiges of vertically integrated monopoly control. In some parts of the country, this approach has been more successful than others. However, in other parts of the country, particularly those that do not have long track records at regional integration, the process of introducing complete wholesale competition has been more painful.

The process initiated by Order 888 was successful in creating an open market by developing an open access transmission tariff (OATT) and open access real time information systems (OASIS). However, the new paradigm has suffered with issues associated with transmission governance. The first challenges were in the post Order 888 environment that envisioned Independent System Organizations (ISOs) as the means of securing transmission independence. The slow, inconsistent pace of ISO development, in addition to the failure of some

⁹Senate Governmental Affairs Committee. Majority Staff Memorandum. *Committee Staff Investigation of the Federal Energy Regulatory Commission’s Oversight of Enron Corporation*. November 12, 2002: 39.

regions to even develop an ISO or other form of independent transmission governing body, led the FERC to issue a more stern policy on transmission organization known as Order 2000.

The new institution of preference, known as Regional Transmission Organizations (RTOs), not only supported a revised and expanded version of transmission governance, it also supported the idea that for-profit transmission companies (Transcos) could exist within an RTO umbrella. The key with Order 2000 was to promote the development of these RTOs on a more “expedited” basis. Nevertheless, the approach was still voluntary and left a significant degree of latitude to transmission owning/forming companies.

Governance is not a theoretical issue. It impacts a number of short term and long term transmission activities including security coordination, long term planning, interconnection agreements, system impact studies, the calculation of available transmission capabilities (ATC), market monitoring, and congestion management. The day in and day out process of moving electrons is entirely governed by the operators of the power transmission grid in any given region. If this process is governed by an entity that also has competing generating assets, the conflict of interest is wholly apparent.

The next stage in the process of opening wholesale power transmission systems, and standardizing processes for moving electricity in wholesale trad3tDro4t issth Ordj 0 -13.5 TD

SECTION 4: INDEPENDENT POWER DEVELOPMENT IN LOUISIANA

Louisiana is an attractive area for locating independent power facilities. These important attributes, while outlined in detail in the 2001 CES IPP Study, are worth repeating.

For independent power developers, one of the primary and important Louisiana attributes is its considerable supply of natural gas. Louisiana is the second largest producer of natural gas in the U.S. Approximately 90 percent of all announced independent power plant additions in the U.S. will be gas-fired. Figure 4 shows the relative gas production by state for 1999.

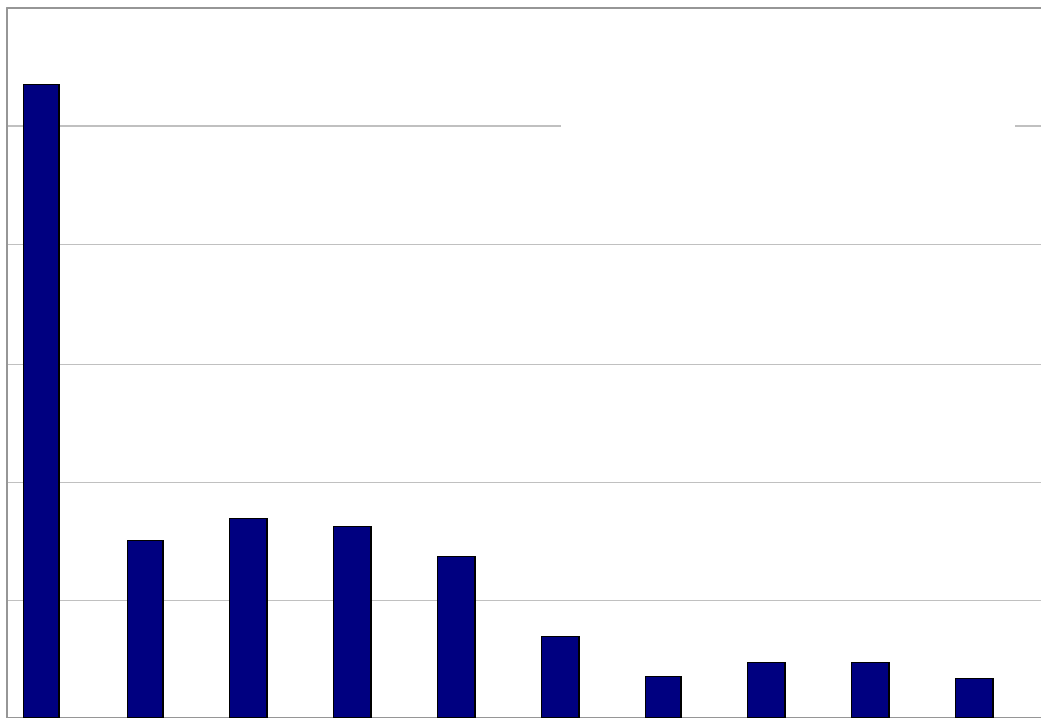


Figure 4: Natural Gas Production By State, 2000

Source: U.S. Department of Energy, Energy Information Administration, *Natural Gas Annual*.

Louisiana also has an extensive network of pipelines to transport its large supplies of natural gas. As shown in Figure 5, a considerable amount of natural gas flows through Louisiana to other regions in the U.S.

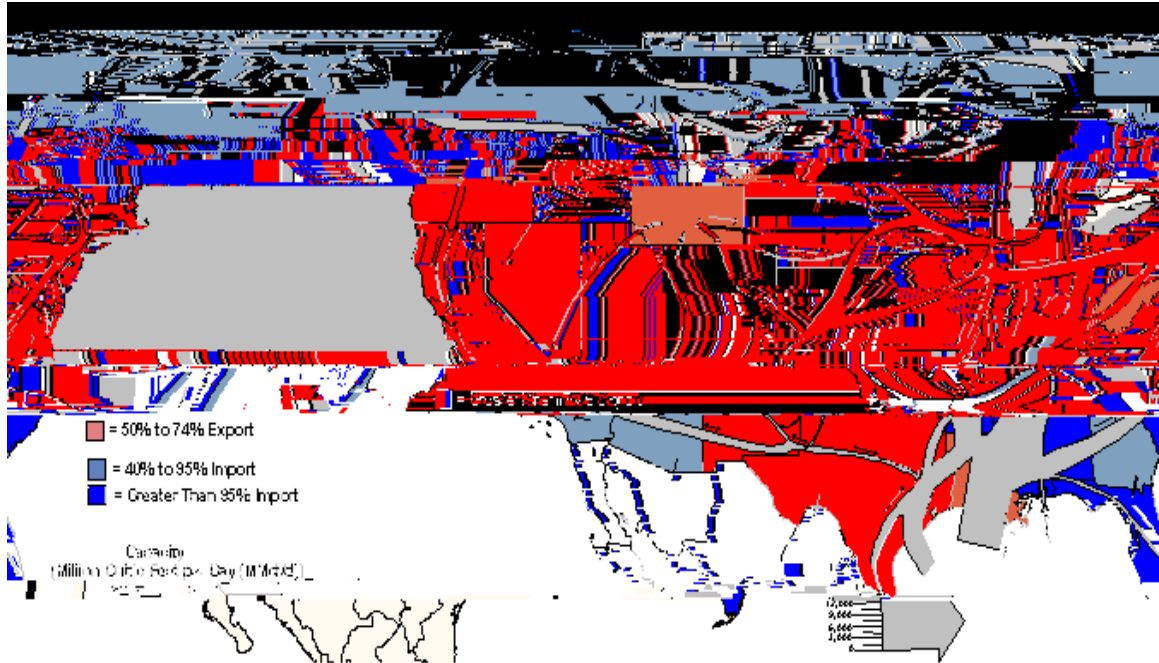


Figure 5: Natural Gas Flows in North America

Source: Energy Information Administration. (1999) *Natural Gas Trends and Issues, 1998*. Washington: U.S. Department of Energy.

Louisiana’s natural gas pipeline industry is also marked by a diversity of providers of transportation services. There are a large number of inter- and intrastate natural gas pipelines in the state. Competitive forces in the industry give independent providers a number of gas transportation alternatives that are not available in other regions. The pipeline industry in Louisiana is one of the most pervasive in the country – one the reasons why it is referred to as “pipeline alley” by many industry analysts.

Louisiana also has a relatively extensive number of electric power transmission lines that can support and facilitate trade in the state and the region’s wholesale

power markets. Louisiana has 23,000 circuit miles of electric power transmission lines – the third highest level in the southeast.¹⁰

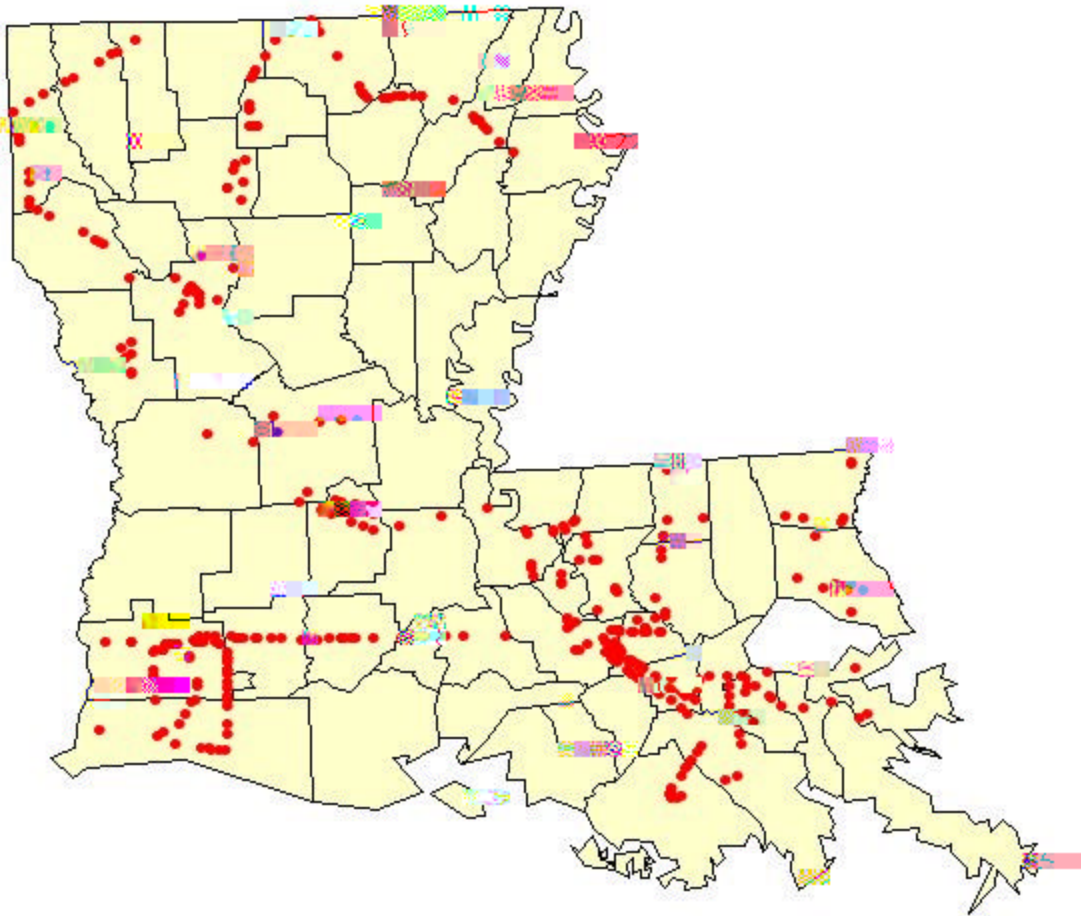


Figure 6: Louisiana Gas and Power Transmission Infrastructure

Source: LSU Center for Energy Studies

Figure 6 presents a map outlining all of the intersections between the natural gas and electric power industry transmission infrastructure. This map is an interesting representation of the confluence between these two important energy industries. Intersections between gas and power transmission lines reveal potential opportunities for siting an independent generating facility.

¹⁰As noted in the earlier CES IPP Study, despite the extensive nature of the existing transmission system, there is still a need to upgrade transmission systems through many areas of the southeast to facilitate the growing amount of wholesale trades on the system. One of the ongoing challenges associated with wholesale competition is associated with providing the right incentives for appropriate transmission system planning, upgrades/construction, governance, pricing, and cost recovery.

Another important reason for independent power generators locating in Louisiana is the competitive opportunities these companies have for indirectly serving the state's retail load. Under Louisiana law, and the rules and regulations of the Louisiana Public Service Commission (LPSC), competition for retail end users is

Figure 8

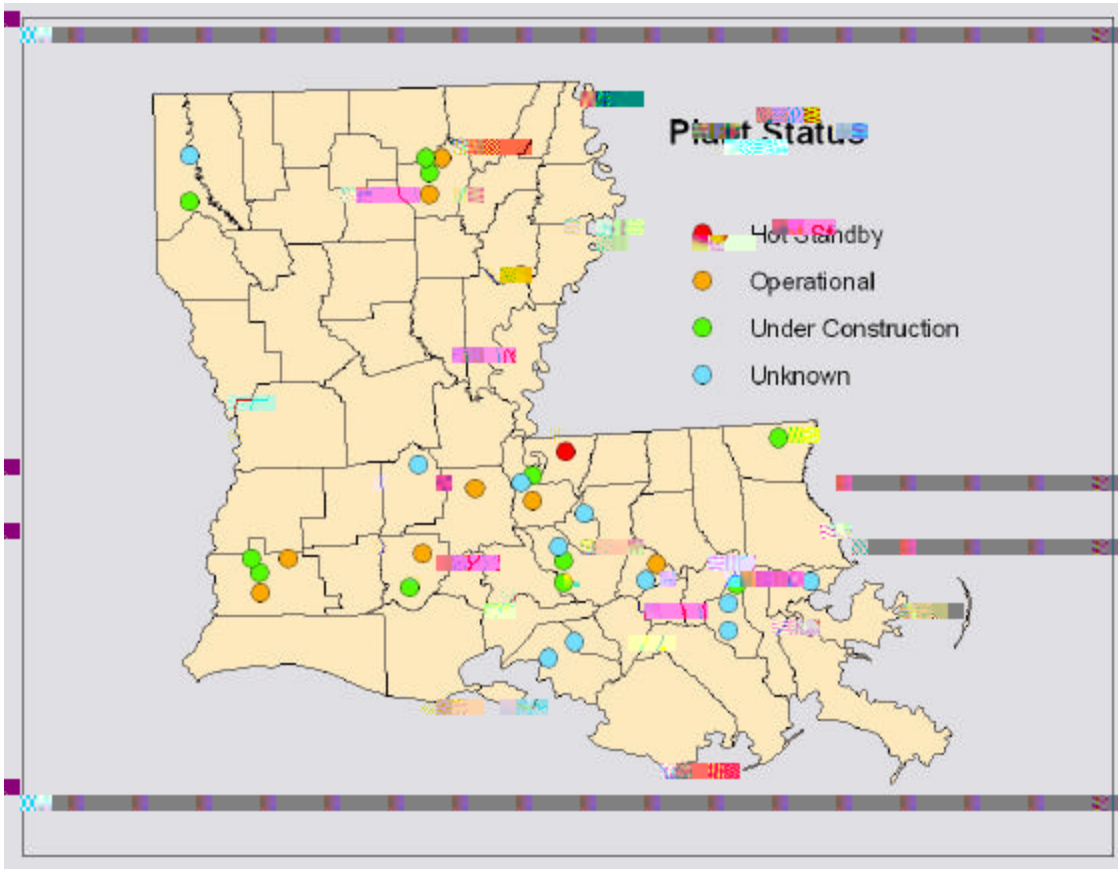


Figure 9: Announced Independent Power Facilities in Louisiana

Despite what appears to continue to be a significant amount of development in the state, Louisiana has also felt the pinch of the recent industry downturn. New capacity development in the state has come to a halt. At the time of the last CES IPP Study, the important issue under investigation was determining how much independent power development would occur in the state, and the economic consequences of this development. Today, the issue under investigation is the determination of how much announced development will be maintained, rather than how much new capacity will be developed.

The high degree of relatively late regional power plant development, in addition to the existing instability in the energy industry, creates considerable uncertainty for ongoing IPP development in Louisiana. The southeastern region, also known as the SERC region,¹¹ has an extensive amount of capacity slated for development over the next decade. Table 4 breaks this development out on an

¹¹SERC stands for the Southeastern Electric Reliability Council and is the regional reliability planning institution associated with the North American Electric Reliability Council (NERC) that oversees and governs many transmission and reliability operations and procedures.

annual basis for each NERC sub-region including the Entergy sub-region (ENT) that includes Louisiana. As seen from the table, the Entergy sub-region is one of the most active in the southeast, accounting for 29 percent of all announced developed over the 2002-2010 period.

Region	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
--------	------	------	------	------	------	------	------	------	------	-------

Unfortunately, there is an almost equally large percent of announced capacity that is “at risk” of not being developed. To date, 1,000 MWs of capacity has officially been cancelled or tabled. Another 5,341 MWs is planned or under early development. The continued development of these projects in the current energy industry environment is questionable. Thus, 46 percent of the previously announced capacity slated for development in the state may never materialize. As shown in Figure 10, Louisiana has the highest levels of capacity “at risk” relative to its neighboring states.

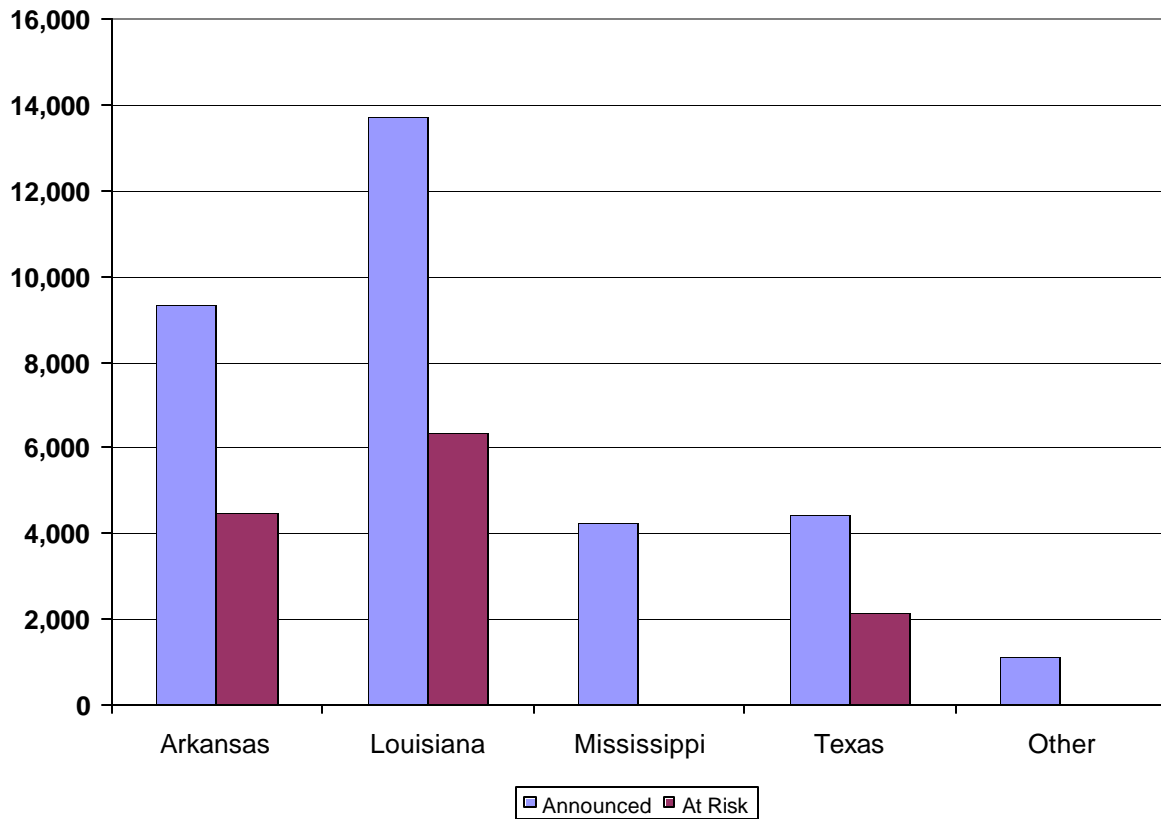
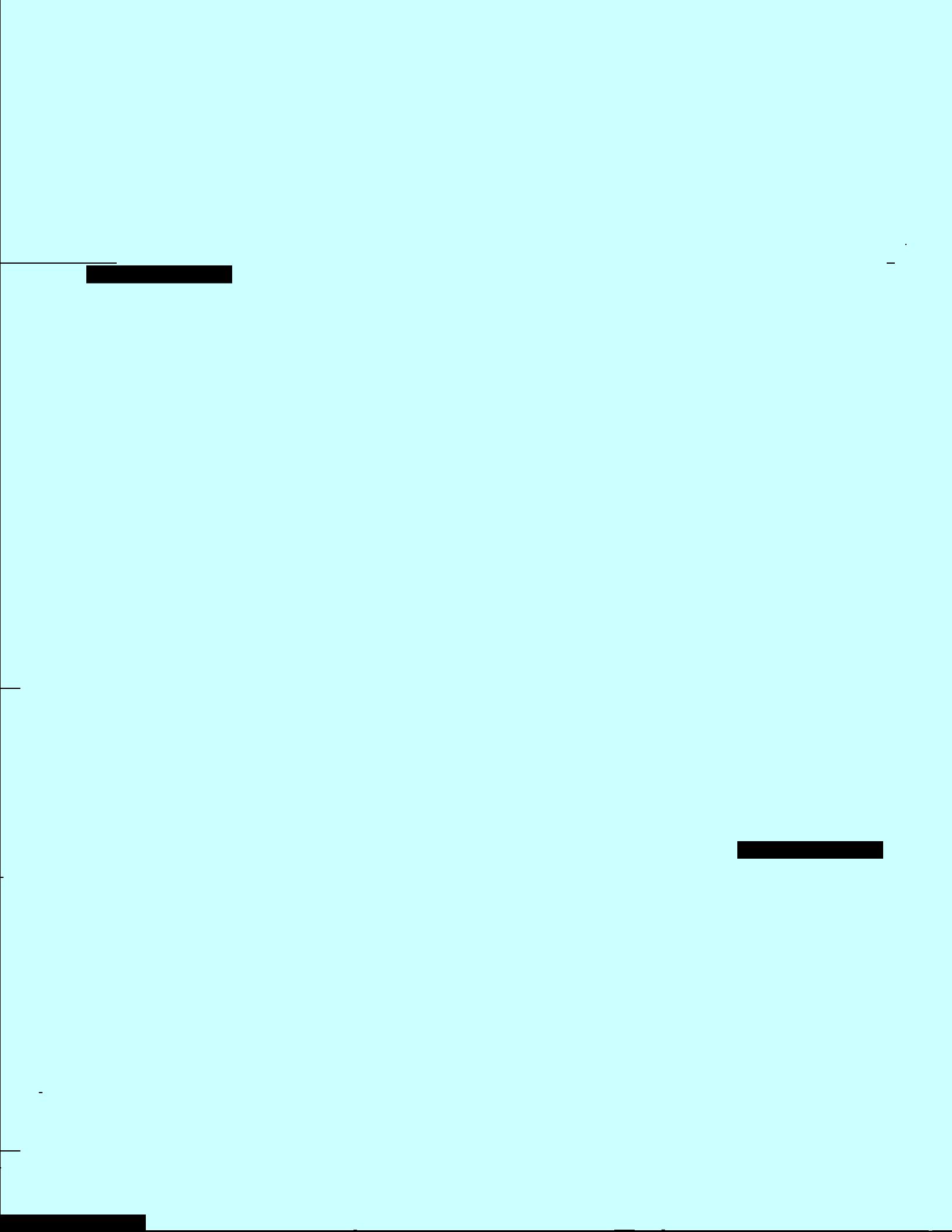


Figure 10: Regional Independent Power Capacity At Risk from Not Being Developed (Entergy Sub-region)

Source: RDI International

As noted above, capacity identified as being “at risk” probably has very little chance of development, and as a consequence, will not result in an economic impact on Louisiana. Since the economic impact figures included in the earlier CES IPP Study were based upon announced capacity additions, some adjustment seems to be in order. Table 6 presents a revised estimate of the



O&M Impacts	Original Impacts	Potential Losses	Net Impacts
<i>rTD /F2</i>			

\$133 million. Total wages are estimated to be around \$38 million with some 787 jobs created.

While the economic impacts associated with constructing and operating these competitive independent power facilities are considerable, they are only one part of the overall benefits associated with more vibrant wholesale competition. These new highly efficient generators have the ability to displace older less efficient utility generation. These efficiency enhancing opportunities create lower cost wholesale electricity, which, in turn, lowers the cost of purchased power for regulated utilities. These lower purchased power costs, in turn, can be passed along to ratepayers who benefit from this enhanced wholesale competition. The next section of this report examines the opportunities for efficiency improvements and estimated the potential implications for Louisiana ratepayers.

Figure 11: Hypothetical Example of Efficiency Enhancing Opportunities of Competitive Generation Markets

Two supply curves have been illustrated in Figure 11. The shift from the first supply curve (S) to the second supply curve (S') is meant to represent the introduction of newer, more efficient independent power generators. The supply curve shifts out because costs are lower throughout the better part of the range of the curve. Demand is represented by the curve D, and at a fixed level (q). As seen in the figure, the displacement of older resources with newer ones, causes the supply curve to shift outwards (from S to S'). As a result, prices are lowered from P to P'. Even without retail competition, these highly efficient resources will lower purchased power costs for incumbent utilities serving regulated load, and thereby lower bills for consumers

with trying to maintain a reliable and stable electric power network. In many instances, voltage support, backup, and other system reliability requirements must be provided locally. This can prevent lower cost power, located outside the immediate vicinity, to be utilized. Again, this prevents the supply curve from reaching the full benefits illustrated in Figure 11.

Market Structure Constraints: Another potential limiting constraint to attaining an optimal region-wide least cost dispatch is associated with market structure in many parts of the U.S. These market structure problems can be the result of poor market design and potential market manipulation, as seen in the Western U.S. during the 1999-2000 time period. Another equally important market structure issue is associated with the vertically integrated utility market structure that exists throughout most of the southeastern U.S., including Louisiana.

A vertically integrated structure entails that generation, transmission, and distribution are all owned by one company. Many competitors find themselves in the position of having to compete with utilities that, in addition to owning generation, also control the monopoly transmission system used to move competitive wholesale electricity.

Many competitors argue that incumbent utilities' investments in generation can provide a powerful economic incentive to operate their monopoly transmission systems to favor their own utility affiliated generation, and to discriminate against non-affiliated generators. In addition, an incumbent utility's significant investments in its own generation can also lead to distortions in the purchased power decisions that it makes on behalf of its captive customers. In this instance, incumbent utilities can have strong economic incentives to preference their own, or affiliate-owned, generation over competitors to maintain their generation market share.

This inherent conflict of interest, a common characteristic of vertical market power, is the primary reason that regulators insist upon independent operation of the transmission grid. Many utilities would argue that since the passage of Order 888, and the implementation of Open Access Transmission Tariffs (OATTs), open and nondiscriminatory access has been the rule of the day for vertically integrated utilities. However, in its recent Standard Market Design (SMD) Notice of Proposed Rulemaking (NOPR), the FERC noted that, despite these

discriminatory transmission practices have continued to occur...[FERC, Notice of Proposed Rulemaking, Docket Number RM01-12-000 at 15, emphasis added.]

5.1 Methods for Estimating Wholesale Market Efficiency Opportunities

One of the primary means of estimating efficiency opportunities for wholesale markets is by developing an economic dispatch model that simulates how power plants are actually run in a region. This baseline is then compared to a simulation based upon the most optimal solution. Here, “optimal,” or the most “efficient,” is defined as the least cost resource. Under an optimal dispatch, generators are essentially ranked, or “stacked” based upon their costs, with the lowest cost unit being utilized first, and the highest cost unit being utilized last.

Our method for developing an economic dispatch model for the region¹² was relatively straightforward. The steps followed include:

- (1) Developing a regional baseline wholesale electric supply curve to determine a baseline level of generation and production costs;
- (2) Estimating an optimal wholesale electric supply curve based upon least cost dispatch regardless of the type of provider; and
- (3) Taking the difference between the baseline and optimal supply curves to estimate the economic efficiency opportunities.

The data used in this analysis came from a variety of sources that included FERC Form 1s, Form EIA-411, RDI International Power Generation Database, Utility Data Institute, and the Environmental Protection Agency’s EGRID air emissions database. The economic dispatch, or rank ordering, of facilities was based upon fuel costs as a measure of marginal costs. Thus, the savings estimated in the models are fuel-related only and do not include such items as capacity payments for securing the resources on a longer term basis.

Admittedly, this development of a wholesale power market is a simplification of the complex methods by which electricity markets work. In addition, this approach does not take into account the potentially considerable transmission or reliability constraints discussed earlier. This approach does, however, present a generalized estimate of forgone opportunities for expanded wholesale trade in the region. More sophisticated power market modeling approaches, which are virtually infinite in their assumptions and detail, could develop more detailed results. Nevertheless, the basic premise that more efficient generation can lead to lower wholesale prices, which in turn, can lead to lower prices for customers,

5.2 Empirical Estimates of Efficiency Opportunities From Expanded Wholesale Markets

The main efficiency opportunitie Markets

Table 9 shows, individually, the number of large (over 100 MW), high heat rate units that are currently in operation in the Entergy sub-region of the southeast.¹⁴ This figures are based upon each unit's "full loaded test heat rate" which is an estimate of its best operating efficiency under full load conditions. In other words, it is the outer boundary of operational efficiency these units can meet. Their actual 2000 reported heat rates have been presented in an adjoining column of the table.

Plant Name	COD	Fully Loaded Test Heat Rate	Actual Heat Rate	Capacity	Age	Annual Capacity Factor
Big Cajun 1, Unit 1	3/1/1972	10,322	10,700	115.0	31	11.0%
Lewis Creek 1	1/1/1962	10,352	10,810	271.4	41	60.2%
Lewis Creek 2	1/1/1962	10,352	10,590	271.4	41	59.9%
Robert E. Ritchie 1	6/1/1961	10,372	12,420	359.0	42	11.9%
Nelson 4	7/1/1970	10,419	11,660	591.8	33	35.8%
Willow Glen 1	3/1/1960	10,431	12,060	163.2	43	29.7%
Sabine 5	12/1/1979	10,442	11,160	507.4	24	51.9%
Nelson 3	3/1/1960	10,476	11,880	163.2	43	32.2%
Baxter Wilson 1	2/1/1967	10,480	10,220	544.6	36	38.2%
Rex Brown 4	9/1/1959	10,499	15,900	238.7	44	12.0%
Willow Glen 5	7/1/1976	10,622	12,820	591.8	27	18.4%
Big Cajun 1, Unit 2	4/1/1972	10,635	11,140	115.0	31	11.3%
Willow Glen 3	12/1/1968	10,698	11,130	591.8	35	16.5%
Willow Glen 2	1/1/1964	10,813	15,590	239.4	39	26.3%
McClellan 1	1/1/1972	10,868	--	136.0	31	32.9%
Michoud 2	2/1/1963	10,997	8,730	261.8	40	35.3%
Ninemile Point 2	7/1/1953	11,135	12,950	112.5	50	30.6%
Delta 1	11/1/1953	11,141	15,540	112.5	50	15.5%
Michoud 3	8/1/1967	11,288	11,020	582.3	36	47.5%
Harvey Couch 2	8/1/1954	11,372	14,480	156.3	49	9.7%
Michoud 1	5/1/1957	11,427	12,660	115.2	46	22.8%
Delta 2	12/1/1953	11,710	16,790	112.5	50	12.1%
Lake Catherine 4	4/1/1970	11,870	10,760	552.5	33	27.6%
Cecil Lynch 3	6/1/1954	12,012	20,400	156.3	49	3.2%
Lake Catherine 3	4/1/1953	12,208	13,660	119.5	50	12.1%

Table 9: Top 25 High Heat Rate Units (Units 100 MW and Greater)

¹⁴ A number of utilities operate in the Entergy sub-region other than the operating companies of Entergy Corp. Thus, the units presented in Table 11 include those of other utilities operating in the Entergy subregion.

The first step in the analysis was to develop two separate regional supply curves. The first supply curve can be thought of as the baseline, and reflects an estimate of how power generation units in the region are currently being utilized. The base year for the analysis was 2000.

The second supply curve developed in the analysis is an approximation of the “optimal” least cost dispatch for the region. This curve treats all units equally, and runs the least cost power plant first, and the most expensive power plant last. Since a number of independent power facilities have, or will, come on line after 2000, similar curves have been developed for the year 2003 and 2005. Electricity demand was also forecasted for this period based upon information provided by the North American Electric Reliability Council (“NERC”).

The results from the 2000 test year analysis have been presented in Figure 12. The higher supply curve displayed in the analysis represents the estimated baseline dispatch of generating units in the region, while the lower supply curve represents the simulated optimal dispatch. As seen from the analysis, there appears to be a number of efficiency enhancing opportunities throughout the system. The source of these efficiencies include greater utilization of independent power facilities.

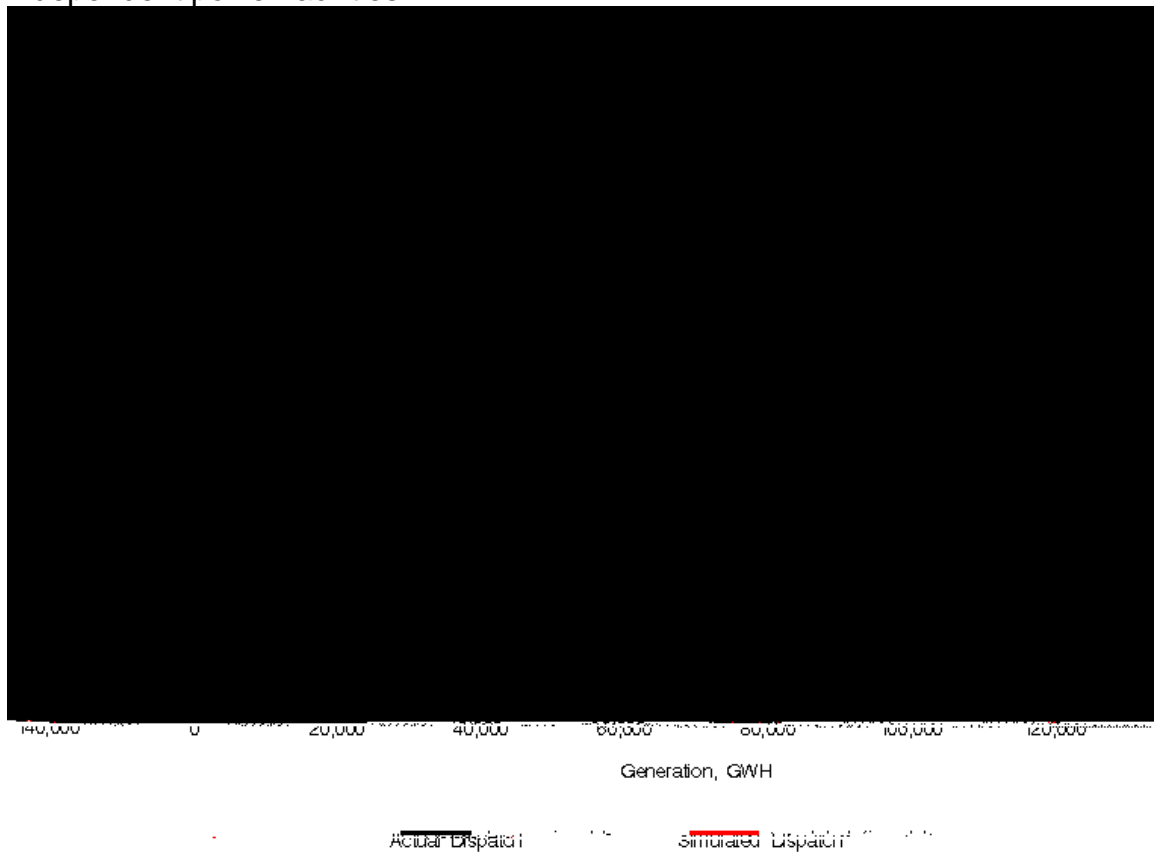


Figure 12: Estimated Base Case and Revised Least Cost Dispatch

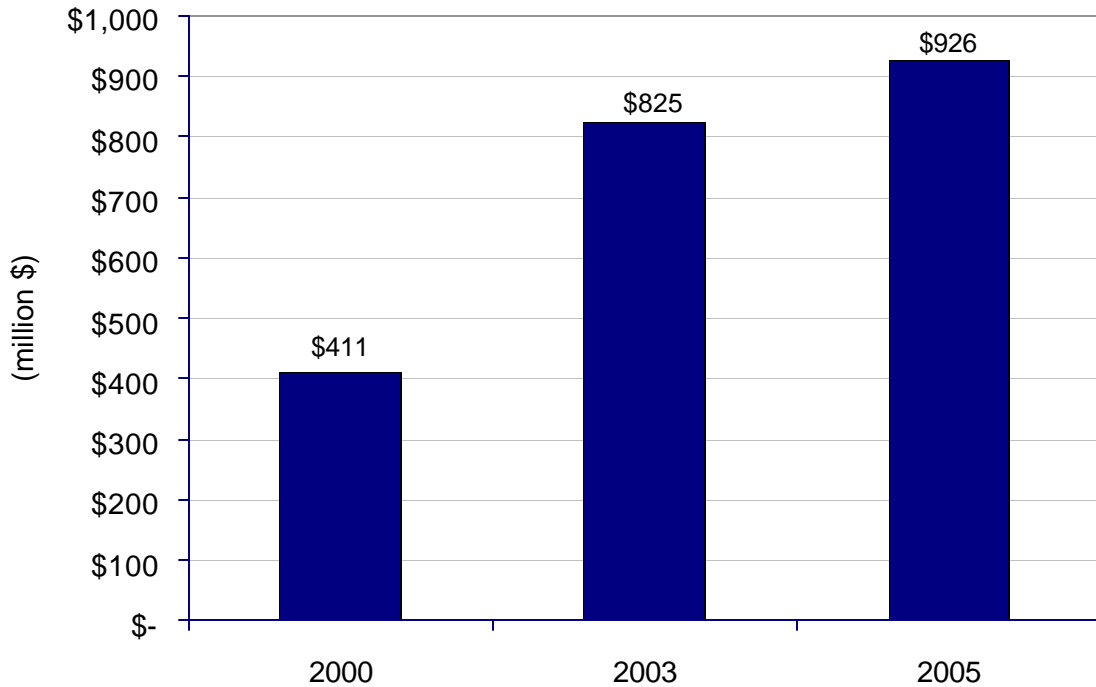


Figure 13: Estimated Total Regional Savings Associated with Efficiency Gains (\$ Millions)

Perhaps the most important issue associated with these savings is what they could possibly mean to ratepayers. We estimated that if all of these efficiency gains could be achieved for customers, there would be a sizable one time benefit for the region, in general, and Louisiana, more specifically.

Table 11 shows the total regional savings associated with more efficient generation in 2000, 2003, and 2005. Three different sets of saving estimates are presented in the table. The first column identifies total estimated regional savings for the entire Entergy sub-region area of the southeast. The second column presents the estimated savings for the Entergy operating companies within the overall Entergy sub-region. The third column provides an estimate of the savings that would accrue to Louisiana operating companies and their customers.

Table 11: Break out of Estimated Regional Savings from Efficiency Gains

A rough approximation of the benefits per customer class in Louisiana can be developed by allocating total Louisiana savings based upon the total sales share for each class. Table 12 breaks these savings out on per customer basis for each major customer class.

	Estimated Savings	Estimated Savings	Estimated Savings

There are a number of legitimate reasons why these competitive facilities may not be getting a greater piece of the region's generation pie. As noted elsewhere in this report, there may be significant transmission and reliability constraints that prevent these facilities from being used. As some incumbent utilities have noted, some of these facilities may simply be in the wrong place given existing infrastructure constraints. In addition, one of the largest potential purchasers of wholesale energy, Entergy and its regional operating companies, has been soliciting bids from competitive providers over the past several years. In addition, over the past year, the Louisiana Public Service Commission has instituted a competitive bidding requirement on utilities that requires them to issue their resource requirements out to competitive bid. Given this framework, one would think that if the capacity and energy bids from these merchant providers were competitive, awards would have been offered and accepted.

Many in the independent power community, on the other hand, recognize that all of these benefits may be difficult to attain in the short run due to legitimate infrastructure constraints. If there were an independent authority governing the transmission system, and making decision about the economic utilization of the region's power grid, constraints associated with transmission and reliability may be easier for many competitors to accept. However, many competitive merchants believe that market structure problems associated with vertically integrated incumbent utilities controlling the grid is the source of the problem, and resulting in a significant number of economic opportunities being unattained. Many have also complained about the competitive bidding practices of the region's incumbent utilities and the fairness of these processes.

Our report has provided a number of estimates of the potential savings that could accrue from a more vibrant regional power market in which newer sources of power were able to be utilized in a fashion comparable to existing utility generation. We recognized that this approach is based upon empirical modeling, which by its definition, is an approximation of the real thing. As noted elsewhere in this report, these estimates should be thought of as the "book-ends" of the economic opportunities for the region. We hope that this analysis will open further discussion about why so many older, uneconomic units continue to run in this region, when more efficient, environmentally sensitive resources located in Louisiana fail to be utilized.