# OILFIELD ELECTRICAL COSTS CAN BE REDUCED BUT OFTEN NOT BY TRADITIONAL METHODS THE HISTORY OF ELECTRICAL OPTIMIZATION AT SALT CREEK

by

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## ABSTRACT:

As most of the energy companies struggle to remain competative in the domestic market, one of the costs which seems to continue to climb is the cost for electricity. For some operations, these costs can represent as much as fifty percent of the operating costs. To continue to operate in the domestic market, it is imperative that energy companies explore all avenues for reducing this cost to a minimum level.

Mobil Exploration and Producing U.S., has entered into a contract with Brazos Electric wherein Brazos Electric will purchase 40,000 kilowatts of Mobil's Salt Creek Field Unit electrical demand, for $25 per kilowatt, or $1,000,000 per year for two years. This paper will discuss the details of this contract and cover the history of the electrical cost reduction methods used at Mobil's Salt Creek Field Unit which led to this agreement. These efforts have combined to reduce the total electrical costs from $0.06/KWH to today's price of $0.0365/KWH.

## INTRODUCTION:

For many years, energy companies were immensely profitable producing, transporting, processing and selling crude oil and petroleum products. After the energy crisis of the seventies, and the introduction of OPEC, the energy business has not been the same. Suddenly, energy companies were forced to operate as efficiently as possible to compete in the global market. International competition continues to mandate that only companies that can operate cost effectively and efficiently will survive.

Since energy companies cannot control the price for our product, we must control our costs to bring that product to market. In recent years, energy companies have been forced to reduce operating costs. Fewer people are doing more with less. Some of this can be attributed to the efficient use of new technology, but impressive results were often achieved just by working "smarter".

We have all worked to get our production costs as low as possible. Our operating budgets have been whittled to the bone and "Layoff" has become a household word. Through this all, one of the largest items on just about any operating budget has often been overlooked. That item is the cost of electricity. We will explore the methods that were used to keep the cost for this electricity competitive and the relative success of each.

## HISTORY OF THE SALT CREEK FIELD UNIT:

The Salt Creek Field, located approximately 40 miles north of Snyder in Kent County, Texas was discovered in 1950. The oil reservoir is found at an average depth of 6300 feet with an average thickness of 170 feet. Original production in 1952 was 10,000 barrels per day. Residue gas injection began immediately and was followed by a water injection program in 1953. A 40 acre drilling program was initiated in 1970 and completed in 1976. After the completion of this drilling program, production peaked at 40,000 BOPD. Residue gas injection was discontinued in 1977 when a refrigerated gas plant was completed and began processing the produced field gas.

The 40 acre development drilling program was extended field wide in 1979 with the drilling of 41 additional wells. The drilling program changed the field decline rate from 8.5% per year to 2.5% per year.

In 1985, production had declined to 20,000 barrels per day. A reservoir study was initiated which led to a 20 acre infill drilling program. This added more than 150 wells to the field. With the drilling program, some of the wells were converted to water injection. At the same time, portions of the field were changed from the inverted nine-spot pattern to a five-spot pattern. This successful program raised the fields production to over 30,000 barrels per day, however the production continued a steady decline. This decline led to the implementation of an Enhanced Oil Recovery Project that involved a carbon dioxide injection program for the Salt Creek Field Unit. The impact of these production programs on the electrical consumption at Salt Creek can be seen in Figure 1.

## ELECTRICAL RATE REDUCTION EFFORTS:

As more and more of the Permian Basin oil field's converted to electrical motor driven pumps, electrical utilities were faced with the task of supplying these new electrical loads. Due to the long time frame involved with the development and approval of a new rate schedule, electrical contracts for oil field electrical loads were often lumped in with other rural commercial rate contracts, such as irrigation wells. Using a rate schedule designed to recover the costs of these cyclic loads led to some high electrical rates on a per KWH basis for a higher load factor operation, but due to the low cost of fuel the overall electrical costs were still low. Also, most companies were under the misconception that there was very little that could be done about the electrical rates.

The Salt Creek field was no exception. In the 1980, electrical costs at the Salt Creek field were less than $0.04 per KWH. Even though this was a high cost for electricity, the small 2,000 kilowatt load did not attract much attention within the Mobil organization and was largely overlooked. However, as the price of fuel increased between 1980 and 1983, so did the cost for electricity. (See Figure 2)

As the price for electricity continued to rise, energy companies caught in the middle of the energy crunch tried to determine methods of reducing their domestic electrical costs. Unfortunately for the Salt Creek field, with a high load factor and good power factor, there was little that could be done to reduce electrical consumption. The only other avenue lay in altering the contract rate with the electrical supplier.

For many years, Mobil tried to effect the rate making process at the Public Utility Commission level in Austin. Between 1983 and 1995, Mobil intervened or filed complaints in nine cases involving rate increases for either Brazos Electric or Dickens Electric Cooperative. Intervening in these cases provided for limited success, but Mobil was able to get some new rates approved for the larger industrial loads.

In the latest rate case in 1994, Brazos Electric was requesting an increase in the rate they charged their customers, the distribution cooperatives. Any increase in this rate would be passed on to Mobil, so Mobil intervened in an attempt to show that even the existing rates were impart, unacceptable. At the end of a long rate case intervention, the Texas PUC ruled to support the rate structure proposed by the cooperative. After this rate case, Mobil felt that there must be a better way to impact our electrical costs.

## LETS TRY SOMETHING NEW:

While Mobil failed to get a favorable ruling from the PUC in 1994, the Commission stipulated in their final ruling that Mobil and Brazos Electric were to work out their differences concerning the Brazos rate structure, in particular the details of an interruptible rate.

Mobil and Brazos met several times to develop the details of a rate structure which could be beneficial to both parties. Both companies stressed the need for a package that was mutually beneficial. During these discussions, Mobil learned that the aggressive load shedding program effort at the Salt Creek field was actually hurting Brazos. The reason is that the Salt Creek field's electricity is actually supplied by WTU, through Brazos and then through Dickens. (See map, figure 3) When the Salt Creek field was successful in avoiding the Brazos peak through load shedding, the savings generated were not realized in a reduction in the amount charged by WTU. This was due to a mismatch in contract terms and these savings had to be absorbed by Brazos. This is not the way Demand Side Management is supposed to work, and we realized this was an opportunity for both companies.

During these negotiations, Brazos proposed the option of buying power from Mobil's Salt Creek field, even though Mobil had no electrical generating capacity. It seemed that when Brazos forecast their load versus generating capacity for 1995 and 1996, Brazos was 61 megawatts short of fulfilling their Electrical Reliability Council of Texas requirements. Brazos proposed that rather than going out on the spot market and buying all 61 megawatts of power as they had always done in the past, they would instead buy 40 megawatts from Mobil at the same price and supplement this with 21 megawatts of spot market power. If the situation arose that Brazos needed power to meet their peak demands, Mobil would shut down the Salt Creek field and Brazos would redirect that power back into their system through WTU, just as if they purchased it from an outside source.

This was an interesting proposition. Buying power by shutting off a customer was not unique. Most utilities have an interruptible rate which functions in a similar manner. However, since the Salt Creek field was "stranded" from the Brazos transmission grid and is actually fed by WTU, interrupting the power at Salt Creek would not relieve generating problems within the Brazos system. Purchasing power from Mobil when the need arose supplied Brazos with the power they needed, just as if they had purchased it on the spot market, and they were able to buy this power from Mobil at a rate similar to other interruptible rate levels.

## DETAILS OF THE POWER PURCHASE CONTRACT:

After eighteen months of negotiating, the Power Purchase Contract was finally approved by Brazos, Mobil, and the PUC. While technically the PUC may not have jurisdiction over power purchases by utilities, both Mobil and Brazos felt it prudent to get their approval before implementing this program. As with most regulatory organizations, the courteous effort of keeping them informed are intentions well appreciated.

The final contract allowed Brazos to purchase 40 megawatts of power from Mobil's Salt Creek field for the two year period of 1995 and 1996. Brazos is paying Mobil $25 per KW demand for this power, which is in line with other power purchase options at the time. (See figure 4) In turn, Mobil agreed to halt the aggressive load shedding program for all electrical load below the 40 megawatt level.

One of the key points in the negotiation of the power purchase contract was the conditions under which the interruption would be initiated. By working together, both parties agreed to tie the interruption to the Electrical Reliability Council of Texas' Operating Guide Emergency Curtailment Plan. Using this as a guideline, Mobil's Salt Creek field will only be interrupted if ERCOT goes to a level of condition 2. Condition 2 requirements are that all members of ERCOT have brought on all available generating capacity and the ERCOT electrical system is still overloaded. By tying the interruptions to ERCOT's guidelines, both parties are able to better plan for the duration and frequency of interruptions.

This contract has been in effect for one year and both parties still feel that they have a true win-win situation. Brazos was able purchase cost effective power to meet it's peak power requirements and eliminate the losses associated with Mobil's aggressive load shedding program. In turn, Mobil has received a rebate of $1,000,000 per year for two years. This brings Salt Creek's electricity costs down to a more cost competitive level. Salt Creek also benefited from eliminating the load shedding program because it was manpower intensive and had a negative impact on production.

## SUMMARY:

In closing, there are no quick fixes to the problem of high electricity costs. Each site must be treated as a unique situation. However, the best results can often be obtained by merely communicating with your electrical supplier, and the utility company's representative on a regular basis. Demonstrate that you are genuinely interested in exploring win-win situations. Only by working together towards these win-win situations can you develop solutions that are beneficial to both parties.

The success at Mobil's Salt Creek field was a result of teamwork between Mobil, Dickens Electric, Brazos Electric and the Texas Public Utility Commission. The success would have been impossible without everyone's commitment to finding a solution that was mutually beneficial. We at Mobil would like to express our sincere appreciation to Dickens Electric, Brazos Electric and the Texas Public Utility Commission for working with us towards achieving these goals. The resulting electrical cost at Salt Creek is allowing Mobil to continue to invest in this area, which is beneficial to everyone. Mobil will continue to work with these companies to explore additional opportunities, through innovative power marketing or whatever means becomes available, to further reduce our electrical costs at Salt Creek.

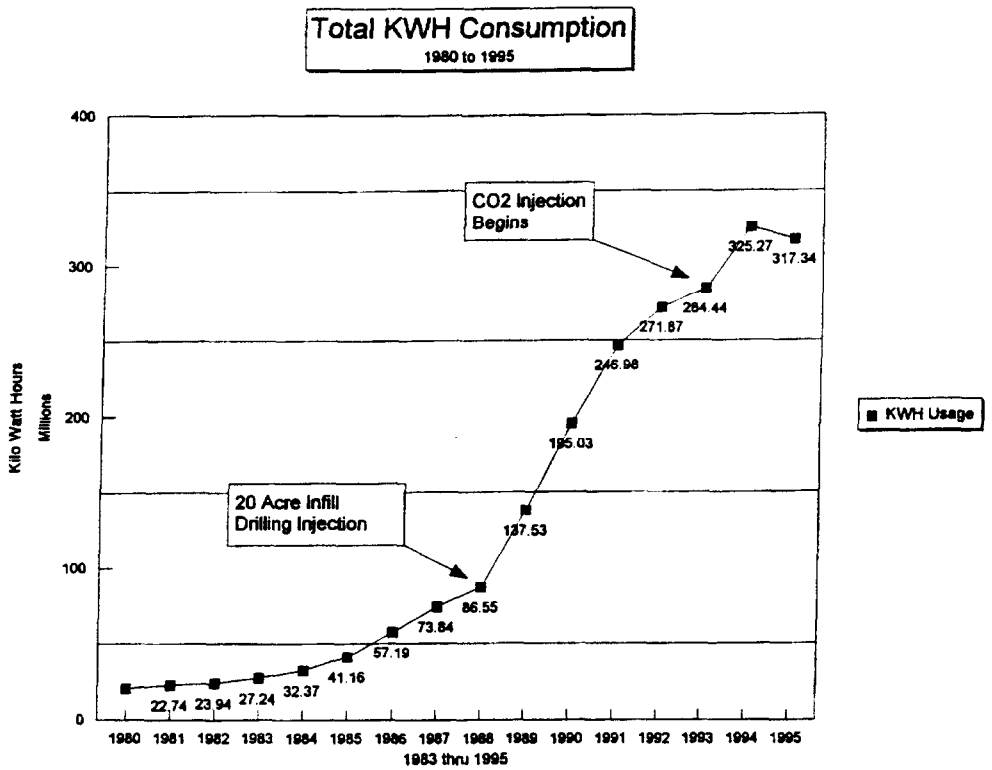


Figure 1

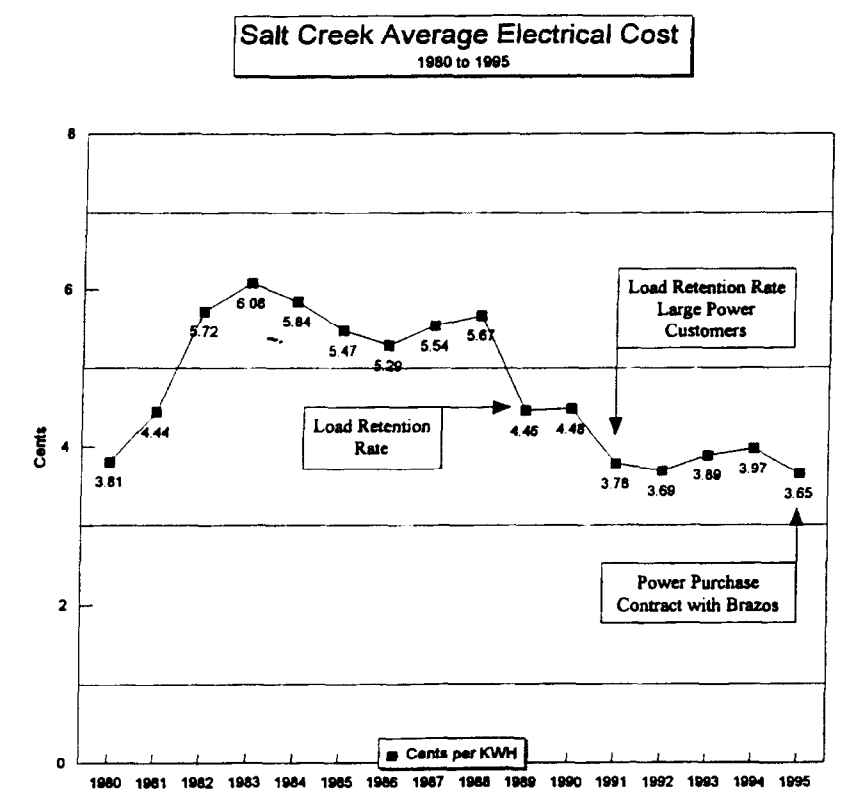


Figure 2

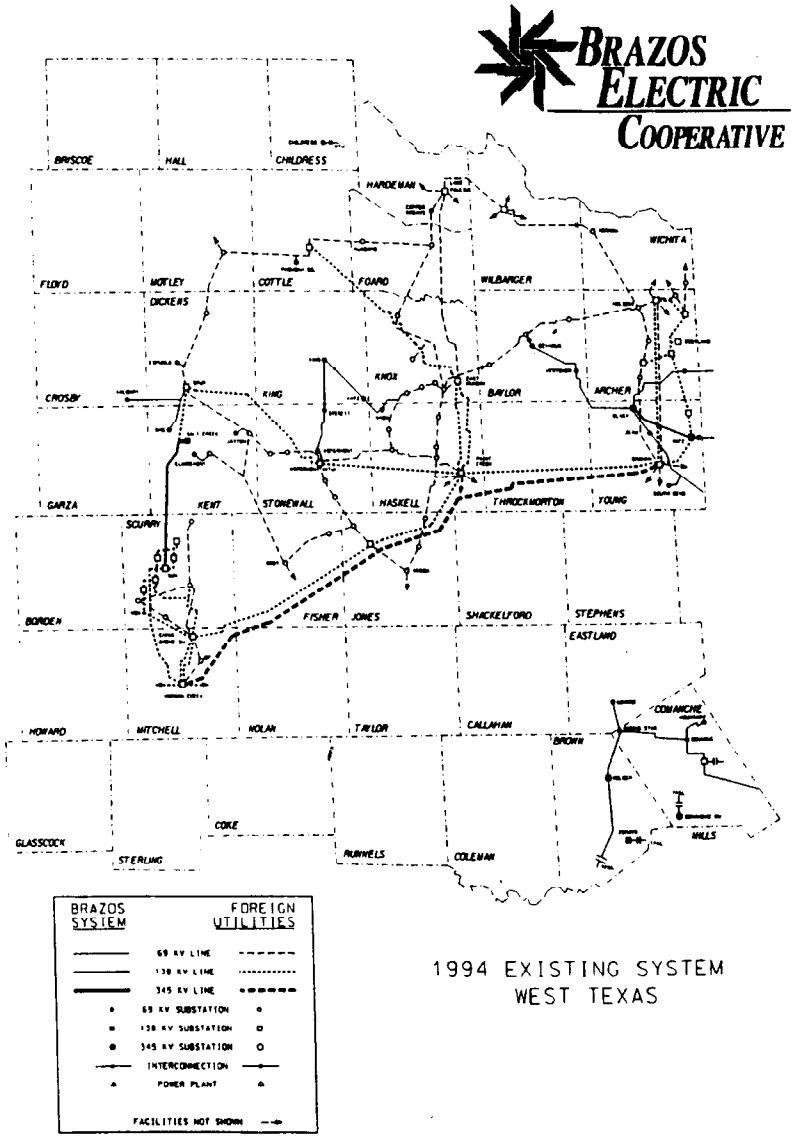


Figure 3

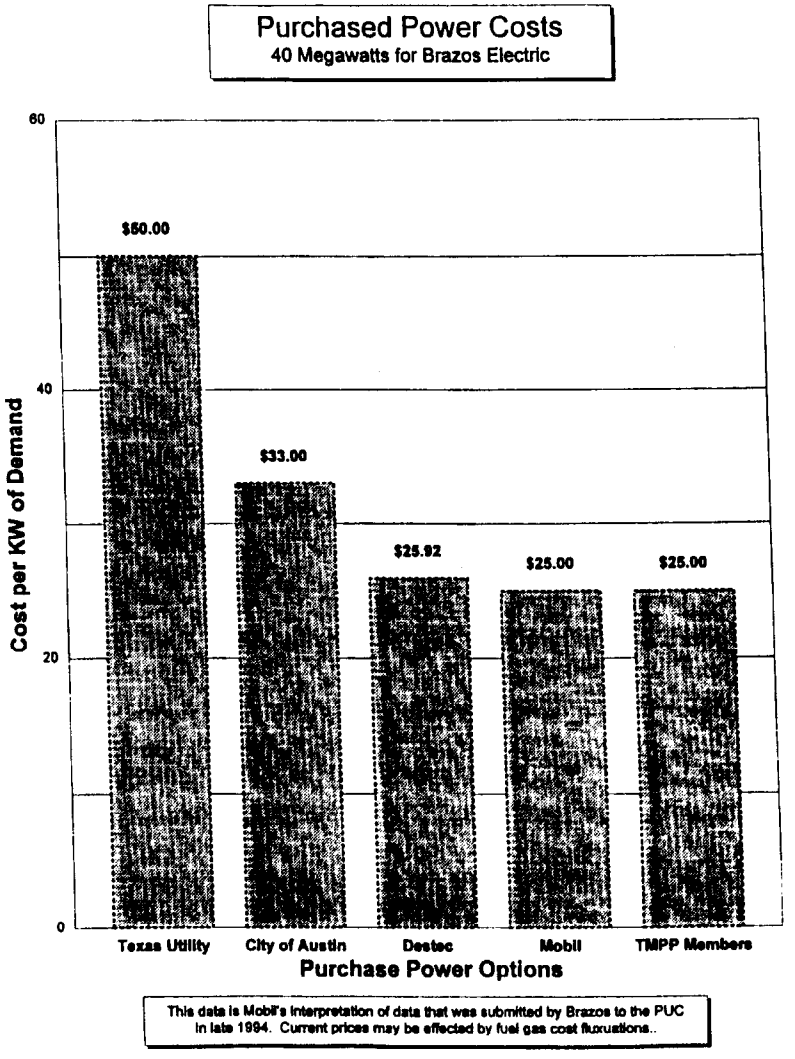


Figure 4