Control Utility Cost and Max Savings

John M. Studebaker, Ph.D.
President
Studebaker Energy Consulting, LLC

Utility costs and their impact on bottom line depend, almost entirely, upon the actions taken by facility managers. Yet many companies are not taking advantage of utility savings opportunities that could be available to them because they are unaware of what can be accomplished.

If the items described following are understood and applied correctly, operational cost savings and financial risk reductions will occur. These items are as follows:

1. **Analyzing Utility Costs**
2. **Utility Bill Content**
3. **Electricity / Natural Gas Deregulation**
4. **What Companies Need To Do**
5. **What Needs To Be Done Now**

John M. Studebaker
www.studebakereenergy.com

1. ANALYZING UTILITY COSTS

Before any utility cost (electricity, natural gas, and water/sewer) can be analyzed, certain base cost data must be available. Base or incremental cost data is developed from a document called a *tariff schedule.*

This tariff schedule describes all of the "costs and conditions" data as they apply to a specific usage characteristic. The information contained in the tariff schedule is developed by the serving utility of the particular commodity (electricity, natural gas, water/sewer) being analyzed.

Once the tariff schedule is developed, it must be approved by the appropriate regulatory agency—Federal, state, city, etc. When all of the development and regulatory process is complete, a final applicable tariff schedule will be released for utilization for the serving utility's customer base. There may be more than one applicable tariff schedule for a given usage characteristic; and, there may be variables for a specific usage characteristic within a given tariff schedule.

All of this probably sounds more complex than it is in practice but if the basics of tariff schedule development and implementation are not understood, very little can be accomplished in trying to determine if cost savings are available.

Before actual analyzing of a particular utility (electricity, natural gas, and water/sewer) can begin, an understanding of how the information and costs shown on the utility billing must be available. The appropriate tariff schedule is the only source for this data. There are at least four sources from which information about specific tariff schedules can be obtained.

1) The serving utility company representative
2) The serving utility company website
3) The regulatory agency responsible for oversight of a particular serving utility company
4) The regulatory agency website

From the serving utility company representative or the website—obtain the complete tariff schedule applicable to the utility being analyzed.

From the appropriate regulatory agency representative or the regulatory website—determine whether there are any of the following "tariff variables" available for a specific usage characteristic:

1) Experimental Rate Tariff
2) Off- / Non-tariff schedule of rates
3) Unregulated marketing affiliate program

Once the complete utility tariff schedule and all of the variables relating to it are available, the analysis process can begin.

2. UTILITY BILL CONTENT

Depending upon the utility type being analyzed, different criteria can be evaluated as follows:

Electricity

1) Tariff schedule appropriateness

Considering specific usage characteristics, is the most cost effective tariff schedule being utilized?

2) Voltage level

Is the service voltage at secondary (110-440 volts), primary (+440-10,000 volts), or other voltage levels? If current service voltage is secondary, can it be changed to primary? And, if it can, what are the savings/cost relationships?

3) Demand level (kVA/kW)

What percentage of the total typical bill is demand based? Could demand levels be reduced or moved to other time periods to reduce costs?

4) Usage level (kWh)

How much of the typical bill is usage based? Can usage be reduced by utilizing more energy-efficient items or managing the “on” times of equipment?

5) Power Factor level (kVA vs. kW)

Are there any "low" power factor penalties/charges on the billing? And, if there are, can they be reduced by utilizing power factor improvement capacitors?

6) Load Factor level (kW vs. kWh)

Is relative efficiency (demand vs. usage) utilized as a cost factor on the billing? If poor/low load factor is increasing utility costs, consider reducing peak demand (kW) levels, which will improve load factor and reduce costs.

7) Opportunity to utilize available tariff schedule rate options

Do tariff schedules provide for any optional rate structures? Example: Time-of-Use, Interruptible, Real Time Pricing, etc. If any alternative structures are available, evaluate each to determine cost reduction opportunities.

8) Non-serving utility-provided electricity commodity

Determine whether there are tariff schedules available that allow the electricity customer to purchase their own electricity commodity through a third-party provider (retail wheeling). If this is possible, arrange for an independent marketer to provide the electricity commodity at a cost less than what the serving utility would charge.

Natural Gas

1) Tariff schedule appropriateness

Considering specific usage characteristics, is the most cost effective tariff schedule being utilized?

2) Usage variability

Is natural gas usage characterized by any of the following conditions—

- Highly variable
- Little or none in the summer
- Bulk of the usage in the winter
- Other highly variable conditions

Can a more uniform usage for natural gas be developed? Can an alternative onsite fuel supply (fuel oil, propane air, etc.) be installed that would reduce the variability of usage?

3) Firm vs. Interruptible

If the current tariff schedule rate is *firm* (non-interruptible), could an *interruptible* (non-firm) rate be utilized if an alternative onsite fuel supply (fuel oil, propane air, etc.) were installed?

4) Non-serving utility-provided natural gas commodity.

Determine whether there are tariff schedules available that allow the natural gas customer to purchase their own natural gas commodity. If this is possible, arrange for an independent marketer to provide the natural gas commodity at a cost less than what the serving utility would charge.

WATER/SEWER

1) Tariff schedule appropriateness

Considering specific usage characteristics, is the most cost effective tariff schedule being utilized?

2) Multiple water meters

If there are multiple water meters in a facility, can they be combined for billing purposes to reduce costs?

3) Water uses not requiring sewage discharge

Is water usage characterized by any of the following conditions —

- Lawn watering
- Process water uses
- Cooling tower evaporative loss makeup
- Swimming pool makeup
- Other similar usages

If water is used in any way that does not require the utilization of the sewer for discharge, determine whether the utility will allow an offset (credit) for sewage charges on any water usage that does not utilize a sewer discharge. Generally, all water that goes through the water meter is considered to be ultimately discharged into the sewer.

3. ELECTRICITY / NATURAL GAS DEREGULATION

Deregulation (as it applies to electricity and natural gas) *is the removal of the commodity portion from the serving utility retail rate so that the retail customer can arrange for the commodity to be provided through an independent third party.*

Utility deregulation affects the commodity portion of the serving utility retail rate only. In electricity, the commodity portion of the serving utility retail rate is typically 20-50% of the total electricity cost. In natural gas, the commodity portion of the serving utility retail rate is typically 50-70% of the total natural gas cost.

STATUS OF DEREGULATION IN THE UNITED STATES

Electricity

A. Electricity deregulation has been enacted in the (24) following states:

1	Arizona	13	New Hampshire
2	Arkansas	14	New Jersey
3	Connecticut	15	New Mexico
4	Delaware	16	New York
5	District of Columbia	17	Ohio
6	Illinois	18	Oklahoma
7	Maine	19	Oregon
8	Maryland	20	Pennsylvania
9	Massachusetts	21	Rhode Island
10	Michigan	22	Texas
11	Montana	23	Virginia
12	Nevada	24	West Virginia

B. Electricity deregulation investigation is ongoing in the (18) following states:

1	Alaska	7	Louisiana	13	South Carolina
2	Colorado	8	Minnesota	14	Utah
3	Florida	9	Mississippi	15	Vermont
4	Indiana	10	Missouri	16	Washington
5	Iowa	11	North Carolina	17	Wisconsin
6	Kentucky	12	North Dakota	18	Wyoming

C. Electricity deregulation has not been instituted for any user in the (8) following states:

1	Alabama	5	Kansas
2	Georgia	6	Nebraska
3	Hawaii	7	South Dakota
4	Idaho	8	Tennessee

D. Electricity deregulation has been rescinded in the following (1) state:

1 California

Natural Gas

A. Natural gas deregulation legislation has been enacted in the (5) following states:

1	New Jersey	4	Ohio
2	New Mexico	5	West Virginia
3	New York		

B. Natural gas deregulation investigation is ongoing in the following (2) states:

1	Maine	2	Oklahoma

C. Natural gas deregulation for small users not instituted. Deregulation for large users instituted in the following (18) states:

1	Arizona	7	Minnesota	13	North Dakota
2	Connecticut	8	Mississippi	14	Rhode Island
3	Florida	9	Missouri	15	Tennessee
4	Indiana	10	Nevada	16	Texas
5	Iowa	11	New Hampshire	17	Utah
6	Kansas	12	North Carolina	18	Washington

D. Natural gas deregulation for small users partially instituted. Deregulation for large users instituted in the following (10) states:

1	California	6	Michigan
2	Delaware	7	Montana
3	Kentucky	8	Pennsylvania
4	Maryland	9	South Dakota
5	Massachusetts	10	Vermont

E. Natural gas deregulation for all users partially instituted in the following (8) states:

1	Colorado	5	Nebraska
2	District of Columbia	6	Virginia
3	Georgia	7	Wisconsin
4	Illinois	8	Wyoming

F. Natural gas deregulation not instituted for any user in the following (8) states:

1	Alabama	5	Idaho
2	Alaska	6	Louisiana
3	Georgia	7	Wisconsin
4	Illinois	8	Wyoming

4. WHAT COMPANIES NEED TO DO

Become Proactive!

- Doing nothing will increase your utility costs and risks.

What companies must have, understand, and manage:

1) Have accurate electricity, natural gas, and water/sewer usage data
2) Understand current status of utility deregulation
3) Understand individual facility utility usage characteristics
4) Manage commodity cost/usage

What companies need to consider internally to control / reduce their utility costs:

1) Develop a utility cost reduction strategy
2) Consider internal facility organizational factors
3) Understand commodity and utility service contracts and their long-term implications

5. WHAT NEEDS TO BE DONE NOW

Develop a utility cost control/reduction strategy:

1) Know your current utility costs
2) Analyze your savings potentials
3) Utilize internal/external expertise to reduce utility costs

Items that should be included in any successful utility cost reduction strategy:

1) **Electricity**—items to evaluate:

   (a) Usage characteristics—

   - Hours per day
   - Days per week
   - Usage variables, etc.

   (b) Deregulated commodity purchasing

   (c) Tariff schedule rate alternatives

   (d) Combined billing/metering if more than one meter utilized

   (e) Onsite backup/peaking generation options

   (f) Thermal storage systems

   (g) Energy efficient items—

   - Lighting
   - Motors
   - Energy management systems, etc.

2) **Natural Gas**—items to evaluate:

   (a) Usage characteristics—

   - Usage variables by day, month, season, etc.
   - Firm
   - Interruptible
   - Peak
   - Non-peak

   (b) Deregulated commodity purchasing

   (c) Tariff schedule rate alternatives

   (d) Combined billing/metering if more than one meter utilized

   (e) Class of service variables—

   - Firm
   - Interruptible
   - Peaking

3) **Water/Sewer**—items to evaluate:

(a) Tariff schedule rate alternatives

(b) Combined billing/metering if more than one meter utilized

(c) Fire hydrant charges

(d) Trash removal charges

(e) Water leaks

(f) Water uses where sewer is not required—

- Lawn watering
- Process water uses
- Cooling tower evaporative loss makeup
- Swimming pool makeup
- Other similar uses

4) **Petroleum Distillates**—items to evaluate:

(a) Purchasing strategies

(b) Price hedging programs

(c) Aggregation of multiple facility purchasing requirements

(d) Utilization of petroleum distillates to replace/augment electricity/natural gas usage/processes

SUMMARY

While evaluating utility costs within a company may not currently be a priority, if properly designed, this procedure becomes a valuable utilization of time and resources. Many companies are reacting to, rather than planning for, utility costs. To accomplish utility cost reduction programs—you need the right information, at the right time, in the right format.

In every company, whether for-profit or not-for-profit, there are areas of utility cost reduction opportunities available. In the scenario of today's utility cost instability, now is the time to get started with utility cost reduction strategies.

Utility costs are not going down and every day that a realistic cost saving strategy is not utilized, the lost cost savings potential will never be recovered. The process of utility cost reduction requires time and expertise, but delaying the process only reduces he savings potential and increases lost opportunity costs.