



What May The 'Smart Grid' Mean To You? *Inside This Issue*

The 'smart grid' is a collection of converging technologies that marry high-speed digital communications, advanced meters that report power characteristics and flow in near real time, and automation systems that rapidly direct power flows and control demand.

The bottom line to end users is that, much like the Internet and electric deregulation, a variety of new options, opportunities, and pitfalls will be arriving at your doorstep as the electric meter gets some bells and whistles.

A variety of drivers are pushing this marriage of technology and the energy cash register. They include:

- The need for more generating and transmission capacity: demand response programs were one of the first manifestations of the smart grid. Using interval meters, the Internet, and wireless communications, customer loads could be monitored and remotely controlled when the grid was under stress, or hourly wholesale pricing was spiking.
- The expansion of renewable power sources: their irregular output (there must be sun or

wind) necessitates close monitoring and adjustment of generation and transmission.

- Utility and regulator desires to expand time-sensitive electric rates: millions of electricity customers are still immune to the cost impacts of how and when they use power. Two-way communication with revenue meters also offers a host of useful options: immediate location of outages, remote meter reading, new tariff structures, and remote turn on (and shut off) of power.

The taxpayers are heavily supporting smart grid development through the 2007 energy act, the recovery act, and (if passed) the climate bill, smart grid research and implementation. Venture capitalists seeking to cash in on these developments have christened the smart grid 'MeterNet', raising hopes of another dotcom boom (preferably one without the bust).

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Luthin Associates Staff pictured on the beach in Avon, NJ. From left to right: John Luthin, Natale DiDonato, John Dowling, Fallon Mastropierro, Erin Sullivan, Annie Rooney, Catherine Luthin, Ellen Northrup, Fran Rooney, Jim Ferris and Rakesh Parasuraman.

From the perspective of the energy end user, the smart grid is manifesting itself in a variety of ways. Time-of-use, real time, and critical

peak pricing tariffs are being expanded in tandem with smart meter deployment. Where only thousands were so metered, soon millions will be seeing such rates.

For better or worse, many will begin to grasp how, at times, electricity can be significantly more expensive (or cheaper). That may influence how they use power, how they choose power-using devices, and ways to work (and live) more energy efficiently.

New appliances, thermostats, and other energy-consuming devices are being wired up in ways that connect (through combinations *(Continued on page 4)*)

Managing Electric Costs in a Down Economy

Retail Access, the term used to describe the opening of competition in electric supply, provides institutions with flexibility in determining where and how they can purchase electricity. This flexibility is especially attractive in times where energy prices are so volatile. Prices for electricity in New York City (these trends reflect the national experience as well) reached a market high of almost \$0.18 per kilowatt hour (KWh) in July. The price of electricity fell to \$0.105 by October (42%) and was followed by an additional decrease to about \$0.08 in January. Natural gas prices which trend in a manner similar to electricity, declined as well. The Energy Information Agency, the Federal agency that monitors energy usage and future trends, is calling for energy prices to remain constant in 2009 with small increases in 2010. While low prices are great news and it appears prices will remain steady in the near term, we all know that international events can always change how the commodity markets perform.

It is important for facility and energy managers to take a look at how they are purchasing electricity and decide upon a plan of action to enable them to benefit from market extremes or at least manage them. An initial step in the process is to assess the goals of your organization and develop a risk profile. What is most

important? Price certainty can be had for a slight cost premium. This cost premium is similar to an insurance policy. By locking in a price for a period of time in the future, all of the risk that the price may change is absorbed by the supplier. In return for taking that risk, the supplier increases your electric price. This insurance policy will protect you when the market goes higher but it prevents you from taking advantage of a downward trend. Your organization can take a different approach and decide to absorb some risk with a chance of catching that downward movement in the market. The disadvantage is that if the market never turns down, you risk a higher price. This strategy can be pursued at various levels of the risk reward matrix. Once you understand the level of risks you are willing to accept and have set reasonable goals for your electricity budgets, a plan of action can be developed.

To assist our clients in managing price volatility, there are several energy purchasing options that are available in the marketplace. The products that are available to commercial buildings and those that our clients are using to manage risk and maximize savings in energy procurement fall into three pricing structures, the Fixed Price, Indexed Price and the Hybrid Product.

The simplest and most common purchasing method is the Fixed Price contract. In this type

of deal, the customer agrees to a fixed price per KWh for an agreed period of time, typically one to two years. This product serves an organization with a small tolerance for risk by placing most of the risk on the supplier. It also satisfies an organization's need to have budget certainty. There are two variables that impact the cost of electricity, market pricing and weather. Since weather can not be managed at this level, some institutions may find it desirable to manage the other variable, the price. The Fixed Price will protect your company from upward price swings but it will also keep you from fully participating in a downward trend in pricing. The benefit of downward price trends can be partially realized for Fixed Price contracts through the "Blend and Extend" process. Blend and Extend describes a service that most suppliers will provide to their clients. If the market turns downward after you have begun to receive power under your new agreement, the supplier will agree to extend your contract out another year or two to take advantage of the lower prices and blend the cheaper future rates with your current rate for a new overall contract that reflects an overall lower price. In recent months, we have seen some of our clients entering into Blend and Extend agreements every three months since signing contracts during the summer. This enables them to take advantage of a continuing

(Continued on page 3)

Feds Looking to Rein In Commodity Speculators

The Obama administration is moving forward with legislation to improve oversight and control of index trading in commodities, such as oil and natural gas. Congress recently ratified his choice (Gary Gensler) to head the Commodity Futures Trading Commission (CFTC). Gensler is spearheading changes to regulations and seeking new authority to limit speculation in energy futures. Such changes could mute price spikes, but may also limit opportunities for lower pricing and competition.

A June 2009 report released by a Senate committee fingered speculation in futures and other derivatives by "non-commercial" traders as a source of market instability. Such traders have no direct interest in energy purchasing (i.e., they do not use commodities) and participate solely to take advantage of (and some say influence) price volatility. Key among such traders are large investment organizations (including hedge and pension funds) that are able, through financial clout, to have a much larger impact than the small speculators that are seen as vital to market liquidity.

Much of the action in energy takes place in over-the-counter (OTC) markets that are opaque to regulators. The Senate report pointed out that CFTC monitors and reports on agricultural market indexes, but doesn't do so for energy. Referring to that lack of oversight, the report stated that "to understand the role of index trading in energy..., the CFTC will need to improve its data collection and analysis efforts for both the OTC markets and index trading. Given the importance of this issue..., CFTC should undertake this effort to bring additional transparency to the impact of index trading on energy futures markets."

Translation: tighter regulations should better track markets and limit the number and magnitude of spikes, like last year's tripling of oil and natural gas prices (which also caused retail power prices to nearly double). Included in the Obama bill are enhanced powers to require higher margins for index trading. Centralized clearing of derivatives trades (i.e., requiring that even OTC trades be visible through some form of exchange) is also being pushed to expose intentional efforts to move a market. Higher margins could, however, translate into higher retail energy prices.

While many involved with energy support expanded federal oversight, they also fear its dampening effect. Speaking for the Electric Power Supply Association (EPSA) which represents power marketers, John Shelk said "it is critical that regulation of energy commodity trading not unnecessarily hinder the ability of power suppliers to effectively and efficiently manage the price risk for both their fuel inputs and their power output." EPSA is concerned that forcing all trades through exchanges (which have margin requirements) would require power marketers to ante up cash that would otherwise be used for internal investment and development of product offerings. Suppliers that depend heavily on use of derivatives claim they could be forced out of business, narrowing choices for end users, and higher prices for those that are offered. Gensler will roll out and defend his proposed changes in Congressional hearings running through mid-August.

Managing Electric Costs in a Down Economy (continued from page 2)

trend of lower prices. As previously mentioned, since the Fixed Price contract places most of the risk on the energy provider,

you will pay a small premium for this protection.

The Index Price agreement is a contract that ties your cost of power to some index. The energy supplier will provide you with a discount on a pricing mechanism such as that provided by your local Regional Transmission Organization (RTO). RTOs such as the New York Independent System Operator (NYISO) or the Electric Reliability Council of Texas (ERCOT) manage electric generation and transportation in a region and they set the market prices. Typical market price structures such as those in New York are the Day Ahead, Hour Ahead and Real Time Market. As its name implies, the Day Ahead Market will tell you on Monday what the electric prices will be for any given hour on Tuesday. The discount in the Index Price

may be applied to a utility rate as well. One of the advantages of the Index product is that it allows you to float with the current market until a decision about a long term trend becomes apparent. These deals if structured correctly, should allow you to move into a Fixed Price contract if the market price starts to decline. It is important that you negotiate into your supply contract the ability to change to a fixed price deal. The Index has more risk for the customer than the Fixed Price deal because if market conditions start to trend upwards, your price increases. The flexibility of getting out of an upward cycle by locking in a fixed price can control this risk.

The third option is a Hybrid Product. This structure provides some of the components of both the Fixed and Index contracts. Customers and their energy providers or consultants will identify some level of a base load which can be fixed in the market. The base load is a block of electric

power that will always be used by your facility during a given time period. An example of a base load is the lowest level of energy usage on any given day. If your facility's load profile shows that the lowest demand period during the last twelve months is 50 kilowatts, the energy supplier will look at this as a block of power that can always be predicted to be exactly 50 kilowatts. This block can be purchased at a fixed cost with very little risk premium (or insurance). The balance of the load that is not included in the base load would float in the market place and be tied to a market based RTO index. This would allow an organization to take advantage of downward price trends for that portion of their load that is not on the fixed price. The customer should also be able to convert this type of structure to a fully fixed deal and/or Blend and Extend if the market price increases. Because the energy supplier's risk is reduced while your risk increases, the supplier will charge a lower risk premium

for the floating block of power as well. The volume subject to the fixed price can be determined by an analysis of your load profile which your consultant can provide. Your consultant should also be able to provide you an analysis showing the percentage of load that is exposed to market risk and be able to build base, best, worst case projected cost scenarios by utilizing your historical, hourly profile and historical prices of the index you will be tracking.

Did You Know?

If the electricity that is generated by a 1.5 MW wind turbine, over its 20-year lifetime, was instead generated by coal, it would take a pile that is 115 feet high and 230 feet wide. That is about 1/3 the height of the turbine and greater than the width of its blades. The coal pile would weigh 3800 tons.

The Future of High Altitude Kites

The hobby of flying kites could turn out to be more productive than most mindless activities, aka hobbies. In fact, it may assist in solving the current energy crisis. Windmills have been around for ages, not only as a place to eat along the Jersey Shore (see photo), but also to provide energy for farms, businesses and homes. We are all familiar with turbines that are used to capture and utilize ground level winds.



www.flickr.com

Two environmental and climate scientists from Stanford University, Cristina Archer and Ken

Caldeira completed a study at the Carnegie Institution and the California State Institution that explored the potential of high altitude winds. The study was published in the journal *Energies* on May 26, 2009. Their research analyzed twenty-eight years of wind data to identify locations for the most persistent winds. As a result, one of the best cities for utilizing high altitude winds is New York City. The wind streams above New York have the potential of supplying a wind power density of 16 kilowatts per square meter of power. That is sixteen times more potential energy than ground based winds produce. Other major cities like Tokyo and Seoul contain the same wind strength potential.

However, harnessing these extreme winds is a significant challenge. Two possible kite designs, one from Kite Gen and another from The Flying Electric Generator, are in development. KiteGen

is constructed of a ground based generator that is attached to two lines. These two lines are connected to the kite that can fly at a high altitude. The kite captures the wind energy which is then transferred back down to the generator where it is processed. This kite will fly as high as 32,800 ft where the average wind speeds are sometimes over 100 mph. See the official KiteGen website, www.kitegen.com, for more information on this invention.

The Flying Electric Generator (FEG) is the second design. The FEG uses electric power from the ground to aid its lift-off until it is secure and stable in the high altitude winds. The strong winds will spin rotors on the FEGs that then generate an electrical current that is transmitted along tethers down to ground stations. Also known as "flying windmills" this is the most advanced wind capturing technology and is estimated to cost less than 2 cents per kilowatt hour.

While the idea seems promising, high-altitude winds are said to fail at least 5% of the time. Although still better than ground based winds because of



www.skywindpower.com

their superior strength, more research and development on high altitude winds is still needed to put this plan of action into flight.

In retrospect, Franklin had the right idea; he just wasn't thinking "high" enough!

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Consumer Power
Advocates Meetings 2009

September 16	October 20
November 17	December 15
January 19	February 16

Founded in 2001 by Catherine Luthin, Consumer Power Advocates (CPA) is an alliance of large not-for-profit institutions in the greater New York region. CPA's mission is to lower energy costs for its members through representation in energy-related regulatory and legislative proceedings.

Membership is open to hospitals, universities, medical schools, and cultural institutions. See www.luthin.com for more information.

New Luthin Staff Members

Luthin Associates, Inc. has increased its firm with the addition of three new staff members.

Erin Sullivan joins the firm after one year of intern work. The unfamiliar voice answering the phones has officially graduated from Monmouth University with a BS in Business Administration and has moved up from data entry to a Junior Energy Analyst position where she will work with utility reporting and the processing of refunds and rebates for our clients.

Jim Ferris, PE, joins Luthin Associates as a consultant to the NYSEDA Focus on Healthcare Program. We are very lucky to employ Jim after his many years of experience not only as a Consulting Engineer, but as well as being a partner in a leading Engineering Firm in New Jersey. Jim will assist Luthin Associates in many ways including our outreach endeavors to major New York State healthcare facilities and other energy services.

John Luthin has been appointed Chief Financial Officer as of March 2009 and will be assisting Luthin Associates with the firm's billing and financial operations. John's managerial experience comes from his many years working as an executive chef at exclusive golf clubs in New Jersey.

'Smart Grid' (cont from pg 1)

of wireless and web communications) through the smart grid to report usage and enable remote control of their operations.

Now imagine each of those points being billed at a different electric rate: an electric hot water heater or A/C compressor, for example, could be on an interruptible rate, while dimmable lighting might be on a demand reduction rate, and elevators would be on a firm electric rate. A 'smart' electric bill would show the usages and costs of each device, greatly expanding customer knowledge while offering savings options to those best able to manage their loads.

To track such developments, check out www.smartgridnews.com. Much has yet to be ironed out (e.g., standardized communication protocols), but – for a useful perspective – remember how far (and fast) things changed once the lowly desk phone finally grew up.



Luthin Associates has made efforts to reduce carbon emissions by not only switching to paper-less billing but also in using other forms of transportation. Our staff frequently rides a bicycle to the office in Avon-by-the-Sea. Pictured above is a bicycle parked at the office.

On a Personal Note...

It's summertime, summertime
 Sum-sum-summertime
 Summert-i-me

**Well, are you comin' or are you ain't?
 You slow pokes are my one complaint
 Hurry up before I faint
 It's summerti-i-me**

**(Ba-ba-bom)
 Well, I'm so happy that I could flip
 Oh, how I love to take a dip**

**Well, we'll go swimmin' everyday
 No time to work just time to play
 If your folks complain just say
 'It's summerti-i-me'**

**Summertime, summertime
 Sum-sum-summertime
 Summertime, summertime
 Sum-sum-summertime
 Summert-i-me.
 It's summertime!**

Lyrics: "Summertime Summertime" By The Jamies

It's the height of the summer here at the Jersey Shore, the Shoobies (a short-term jersey shore visitor a.k.a. "benny") have invaded "our" beach, the roads are congested, and nephews from Arizona (age 9 & 11) have camped out at Casa Luthin for the past two weeks. The boys attended surf camp, and Coach Carter loaned us the boards for the photo shoot. Thanks Coach Carter!

All of these trips to the Windmill (serving more than just the world's greatest hot dogs since 1963) got us thinking about what's on the horizon regarding renewable energy (see: *The Future of High Altitude Kites*).

Public Awareness, Corporate Commitment, and Obama's stimulus money has set the stage for all of us to accomplish significant energy conservation and sustainability goals. As the smart grid gets "smarter", there are some financially sound opportunities out there for energy consumers.

Taking advantage of today's low energy prices is one of them. If you have not locked in your competitive energy supply, there is no time to waste! The article on "How to Manage Electric Costs in a Down Economy" will provide strategy and advice and hopefully help you take the next step. NYSEDA is administering the American Recovery and Reinvestment Act. If you are a non-profit, now is the time to look for substantial funding opportunities. Solar rebates were reduced this year but they still are available.

While part of the theme of this newsletter harkens upon the quiet, lazy days of summer, the opportunities to cut your energy dollars do not care about vacations. There is a window of opportunity that will only stay open for a short time so get moving before the, "winter of our energy price discontent," resurfaces.

Catherine Luthin