ANOTHER "Energy "Beast" Emerges!

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ABSTRACT

In the world of energy consumers there exist a new and much misunderstood entity. In fact an entire new market segment is spreading across the planet and challenging the power industry as it spreads. The much clichéd word 'paradigm' has been used to death, but in this instance indeed truly applies when attached to a quantum change in the way an entire industry does business.

Internet Host Farms
Internet Data Centers
Telecom Hubs
Switching Centers
Network Access Point

Whatever the application, they are here and they are spreading—fast. They are also folding at a rate not seen since we watched ESCOs drop on a daily basis three years ago. What we are watching is the early evolution of a new industry, and the emergence of a dominant few.

Until now, the typical utility service request has always been in the range of four to seven watts per square foot, with occasional heavy users such as ice storage facilities and heavy manufacturing. These new information routing facilities require **100, and now even 300, watts per square foot!**

It is not uncommon to request, of a utility, new service with capacity for 50 megawatts to serve a warehouse that in its previous incarnation required 100 kilowatts.

A NEW ENERGY "BEAST" HAS ARRIVED

In 23 years of working in the energy sector I have never seen a more misunderstood, and misrepresented, aspect of the industry. Articles abound and seemingly deal with this new consumer as almost something of a mythical beast to be feared, and certainly to be avoided. When it comes to town, the lights go dim and the grid sags under the demand for electrons.

My firm is fortunate to represent the largest of these new consumers, and several like firms around the world. With projects both new and fully established in dozens of countries and across the United States it is past time for us to set straight many of the misconceptions.

A NEW FACE

We are all well familiar with the concept of rental self-storage units. Filled with our old and never again to be used televisions, sofas, Route 66 highway signs and more, we pay a monthly fee to someone who had the presence of mind to build exactly the type of facility we require. In exchange for a fee we get a secure storage space with basic but appropriate features.

Well, this concept has been taken to the extreme by entrepreneurs who offer the same type of move-in ready facility for those requiring a computer room environment. Raised floor, top security, fire suppression, absolute faultless power, air conditioning—all the extremely expensive provisions are in place. You simply install your hardware racks and start plugging in your equipment. And like the self-storage units, this rental host center is more cost effective than building it yourself.

Generally speaking, these facilities come in one of two specialty-focused configurations, either for Internet servers or telecommunications. Variations may include the outside world connectivity (fiber plus copper/voice plus data), the floor loading in terms of watts per square foot, and frequently geographic location as the hubs for voice and data are not necessarily collocated. However it is not uncommon to find a mix of users under one roof, although this is almost always limited to those properties where space was leased in advance and the floor built-out to the specification of the user.

The tenants who lease this floor space are often very large, and immediately recognized names who require significant space for their

hardware. But even the smallest Mom & Pop Internet Service Provider can lease a 10-foot by 10-foot cage and enjoy the exact same environment and service provisions as the largest technology firms.

Where else could a small operation acquire on-site access to the major fiber carriers? Full UPS and on-site back-up generation? Complete HVAC regardless of season or demand? Security and other amenities are made practical as well.

But all these tenants have one thing in common—they plug in a lot of equipment. Imagine 100,000 square feet of computer floor loaded with 19-inch racks, and every rack filled with energy hungry electronics. Twenty-four hours a day, every day, without stop.

Then imagine the air conditioning required to cool such a space. And not the most efficient air conditioning either, with chillers and cooling towers, but fully contained package units of a scale so large they have to be specially manufactured.

Imagine all that floor space being powered by UPS with its associated power loss factor. Lighting around the clock as dozens of service technicians go about their various chores. Batteries for 50 megawatts of standby generators. Or 100 megawatts. Or more.

The load is awesome, and it is unprecedented. It is also unsubstantiated and this is where much of the confusion comes from.

When approached for this new service, every utility company has the same request to see a bill from another site where the load is actually 100 watts per foot. They haven't seen one yet, and they won't see one for a while. But that doesn't mean the request for power isn't valid, and perhaps even understated in some cases.

A UNIVERSAL DEMAND... FOR MORE POWER

Around the world utilities are being approached with requests for power that immediately require the construction of a new substation. Feeders, often redundant feeders, network upgrades, even transmission line reconductoring can result from these requests. Such work does not come cheap, nor quickly. And the utility is expected to provide this without substantiation of the load ever appearing. How are they to recoup their investment capital?

And what of the electric capacity itself?

If the utility is requested to deliver 50 megawatts of power then they will reserve that amount, effectively removing it from availability

to others. And yet the actual load may never approach 50 megawatts. Now the utility has to make other provisions to serve other clients, even though they may physically possess enough capacity in their system. Again—all based on unsubstantiated service demands.

Internal utility engineering resources are in short supply as it is, and now one of these projects comes along and requires significant attention. Some utility service areas have several of these projects underway. Somebody has to pay for this, or at least demonstrate that there will be an appropriate revenue stream over the years to recoup the investment.

Because there is no history to support the claims, many utilities are pushing back in one form or another—essentially, declining to meet the requests.

On the other side is the cutting edge business trying to capture a new market and lock in the best tenants. They need to build this space fast, very fast, and get it open and occupied. To do this they need connectivity with the information carriers, and they need electricity. Without both they have no product. They need electricity delivered in the amount of time the utility normally requires just to perform engineering.

A new substation can generally be built in about eighteen months, allowing for permitting and associated paper tasks. A new host environment can be operational from the ground up in one-third that time. You see where the pressure is going to rest?

Right! On the utility!

And the facility must have the guaranty of power up-front before even committing to buy or build the property! No utility wants to make such a commitment without full engineering, and no business can wait that long for an answer.

It is easy to see several of the problem areas experienced with this new market sector, and to get a feel for why there is so much confusion. The average historic consumption for these sites is below 50 watts per square foot, so why would any utility build for more than that?

But when a prospective major tenant demands of the developer that the space support 100 watts per foot, what choice does a developer have but to pass along such a requirement?

VARIOUS ANSWERS TO THE PROBLEM

The solutions to these problems have been different for different companies and also vary from utility to utility. **Sometimes the answer**

is simple—money. Just throw money at it until it works. The utility will build whatever is asked for as long as the money, millions of dollars, is paid up-front. Some form or other of rebate is typically associated with this approach.

Sometimes the answer is phased implementation, allowing the utility to keep pace with the development and loading of the site. This is a nerve-wracking solution for the developer because of the fear of getting caught short and not being able to lease out the space. And, rare indeed is the utility that will contractually agree to a delivery date.

One approach catching on is for the developer to provide the contractors who will do the work under the supervision of the utility. This is by far the best approach for most circumstances, but it has yet to meet with much enthusiasm by the utility. Given the workload, it may evolve into an acceptable method by more and more utilities burdened with resource constraints.

So the big question is, why don't people simply request a smaller amount of capacity for their first phase of occupancy, and allow the utility to build up to full load in increments over time? This would make things much easier and would demonstrate true load to the utility.

The answer is **time**—the utility simply cannot build fast enough to meet the pace of the consumer. For a meaningful increase, say ten megawatts, a utility typically needs about one year or perhaps even six months beyond that. Just as in the case of initial construction, the developer cannot afford that kind of delay. So they ask for the entire projected amount up front.

A new approach with reasonable phased construction has been working well on several of our projects and seems to be a method acceptable by the utility and consumer. It does allow for reasonable amounts of power to be available when needed, and at the same time provides the utility a much more generous construction period.

BUT... WHAT ABOUT THE CONTRACT?

Then comes the contractual relationship between the two parties. Some vehicle of assurance must exist to allow for all this construction and all this revenue flow. But most utilities have not been presented with this type of requirement in the past and so do not have any boilerplate contract available. And as you may well know it is no short or easy process to get a new contract through the approval process of a

regulated entity.

When the utility does have a contract available it normally spells out all the performance requirements of the consumer, payments and consumption levels, with no mention at all as to what the utility is obligated to do. Several have been seen that literally require millions of dollars—**and do not even reference what will be supplied in return**! Obviously this is a difficult contract for the developer, and again making revisions gets back to the problem of working outside the envelope in a regulated company.

These contracts are, at least in the US, based entirely on the construction and distribution elements of service, rather than generation. It is common for the contract to insist on a certain level of consumption, again meaning distribution and not generation, for a defined period of time in order for the utility to recover some of the money invested in their system improvements.

This minimum take or pay is a tricky approach and requires an experienced consumer because they are going to pay for this level of service regardless of actual consumption, and it establishes a minimum monthly bill. If the consumer requested several megawatts of capacity, and accepted a contract with perhaps half that level as a baseline, but then only uses several hundred kilowatts… **somebody is going to be very unhappy!**

And what of the utility? With so many of these start-up companies folding, and the utility holding a five-year commitment on millions of dollars of revenue flow, there are default concerns emerging.

One response by a major utility has been to craft a deposit concept where the deposit is eroded monthly in lieu of the minimum take or pay. This, though, is brutal to the developer, who has to produce a multi-million dollar deposit, and may well mark this utility territory as not acceptable for development.

Fortunately there are answers and methodologies to respond to all these issues. By using appropriate and experienced utility consultants, the tech park developer is experiencing a smoother entry into the market. And by listening to the presentations of these same consultants, the utilities are becoming better equipped to handle the unique demands they are now facing.

Not mentioned so far is commodity, those dear electrons themselves. As far as the utility is concerned the sale of commodity rarely comes to play in these construction and distribution issues. Whether

deregulation allows for competitive providers, or perhaps using a wholesaler behind the regulated utility, there are many approaches and the discussion is far too lengthy for this article.

Another article will speak to the countless difficulties of attempting to acquire competitive energy in these quantities.

The host-type property is here to stay—it just makes too much sense to go away. Utilities and developers alike are on a difficult and fast-track learning curve as they work through these new processes.

The engineers, contractors, consultants and even local governments are all learning their role in satisfying this unique market. And the end consumer benefits from service providers who are taking advantage of cost control measures through more efficient equipment locations.

It's a good thing all the way around.

ABOUT THE AUTHOR

Mr. Fraser has 20 years of real estate experience in facilities management, construction, design (mechanical/electrical/plumbing) and consulting. A recognized expert in building systems and energy management, he has specialized in multi-site facility operations and review, with a focus on energy acquisition and energy project design.

Prior to establishing his own firm, he served PG&E Energy Services as a national director. Earlier, Mr. Fraser was an international corporate real estate consultant for Ernst & Young Kenneth Leventhal. He has held facilities and administration management responsibilities for David Rockefeller, Prudential Insurance, John Portman & Associates, Pacific Park Plaza and Wind River Systems.

In these positions he has been responsible for the immediate supervision of more than 100 stationary engineers; daily direct operation of eight million square feet of office, retail, residential, guest and R&D in the U.S.; and nine international sites. Construction/project management includes over ten million square feet of new and tenant improvement construction, with single project values exceeding $100 million. Mr. Fraser's specialty expertise is often utilized in leading high-level negotiations.

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