

Prioritize the Action on Your Grid

Not all demand is created equal; but new demand dispatch technology intelligently manages demand to match supply.

Utilities will continue to rely on four forms of generation to drive operations: coal, nuclear, natural gas, and renewables (hydroelectric, wind and solar), but the days of simply managing supply to meet whatever demand presents itself on the system are in the distant past. New management challenges are forcing new approaches to distribution system and capacity management. Today, more utility leaders are expressing increasing confidence in what they call “the fifth fuel” - efficiency. New technology has increased the potential for energy efficiency through intelligent management of distribution assets and demand, allowing these utilities to strive for optimal energy delivery. A prime example of new intelligent distribution solutions is Demand Dispatch which integrates direct control demand management with delivery optimization and asset protection.

As table 1 indicates, distribution management pressures are mounting. From simply keeping up with the fast-growing demand, to keeping energy affordable, to meeting new emissions standards and avoiding peak pricing, network management has become increasingly complex. Demand Dispatch is a key solution that addresses many of the complex challenges facing electric utilities.

The demand-dispatch form of efficiency is important to utilities because when surging demand threatens fixed generation capabilities, utilities are exposed to serious operational risks. Frequently during those peaks, they are subject to spending much more for supply. They are at risk of

damaging their assets through thermal load levels that are too high to control. They are at risk of system failure, where the network cannot handle these heights of demand. These issues can lead to unhappy customers.

Demand Dispatch is a low risk, high reward direct load management and distribution optimization approach that promises more meaningful long term remedy than current demand side management solutions. Demand Dispatch technology can be used to reframe the supply/demand imbalance for more effective strategic resolution.

Direct Load Control

For a look at the future possibilities, and they are more near-term than you might think, consider the following: Demand Dispatch technology implementation interacts directly with specific premise loads to more effectively and granularly manage load across an entire distribution footprint.

Evolving beyond existing blind-cycling demand management or the requirements of customer behavior change based demand response approaches; Demand Dispatch uses robust two-way communications and power system software to manage a network of premise controllers. Demand Dispatch technology can efficiently manage interruptible load in very granular way – device by device in a customer’s premise. An enterprise computer system monitors premise conditions for temperature and voltage, manages all information related to individualized customer usage programs, sends dispatch instructions to premise controllers, and controls the network via internet connections through multiple radio concentrator units. This is integrated into the generation and distribution systems to optimize efficiency of energy delivery taking into account important factors including pricing on the wholesale energy market, grid location issues such as congestion, asset protection, and energy emissions impact.

Table 1: New challenges for utilities

Objectives	Market Trends & Challenges
Service Demand Growth	Global 35% jump over next 10 years – adding generation cannot keep up
Clean Energy/ Lower Emissions	Global warming – public scrutiny of utility emissions and demand for green/clean energy solutions
Keep Electricity Affordable	Digital economy makes electricity key driver of GDP growth – affordable and predictable electricity costs stimulate economic development
Manage Op-Ex	Surging peak power and fuel prices
Manage Cap-Ex	Traditional maintenance methods require large Cap-Ex in ageing systems
	Current supply capacity is 40% greater than average base load to meet peak demand occurring less than 5% of the time
Enhance Customer Satisfaction	Improve reliability by reducing frequency and duration of outages Keep Electricity affordable and reduce climate impact
Improve Standing with Regulators	Mandatory energy efficiency objectives target energy independence and green/clean energy solutions

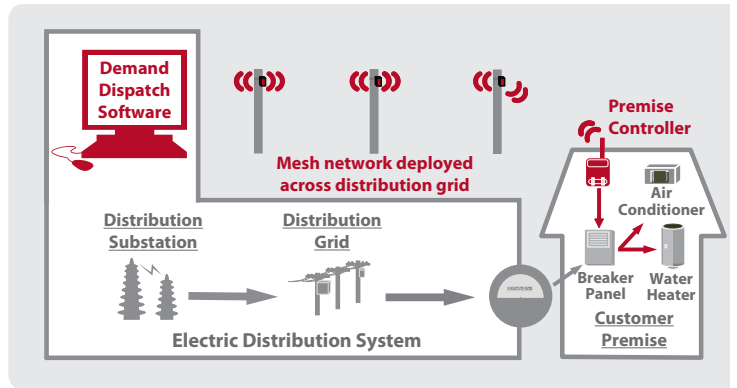


Figure 1 illustrates how sensors at the premise can communicate the use of non-essential, interruptible power (for appliances like pool pumps, air conditioners and water heaters). Small amounts of economy from individual residential, commercial and industrial premises can add up for impressive grid-wide shedding of non-essential loads.

Compelling ROI

Demand Dispatch must provide a good balance of reduced capital investment plus a strong return on investment for the utility. Of significant importance to the value proposition of Demand Dispatch is the ROI outcome. Specific feasibility studies indicate that the implementation of Demand Dispatch technology will provide a very attractive return, with a pre-tax margin of 16%.

In one feasibility case study, driven by actual load, price and wholesale grid conditions over an entire peaking season, a number of parameters were found to be in place (see sidebar opposite). The feasibility study results indicated that the most favorable means of addressing the system demand requirements was via Demand Dispatch. When compared to the options of purchasing peak power or investing in generation, the pre-tax profit margin associated with the Demand Dispatch option was the most promising, at 16 percent. Investment in generation resulted in a loss, whereas the purchasing of peak power resulted in just an 11 percent pre-tax profit margin. It would be expected that peak power profitability would decline even further as demand continues to increase yet supply remains relatively flat.

Bringing the customer into the mix

It may seem like a counter-intuitive step to the textbook capitalist who will bend over backwards to up-sell, but when positioned as a win-win, a utility's energy efficiency message can be well received by the customer and make business sense to the utility. This is particularly true if we introduce the environment into the scenario, since it is established that efficiency reduces greenhouse gas emissions resulting in a cleaner environment.

BPL Global recently conducted a survey to determine end-user interest in opt-in energy efficiency programs. BPL Global found that electric customers were more open to programs that automatically balance comfort and electric cost savings during peak summer load periods than would have been expected.

The survey indicated that while only 54 percent of respondents have heard about demand management programs, 72 percent would be interested in signing up for the energy conservation benefits. Other findings:

- 85 percent agree or strongly agree with a statement self-describing as a "person who wants to save energy"
- 95 percent believe they are already doing things to save energy
- 72 percent agree or strongly agree that efficiency and conservation measures should be pursued before building new power plants
- 60 percent said they would sign-on for Demand Dispatch programs that allowed for energy savings on air conditioning usage, by allowing indoor premise temperatures to increase to 80°F

There is increasing alignment between utilities, regulators and customers that energy can be delivered and used more efficiently, and that solutions improving efficiency are the cleanest possible, with something to satisfy everyone. Demand Dispatch technology has the potential to:

- Better manage supply and demand by curtailing peak load.
- Significantly reduce the energy wasted by inefficient transmission, distribution and use.
- Improve grid reliability by protecting assets from overload conditions and thermal failure.

Feasibility Case Study for Typical Municipality

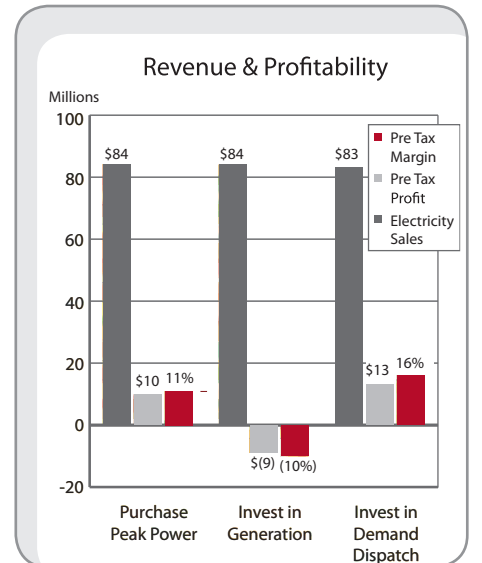
A utility now has three options to meet peak power requirements:

- Purchase peak power
- Invest in and own generation for peak demand*
- Invest in Demand Dispatch

The demand management solution using Power SG™ Demand Dispatch from BPL Global provided the highest return with a pre-tax margin of 16% percent. Key assumptions:

- 40,000 customers
- 70% of customer engaged in program
- Peak demand occurs 1.5 percent of time
- Steep ISO peak power price curve: \$0.05/kWh; at 60MW rising to \$0.70+ at 150+ MW
- Distribution system designed to safely handle 120 MW peak load, exceeded on hottest days
- Cannot pass peak ISO pricing on to consumer

*60MW generation plant required for only 400 hrs of peak demand per year. Not profitable due to ongoing costs to operate plant.



- Reduce the operating cost required to produce or purchase peak energy.
- Delay the need for new generation capacity by using efficiency as the "fifth fuel".
- Protect our environment by reducing CO₂ and other greenhouse gas emissions.

The next step to increase energy efficiency is more intelligent management of distribution assets and demand for optimal energy delivery, and the technology available to do so is here today.

For more information please contact BPL Global - www.bplglobal.net, info@bplglobal.net.