Battery Energy Storage for Congestion Relief
Relieving stress on transmission bottlenecks

Power limitations in the transmission system often lead to bottlenecks that put heavy stress on substations and power lines. When combined with the unpredictability of wind and solar power, this can have other costly consequences such as the need to curtail scheduled generation. A battery energy storage system from ABB can provide such grids with much needed congestion relief, which will allow the system operator to see several key benefits such as increasing reserves and avoiding curtailment of renewables.

Pushing grids to the limit
Growing energy needs have spurred rapid development of generation capacity in many grids, including numerous installations of renewable wind and solar power. In some cases this growth is becoming both problematic and costly for system operators as output begins to reach the power limitations at critical nodes.

The addition of intermittent renewable resources amplifies these challenges and requires greater flexibility than these circuits were ever designed to provide. Grids that were designed for simple distribution are now being asked to transmit unpredictable renewable generation at their full capacity.

As these nodes become more constrained and congested, the resulting challenges will continue to grow. For example, more and more renewable energy will need to be curtailed, which will drive up costs for the system operator. Additionally, these bottlenecks reduce the effectiveness of installed wind and solar generation, which is essential for reaching environmental goals.

Choosing the right solution
A battery energy storage system (BESS) from ABB provides system operators and planners with a new alternative for solving grid congestion. Rather than being limited to making upgrades to the transmission and distribution (T&D) system, grid operators now have the choice to defer such investments and planning and may even be able to avoid some upgrades altogether.

On the other hand, system operators can opt to wait for technological advances or cost reductions, but would be left with frequent bottlenecks and mounting costs as the grid grows more and more congested.

By using a battery energy storage system from ABB to relieve grid congestion, system operators can quickly achieve several key benefits. Aside from significant savings from avoiding curtailment, system operators can also provide the system with extra reserves and primary regulation. Additionally, they will have the option to defer major T&D investments.
Energy storage achieves significant cost savings

An ABB battery energy storage power conversion system was installed at the Long Island Bus Company (LIB) refueling depot in Garden City, New York. This 1.2MW, 7.2MWh system uses advanced sodium sulfur batteries and allows the LIB to avoid expensive day-time peak demand rates by shifting peak demand to night time when rates are lower. The result is significant cost savings on both energy and labor costs.

Other benefits are also achieved by the local utility such as the reduction of peak power demands on its congested distribution system. Additionally, in the event of an interruption, the battery energy storage system can provide backup power to the depot's gas compressors so that LIB can keep their buses running.

ABB BESS technology and offering

ABB has a long history of successful energy storage solutions including over a decade of expertise in implementing battery energy storage systems. This experience gives ABB the capability to develop and deliver the ideal battery energy storage system to meet all power requirements. ABB integrates batteries, power converters, and system control into a single solution that effectively reduces grid congestion.

ABB Mach 2 control system

Additionally, ABB is an industry leader with the individual core technologies of energy storage like converters and control systems ranging from tens of kilowatts to hundreds of megawatts. This expertise will be essential for managing bottlenecks in the grid and maximizing the additional benefits.

ABB Ltd
P.O Box 8131
CH-8050 Zurich, Switzerland
Phone: +41 (0)43 317 71 11
Fax: +41 (0)43 317 79 58

http://www.abb.com/smartgrids