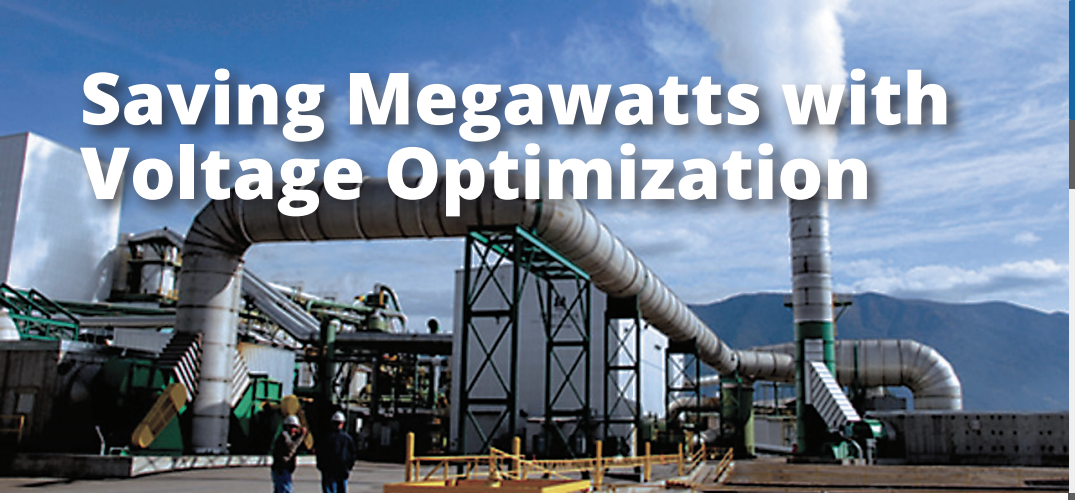
Saving Megawatts with Voltage Optimization



The Project

Plum Creek Timber Company is the largest and most geographically diverse private landowner in the nation, spanning approximately 7 million acres in major timber-producing regions of the United States. The company produces lumber and other wood products in their manufacturing facilities in the Pacific Northwest.

In September 2008, Utilidata deployed its AdaptiVolt™ voltage optimization software at Plum Creek Timber's Medium Density Fiberboard (MDF) facility in Columbia Falls, Montana. The patented AdaptiVolt™ software has been installed at major electric utilities and industrial facilities in the U.S. and Canada.

The AdaptiVolt™ software has provided significant energy savings when implementing conservation voltage reduction in previous deployments. Real-time voltage monitoring and Utilidata's patented algorithms allow the system to operate in facilities with varying industrial processes while providing savings and enhancing reliability.

Advanced Conservation Voltage Reduction

Conservation voltage reduction is the practice of operating electric distribution systems at voltages in the lower range of allowable levels, thereby improving the efficiency of many electric utilization devices (e.g. induction and synchronous motors, transformers, lighting systems, etc.).

This approach can be applied to a variety of industrial settings; however, using an advanced real-time control system such as AdaptiVolt™ is critical to ensuring that voltages don't drop to levels that put important processes at risk. AdaptiVolt™ monitors voltages through the facility in real-time and makes control decisions to safely reduce voltage, thereby achieving energy efficiency gains while maintaining process reliability.

Project Summary

Energy Savings

Demand Savings
3.72%

Energy Savings
9,063,800 kWh/yr (@ full production)

Voltage Tap Change Performance
13.6 taps per day on average

Environmental Impact

9,063,800 kWh of energy saving achieves a reduction of:

6,250 metric tons of CO_2

18,700 pounds of NOx

48,500 pounds of SO_2

Financial Benefit

Plum Creek Timber earned an incentive of **$337,000** for this project from Flathead Electric Cooperative and the Bonneville Power Administration.

Learn More

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Utilidata

Learn more at utilidata.com

Initial Feasability Study and Report

Prior to beginning a full implementation of AdaptiVolt™, Bonneville Power Administration conducted a study to evaluate the potential for energy savings at the facility. Based on the initial evaluation and audit report, Plum Creek decided to proceed with a full-scale deployment of AdaptiVolt™. The project completed commissioning and went into operation in September 2008.

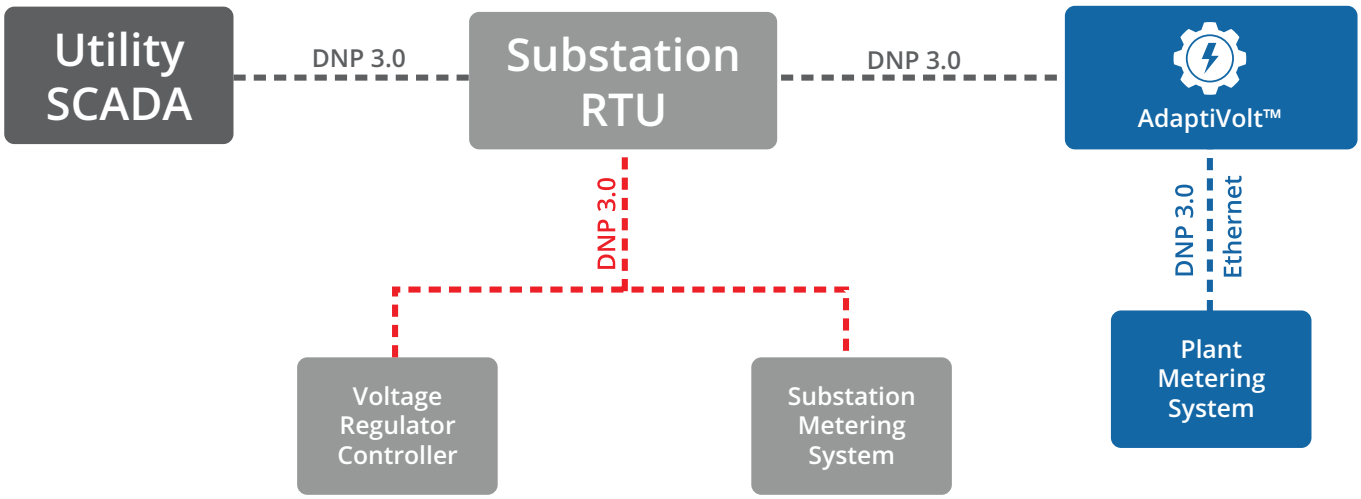
Project Description

Plum Creek's MDF facility has two production lines: Process Line #1 and Process Line #2. Each process line has large plate refiners driven by high-horsepower (10,000+ hp) synchronous motors, which are each directly connected to one of three 13.8 kV feeders from the electric distribution substation. Each process line also has another direct connect feeder to the substation that powers the balance of the process, including motors for rolling, pressing, material handling and environmental conditioning. Each of the five electric circuits feeding the MDF facility are individually controlled at the substation by three-phase voltage regulators.

Plum Creek installed an energy metering subsystem to collect voltages for this project. Meters were installed on each circuit in the substation; installed at each synchronous motor; and, installed at 27 other locations throughout the facility.

The AdaptiVolt™ software connects to the electric metering system to obtain voltage readings, and then issues control commands to the voltage regulators in the substation. Plum Creek engineers and local electric utility operators have full visibility and control of the system through a SCADA user interface.

Project Architecture



Savings

Using a Measurement and Verification protocol approved by the Bonneville Power Administration, operation of the AdaptiVolt™ system has reduced demand at the facility by 3.72% and created an annual energy savings of over 9,000,000 kWh (at full production capacity).

Measurement & Verification Analysis

	Process Line 1			Process Line 2	
	Balance of Plant Feeder 1	**Refiner 1 Feeder 2**	**Refiner 2 Feeder 3**	**Refiner 3 Feeder 4**	**Balance of Plant Feeder 5**
Average Voltate Reduction	2.42% ΔV	3.33% ΔV	3.06% ΔV	4.82% ΔV	2.42% ΔV
Demand Reduction	2.13% ΔMW	7.19% ΔMW	5.60% ΔMW	4.68% ΔMW	2.49% ΔMW
Tap Change Performace	11.8 per day	8.9 per day	N/A	22.5 per day	11.3 per day

Operational Results

There have been no production outages at Plum Creek's MDF facility due to AdaptiVolt™. In fact, Plum Creek has experienced other benefits that have further improved process reliability.

Prior to the implementation of AdaptiVolt™, the facility had occasionally experienced failures of variable frequency drives during the times that production levels were ramping down. Since the implementation of voltage optimization these occurrences have been greatly reduced. These premature failures are thought to have been caused by high voltage as load was reduced, a condition that does not occur with voltage optimization technology.

Is Your Facility an AdaptiVolt™ Candidate

Many large industrial facilities are candidates for AdaptiVolt™, along with other large institutions with like military bases, or corporate headquarters. Key factors in determining whether a particular facility is a good candidate for VVO include:

1. The facility should have its own substation(s) (whether owned by the facility or the serving utility) or be the only customer on a utility feeder.

2. The facility must have existing voltage regulation capability, minimizing the initial cost of a VVO system.

3. The size of the electrical load of the facility and its peak load help determine the economics of an AdaptiVolt™ VVO system.

4. The facility's electrical system must be designed adequately to allow for voltage optimization.

5. Large or critical process loads should be evaluated for their impact on energy savings, and may require dedicated energy metering.

6. Existing facility infrastructure such as metering or energy management systems and communications can reduce the overall cost of an AdaptiVolt™ VVO system. On the other hand, an AdaptiVolt™ VVO system can often be used to help justify the addition of an energy management system or other infrastructure.