



Weyerhaeuser

Electrical Load Efficiency

A Structured Systems Perspective

Taking A Systems Approach to Loads

- Performed Two Site Wide Assessments
 - Both multi-businesses manufacturing sites
 - One performed with DOE PWA matching funds
 - Second replicated with internal funding
- Developed Three Step Process
 - *Site-Wide* Opportunity Systems **Discovery**
 - Prioritized *Systems* Level **Development**
 - Systems Efficiency **Delivery Plan**

Site-Wide Discovery

- Simulated Individual Loads, Including Motors Down to 5 Hp, Into One Total Site Load Model
- Validated Model Against Available Load Meters
- Model Indicated Greatest Efficiency Opportunities Came From Logical Load Systems
- Found Both Sites Could Be Self-Sustaining If Each Implemented Best Available Load Reduction Technologies and Best Management Practices & Tools
- Identified and Prioritized Systems for Development Level Analysis
 - E.g. HVAC load system at one mill was 6% of total load

Systems Development

- **Structured Analysis of Each System Included**
 - Load reduction measures
 - Utilizing measured baseline profiles with analysis tools like PSAT identified higher return load reduction measures
 - Management measures
 - Assigning systems owners then improving awareness and skills identified considerable more no to low cost efficiency measures
 - Decision support measures
 - Establishing measured baseline profiles and analyzing loads as a system created a more credible business case

Delivery Plan

- A Sustainable System Efficiency Plan Included
 - Load reduction technologies
 - Utilizing structured analysis in development step justified most cost effective measures
 - Management practices
 - Improving operating behaviors led to creative practices and sustained systems savings measures
 - Decision support tools
 - Implementing management tools allowed operators to control electricity more as a variable cost rather than a fixed cost

Key Learning

- Taking A System Perspective Requires A Shift In Thinking From Both Operating And Optimizing The System – An Education Process Becomes A Key Part Of The Approach
- Load Modeling Can Be An Effective Tool To Identify High Impact Target Systems
- Measured Baseline Profiles Supporting System Analysis Techniques And Tools Can Insure That High Impact Opportunities Are Realized