

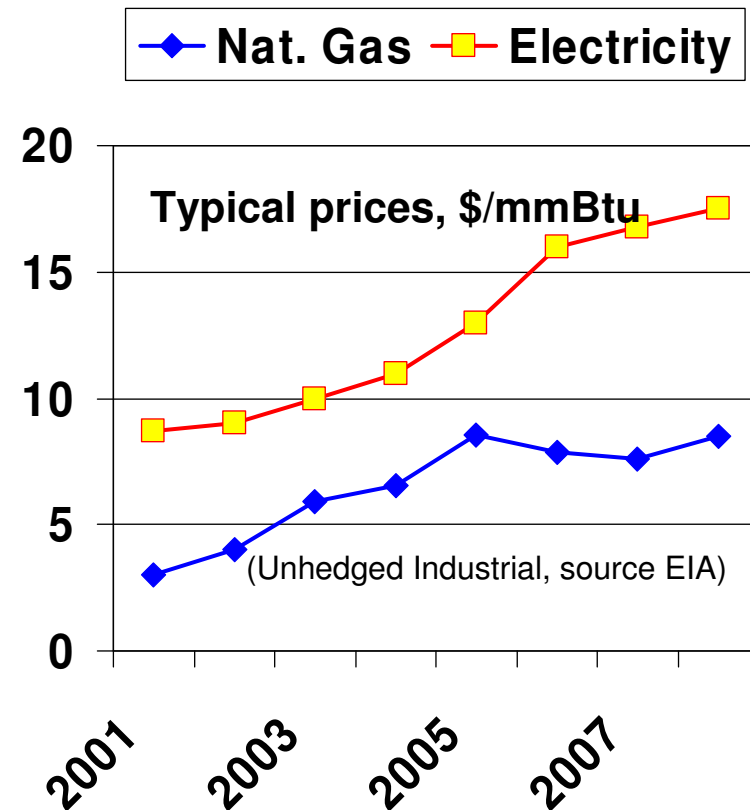


Industrial Energy Efficiency: Strategies & Helpful Resources

**Lake States TAPPI
Energy Forum
May 14, 2008**

Energy Efficiency Project Drivers

- **Energy costs**
- Good project ROI
- Customers (GHG)
- Other



Survival & Profitability Through Energy Efficiency



CTP/FOCUS Definitions

- Energy Efficiency (**EE**) – reduce the amount of electricity or natural gas needed per unit of output
- Best Practice (BP) Technology
 - Off-the-shelf, market-proven technologies that are not yet standard practice in Wisconsin
 - Little or no perceived technology risk
 - Focus provides grants to deploy Best Practices
- Emerging Technology (ET)
 - Technologies that have not been adopted in Wisconsin
 - Real or perceived technical risk
 - Once adopted, can become Best Practices

Assess Your EE Opportunities

“You can’t control what you don’t measure”

- Measure – to most reliable level of data
- Benchmark energy data (TAPPI et al)
- Technical support to identify EE opportunities:
 - DOE Save Energy Now (SSAT, PSAT, etc.)
 - Energy Scorecard: another tool
 - Others (e.g., comp air or vacuum system studies)
 - Mill energy team is a great resource...

Develop Your EE Plan

- Mill energy team (a best practice)
- Set targets and goals with a timeline
- Identify potential EE projects
- Scope and develop EE projects
- Identify resources needed for projects

EE Project Resources

- Focus on Energy incentives (custom and prescriptive grants, technical services, tool lending library)
- CleanTech Partners loans for “emerging” technology
- CTP/FOCUS industry & business expertise
- Stalled Best Practices Financing (pilot program)
- Other grants and loans (DOE, USDA, WI Commerce, others)
- Corporate capital funding
- Allies (e.g., suppliers, consultants) as appropriate

Pulp & Paper Staffing Grant

- Barrier: No engineer on mill staff to implement energy projects, even if projects identified.
- “Staffing Grant” approach approved in 2007
 - Application deadline December 2007
 - Selections made January 14-24, 2008 (five)
 - Up to \$120,000 per year to hire energy engineer
 - Best Practices, grants/loans/other funding still apply

EE Project Absolute Needs...

- Process owner's buy-in;
- Minimal risk to production or quality;
- Minimal impact on staffing resources;
- Positive impact on competitiveness;
- ROI hurdle

CleanTech Partners Overview

- Non-profit: Launched by FOCUS 2003
- Mission: Save natural gas & electricity in Wisconsin
- Funding: Focus on Energy (pri), USDA, DOE, contracts
- Team: Six experts
- Loan-based model for emerging tech deployment
 - Manage a \$4MM investment fund
 - Investment fund initiated by Focus grant

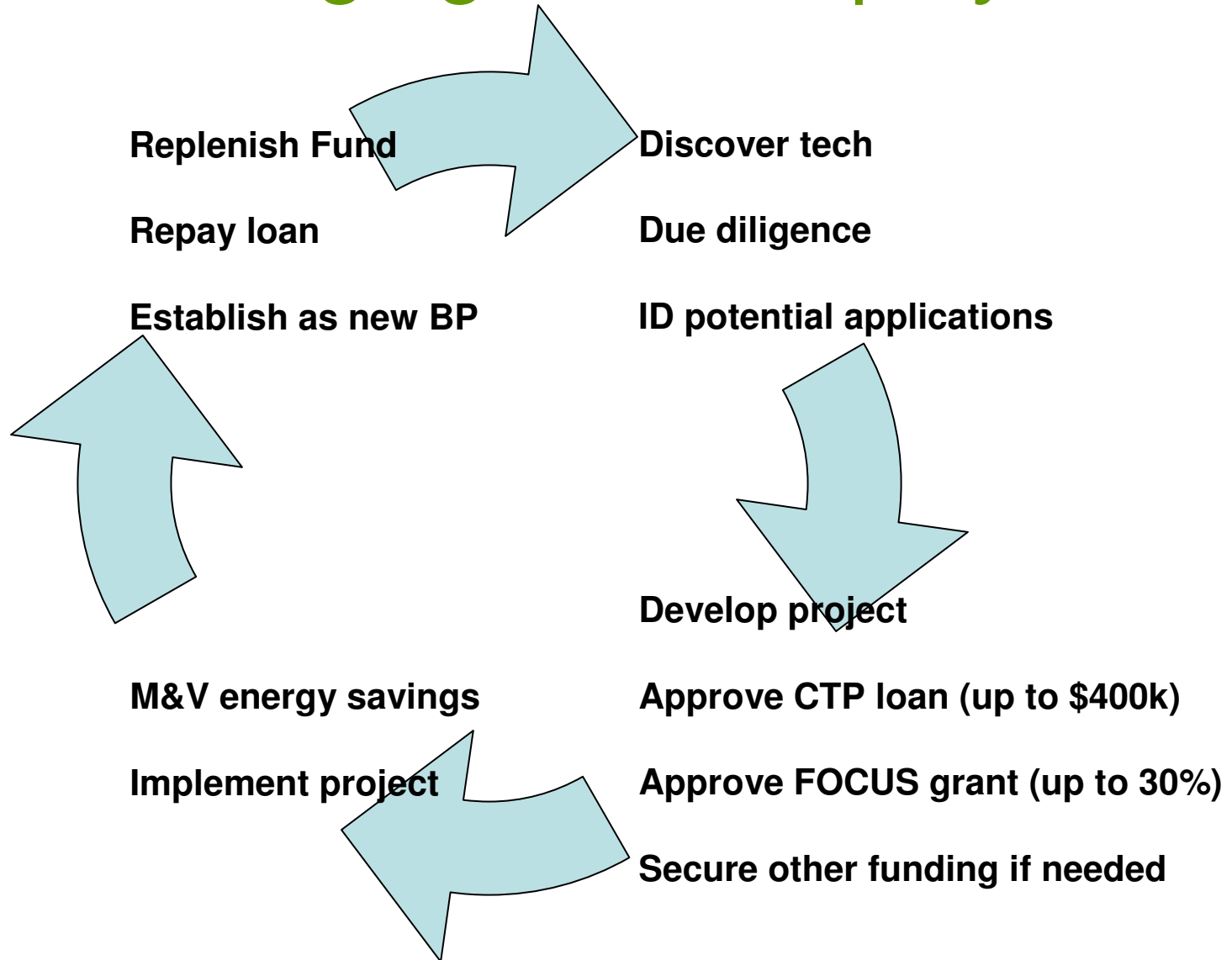
CTP Expertise

- Business startups
- Equity investments,
- Banking
- Energy & Utilities
- Engineering & Chemistry
- Product development
- Business development
- Marketing
- Government relations

In Clusters:

- Pulp & Paper / Forest Products
- Metal casting
- Printing & Plastics
- Food Processing
- Biofuels
- Renewables

CTP Emerging Tech Deployment



Questions



Emerging Technology Examples

1. Organic Rankine Cycle
2. Online Freeness to Refiner Control
3. VersaBrush (PM felt cleaning system)
4. Air Doctor (TAPPI 2008 tech paper)
5. Thermosorber
6. LignoBoost

Emerging Tech: Organic Rankine Cycle

- Waste heat generates electricity, zero emissions
- Uses waste heat as low as 170°F
- Proven in geothermal and landfill gas applications
- Economics improving in industrial applications
- Simplicity of the install key to the economics
- 2 to 4 year simple payback before incentives

Emerging Tech: Thermosorber

- Low grade heat energy recovery
- 1.0 unit of low grade heat in
 - 0.6 unit of cooling out (42F)
 - 1.6 unit of hotter fluid out



Emerging Tech: LignoBoost

- Applies to Kraft process CPM
- Removal of lignin from black liquor
- Biomass stream produced
 - Filter cake with high Btu value
 - Can also be pelletized
 - Use in solid fuel boiler, or,
 - Displace natural gas at the lime kiln

Questions



Thank You!

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U.S. DOE Energy Savings Goal

Reduce industrial energy intensity by 25% over 10 year period (ITP)

- MOU between DOE & Wisconsin (1st in US) based on CTP's successful deployment model and Focus on Energy Industrial Program
- Result: January 30 Energy Summit
 - Public/private stakeholders meeting in Milwaukee; New Page participated
 - Identify barriers to reducing energy in Wisconsin
 - U.S. EPA and DNR attended and pledge support
 - Action plan developed (moving forward w/clusters)
 - Meet with Industry Ass'n leaders May 19 (needs/solutions)
 - Meet with Policymakers based on industry needs

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