

Recycled water cools welds at Johnson Screens

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Johnson Screens, a fabricator of metal filters and screens, continually investigates ways to improve the environmental impact of the facility in New Brighton, Minnesota. In 2009, the company hosted a **MnTAP intern** who worked with staff members to explore opportunities to improve processes and upgrade to more efficient equipment.

The **MnTAP intern** focused primarily on water and electricity use. Prior to hosting the intern, more than ten million gallons of water were consumed annually for manufacturing processes such as cleaning parts and cooling both parts and machines. The water use presented opportunities for improvement through reuse and reduction. Significant amounts of electricity were also used to support welding operations, air conditioning, lighting, various motors, and compressed air.

Water Use Recommendations

Approximately 2.5 million gallons of tap or recycled water were used in the screen fabrication machines (SFMs) to directly cool the welds and the welding equipment. The water recycling system collected used water from the SFMs in a trough and diverted it to a sump near the water tank. A sump pump, operated by an automatic float, pumped that water into a three-part collection tank. Debris that was heavier than water was collected at the bottom of the first tank; water then flowed into the second tank, where oils were skimmed off. Water from the third tank was pumped back to the SFMs and as the tank levels dropped, fresh water was added. Despite having a water recycling system in place, not all SFMs were connected to or using water from the system.

The **MnTAP intern** explored non-aqueous cooling alternatives for the SFMs, such as carbon dioxide snow, but found that water was the most cost effective method for cooling the



MnTAP intern Zach Zurbey (left) and MnTAP technical director Jeff Becker (right) inspect the centrifugal separator before installation. Zurbey's recommendations to Johnson Screens saves the company \$36,600 annually.

welds. Therefore, the intern evaluated improvements and replacement opportunities for the water recycling system. Changes that incorporated the current pipes and water system were the most economical way to reduce the amount of water used. The **MnTAP intern** recommended integrating all SFMs into the current recycling system and installing a centrifugal separator and belt skimmer to the tanks. The centrifugal separator creates a vortex in the first tank that forces debris out of the water and into a chamber that gets manually dumped daily. The belt skimmer provides a more efficient separation of oil from the water in the second tank. The improved water recycling system conserves up to 2.4 million gallons of water per year, providing Johnson Screens with \$9,700 in annual cost savings. To further improve the water recycling process, Johnson Screens is currently investigating a CoMag water filtration system installation, which is an enhanced water polishing technology.

Energy Efficiency Recommendations

Through a compressed air audit, the intern determined that the air dryer for the backup air compressor ran almost continuously for about 8,000 hours per year, while its compressor only ran when the pressure of the system dropped to 90 psi or lower,

Route:

- health and safety
- maintenance
- owner/president
- process engineer
- purchasing

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Green team reduces waste, water, and energy

Graco, in an effort to reduce waste and improve efficiency, formed a team of various facility employees. This team meets monthly to investigate waste reduction, energy efficiency, and general plant efficiency opportunities. Since 2008, MnTAP has provided assistance to the Graco green team and has witnessed the value the team brings to the facility.

Graco manufactures handling systems and components that transport, dispense, measure and control fluid systems. Operations areas manufacture products for global platforms, such as machining, printing, painting and assembling. The green team has evaluated procedures and refined processes in each area to reduce materials waste, increase recycling on the shop floor and within the office, and conserve energy through process and equipment improvements.

One project involved investigating a pretreatment coating line, where counterflow rinsing has the potential to save Graco nearly 700,000 gallons of freshwater each year. The team monitored water flow at each rinse station, balanced the

system, and ensured that the conductivity of the final rinse met process specifications. By installing a cascading rinse configuration, Graco will save approximately \$5,000 in water supply and discharge costs.

Another project involved evaluating the performance of the facility's compressed air system. Upon examining the compressor system's cycling, the team determined that leaks in the facility accounted for 19% of the total air demand. The team members are working closely with each department within the facility to find leaks and train employees how to both detect and repair leaks. Throughout one facility, a number of leaks were discovered that, when repaired, will save the company over \$27,000 in electricity costs. By employing a preventive maintenance program within each department, employees feel challenged and empowered to repair leaks to optimize the performance of the department.

Additional green team projects have netted solid waste reduction of almost two tons by recycling paper and cardboard and printing double-sided documents. Company-wide team efforts, such as recycling, enhance a green work culture as Graco continues to search for further improvements.

Currently, the team is examining solvent recycling, maximizing the use of shrink wrap, expanding the current recycling program, and evaluating lighting systems. Graco's green team helps reduce the company's environmental impact and drive down costs by identifying opportunities for waste reduction and involving employees in improvement processes. ■

Graco Benefits Overview

Waste Reduction Option	Waste Reduced/ Materials Savings	Annual Cost Savings
Coating line water rinse	697,361 gal	\$4,600
Repair compressed air leaks	265 CFM 71,032 kWh	\$27,850
Condition high-pressure intake air	13,653 kWh	\$683
Paint solvent recovery	1,100 gal	\$4,400

Intern at Johnson Screens investigates water and energy

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which was about 550 hours per year on average. To conserve energy, a relay switch was installed on the compressed air dryer, so that it only runs when the backup air compressor is on. This improvement conserves 26,000 kWh and saves \$1,400 per year. The intern also found and fixed compressed air leaks, saving over 312,000 kWh and \$16,000 annually.

Additional Recommendations

In addition to improvements to the cooling water recycling and the compressed air dryer processes, Johnson Screens implemented other recommendations. For example, the office

steam humidifier was replaced with a dry fog humidifier, saving \$7,500 per year, and the wash room ventilator run time was reduced, saving 21,900 kWh and \$1,200. Overall, the company implemented recommendations to reduce 150 pounds of waste, 2.4 million gallons of water, over 360,000 kWh, and 3,000 therms per year, with a total annual savings of \$36,600.

Recently, Johnson Screens was awarded the Manufacturers' Alliance 2010 Manufacturer of the Year Award for sharing information and experiences that can help strengthen the local manufacturing community. ■

Successful teams link green and Lean opportunities

If you think back to the summer of 2008, you may have experienced a shocking gas bill at the pump as you filled up for the weekend getaway. You may have also noticed that many products became more expensive or came in smaller packaging. The primary reason for this was the instability of fuel prices and feedstocks for the petrochemical industry. However, by reducing the package size of items, such as laundry detergent, not only did companies reduce shipping costs, but they also reduced pollution, packaging waste, and their overall environmental footprint.

We rarely see what goes on behind the scenes in the production of products and processes. In fact, much of the unseen processes hold great significance to firms seeking cost reduction, energy conservation, and materials waste reduction. MnTAP helped multiple companies achieve pollution prevention and energy efficiency goals by working with facility green teams to evaluate Lean and pollution prevention/energy efficiency opportunities. Teams worked to optimize manufacturing and production processes, improve equipment periodic inspections and maintenance, and seek ways to improve energy utilization.

Team efforts at both Harmony Enterprises, Inc. and Valley Design investigated savings opportunities in energy-using systems, such as compressed air, and made improvements to initiate their application for the U.S. EPA's Green Suppliers Network (GSN). Being part of the GSN gives businesses increased visibility as a continuously improving business entity. The program provides a framework to achieve Lean and green goals. Both firms are working toward energy conservation

goals and are insulating boilers and condensate return lines, saving thermal energy. The team at Harmony Enterprises is investigating installing a new paint booth with variable-frequency drive fan control and high-velocity, low-pressure nozzles that could potentially save the firm over \$10,000 annually. Meanwhile, Valley Design's team reduced annual energy use by 200,000 kWh by upgrading facility lighting systems. This upgrade saved the company almost \$20,000. The two firms suggested and evaluated a total of 14 projects that met their guidelines for applying to be GSN members.

These two companies took advantage of MnTAP's expertise in developing cross-functional teams within facilities. By partnering with MnTAP and Enterprise Minnesota, Valley Design is now a GSN member and Harmony Enterprises is well on its way to being added to GSN. ■



Interested in greening your products?

Do you want to eliminate PVC or BPA from your products or packaging? Or are you looking to cut PBDE from product fire protection or from products using a photoresist process? Maybe you'd like to launch a new sealant or adhesive and need an alternative to isocyanate with equivalent functionality. Whether you are considering a change to an existing product or developing a green component for a new product, the Prevention and Assistance Division (PAD) at the Minnesota Pollution Control Agency (MPCA) would like to hear from you.

PAD staff members are considering various assistance methods that could support Minnesota businesses developing marketable green chemistry and design products. If you have projects in mind, but are unable to tackle them, please contact Al Innes at MPCA's Prevention and Assistance Division at 651.757.2457 or alister.innes@state.mn.us. ■

Online tool helps non-hospital healthcare facilities assess wastes

The Minnesota Pollution Control Agency (MPCA) is partnering with MnTAP to help dentists, long-term care facilities, medical clinics, pharmacies, and veterinarians comply with hazardous waste regulations and reduce the amount of hazardous waste generated by their facilities.



As a result of the partnership, an online self-assessment has been created for each non-hospital healthcare area. The self-assessment is a voluntary compliance assistance tool that qualifies for the Minnesota Environmental Audit Program (EAP). To complete this audit and qualify for

a Green Star award, a facility must disclose past violations and certify that it will operate in compliance with environmental regulations going forward. Past enforcement actions by the MPCA or metropolitan county hazardous waste programs (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington) disqualify facilities from receiving a Green Star award.

The assessments will be available from April 1 to July 31, 2010. You can access the sector specific assessments by visiting www.mntap.umn.edu/healthcarehw/index.html. ■

MnTAP awarded DOE grant for energy assistance

Minnesota industrial users consumed 560 trillion Btus of energy in 2005, 30% of the State's energy use, to deliver products and services. Significant energy efficiency opportunities, 15-20% savings, exist in industrial manufacturing facilities through conserving resources and increasing efficiency. MnTAP has

been awarded a U.S. Department of Energy (DOE) grant to provide energy efficiency assistance to Minnesota businesses that will result in energy and cost savings. Efforts will be focused on seven high-energy use sectors: chemical manufacturing, ethanol production, food processing, metal casting, metal fabrication, mining, and pulp and paper.

The goal of the project is to deliver a comprehensive program with energy efficiency resources to assist businesses with implementing

energy saving technologies. To achieve this goal, MnTAP will be coordinating on-site assessments, trainings, and technology demonstrations throughout the State.

On-site Industrial Assessments

At this time, MnTAP is recruiting high energy using companies

to participate in on-site assessments with a DOE specialist. We are particularly interested in businesses with compressed air systems, motors and fans, and steam systems.

Training Workshops

Three training workshops, delivered by DOE-qualified specialists, will be held in various locations throughout Minnesota and will cover energy efficiency information for compressed air systems, steam systems, and motors and fans. The first workshop is scheduled for April 20 and will address compressed air systems. Information regarding registration for the event can be found on the MnTAP calendar.

Technology Demonstrations

Additionally, demonstrations showcasing energy efficiency technologies, utilizing the knowledge and experience of shop personnel, vendors, utilities, and trade associations, will be offered. We are currently seeking companies that would like to host a technology demonstration. If your company has implemented an innovative energy saving practice and is willing to share this information, please contact MnTAP.

Project Funding Information

This project was made possible by a grant from the DOE and the Minnesota Department of Commerce through the American Recovery and Reinvestment Act of 2009 (ARRA). ■

Contact us!

If you are interested in an on-site assessment or showcasing your energy efficiency efforts through a technology demonstration, contact:

Cindy McComas, 612.624.1300 or mntap@umn.edu

Project partners

Minnesota Department of Commerce
Office of Energy Security

Center for Energy and Environment

Iowa State University Industrial Assessment Center

Xcel's energy and heating efficiency rebates increase

In 2010, Xcel Energy has increased their rebate program to encourage energy efficiency projects. Xcel customers that are considering upgrading to more efficient processes and/or equipment should consider applying for rebates to help offset capital costs.

Boiler Upgrades

Boiler rebates are up to seven times higher than before. With the new rebate levels, a straightforward \$3,500/MMBtu is available for new condensing boilers that are 92% efficient and higher. Also, Xcel is offering rebates for both space heating and combination space/domestic winter heater boilers.

Drive and Motor Upgrades

The rebate for a 5 hp drive is now \$600 compared to \$30/hp or \$150 in 2009. Motor rebates offers a standard rebate level based on horsepower.

Study Rebates

Xcel offers financial reimbursement for studies that analyze energy use and recommend energy-saving strategies. Xcel's funding reimburses up to 75% of the total cost (up to \$25,000) for studies including efficiency controls, engineering assistance, recommissioning, and refrigeration recommissioning.

Payback Threshold Reduction

Xcel lowered the payback threshold to nine months, reduced from a payback of one year or greater. This increases the chance of receiving rebates for lower payback projects. Projects including process efficiency and recommissioning are eligible for rebates of up to \$400 per kWh and up to \$5 per DTH saved.

For more information about Xcel's rebate programs, visit www.xcelenergy.com/Rebates or contact Xcel's Business Solutions Center at bsc@xcelenergy.com or 1.800.481.4700. ■

Spotlight on technology: the PuriGator



Tramp oils, a serious concern for metal working facilities, can accumulate and cause significant problems within metal working fluids. They can act as a nutrient source for bacteria, degrading the metal working fluids and also producing odors. Once tramp oils have degraded the metal working fluid, it is no longer useful and needs to be disposed of. However, if tramp oils can be removed, the metal working fluid can be reused, saving facilities significant purchase and disposal costs. In addition to tramp oil, metal working shops also are concerned with particles that enter the metal working fluids during production processes. These particles can clog machines, cause down time, and make metal working fluid unusable. Therefore, technologies that remove tramp oil and particles from metal working fluids can be valuable solutions.

One tramp oil removal system, the PuriGator offered by Solvent Systems International, uses a weir skimmer to vacuum the surface of the metal working fluid tank and remove free oils and other light fluids. Once removed, these fluids are sent to the purifier where they are separated, concentrated, and collected in a reservoir. From the reservoir, the concentrated oil is discharged for collection. The oil is valuable and able to be recycled.

Once the oil is removed, the remainder of what's left in the reservoir is purified fluid, which can be reused in the machining process. Oil skimming technologies, like the PuriGator, extend the life of industrial metal working fluids by effectively aerating

the fluids, reducing the microbial activity that can degrade the fluid, and removing particles that can alter the fluid's effectiveness.

Case Study: Graco

Graco, working with MnTAP, installed a PuriGator at the Anoka facility on a trial basis in February 2010. The company was concerned with the amount of oil tramp in the machine sump and the amount of metal working fluid being disposed of with captured oil. Therefore, Graco wanted to investigate a solution which would turn the otherwise useless oil into something valuable while preserving the metal working fluid for reuse in production processes.

From the initial results of the trial, the metalworking fluid appears to have more effective aeration, which may in part be due to increased treatment flow. The unit also appears to have equaled the tramp oil removal performance of Graco's traditional skimmer. Since the traditional fluid separator needed periodic parts replacement, the PuriGator is expected help Graco save on replacement costs. ■



The PuriGator extends fluid life by:

- Aggressive removal of tramp oil
- Effective aeration of fluids
- Reduction of microbial activity and odors
- Removal of particles

Results of using the PuriGator:

- Cleaner coolant
- Lower chemical costs
- Lower waste disposal volumes and cost
- Better machine performance
- Reduced change out time

MnTAP and the U of M offer food processing symposium

Food processing facility managers and staff are invited to attend an exciting and engaging food processing symposium at the University of Minnesota to learn more about how food safety and security coincide with facility water and energy use.

Experts from MnTAP and the Food Science and Nutrition Department at the University of Minnesota will speak about opportunities to improve your processes. Speakers will address ways to ensure food safety and security and also to reduce your water use, energy use, and wastewater loading.

Additionally, you will have the opportunity to learn more about experts at the University of Minnesota who can provide assistance to your facility.

The event will be held on Tuesday, May 25, 2010, in the Food Science and Nutrition Building on the University of Minnesota's Saint Paul Campus.

Registration begins at 8:30 a.m. and presentations will wrap up at 3:00 p.m.

To learn more about the speakers and topics for this symposium, visit <www.fscn.cfans.umn.edu/> or call MnTAP at 612.624.1300. ■

Eight interns gear up for summer projects

This year, interns will be investigating energy efficiency and waste reduction measures for eight Minnesota companies. The interns will be responsible for developing effective solutions to help their facilities save costs, reduce regulatory compliance burden, and decrease environmental impacts. The 2010 intern projects include:

- **3M, Saint Paul:** Evaluate fume hoods for energy efficiency and recommend changes/upgrades to increase efficiency.
- **ConAgra Foods, Hastings:** Evaluate and recommend solutions for energy efficiency in process equipment.
- **Consolidated Precision Products, Bloomington:** Evaluate energy efficiency of exhaust fans, lighting, and electric and natural gas melters and heat treat ovens.
- **General Mills, Golden Valley:** Determine feasibility and specification criteria for solvent recovery and reuse.
- **Malt-O-Meal, Northfield:** Address compressed air, steam, cooling water, and other areas for energy efficiency.
- **ME Elecmetal, Duluth:** Evaluate heat loss and energy efficiency of heat treat ovens, ladles, and other natural gas uses; investigate air vacuum and compressor systems.
- **Melrose Dairy Proteins, Melrose:** Address product recovery opportunities as well as water reuse potential.
- **Valley Craft, Lake City:** Investigate phosphate-free, low-temperature conversion coatings for paint line.

Of the eight interns, three will primarily address pollution prevention opportunities, while the other five will be more focused on energy efficiency.

This year, Xcel Energy has partnered with the MnTAP intern program to offer its customers the opportunity to participate in the program. Companies participating through the Xcel Energy partnership will receive a MnTAP intern at no cost and the intern will focus solely on energy efficiency opportunities. Two of the companies participating this year, Malt-O-Meal and 3M, are funded through this partnership. Additionally, Xcel Energy is providing partial sponsorship of the interns at ConAgra Foods and Consolidated Precision Products.

The MnTAP intern program has been successfully completing projects for businesses for 25 years. Over the past four years, MnTAP interns have helped participating businesses realize savings of over \$1.2 million from implemented solutions. These companies have cumulatively improved their environmental impact by reducing over 60,000 pounds of waste, 23 million gallons of water, 13.4 million kWh, and 167,000 therms.

The 2010 interns will be presenting their projects at a public forum on August 19, 2010, at the University of Minnesota. For more information about the intern program, visit MnTAP's web site at <www.mntap.umn.edu> or contact Krysta Larson, 612.624.4697. ■

Celebrating success in 2009 and 25 years of service in 2010

In 2009, MnTAP successfully helped several Minnesota businesses with their waste and energy reduction projects. Through site visits, intern projects, facilitated teams, and other technical assistance measures, MnTAP helped companies achieve savings of over \$1 million and substantially reduce their environmental impact.

Companies who hosted intern companies, participated in site visits, and facilitated teams implemented a number of recommendations made by MnTAP staff members. Implementation resulted in reductions of 748,000 pounds of waste, 13,400 pounds of air emissions, 3.8 million pounds of wastewater loading, 17.6 million gallons of water, 1.7 million kWh, 98,000 therms, and 4 million pounds of carbon dioxide emissions.



Activities associated with the Materials Exchange program resulted in 512,000 pounds of waste diverted from the landfill, saving companies \$295,000.

In 2010, MnTAP is celebrating 25 years of providing assistance to Minnesota businesses. Since its inception in 1985, MnTAP has helped companies realize reductions of 383.6 million pounds of waste, 446.5 million gallons of water, 33.6 million kWh, and 1.2 million therms. Overall, companies have saved over \$29 million.

To mark the occasion, an open house is planned following the intern presentations on August 19 at the McNamara Alumni Building at the University of Minnesota. For more information, visit the MnTAP Web site at <www.mntap.umn.edu>. ■



Materials Exchange 2009 Annual Report

The Minnesota Materials Exchange program lists one company's unwanted material and makes it available for use

by another company. For more information, call MnTAP at 612.624.1300 or 800.247.0015.

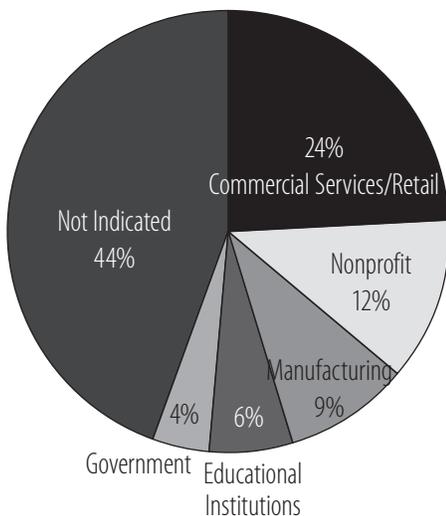
2009 Goal

Annually achieve 337 exchanges for an estimated 600,700 pounds (300 tons) exchanged and add six additional continuous exchanges.

2009 Accomplishments

Materials exchange staff responded to 138 calls and helped facilitate 10,381 Web self-referrals to the online database. Web site and database support continued (with ongoing enhancements) for the eight local exchange sites: St. Louis County, WLSSD, West Central, North Central, Chisago County, Otter Tail County, Southwest, and Southeast. New outreach materials were developed and can be customized for each Alliance site. Chisago County used a new flier in 2009 to promote their program.

Use of the materials exchange at all Alliance sites resulted in a total of 207 exchanges of 511,687 pounds (256 tons) of solid and hazardous material. Four new continuous exchanges were added in 2009. Overall, exchanges saved companies \$294,934 in avoided purchase and disposal costs. MnTAP-covered areas of the state accounted for 66% of the total weight of materials exchanged, and 46% of the cost savings documented.



The top four material categories exchanged include pallets, containers, furniture, and electronics. Materials exchange is utilized by various types of organizations with the greatest number in the commercial services sector including retail, offices, real estate, recyclers, dry cleaners, and others. During 2009, a greater amount of materials were exchanged in the metro area versus out-state areas. Approximately 56% of users were located in the metro area, 43% of users were outside the metro area, and 1% were out of state users.

The twice monthly e-mail containing the newest listings continues to be a popular service. Currently, the e-mail is disseminated to 4,067 e-mail addresses.

MnTAP continues to support the eight statewide local exchanges through the Minnesota Materials Exchange Alliance by maintaining the Web site and database, verifying listings, and compiling quarterly exchange reports. MnTAP and the local exchanges maximize personal contacts to facilitate exchanges.

Future Plans

- Continue to expand the use of the "new listings e-mail update" to provide timely information and keep materials exchange in front of businesses and other users.
- Request the weight of items when users list items on the Web site to provide more accurate information about items and ease the task of reporting successful exchanges. A list of standard weights will be provided to assist them.
- Survey current materials exchange users to identify potential areas of improvement including the reporting system.
- Initiate a marketing effort for FY11 to increase the use of the service.
- Connect MnTAP's hospitality outreach efforts with Materials Exchange. ■

Help us reduce our impact

If half of the subscribers to the *Source* newsletter opted to receive their pollution prevention and energy efficiency news online rather than in printed form, we could reduce our annual environmental impact by:

- 1,500 lbs CO₂
- 4,300 gallons of water
- 500 lbs solid waste

Subscribe today to receive future issues of the *Source* via e-mail. Simply send your e-mail address to mntap@umn.edu. Past issues are online at www.mntap.umn.edu. ■

Minnesota Technical Assistance Program

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MINNESOTA TECHNICAL ASSISTANCE PROGRAM

UNIVERSITY OF MINNESOTA

The Minnesota Technical Assistance Program (MnTAP) helps businesses and industries develop and implement industry-tailored solutions that maximize resource efficiency, prevent pollution and reduce costs and energy use to improve public health and the environment. As an outreach program at the University of Minnesota, MnTAP provides free technical assistance tailored to individual businesses. By reducing waste and increasing efficiency, companies save on disposal and raw-material costs and make working conditions healthier and safer for employees.

MnTAP is funded primarily by the Minnesota Pollution Control Agency's Prevention and Assistance Division and is located at the University of Minnesota in the School of Public Health, Division of Environmental Health Sciences. The University's mission, carried out on multiple campuses and throughout the state, is threefold: research and discovery, teaching and learning, and outreach and public service.

The University of Minnesota shall provide equal access to and opportunity in its programs, facilities, and employment without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression.



The *Source* is printed with low-VOC agri-based inks on 100% post-consumer recycled, Forest Stewardship Council-certified, process chlorine-free (PCF) paper that is produced with green energy.

Calendar

April 20, 2010. **MnTAP Compressed Air Training Workshop.** Continuing Education Center, University of Minnesota, Saint Paul, MN. 8:00 a.m. – 4:30 p.m. Registration starts at 7:30 a.m. Find out how a compressed air system works and the benefits of optimizing your system's performance, including both supply and demand side. The cost is \$35. For more information contact MnTAP.

April 22, 2010. **Second Annual Sustainability Conference.** Employer's Association, Plymouth, MN. 8:00 a.m. – 4:30 p.m. Theme: Business future and climate change: The greening of the economy. Sponsored by Employer's Association. Contact Chuck Emnett at 763.253.9164 for more information.

April 27, 2010. **Greening Your Business Expo.** Target Field, Minneapolis. 4:30-7:30. This is an opportunity to reach business decision makers who are interested in learning about sustainable products and services for the workplace. Free.

May 4 & 20, 2010. **Emergency Planning and Community Right-to-Know Act Seminar.** New Brighton Public Safety Center, New Brighton, MN. 8:00 a.m. – 3:30 p.m. This seminar covers reporting required the federal Emergency Planning and Community Right-to-Know Act. Sponsored by Minnesota Department of Public Safety and U.S. EPA. \$20. No same day registration. For more information contact Steve Tomlyanovich at 651.201.7417 or steve.tomlyanovich@state.mn.us.

May 25, 2010. **Food Processing Symposium.** University of Minnesota Food Science and Nutrition Building, Saint Paul, MN. 8:30 a.m. – 3:00 p.m. Speakers will address ways to ensure food safety and security and to reduce your waste use, energy use, and wastewater loading. Contact MnTAP for more information.

For more information, visit MnTAP's online calendar at mntap.umn.edu/resources/cal.htm.

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